

# ENVIRONMENTAL IMPACT ASSESSMENT REPORT

## VOLUME III TECHNICAL APPENDICES



**PROPOSED RESIDENTIAL DEVELOPMENT**

**AT**

**Farrankelly, Delgany, Greystones, Co. Wicklow**

**Prepared by**



**In Conjunction with**

**ROD Engineers/Openfield/Byrne Environmental/CSR Landscape Architects/IAC**

**September 2019**

## DOCUMENT CONTROL SHEET

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## **Appendix 13.1 Geophysical Report**

GEOPHYSICAL SURVEY REPORT

FARRANKELLY,

DELGANY

COUNTY WICKLOW

LICENCE NUMBER: 15R0124

09/11/2015

CLIENT:

IAC LTD.





**GEOPHYSICAL SURVEY SUMMARY SHEET  
 FARRANKELLY, COUNTY WICKLOW**

<b>Site Name</b>	Farrankelly, County Wicklow	<b>Ref No.</b>	15028
<b>Townland</b>	Farrankelly	<b>Licence No.</b>	15-R-0124
<b>County</b>	Wicklow	<b>Licence Holder</b>	Joanna Leigh
<b>ITM (centre)</b>	E728470/N710330	<b>Purpose</b>	Pre-planning investigation
<b>Client</b>	IAC Ltd.	<b>Planning No.</b>	NA

<b>Closest RMP</b>	WI013:076	<b>Classification</b>	Habitation Site
<b>ITM</b>	E729133/N710271	<b>Location</b>	c.500m to the west of application area
<b>Townland</b>	Charlesland		

**Current land use**      Application area contained within 8 fields, comprising of: harvested cereal crop, tall pasture or overgrown vegetation.

**Survey Type**      Gradiometer scanning and targeted detailed survey.

**Summary of Results**

Gradiometer scanning identified an area of increased background response in the south-west of the application area, correlating with the location of several curving crop marks identified through aerial photography. Detailed gradiometer survey in this area identified two clear circular ditch-type responses, measuring c.11.25m and 12.25m in diameter and several other responses of potential interest. The circular ditches appear to be contained within a larger ill-defined circular feature (possible enclosure). Increased magnetic response to the south-east of this may represent a spread of burnt material indicative of activity, although natural broad striations in the data are also evident here. To the north-east of the possible circular enclosure there are a cluster of magnetically strong responses. Although no clear archaeological pattern is evident they correlate with the location of a former kiln, marked on historic mapping. It is possible that the remains of this feature are represented here. Scanning and detailed survey throughout the remainder of the application area identified large areas of modern magnetic disturbance and broad natural responses. No further clear responses indicative of archaeological activity were recorded.

**Report Date**      09/11/2015

**Report Author**      Joanna Leigh

## **Geophysical Survey Report Farrankelly, County Wicklow**

### **1 Introduction**

- 1.1 A geophysical survey has been conducted by J. M. Leigh Surveys as part of a pre-planning investigation at a site in the townland of Farrankelly, County Wicklow, to the south of Delgany village. This survey forms part of a wider archaeological study undertaken by IAC Ltd.
- 1.2 The application area totals c.18 hectares. Parts of the application area were unsuitable for geophysical survey, comprising of established woods and dense vegetation. The areas available for survey are contained within 8 fields (Fields 1 – 8). Figure 1 at a scale of 1:2,500 presents a site location diagram.
- 1.3 Recently harvested cereal crop and tall pasture covered much of the application area. There is a gentle rolling topography which slopes steeply in places, towards the Three Trouts River. Much of the site lies in a scenic landscape and raised areas have panoramic views. The highest point is located in the east of Field 5, which has sea views to the north and east.
- 1.4 There are no recorded monuments within the application area. However, archaeological potential in the south-west of Field 3 (Figure 1) was identified by a series of semi-circular crop marks detected through aerial photographic analysis (EIS report, Irish Archaeological Consultancy Ltd. 2015). A clear semi-circular shape can be seen (c. 12m diameter) while a larger arcing semi-circular cropmark (c. 55m diameter) partially encloses the smaller one. In addition, a lime kiln is marked in the south of this field on the First Edition Ordnance Survey map, 1839. The EIS report identified Field 3 as of archaeological potential.
- 1.5 There are thirteen recorded monuments within 500m of the application area. Most of these were identified during archaeological works for residential developments and local road schemes. The monuments recorded suggest a possible Bronze Age landscape, with several ring-ditches, barrows and pits identified.
- 1.6 The main aim of the geophysical survey was to locate and identify any geophysical response that may suggest the presence of archaeological remains within the application area. A preliminary gradiometer scan was undertaken to identify anomalies of possible interest. These were then investigated through detailed gradiometer survey. The survey was conducted under licence 15-R-0124 issued by the Department of Arts, Heritage and the Gaeltacht.



## 2 Survey ground conditions and further information

- 2.1 Survey ground conditions on the whole were suitable, comprising of harvested cereal crop and pasture. Areas in the north-west and north of the site comprised of very steep topography which restricted survey. In addition, overgrown vegetation in the north of the application area also restricted fieldwork.
- 2.2 Post and wire fencing along some of the fields produced localised magnetic disturbance but this did not impact on the overall survey results.

## 3 Survey Methodology

- 3.1 A preliminary gradiometer scan of the available areas was conducted. Anomalies and areas of potential interest were subject to detailed recorded gradiometer survey to investigate the results of the gradiometer scanning and the potential for sub-surface archaeological remains. In total, five areas (Areas A-E) were subject to detailed gradiometer investigation. The location of the detailed survey areas is presented in Figure 2, at a scale of 1:2,500.

### *Preliminary Gradiometer Scanning*

- 3.2 Gradiometer scanning is a fast and effective technique for identifying areas of potential archaeological interest. Scanning is used in conjunction with targeted detailed survey and is effective when assessing large areas.
- 3.3 The gradiometer instrument is set to scanning mode. 10m traverses of the application area are undertaken. The magnetic fluctuations on the instrument display panel are monitored and any anomalies of potential interest observed are marked in the field for further investigation through detailed gradiometer survey. Detailed survey grids are accurately positioned with a GPS VRS instrument.

### *Detailed Gradiometer Survey*

- 3.4 A detailed gradiometer survey detects subtle variations in the local magnetic field and measurements are recorded in nano-Tesla (nT). Some archaeological features such as ditches, large pits and fired features have an enhanced magnetic signal and can be detected through recorded survey.
- 3.5 Data was collected with a Bartington Grad 601-2 instrument. This is a specifically designed gradiometer for use in archaeological



- prospection. The gradiometer operates with a dual sensor capacity making survey fast and effective.
- 3.6 The instrument is calibrated in the field to ensure a constant high quality of data. Extremely sensitive, these instruments can detect variations in soil magnetism to 0.01nT, affording diverse application throughout a variety of archaeological, soil morphological and geological conditions.
- 3.7 All data was collected in 'zigzag' traverses. Grid orientation remained constant throughout each field to facilitate the data display and interpretation. Data was collected with a sample interval of 0.25m and a traverse interval of 1m, providing 1600 readings per 20m x 20m grid. The survey grid was set-out using a GPS VRS unit. Survey tie-in information is available upon request.

#### **4 Data display**

- 4.1 The results of the preliminary gradiometer scan are presented in Figure 1 at a scale of 1:2,500. The location of the subsequent targeted detailed survey is presented in Figure 2, at the same scale.
- 4.2 Figures 3 and 4 present the detailed gradiometer survey in Areas A-D as a summary greyscale image and accompanying interpretation diagram, both at a scale of 1:1,250. The greyscale and interpretation for Area E is presented in Figures 5 and 6, also at a scale of 1:1,250.
- 4.3 Letters in parentheses in the text of the report refer to specific responses highlighted in the detailed gradiometer survey interpretation diagrams (Figure 4 & 6).
- 4.4 The raw gradiometer data was used to aid the interpretation of the results and is displayed as raw data xy-trace plots and greyscale images. This archive data can be provided upon request.
- 4.5 The display formats referred to above and the interpretation categories are discussed in the summary technical information section at the end of this report.

## **5 Gradiometer Scanning Results & Further Information (Figure 1)**

### **Field 1**

- 5.1 Gradiometer scanning in Field 1 was restricted by overgrown vegetation in the north of the field, which was also located on a steep north facing slope. The extent of the vegetation was restricted by a former track-way which curved through the field, heading south to Field 2. A further steep slope in the east of the field was also overgrown. A deep hollowed area in the centre of the field may result from local quarrying and this topographic feature was unsuitable for survey.
- 5.2 No clear anomalies of potential interest were identified in Field 1 and poor ground conditions restricted the available area. No detailed survey was undertaken in Field 1.

### **Field 2**

- 5.3 The former track-way in Field 1 continues into Field 2, running along the western extent of the field. Field 2 is largely level with no clear topographic features, although the ground starts to slope to the north at the northern extent of the field. Field 2 comprised of harvested cereal crop at the time of survey.
- 5.4 Gradiometer scanning in Field 2 identified largely disturbed ground throughout. The disturbance is typical of modern activity and it is suspected that this field was used as the site depot for the newly constructed adjacent housing estate. Detailed survey Areas A and B were positioned here to confirm the modern disturbance.

### **Field 3**

- 5.5 Field 3, which comprised of harvested cereal crop, has a natural raised area in the south of the field. Electricity posts and overhead cables traverse the field and are parallel to the change in slope, where the topography drops steeply then gently slopes to the north.
- 5.6 The previously identified crop marks are located within the raised area in the south of the field. Gradiometer scanning identified a clear increase in background response and clusters of anomalies of potential archaeology throughout the south of the field. Detailed gradiometer Area C was positioned across the raised area and extended throughout Field 3 to fully investigate the potential for archaeological remains here.

**Field 4**

- 5.7 Field 4 was subdivided into three by broken post and wire fencing. The northern half of the field comprised of long pasture and has a steep north facing slope. The western extent, also pasture, has a steep west facing slope. The southern part of the field is level with no distinct topographical features and comprised harvested cereal crop at the time of survey.
- 5.8 Gradiometer scanning in Field 4 identified no clear anomalies although a broad spread of increased background response was observed in the south-east of the field. Detailed survey Area D was positioned here to investigate.

**Field 5**

- 5.9 Field 5, located in the east of the application area, comprises of a rolling topography which predominantly slopes downwards to the west. The highest point is located in the east of the field, with vistas overlooking the coastline and Irish Sea. Gradiometer scanning in the south of Field 5 identified more magnetic disturbance, similar to that in Field 2. The magnetic background in the eastern half of Field 5 presented no magnetic disturbance and no clear anomalies of interest. Detailed survey Area E was positioned in the east of Field 5 to test the absence of anomalies.

**Field 6**

- 5.10 Field 6 comprised of pasture and was notably difficult to scan due to the near vertical north facing slope. No anomalies were detected and magnetic disturbance indicative of modern pipes was observed in the west and east of the field. No detailed survey could be positioned here due to the extreme slope.

**Field 7**

- 5.11 Field 7 forms part of a lawn area. Modern magnetic disturbance from landscaping was noted and no detailed survey was conducted here.

**Field 8**

- 5.12 Field 8, immediately adjacent to a watercourse, is susceptible to flooding and was notably wet at the time of survey. Modern disturbance resulting from drains leading into the watercourse resulted in significant magnetic disturbance across the field. This area was not deemed suitable for detailed gradiometer survey.

## 6 Detailed Survey Results

### Areas A & B

6.1 Detailed survey in Areas A and B confirmed the results of the scanning. The data comprises of large magnetic disturbance. No archaeological information can be derived from these results and it is possible that subtle archaeological features remain undetected. The magnetic disturbance may mask any responses indicative of archaeology in Field 2.

### Area C

6.2 Detailed survey in Area C has identified responses of clear archaeological potential. The responses correlate with crop marks identified through aerial photographic analysis.

6.3 Responses of interest are located in the south of Field 3, across the natural raised level area. Two clear circular responses (1) are indicative of circular ditched archaeological features. The two circles are c.8m apart east to west. The eastern circle measures c.11.25m and the western one measures c.12.25m.

6.4 To the north of the responses (1) there is a faint circular negative response (2). This is barely discernable in the data and may reflect natural variations. However, an archaeological interpretation must also be considered. The negative signature may suggest a banked circular feature, or represent a significantly plough damaged feature. Although interpretation is cautious this trend may be of archaeological origin.

6.5 Enclosing the circular responses (1) and the negative trend (2) are a series of positive and negative trends (3). These are ill-defined but may represent a bank (negative trend) and ditch (positive trend) outer enclosure measuring c.55m. This is speculative but must be considered.

6.6 An area of increased magnetic responses (4) appears to extend to the south-east from (3). This may represent an area of activity and spread of material. Although this is poorly defined it is possible that archaeological features, such as pits and burnt spreads, are located within the increased response.

6.7 The extent and origin of (4) is confused by a broad spread of magnetic response (5). This is indicative of natural variations. Similar responses (6) and (7) have a

similar orientation and have no clear archaeological form. These responses are interpreted as natural in origin.

- 6.8 To the immediate south of (7) there is a cluster of responses (8). Although there is no clear pattern the responses have a magnetic signature indicative of burnt features. It is speculated that the responses represent large pits or perhaps the remains of a lime kiln, as indicated on historic mapping in this area. These responses are considered to be of interest.

#### **Area D**

- 6.9 A broad spread of magnetic variation (9) is similar to responses (5), (6) and (7). These are indicative of natural variations.
- 6.10 A broad negative response (10) correlates with the location of an electricity post and is not of archaeological interest.

#### **Area E**

- 6.11 Another broad response (11) orientated north to south has no clear archaeological form and is interpreted as natural in origin.
- 6.12 Ferrous response (12) is located at two manhole covers and is interpreted as modern in origin.
- 6.13 A faint negative linear trend (13) is not thought to be of interest. It is likely that a modern plastic service pipe is represented here.

## 7 Discussion & Conclusion

- 7.1 Gradiometer scanning identified an area of increased background response in the south-west of the application area, correlating with the location of several curving crop marks, previously identified through aerial photography (IAC Ltd 2015).
- 7.2 Detailed gradiometer survey in this area identified two clear circular ditch-type responses, measuring c.11.25m and 12.25m in diameter. There is a circular negative trend to the north which may be of interest, although this may equally be natural in origin. The circular responses appear to be contained within a larger circular feature (possible enclosure). This is represented by faint linear trends and its extent is poorly defined. This suggests the enclosure feature may be significantly plough damaged.
- 7.3 A large spread of increased magnetic background response is evident to the south-east of the possible enclosure. This is suggestive of activity, although a natural broad response here confuses interpretation. Nevertheless, it is possible that burnt spreads and pit type features are located here.
- 7.4 To the north-east of the possible circular enclosure there are a cluster of magnetically strong responses. Although no clear archaeological pattern is evident this correlates with the location of a former lime kiln, marked on historic mapping. It is possible that the remains of this feature are represented here.
- 7.5 Scanning and detailed survey throughout the remainder of the application area identified large areas of modern magnetic disturbance and broad natural responses. No further responses indicative of archaeological activity were recorded.
- 7.6 Consultation with a licensed archaeologist and with the Department of Arts, Heritage and the Gaeltacht is recommended to establish if any additional archaeological works are required.

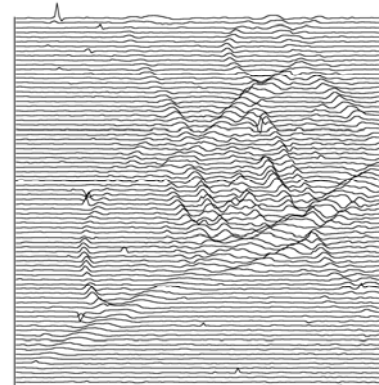
## Technical Information Section

### Data Display & Presentation

#### **Gradiometer Survey**

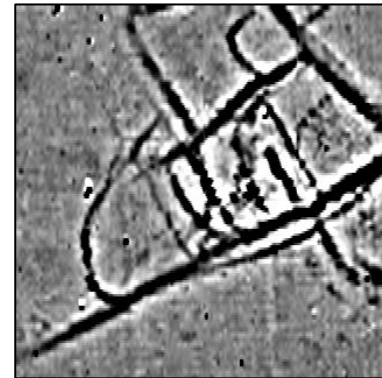
##### **XY Trace**

The data are presented as a series of linear traces, enabling a semi-profile display of the respective anomalies along the X and Y-axes. This display option is essential for distinguishing between modern ferrous materials (buried metal debris) and potential archaeological responses. The XY trace plot provides a linear display of the magnitude of the response within a given data set.



##### **Greyscale\***

As with dot density plots, the greyscale format assigns a cell to each datum according to its location on the grid. The display of each data point is conducted at very fine increments, allowing the full range of values to be displayed within the given data set. This display method also enables the identification of discrete responses that may be at the limits of instrument detection. In the summary diagrams processed, interpolated data is presented. Raw data is presented in the archive drawings along with the xy-trace plots.



##### **Interpretation**

An interpretation of the data is made using many of the plots presented in the final report, in addition to examination of the raw and processed data. The project managers' knowledge and experience allows a detailed interpretation of the survey results with respect to archaeological potential.



*\*XY Trace and raw greyscale plots are presented in archive form for display of the raw survey data. Summary greyscale images of the interpolated data are included for presentation purposes and to assist interpretation.*



## **Glossary of Interpretation Terms**

### ***Archaeology***

This category refers to responses which are interpreted as of clear archaeological potential, and are supported by further archaeological evidence such as aerial photography or excavation. The term is generally associated with significant concentrations of former settlement, such as ditched enclosures, storage pits and associated features.

### ***? Archaeology***

This term corresponds to anomalies that display typical archaeological patterns where no record of comparative archaeological evidence is available. In some cases, it may prove difficult to distinguish between these and evidence of more recent activity also visible in the data.

### ***? Industrial***

Such anomalies generally possess a strong magnetic response and may equate with archaeological features such as kilns, furnaces, concentrations of fired debris and associated industrial material.

### ***Area of Increased Magnetic Response***

These responses often lack any distinctive archaeological form, and it is therefore difficult to assign any specific interpretation. The resulting responses are site specific, possibly associated with concentrations of archaeological debris or more recent disturbance to underlying archaeological features.

### ***Trend***

This category refers to low-level magnetic responses barely visible above the magnetic background of the soil. Interpretation is tentative, as these anomalies are often at the limits of instrument detection.

### ***Ploughing/Ridge & Furrow***

Visible as a series of linear responses, these anomalies equate with recent or archaeological cultivation activity.

### ***? Natural***

A broad response resulting from localised natural variations in the magnetic background of the subsoil; presenting as broad amorphous responses most likely resulting from geological features.

### ***Ferrous Response***

These anomalies exhibit a typically strong magnetic response, often referred to as 'iron spikes,' and are the result of modern metal debris located within the topsoil.

### ***Area of Magnetic Disturbance***

This term refers to large-scale magnetic interference from existing services or structures. The extent of this interference may in some cases obscure anomalies of potential archaeological interest.

## **Bibliography**

English Heritage (2008) 'Geophysical guidelines: Geophysical Survey in Archaeological Field Evaluation.' Second Edition.

Gaffney, C. Gater, J. & Ovenden, S. (2006) 'The use of Geophysical Techniques in Archaeological Evaluations.' IFA Paper No. 6'

Gaffney, C & Gater, J (2003). 'Revealing the buried past: Geophysics for Archaeologists.' Tempus Publishing Limited.

National Soil Survey of Ireland (1980) *General soil map second edition (1:575,000)*. An Foras Taluntais

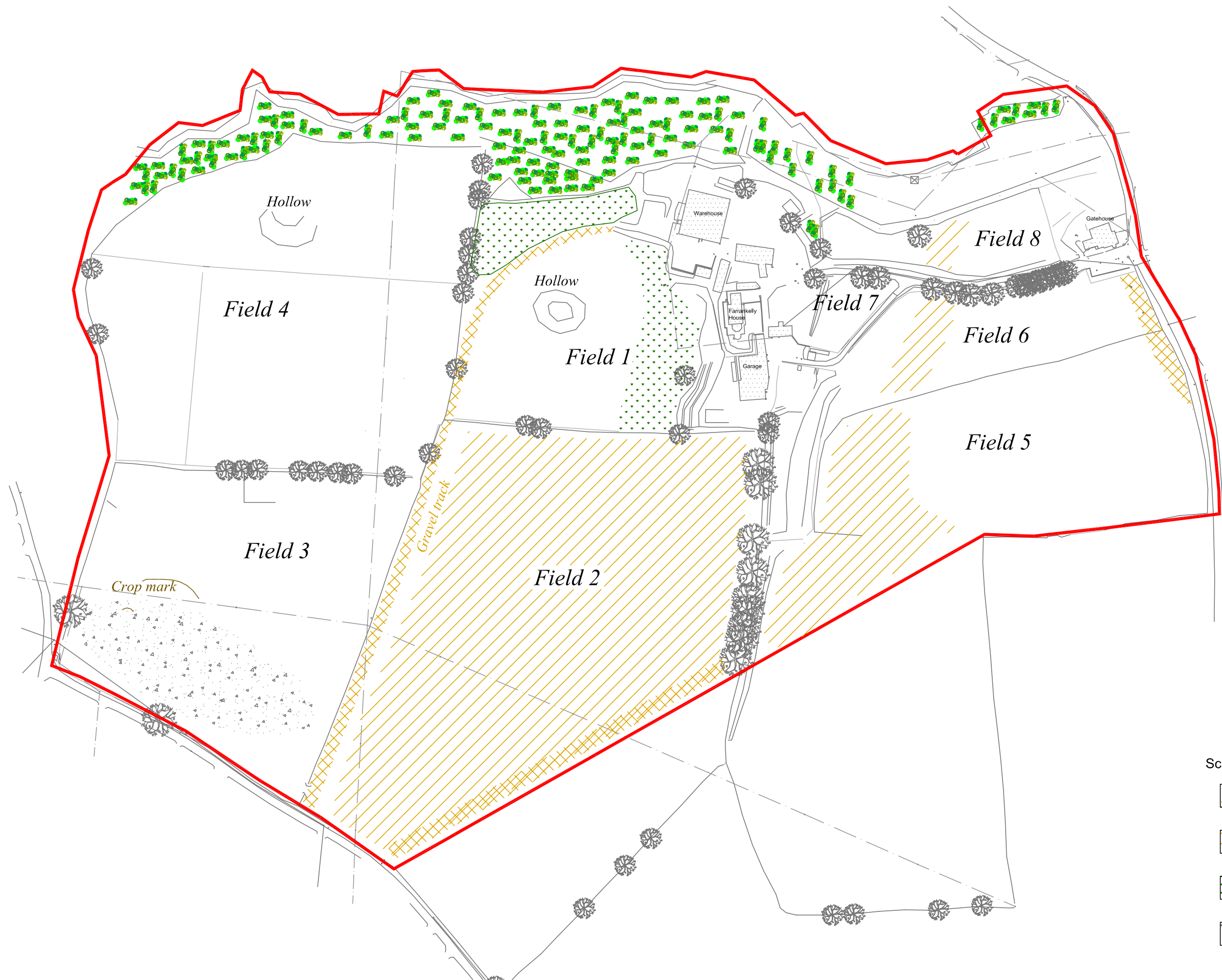
IAC Ltd (2015) Farrankelly EIS Report, unpublished.





**List of Figures**

<b>Figure</b>	<b>Description</b>	<b>Paper Size</b>	<b>Scale</b>
Figure 1	Site Location Diagram	A3	1:2,500
Figure 2	Survey Location Diagram	A3	1:2,500
Figure 3	Summary Greyscale Image: Areas A-D	A3	1:1,250
Figure 4	Summary Interpretation: Areas A-D	A3	1:1,250
Figure 5	Summary Greyscale Image: Area E	A4	1:1,250
Figure 6	Summary Interpretation: Area E	A4	1:1,250

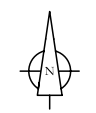
**Archive Raw data Plots**

A1.01	Raw data xy-trace plot: Areas A-D	A0	1:500
A1.02	Raw data greyscale images: Areas A-D	A0	1:500
A1.03	Raw data xy-trace plot: Area: E	A3	1:500
A1.04	Raw data greyscale images Area: E	A3	1:500



- Scanning notes
-  Modern trackway
  -  Modern Magnetic Disturbance
  -  Overgrown Vegetation
  -  Increase in background magnetic response

0 metres 100



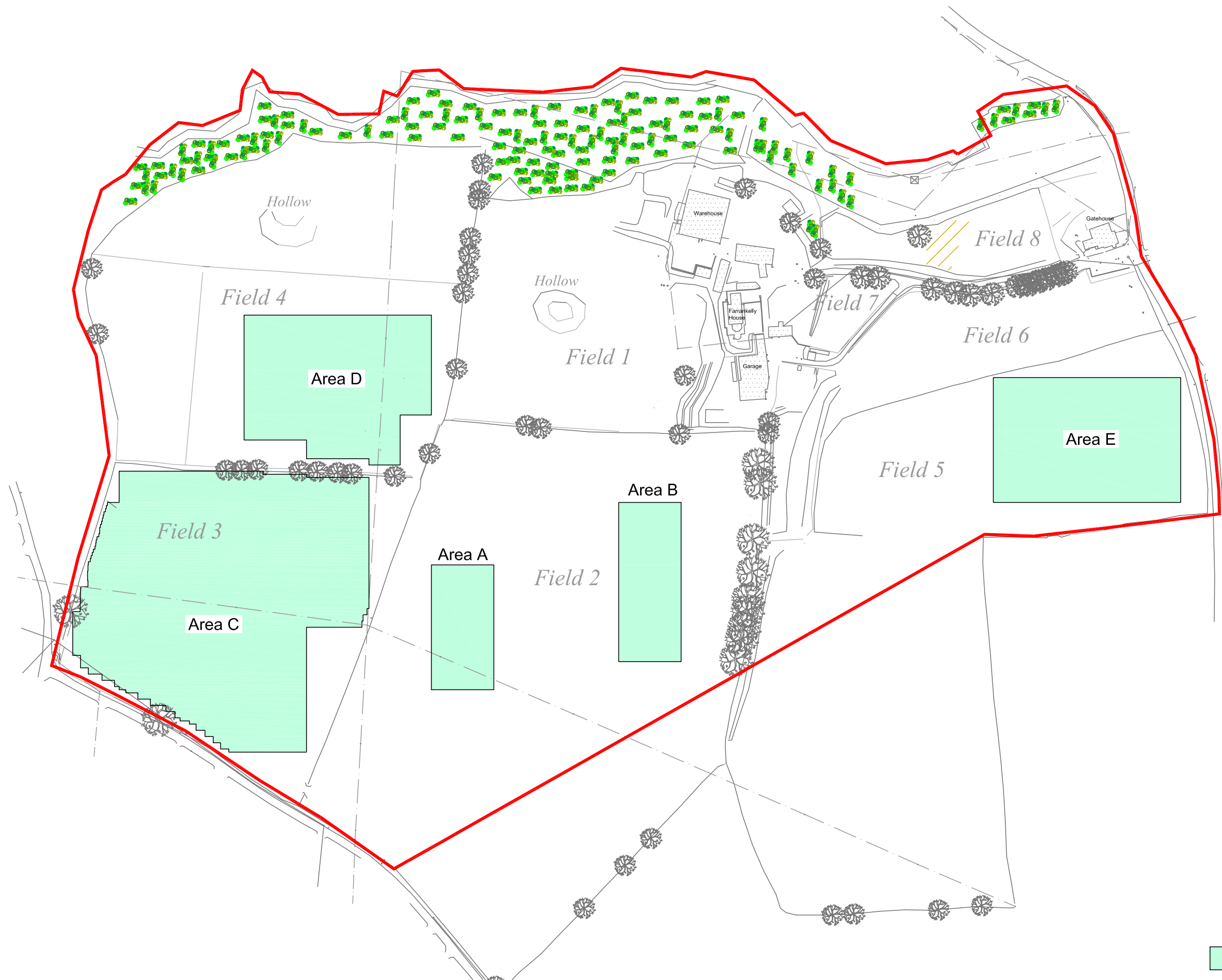
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
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Geophysical Survey:  
Lands at Farrankelly, Delgany,  
County Wicklow

Title:  
Site Location Diagram

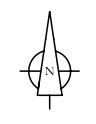
**J.M. Leigh**  
surveys  
www.jmlsurveys.com

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Issue Date: 09.11.2015



 Detailed gradiometer survey

0 metres 100



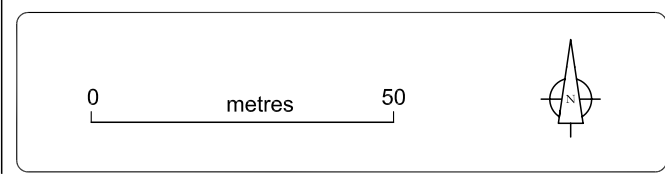
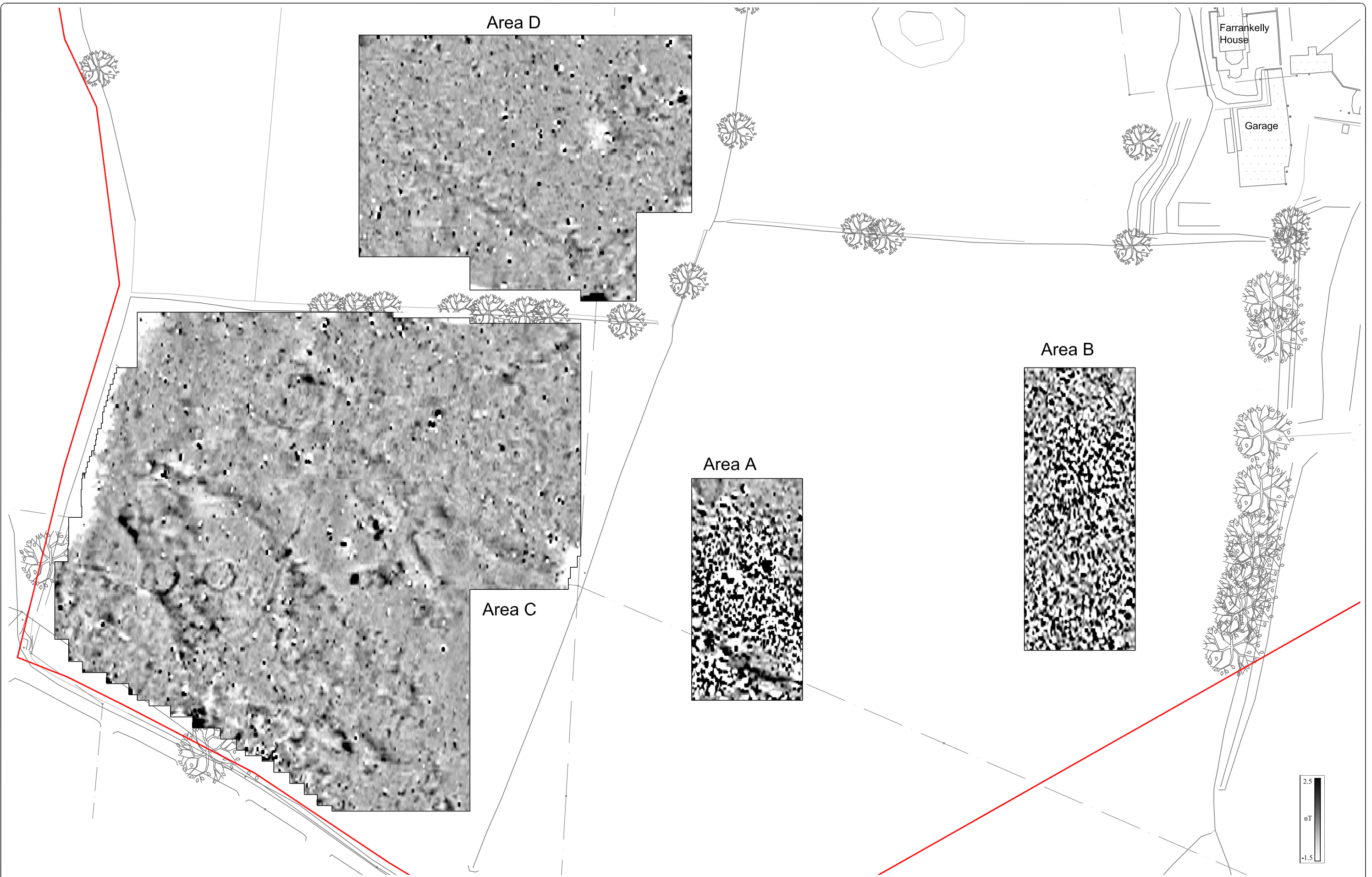
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IAC Ltd.

Project:  
Geophysical Survey:  
Lands at Farrankelly, Delgany,  
County Wicklow

Title:  
Survey Location Diagram

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Scale @ A3: 1:2,500  
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Licence No.: 15-R-0124  
Issue Date: 09.11.2015



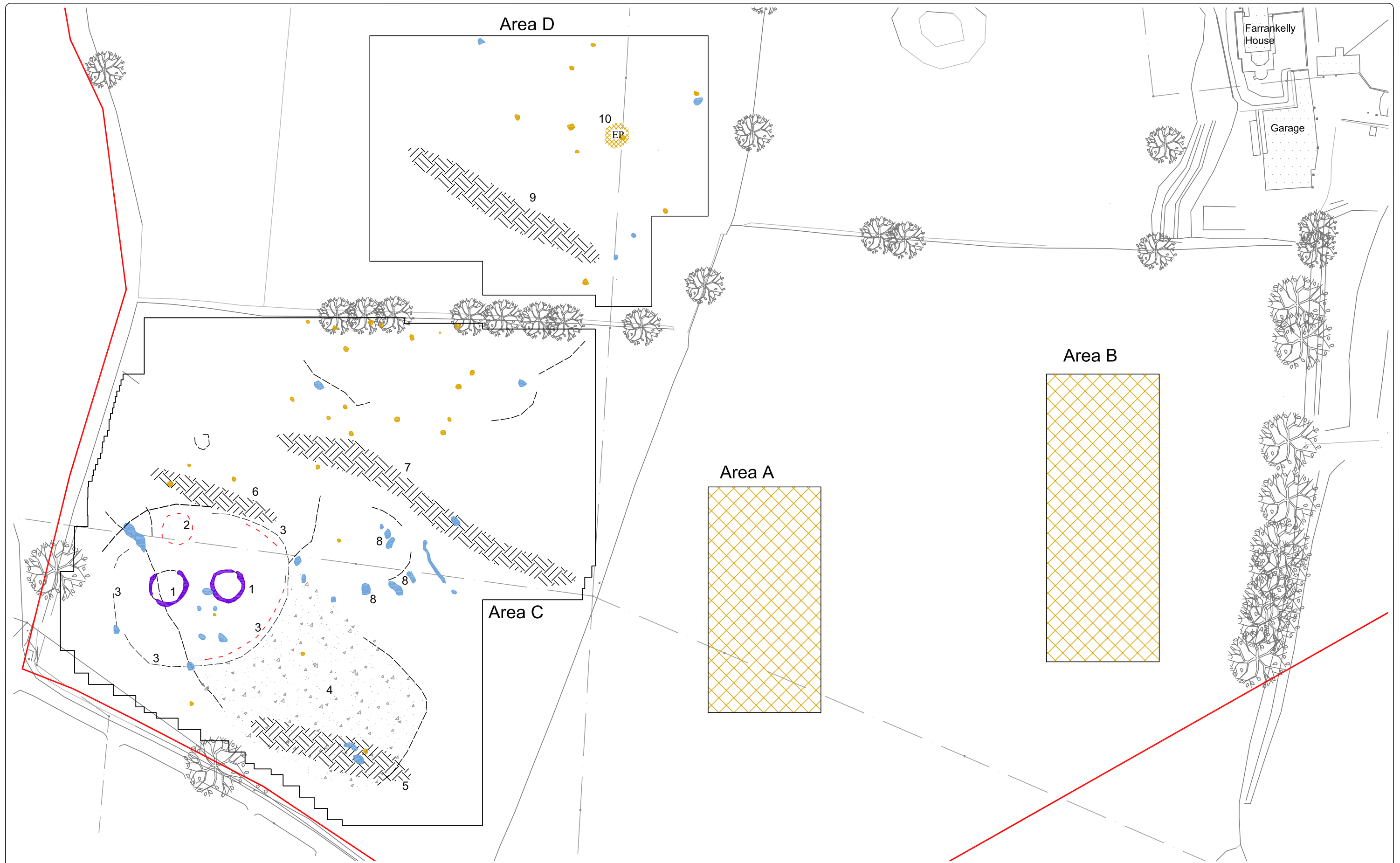
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Project:  
Geophysical Survey:  
Lands at Farrankelly, Delgany,  
County Wicklow

Title:  
Summary Greyscale Image  
Areas A-D

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Scale @ A3: 1:1,250  
Figure: 3  
Licence No.: 15-R-0124  
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- Archaeology - Ditch
- ?Archaeology - Pit / Ditch
- Positive trend
- Negative trend
- Increased magnetic response
- ? Natural variation
- Modern magnetic disturbance
- Modern Ferrous

0 metres 50

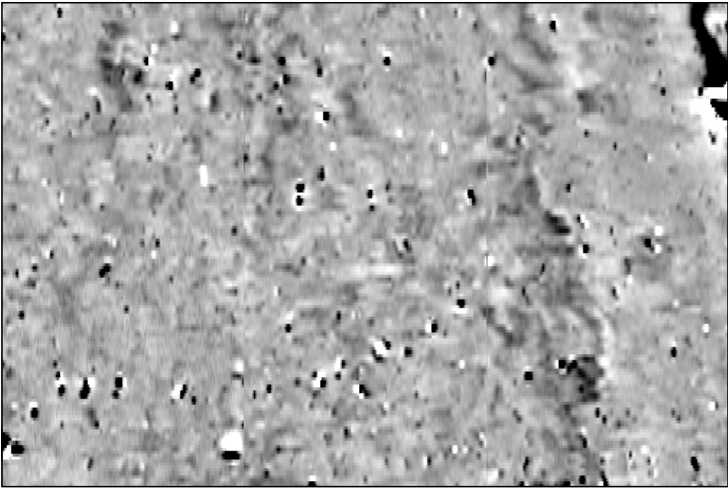
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Project:  
Geophysical Survey:  
Lands at Farrankelly, Delgany,  
County Wicklow

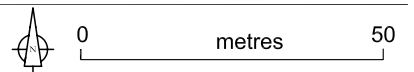
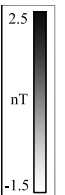
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Summary Interpretation  
Areas A-D

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Issue Date: 09.11.2015

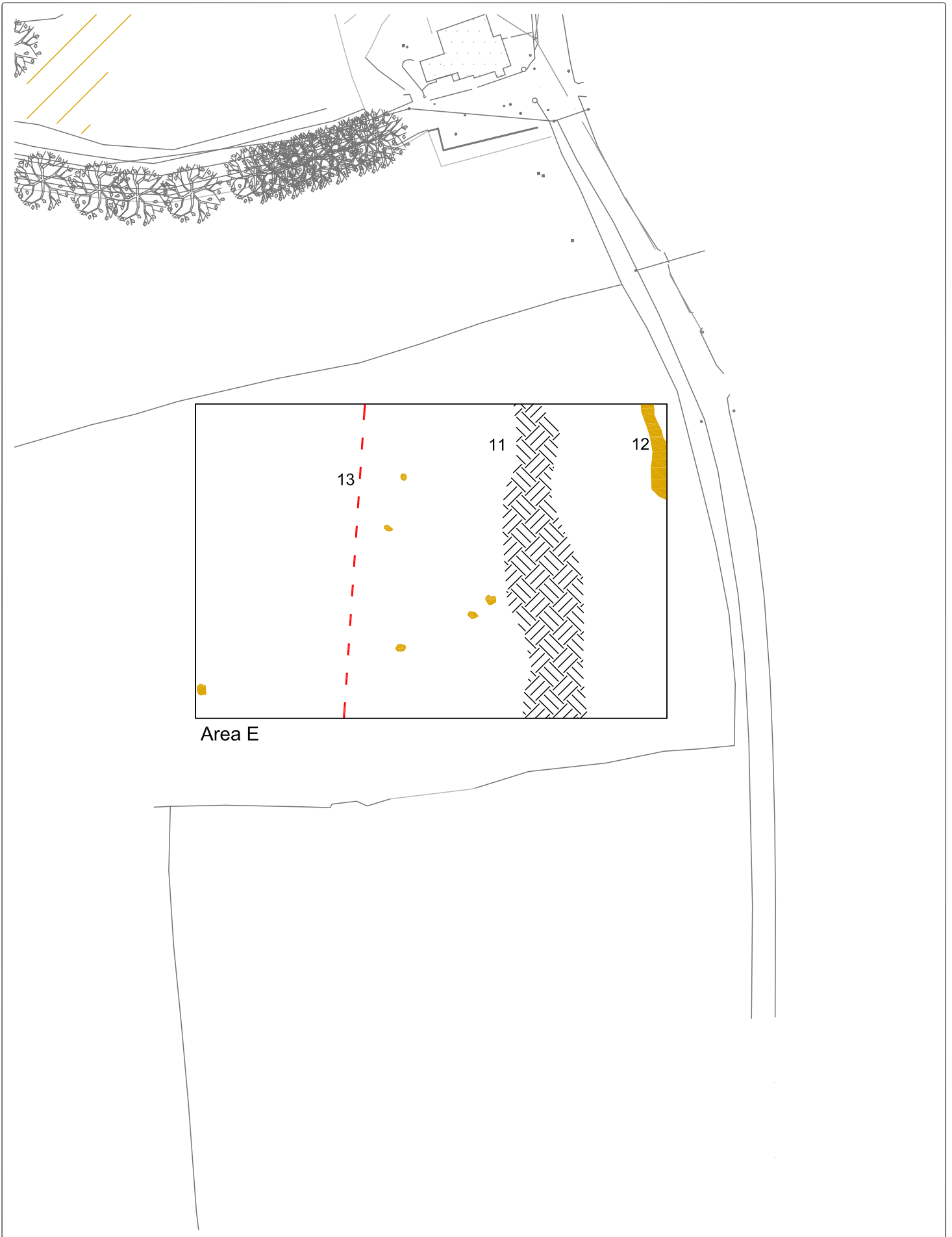


Area E




<p>Client:</p> <p>IAC Ltd.</p>	<p>Project:</p> <p>Geophysical Survey: Lands at Farrankelly, Delgany, County Wicklow</p>	<p>Title:</p> <p>Summary Greyscale Area E</p>	<p><b>J.M.Leigh</b> surveys www.jmlsurveys.com</p>	<p>Scale @ A4: 1:1,250 Figure: 5 Licence No.: 15-R-0124 Issue Date: 09.11.2015</p>
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Area E

 Negative trend - Plastic Pipe

 ? Natural variation

 Modern Ferrous



0 metres 50

Client:  
IAC Ltd.

Project:  
Geophysical Survey:  
Lands at Farrankelly, Delgany,  
County Wicklow

Title:  
Summary Interpretation  
Area E

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Scale @ A4: 1:1,250  
Figure: 6  
Licence No.: 15-R-0124  
Issue Date: 09.11.2015

## **Appendix 13.2 Testing Report**

**ARCHAEOLOGICAL ASSESSMENT  
AT  
FARRANKELLY,  
CO. WICKLOW**

**LICENCE NUMBER: 17E0292**

**FOR: CAIRN HOMES**

**I.T.M.: 728504, 710233**

**LICENCEE: ROB LYNCH  
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## **ABSTRACT**

Irish Archaeological Consultancy Ltd undertook an archaeological test trenching assessment of a proposed residential development at Farrankelly, Co. Wicklow. This assessment was undertaken by Rob Lynch and Enda Lydon of IAC Ltd under licence 17E0292 as part of a pre-planning assessment of the site. Testing commenced on the 26th June and was completed on the 5th July 2017.

A total of 64 trenches were mechanically investigated across the test area. Testing followed on from a geophysical survey of the site, which was carried out as part of an earlier phase of works by Joanna Leigh in 2015 (Licence Ref.: 15R0124).

Prior to testing crop marks had been identified within the southwest corner of the proposed development. Detailed gradiometer survey in this area identified two clear circular ditch-type responses, measuring c.11.25m and 12.25m in diameter and several other responses of potential interest. The circular ditches appeared to be contained within a larger ill-defined circular feature (possible enclosure).

Three areas of archaeology were identified in the testing assessment (Archaeological Areas 1–3). The remains are likely to be Bronze Age in date and are similar to other sites that have been recorded within the surrounding landscape.

### **Archaeological Area 1**

The core of Archaeological Area 1 comprises the two circular anomalies, an outer enclosure and associated features as identified in the geophysical survey and aerial photography in the southwestern portion of the site.

Central to Archaeological Area 1 are two ring-ditches (one c. 15m diameter and one 12.5m diameter) enclosed by an outer enclosure with a projected diameter of c. 50m.

Peripheral archaeological activity to the southeast and north include groups of pits and a ditch representing peripheral archaeological activity that is considered to be associated with the ring-ditches and enclosure.

### **Archaeological Area 2**

Archaeological Area 2 comprises a spread of charcoal-rich material, a possible kiln and a large pit and a group of charcoal-rich pits.

### **Archaeological Area 3**

Archaeological Area 3 comprises two charcoal-rich isolated pits.

Ground disturbances associated with the proposed residential development at Farrankelly would have a permanent and direct negative impact on the archaeology identified in Archaeological Areas 1–3. It is not possible to avoid the archaeological remains within the layout of the proposed development.

While it is recognised that The National Monuments Service of the Department of the Culture, Heritage and the Gaeltacht pursue a policy of preservation *in situ* of archaeological remains where practicable, the nature of this development at Farrankelly does not allow for preservation *in situ*.

It is therefore recommended that Archaeological Areas 1–3 are preserved by record by (archaeological excavation) in advance of development. This should be undertaken under licence to the National Monuments Service of the DoCHG. It is the developer's responsibility to ensure that full financial provision is made available for the required field work and any post excavation works.

It is possible that there may be further negative impacts on previously unrecorded archaeological features or deposits—outside of Archaeological Areas 1–3—that have the potential to survive beneath the current ground level. This will be caused by ground disturbances associated with the proposed development.

It is recommended that all topsoil stripping associated with the proposed development be monitored by a suitably qualified archaeologist. If any features of archaeological potential are discovered during the course of the works, further archaeological mitigation may be required such as preservation *in-situ* or by record. Any further mitigation will require approval from the National Monuments Service of the DoCHG.

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# **1 INTRODUCTION**

## **1.1 GENERAL**

The following report details the results of a programme of archaeological testing undertaken at Farrankelly, County Wicklow, prior to a proposed residential development. This assessment has been carried out to ascertain the potential impact of the proposed development on the archaeological resource that may exist within the proposed development area. The assessment (Licence Ref.: 17E0292) was undertaken by Rob Lynch and Enda Lydon of Irish Archaeological Consultancy Ltd, on behalf of Cairn Homes.

Test trenching commenced at the site on 26th June 2017 and was completed on the 5th July. This was carried out using a 13 tonne 360 degree tracked excavator, with a flat, toothless bucket, under strict archaeological supervision. A total of 64 trenches (totalling 2850 linear meters) were mechanically investigated across the test area.

This is a pre-planning assessment and the results will be submitted with a planning application for the site. Testing follows on from a geophysical survey of the site, which was carried out as part of an earlier phase of works by Joanna Leigh in 2015 (Licence Ref.: 15R0124).

## **1.2 THE DEVELOPMENT**

The proposed development will be residential in nature. A provisional plan of the development is outlined in Figure 3.

## 2 ARCHAEOLOGICAL AND HISTORICAL BACKGROUND

### 2.1 BACKGROUND

The proposed development area is formed by three fields under arable crop, a narrow valley under pasture and a rough field of pasture that has been subject to disturbance by dumping and possible small scale quarrying (Fields 1–4; Plates 1–4).

A total of 13 sites are recorded in the Sites and Monuments Record within a 500m radius (Figure 2). These sites, largely discovered during recent construction works at Charlesland, comprise a significant Bronze Age ritual landscape including two ring-ditches (WI013-077 and WI013-105), an urn burial (WI013-112) and a cremation pit (WI013-113). Three structures dating from broadly the same period have also been excavated in the vicinity of the proposed development area (WI013-076, WI013-114 and WI013-115). Pits, spreads and a kiln of medieval date have also been excavated within 500m of the proposed development area (WI013-111 and WI013-097).

Of the 13 sites, only one is proposed for inclusion at the next revision of the Record of Monuments and Places. This consists of a ring ditch (WI013-105), half of which is preserved outside of the construction corridor of the R774, c. 450m to the south-southeast of the proposed development area.

#### 2.1.1 Prehistoric Period

##### **Mesolithic Period (c. 7000–4000BC)**

The Mesolithic Period (c. 7000-4000BC) is the earliest time for which there is clear evidence for prehistoric activity in Ireland. During this period people hunted, foraged and gathered food and appear to have had a mobile lifestyle. Small numbers of these flakes have been found at Dalkey Island, Dun Laoghaire, Rathfarnham and Loughlinstown to the north and at St. Bride's Head close to Wicklow Town and Brittas Bay to the south. These sites may indicate small-scale transient settlement along the riverbanks and seashores (Stout 1994). There is no evidence for Mesolithic activity in the vicinity of the proposed development.

##### **Neolithic Period (c. 4000–2500BC)**

During the Neolithic period (c. 4000–2400 BC) communities became less mobile and their economy became based on the rearing of stock and cereal cultivation. This transition was accompanied by major social change. Agriculture demanded an altering of the physical landscape. Forests were cleared and field boundaries constructed. There was a greater concern for territory, which saw the construction of large communal ritual monuments called megalithic tombs, which are characteristic of the period. The main focus of Neolithic tomb building in Wicklow is located in the north of the county, close to the Dublin border. There are 20 passage tombs located within this area and most of these are situated above the 240m contour.

A number of pits containing early Neolithic pottery and saddle quernstones were retrieved during excavation in Charlesland (WI013-076) c. 190m east of the proposed

development area. Early Neolithic activity, in the form of two structures, was identified in Killincarrig townland during recent excavations c. 950m east of the proposed development area (Whitty 2011; Licence Ref.: 10E025). Further Neolithic activity in the wider landscape includes early Neolithic habitation sites at Sea Road, Kilcoole, c. 2.5km to the south-southeast (Bennett 2008:1318, Licence Ref.: 06E0670 ext.) and on the shores of the Poulaphuca Reservoir (Corlett 2009).

### **Bronze Age Period (c. 2500–800BC)**

The Bronze Age (c. 2400-800BC) in Ireland was marked by the use of metal for the first time. As with the transition from Mesolithic to Neolithic, the transition into the early Bronze Age was accompanied by changes in society. Megaliths were replaced in favour of individual, subterranean cist or pit burials that were either in isolation or in small cemeteries. These burials contained inhumed or cremated remains and were often, but not always, accompanied by a pottery vessel. Different forms of burial barrows were also being constructed during this period, as well as ceremonial monuments such as henges. Unenclosed cemeteries are also known from this period and are termed 'flat cemeteries'.

Activity during this period is well attested in the archaeological record within the immediate vicinity of the proposed development area. A significant Bronze Age ritual landscape including two ring-ditches (WI013-077 and WI013-105), an urn burial (WI013-112) and a cremation pit (WI013-113) were excavated within 500m to the east and south of the proposed development area. Three structures dating from broadly the same period have also been excavated in the vicinity of the proposed development area (WI013-076, WI013-114 and WI013-114). A substantial early Bronze Age burnt mound was also excavated c. 650m east of the proposed development lands at Farrankelly. This was associated with four troughs and numerous pits and postholes (WI013-079). A set of possible music pipes carved from yew wood were found at the base of the one of the wicker-lined troughs (Molloy, 2004).

Occupation in the Charlesland area continued into the late Bronze Age with several excavated sites dating to this period. A late Bronze Age socketed looped axe and Beaker pottery were retrieved from site WI013-075 c. 670m east-southeast of the proposed development site.

### **Iron Age Period (c. 800BC – AD400)**

Compared to the rest of Irish prehistory, there is very little evidence in Ireland, as a whole, representing the Iron Age. As in Europe, there are two phases of the Iron Age in Ireland; the Hallstatt and the La Tène. The Hallstatt period generally dates from 700BC onwards and spread rapidly from Austria, across Europe, and then into Ireland. The later Iron Age or La Tène also originated in Europe during the middle of the 5th century BC. For several centuries the La Tène Celts were the dominant people in Europe, until they were finally overcome by the Roman Empire. While many ring-ditches may have continued in use into the Iron Age, there are no confirmed Iron Age sites within the vicinity of the proposed development area.

### **2.1.2 Early Medieval Period (AD 400–1100)**

During this period the area surrounding Greystones was located within the territories of the Uí Dúinchada, the ruling branch of which was the Mac Gilla Mo Cholmóc (Simpson 1994). At the time of the Anglo-Norman invasion the ruler Domhnall sided with the Anglo-Normans and as such managed to retain much of his land.

The ringfort or rath is considered to be the most common indicator of settlement during the Early Medieval Period (c. 400–1160 AD). Although there are no definite recorded ringforts within the landscape surrounding the proposed development, there are two enclosures located 135m to the west-northwest (WI013-010) and c. 140m northwest (WI013-009).

### **2.1.3 Medieval Period (AD 1100–1600)**

There are a number of recorded medieval sites within the wider area surrounding the proposed development area. In the 19th century, the Ordnance Survey recorded a possible Anglo-Norman motte or earthwork castle close to the church of Ballynerrin (WI013-011). It is possible that one of the enclosure sites listed to the east-northeast of the development area (WI013-009 and 010) may represent the site of a former castle (Molly 2009, 150). A number of medieval sites have also recently been excavated (2002–2004) in the wider landscape, within 500m to the southeast of the development area. These include field systems, kilns, the truncated remains of an animal enclosure and a moated medieval farmstead (WI013-111).

## **2.2 SUMMARY OF PREVIOUS ARCHAEOLOGICAL FIELDWORK**

A review of the Excavations Bulletin (1970–2016) has revealed that a substantial number of archaeological excavations have been undertaken in the townlands surrounding Farrankelly, although no previous investigations have been carried out within the proposed development lands (with the exception of geophysical survey – please see below). The majority of excavations were carried out in advance of the construction of the Greystones southern access route (GSAR) and the development of residential housing in Charlesland.

Five test-trenches were excavated in 2001, c. 160m to the east of the proposed development area in advance of the construction of extensive housing units. Trenches 1, 3 and 4 revealed curving linear features, one of which contained fragments of prehistoric pottery. Trench 2 revealed burnt mound material. Trench 5 revealed a wide curving ditch over 17m in diameter. It was not possible to correlate exactly the features located during testing with those visible on the aerial photograph, but testing revealed two definite circular enclosures (Bennett 2001:1350, Licence Ref.: 01E1132). Further testing in this area in 2001 and 2002 encountered nothing of archaeological significance (Bennett 2001:1351, Licence Ref.: 01E1133 and Bennett 2002:1963, Licence Ref.: 01E1133).

Two structures with a series of associated pits and postholes were excavated c. 160m to the east off the proposed development area in 2003. These proved to be Bronze Age in date (Bennett 2003:2076, Licence Ref.: 03E0146).

A series of pits, post holes, stake holes, hearths, troughs and burnt spreads were uncovered during topsoil stripping in 2004 c. 300m east of the proposed development area as part of the construction work associated with Charlesland Residential Development (Bennett 2003:2081, Licence Ref.: 03E1188).

The remains of an isolated Bronze Age urn was excavated c. 350m southeast of the proposed development area as part of the construction work associated with Charlesland Residential Development (Excavation Licence 04E0387). Several features of medieval date were also excavated although nothing of a structural nature was found.

A ring ditch, a large cremation pit, two structures and a cluster of pits and postholes were excavated c. 460m to the south-southeast of the proposed development area in 2003 (Bennett 2003:2077, Licence number: 03E0147).

A total of 12 prehistoric pits dispersed over a large area were excavated c. 460m south-southeast of the proposed development area as part of the construction work associated with the GSAR. Six of the pits contained burnt stones suggesting that hearths where stones were heated must have been located in this general vicinity. The excavated pits were not utilised for *in-situ* burning but appear to represent negative features where material derived from adjacent hearths was dumped (Bennett 2004:1864, Licence Ref.: 04E0466).

A curving arc of ditch, two slot-trenches and a number of pits and postholes were excavated c. 480m south-southeast of the proposed development area, prior to the construction of the GSAR. One of the slot-trenches contained a barbed and tanged arrow head and prehistoric pottery and one of the pits contained a fragment of prehistoric pottery (Bennett 2003:2082, Licence Ref.: 03E1550).

Monitoring of road construction work for the GSAR took place between February and March 2004. The GSAR is located c. 490m south of the proposed development area. The roadway traversed the townlands of Farrankelly, Priestsnewtown and Kilpedder East, crossing 12 fields. Four sites were identified and investigated, all of which were located in the townland of Priestsnewtown. The sites included two burnt spreads and several clusters of pits and postholes predominantly prehistoric in date (Bennett 2004:1863, Licence Ref.: 04E0128).

The southern half of a circular ditch (diam. c. 12m) was excavated c. 500m south of the proposed development area. No internal features or finds were uncovered. The remaining half is preserved outside of the road-take. A stone lined hearth was excavated c. 22m to the east (Bennett 2004:1884, Licence Ref.: 04E0467).

### **2.3 CARTOGRAPHIC ANALYSIS**

A review of the historic mapping shows that the proposed development area once formed part of a demesne-like landscape associated with Farrankelly House, which is situated to the north and east of the site. The first edition 6-inch OS map (Co. Wicklow Sheet 13, 1837) shows a lime kiln within the area of the potential prehistoric

enclosures in the southwest corner of the site. This is not marked on later editions and no clear remains were identified within the geophysical survey that may relate to this feature (25-inch OS map, 1911). There are no other major changes to note within the historic cartography that relate to the proposed development area.

#### **2.4 AERIAL PHOTOGRAPHIC ANALYSIS**

A review of the aerial photographic resource has shown that the crop marks of the enclosures are present within the 2013 Google Earth coverage, but are not apparent within the other sources (OSI and Bing Maps). No other features of archaeological potential were noted within the remaining part of the proposed development area.

#### **2.5 SUMMARY OF GEOPHYSICAL RESULTS**

Following the identification of crop marks within the southwest corner of the proposed development area, a geophysical survey was carried out by Joanna Leigh in 2015 (Licence Ref.: 15R0124). Gradiometer scanning identified an area of increased background response in the southwest of the application area, correlating with the location of several curving crop marks. Detailed gradiometer survey in this area identified two clear circular ditch-type responses, measuring c.11.25m and 12.25m in diameter and several other responses of potential interest. The circular ditches appear to be contained within a larger ill-defined circular feature (possible enclosure). Increased magnetic response to the southeast of this may represent a spread of burnt material indicative of activity, although natural broad striations in the data are also evident here.

### 3 ARCHAEOLOGICAL TESTING

#### 3.1 GENERAL

Test trenching took place between 26th June and 5th July 2017, using a 13 tonne 360 degree tracked excavator equipped with a flat, toothless bucket under strict archaeological supervision. A total of 64 trenches were excavated within the area of proposed development (Figure 4). These trenches were positioned to target the key geophysical anomalies identified in the geophysical survey and to provide a representative assessment of the wider development area. Any investigated deposits were preserved by record. This was by means of written, drawn and photographic records.

The test trenches were excavated to determine, as far as reasonably possible, the location, extent, date, character, condition, significance and quality of any surviving archaeological remains threatened by the proposed development. Test trenching was also carried out to clarify the nature and extent of existing disturbance and intrusions and to assess the degree of archaeological survival in order to formulate further mitigation strategies. These are designed to reduce or offset the impact of the proposed development scheme.

#### 3.2 TESTING RESULTS

A total of 59 trenches were originally proposed for excavation across the site, all of which were excavated. In addition to these a further 5 were added (X1–X5) along with extensions to some of the original trenches (Figures 4–8). Within Archaeological Area 1 the natural subsoil was generally a mid to pale brown stony sandy clay and may account for some geophysical survey responses which turned out to be non-archaeological in nature. The topsoil was on average 0.5m deep and comprises a dark brown loam/clay.

TABLE 1: Test Trench Results

TRENCH	LENGTH (m)	WIDTH (m)	DEPTH (m)	ORIENTATION	DETAILS
1	45	2	0.55	North–south	Northeast-southwest drain (Plate 5).
2	25	2	0.6	East–west	Nothing of archaeological interest.
3	25	2	0.5	East–west	Nothing of archaeological interest.
4	14.8	2	0.4	NNE–SSW	Nothing of archaeological interest.
5	45.6	2	0.65–0.7	North–south	Oval pit (C27) containing charcoal. Small pit (C28) containing charcoal and scorched clay.
6	14.8	2	0.65	Northeast-southwest	A northwest–southeast linear feature (C29) ran across the centre of the trench and possibly is the continuation of the northwest–southeast linear C30 in Trench 7 to the south (Plate 6). It measures 1.15m in width and 0.52m deep. A possible pivot stone was recovered from the fill of C29.
7	49.6	2	0.5–0.6	East–west	Linear feature (C30) was recorded 7m from the western end of the trench. It is likely that this represented a continuation of C30 located in

TRENCH	LENGTH (m)	WIDTH (m)	DEPTH (m)	ORIENTATION	DETAILS
					Trench 6 to the north. The end of another north-south orientated linear ( <b>C31</b> ) was identified c. 12m to the east of <b>C30</b> .
8	44.6	2	0.65	North-south	Large oval pit ( <b>C32</b> ) containing charcoal (2.5m in length by 1.83m wide) (Plate 7).
9	15	2	0.55-0.58	Northwest-southeast	Nothing of archaeological interest.
10	15	2	0.35	Northwest-southeast	Nothing of archaeological interest.
11	15	2	0.35-0.4	ENE-WSW	Nothing of archaeological interest.
12	20.1	2	0.42-0.49	Northwest-southeast	A northwest-southeast ditch ( <b>C33</b> ) ran along the length of the trench. It measures c. 20m in length by 1.55m in width by 0.49m in depth (Plates 8 and 9). <b>C33</b> appeared to truncate a possible ring ditch ( <b>C34</b> ). A section through the ditch of <b>C34</b> revealed concave sides and base and measured 0.95m in width by 0.26m in depth (Plate 10). Charcoal and burnt bone noted were recorded in the fill.
13	11.1	2	0.4	Northeast-southwest	An east-west narrow linear feature ( <b>C36</b> ) was recorded near the middle of the trench (Plate 11). Immediately to its south was an oval pit ( <b>C35</b> ) which contained inclusions of charcoal.
14	14.3	2	0.8	Northeast-southwest	A small portion of a northwest-southeast ditch ( <b>C46</b> ) was recorded at the northeast end of the trench. This is the continuation of the ditch exposed in Trenches 15 and X1 to the east and Trench 16 to the north. An irregular shaped pit ( <b>C40</b> ) which contained occasional charcoal flecks was also recorded. It measures 2m in length by 0.52m in width.
15	14.3	2	1	Northeast-southwest	An east-west linear feature ( <b>C39</b> ) was recorded at the northeast end of the trench. Immediately to the south was a large ditch ( <b>C46</b> ) which was also recorded in Trenches X1, 14 and 16 (Plates 12 and 13). A section revealed concave sides and a flat base. It measured 2.4m in width by 1.3m in depth and contained fills with charcoal inclusions.
16	16.1	2	0.5	East-west	A northeast-southwest ditch ( <b>C46</b> ) was identified at the western end of the trench. It is the continuation of the same ditch in trenches X1, 14 and 15. At this location it measured 2.4m in width with charcoal rich bands recorded along its sides. Two pits ( <b>C37</b> and <b>C38</b> ) both with diameters of c.0.95m were recorded c. 3m from the eastern end of the trench (Plate 14). A flint blade and a piece of flint debitage were recorded as surface finds.
17	20.1	2	0.38-0.4	ENE-WSW	A possible ring ditch ( <b>C41</b> ) was recorded 3m from the east end of the trench and was identified again 4m from the west end of the trench. At the



TRENCH	LENGTH (m)	WIDTH (m)	DEPTH (m)	ORIENTATION	DETAILS
					eastern end of the trench it was orientated north-south while its fill contained charcoal and burnt bone. Here it measured up to 1.58m in width. At the western end of the trench it turned southeast-northeast and measured c. 1.5m in width with scorched clay and charcoal inclusions. Three small charcoal rich pits ( <b>C42</b> , <b>C43</b> and <b>C44</b> ) were recorded to the east (Plates 15 and 16).
18	14.6	2	0.6	Northwest-southeast	A large ditch ( <b>C8</b> ) was identified in the northwest half of the trench (Plate 17). This is the continuation of the same ditch recorded in Trench X4 to the north and Trenches X2 and X3 to the southwest. A section revealed concave sides and a flattish base. It measured 3.6m in width by 1.21m in depth.
19	15	2	0.35	North-south	Nothing of archaeological interest.
20	15	2	0.6	Northeast-southwest	Nothing of archaeological interest (Plate 18)
21	50.4	2	0.5	Northwest-southeast	A narrow north northeast-south southwest linear feature ( <b>C9</b> ) was recorded 4m from the northwest end of the trench. A section revealed steep sides and a flat base. A shallow pit ( <b>C10</b> ) was identified c. 7m to the west. In the southeast of the trench two pits ( <b>C11</b> and <b>C12</b> ) and a possible shallow pit feature ( <b>C13</b> ) were recorded.
22	50.7	2	0.5	Northwest-southeast	Three pits ( <b>C3</b> , <b>C4</b> and <b>C5</b> ), a small spread ( <b>C6</b> ) measuring c. 0.2m diameter and a possible stakehole ( <b>C7</b> ) was recorded (Plate 19).
23	14.5	2	0.4	Northwest-southeast	Pit ( <b>C14</b> ) exposed extending 1.08m from the southeast side of the trench and measures 0.15m in depth.
24	11.6	2	0.35	East-west	A charcoal-rich circular pit ( <b>C1</b> ) measuring 0.5m diameter and charcoal rich pit ( <b>C2</b> ) measuring 0.6m diameter were recorded (Plate 20). Small fragments of burnt bone were recorded in this pit.
25	10.6	2	0.45	NNW-SSE	An irregular shaped pit ( <b>C15</b> ) which contained occasional charcoal flecks was recorded in the middle of the trench. A shallow linear feature ( <b>C16</b> ) was identified c. 1m to the south of <b>C15</b> which measures 0.52m-0.85m in width by 0.15m in depth.
26	25.2	2	0.3-0.38	East-west	A single pit ( <b>C44</b> ) was partially exposed c. 3.1m from the western end of the trench. It contains occasional charcoal and some possible heat affected stone.
27	45	2	0.5	North-south	Nothing of archaeological interest.
28	15.7	2	0.6	East-west	Nothing of archaeological interest.
29	75	2	0.3-0.5	East-west	Nothing of archaeological interest (Plate 21).
30	75	2	0.3-0.5	East-west	Nothing of archaeological interest.

TRENCH	LENGTH (m)	WIDTH (m)	DEPTH (m)	ORIENTATION	DETAILS
31	75	2	0.5	East–west	Nothing of archaeological interest.
32	73.7	2	0.25–0.4	East–west	Nothing of archaeological interest.
33	50	2	0.55–0.6	North–south	A small pit ( <b>C20</b> ) was recorded 15m from the southern end of the trench. Two pits ( <b>C21</b> and <b>C22</b> ) were recorded immediately to the north of <b>C20</b> . A large charcoal rich pit ( <b>C23</b> ) containing scorched clay inclusions was identified c. 6.5m to the north of <b>C22</b> (Plate 22).
34	49.3	2	0.6	East–west	Nothing of archaeological interest.
35	46.3	2	0.6	East–west	Nothing of archaeological interest. Two northeast–southwest plough furrows were noted c. 15m from the western end of the trench.
36	25	2	0.6	North–south	Nothing of archaeological interest.
37	38.6	2	0.7	East–west	Nothing of archaeological interest. A single northeast–southwest plough furrow was noted c. 5m from the western end of the trench. It measures 0.35m in width by 0.12m in depth.
38	73.6	2	0.6	East–west	Nothing of archaeological interest.
39	25	2	0.6	North–south	Nothing of archaeological interest.
40	50	2	0.5	East–west	Nothing of archaeological interest.
41	49	2	0.6	East–west	Nothing of archaeological interest. A single east–west plough furrow was noted.
42	75	2	0.6	North–south	Nothing of archaeological interest.
43	75	2	0.6	North–south	Nothing of archaeological interest.
44	75	2	0.5–0.6	North–south	A large irregular shaped spread of burnt material ( <b>C19</b> ) was recorded in the southern end of the trench (Plate 23). It measures c. 10.5m (north–south) by 8m (east–west) by 0.18m in depth (where investigated). It was truncated by modern disturbance to the southeast.
45	74.2	2	0.45	North–south	A possible kiln ( <b>C17</b> ) was recorded c. 15m from the northern end of the trench (Plate 24). It comprised of black charcoal rich clay which was bounded by a ring of red scorched clay. It measures 1.35m by 1.1m.
46	73.6	2	0.75	North–south	A large pit ( <b>C18</b> ) measuring 3m in length by 2.4m in width by 0.3m in depth was recorded.
47	75	2	0.8	North–south	Nothing of archaeological interest.
48	72.9	2	0.85	East–west	Nothing of archaeological interest. A treebole was noted c. 20m from the eastern end of the trench.
49	48.8	2	0.7	East–west	Nothing of archaeological interest.
50	97.3	2	0.6–0.9	East–west	An east–west ditch ( <b>C26</b> ) was recorded at the western end of the trench. (Plate 27)
51	100	2	0.9	East–west	Nothing of archaeological interest.
52	98	2	0.7	East–west	Two small oval pits ( <b>C24</b> and <b>C25</b> ) (Plates 25 and 26).

TRENCH	LENGTH (m)	WIDTH (m)	DEPTH (m)	ORIENTATION	DETAILS
53	100	2	0.45–1.1	Northeast–southwest	Nothing of archaeological interest. A dump of modern concrete rubble was noted c. 16m from the southwest end of the trench.
54	75	2	0.75–1.5	North–south	Nothing of archaeological interest. The northern portion of the trench had modern disturbance with occasional deposits concrete noted.
55	72.9	2	0.45–0.78	North–south	Nothing of archaeological interest.
56	50	2	0.45–0.9	North–south	Nothing of archaeological interest.
57	50	2	0.4–0.9	North–south	Nothing of archaeological interest.
58	46.4	2	0.45–1.2	North–south	Nothing of archaeological interest.
59	48.7	2	0.5	North–south	Nothing of archaeological interest.
TRX1	6.4	2	0.6	NNW–SSE	An east–west portion of a ditch <b>C46</b> was recorded for 0.8m into the trench from the northern end of the trench. <b>C46</b> continued roughly northwest where it was identified in Trenches 14, 15 and 16. A NNE–SSW ditch ( <b>C45</b> ) measuring 1.05m in width by 0.75m in depth ran diagonally across the trench. It appeared to truncate <b>C46</b> .
TRX2	10.9	2	0.7–0.8	Northwest–southeast	A northeast-southwest portion of <b>C8</b> was recorded in the southeast half of the trench (Plate 28). It measures c. 2.5m in width and was also noted in Trenches X3, X4 and 18 to the northeast.
TRX3	8.4	2	0.7	Northwest–southeast	A northeast to southwest portion of a wide ditch ( <b>C8</b> ) was identified in the centre of the trench. It measures 3.1m wide at this location and was also recorded in Trench X2 to the south east and Trenches 18 and X4 to the northeast.
TRX4	12.7	2	0.48	WNW–ESE	A north–south ditch ( <b>C8</b> ) measuring 3.4m in width was recorded in the central portion of the trench. This ditch was recorded in Trenches 18, X2 and X3 to the southeast.
TRX5	16.3	2	0.42	Northeast–southwest	Nothing of archaeological interest.

### Archaeological Features

Three areas of archaeology were identified in the testing assessment (Archaeological Areas 1–3).

#### Archaeological Area 1

The core of Archaeological Area 1 comprises the two circular anomalies, an outer enclosure and associated features as identified in the geophysical survey and aerial photography in the southwestern portion of the site (Figure 5; Plates 5–20 and 28). The circular geophysical anomalies (1<sup>1</sup>) which were identified by geophysical survey as

<sup>1</sup> These refer to the Geophysical Survey reference numbers

possible circular ditches were tested by Trenches 12 and 17. These were found to represent ring-ditches (Ring-Ditch C34 and Ring-Ditch C41).

Ring-Ditch C34 is c. 15m in diameter and is defined by a ditch measuring 0.95m–1.2m wide. It corresponds to the western circular response (1) as identified in the geophysical survey. An east–west extension to Trench 12 was excavated to investigate the ring ditch further as the northern return of C34 was not identified within the trench. At this location an excavated section revealed concave sides and base with a depth of 0.3m. The fill of this ditch comprises sands/clays with charcoal and burnt bone.

A faint circular negative response (2), possibly representing a banked feature or alternatively variations in the natural subsoil, was identified in the geophysical survey to the north of C34. This area was not tested as it lay within the exclusion zone of overhead power lines.

Ring-Ditch C41 is c. 12.5m in diameter and is defined by a ditch measuring 1.4m–1.6m in width. It corresponds to the eastern circular geophysical response (1). Its fill is similar to that of C34, comprising of sandy clays with concentrations of charcoal and burnt bone. Three small pits (C42, C43 and C44) were identified in the interior of this ring-ditch. Each contained charcoal-rich soils and measure 0.24m–0.31m in diameter. These may represent the remains of a truncated structure within the ring-ditch or alternatively they could represent truncated cremation pits.

Both ring-ditches are enclosed by an enclosure as identified in Trenches 18, X2, X3 and X4 as a large ditch (C8). This partially respects the large enclosing geophysical anomaly (3) which was highlighted by geophysical survey as a potential ditched and banked circular feature. This also corresponds to crop marks identified in aerial photography. A section through this ditch in Trench 18 revealed it to be 3.6m wide and 1.2m deep. Its fills comprise of pale to mid-brown clays with charcoal inclusions. The eastern component of this enclosure is in line with the geophysical results however the southern and western components are unclear. It is projected that the overall diameter of the enclosure is 50m while it was recorded for c. 26m during testing.

To the southwest of C8 a wide curving ditch (C46) was identified in Trenches 14, 15, 16 and X1 and turned clockwise west-northwest direction for c. 18m. It is 2.4m wide and filled with pale to mid brown clays which contained some concentrations of charcoal. A section through this ditch in Trench C15 revealed that the ditch has concave sides and a flattish base with a slight stepping noted along the top of the northern side. While C46 does not correspond with the geophysical response (3) it does consistently share the same width (2.4m) of C8 as recorded in Trench X2.

A narrow linear feature and two large pit features (C37 and C38) were recorded immediately to the north of ditch C46 within Trench 15. They measured c. 1m in diameter and may represent internal features of the large enclosure.

To the northwest of C46, a 2m wide ditch (C33) was recorded for c. 20m within Trench 12. While it was not recorded on geophysical survey it appeared to truncate the Ring-Ditch C34 and may also be the continuation of the ditch C46. Both of which may indicate a multi-phase use of the site.

#### *Peripheral Features*

To the southeast of the enclosure groups of isolated pits (C1–C7, C10–C15) and linear features (C9 and C16) were identified in Trenches 21–26. These potentially represent peripheral, but associated, archaeological activity associated with the ring-ditches/enclosure. Charcoal-rich pits (C27, C28 and C32) and the linear ditch C29/C30 were also identified to the north in Trenches 5, 6, 7 and 8. To the southwest of the enclosure two pits (C35 and C40) and a linear feature (C36) were also identified. This again may represent peripheral archaeological activity that is considered to be peripheral archaeological activity associated with the ring-ditches and enclosure.

### **Archaeological Area 2**

Archaeological Area 2 comprises a spread of charcoal-rich material (C19) identified in Trench 44 and a distinct group of archaeological pits (C20–C23 and C18) in Trenches 33 and 46 (Figure 6; Plates 21–24). The spread (C19) measures c. 10m length and 8m in width while an exploratory slot showed its depth as 0.28m. In addition to these a possible kiln measuring c. 1.3m in diameter was identified in the northern end of Trench 45. Finally a large pit (C18) measuring 3m in length by 2.4m in width by 0.3m in depth was recorded in Trench 46.

### **Archaeological Area 3**

Archaeological Area 3 comprises two charcoal-rich isolated pits (C24 and C25) and a shallow ditch (C26) (Figure 7; Plates 25–27). The pits identified were identified in Trench 52 and ranged in size from c. 0.65m-1m in diameter. A ditch (C26) was recorded in Trench 50 and likely represents the remains of a post-medieval field boundary.

## **3.3 CONCLUSIONS**

Testing at Farrankelly has identified three area of archaeology across the proposed development area the most extensive of which is Archaeological Area 1 in Field 3. This area is defined by two ring-ditches and outer enclosure with associated pits and other archaeological features as previously identified in aerial photography and geophysical survey. It is possible that the ring-ditches are prehistoric (possibly Bronze Age) in date and as the outer enclosure respects these it is suggested that this is contemporary.

Archaeological Areas 2 and 3 represent dispersed archaeological activity across the development area some of which may be contemporary with the ring-ditches and enclosure while some features—notably the kiln in Trench 45—are likely to date to the early medieval or medieval period.

The archaeology discovered in this testing assessment is similar in nature to, and possibly an extension of, the recently discovered archaeological sites in the immediate area at Charlesland (see Section 2.2). At Charlesland a significant Bronze

Age ritual landscape including two ring-ditches, an urn burial, a cremation pit, structures, and burnt mounds have been excavated in advance of residential and road development. In this context it would be considered that the archaeology at Farrankelly would be of local significance only.

## 4 IMPACT ASSESSMENT AND MITIGATION STRATEGY

Impacts can be identified from detailed information about a project, the nature of the area affected and the range of archaeological resources potentially affected. Archaeological sites can be affected adversely in a number of ways: disturbance by excavation, topsoil stripping; disturbance by vehicles working in unsuitable conditions; and burial of sites, limiting access for future archaeological investigation.

### 4.1 IMPACT ASSESSMENT

- Ground disturbances associated with the proposed residential development direct and negative impact on the archaeology identified in Archaeological Areas 1–3. It is not possible to avoid the archaeological remains within the layout of the proposed development.
- It is possible that there may be further negative impacts on previously unrecorded archaeological features or deposits—outside of Archaeological Areas 1–3—that have the potential to survive beneath the current ground level. This will be caused by ground disturbances associated with the proposed development.

### 4.2 MITIGATION

- While it is recognised that The National Monuments Service of the Department of the Culture, Heritage and the Gaeltacht pursue a policy of preservation *in-situ* of archaeological remains where practicable, the nature of this development at Farrankelly does not allow for preservation *in-situ*.

It is therefore recommended that Archaeological Areas 1–3 are preserved by record (archaeological excavation) in advance of development. This should be undertaken under licence to the National Monuments Service of the DoCHG. It is the developer's responsibility to ensure that full financial provision is made available for the required field work and any post excavation works.

- It is recommended that all topsoil stripping associated with the proposed development be monitored by a suitably qualified archaeologist. If any features of archaeological potential are discovered during the course of the works, further archaeological mitigation may be required such as preservation *in-situ* or by record. Any further mitigation will require approval from the National Monuments Service of the DoCHG.

**Please note that all recommendations are subject to approval by the National Monument Section of the Heritage and Planning Division, Department of Culture, Heritage, and the Gaeltacht.**

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### **CARTOGRAPHIC SOURCES**

Ordnance Survey maps of County Wicklow 1837, 1911

### **ELECTRONIC SOURCES**

[www.excavations.ie](http://www.excavations.ie) – Summary of archaeological excavation from 1970–2016

[www.archaeology.ie](http://www.archaeology.ie) – DoCHG website listing all SMR sites with aerial photographs

[www.osiemaps.ie](http://www.osiemaps.ie) – Ordnance Survey aerial photographs dating to 1995, 2000 & 2005 and 6-inch/25-inch OS maps.

[www.googleearth.com](http://www.googleearth.com) – Aerial photographs of the proposed development area

[www.bingmaps.com](http://www.bingmaps.com) – Aerial photographs of the proposed development area

## APPENDIX 1 CONTEXTS

CONTEXT NO.	TRENCH NO.	LENGTH (m)	WIDTH (m)	DEPTH (m)	DESCRIPTION
1	24	0.5	0.5	NA	Pit. Sub-circular in plan. It was filled with an orangey brown charcoal rich clay.
2	24	0.6	0.6	NA	Pit. Circular in plan. It consisted of black charcoal rich silty clay and contained occasion fragments of burnt bone.
3	22	0.65	0.5	NA	Pit. Sub-circular in plan. Orientated NE–SW. Filled with a dark brown silty clay with occasional charcoal inclusions.
4	22	0.5	0.2	NA	Pit. Sub-rectangular in plan. (NE–SW). Filled with dark brown silty clay with occasional charcoal inclusions.
5	22	0.85	0.75	NA	Pit. Tear drop shape in plan. Orientated (NW–SE) Extended into northeast baulk. The fill was mid-brown silty clay with concentrations of charcoal.
6	22	0.2m	0.18	N/A	Small charcoal spread. Irregular shape in plan
7	22	NA	0.8 d.	NA	Stakehole. The fill consisted of dark brown silty clay.
8	18, X2, X3, X4	(Total length) 26	2.4–3.6	1.2	Ditch. Curving NE–SW to N–S. Two fills were identified in Trench 18. The upper fill was consistent in the four trenches. Upper fill: Pale to mid-brown sandy clay of friable compaction with occasional to moderate charcoal and occasional stone inclusions (20mm–30mm d.). It measured 0.5m in thickness. Lower fill: Greenish brown silty clay with moderate stone inclusions (20mm–90mm d.). It measured 0.7m in thickness. The cut comprised of gently sloping concave sides becoming steep as it narrowed in towards a flattish base.
9	21	2.15	0.55	0.45	Linear feature. Orientated NNE–SSW. The fill consisted of mid-brown silty clay with occasional charcoal inclusions. It was steep sided with a flattish base.
10	21	0.82	0.45	0.12	Possible pit. Oval in plan. Orientated NNE–SSW. The fill consisted of mid-brown silty clay which contained occasional charcoal inclusions. The cut comprised of gently sloping sides and a concave base.
11	21	0.65	0.5	0.08	Possible pit. Oval in plan. Orientated NNE–SSW. Its fill consisted of mid-brown silty clay with rare charcoal inclusions. The cut comprised of concave sides and an irregular base.
12	21	1.2 m	1.1	0.3	Large pit. Sub-circular in plan. It was filled with mid-brown silty clay. Occasional charcoal inclusions. Concave sides.
13	21	2.15	0.8	0.28	Linear feature. Orientated N–S. The fill consisted of mid-brown silty clay with occasional charcoal and frequent stone inclusions. The fill became more gravelly towards the northern side of the trench. The cut comprised of moderately sloped sides and an uneven base.

CONTEXT NO.	TRENCH NO.	LENGTH (m)	WIDTH (m)	DEPTH (m)	DESCRIPTION
14	21	1.5	1.08	0.15	Possible pit. Roughly orientated E–W. The fill consisted of stony brown silty clay containing rare flecks of charcoal. The cut comprised of concave sides and base.
15	25	1.55	0.85	0.18	Possible pit. Orientated NW–SE. Irregular in plan. The fill consisted of mid-brown silty clay containing occasional charcoal flecks. The cut comprised of concave sides and an irregular base that tapered in towards the middle of the feature.
16	25	2.15	0.52–0.85	0.14	Linear feature. Orientated WNW–ESE. The fill consisted of a mid-brown stony clay fill. The cut comprised of a southern side with a gentle slope at the top which became steep towards the base. The northern side had a steep slope. The base was flattish.
17	45	1.35	1.1	N/A	Possible kiln. It consisted of a black charcoal rich clay which was bounded by a ring of scorched red clay on the N, S and E sides
18	46	3	2.4	0.3	Large pit. Orientated N–S. It predominantly consisted of greyish brown sandy clay of friable compaction and contained moderate charcoal inclusions.
19	44	10.5	8	0.18	Burnt spread. Orientated N–S. Irregular in plan. It consisted of a mid to dark grey clay containing large stone inclusions. It was charcoal rich on the N side with moderate charcoal inclusions to the SW. Modern disturbance was noted impacted upon its SE edge.
20	33	0.25	0.17	N/A	Pit. Sub-circular in plan. It consisted of brown silty clay.
21	33	0.43	0.4	N/A	Pit. Circular in plan. It consisted of black silty clay.
22	33	0.6	0.35	N/A	Pit. Sub-oval in plan. It consisted of black silty clay.
23	33	1.05 d.	N/A	N/A	Large pit. Circular in plan. It consisted of sandy clay that contained frequent charcoal and occasional red scorched clay inclusions. It was dark greyish brown in colour with a pale brown mottling.
24	52	0.66	0.55	0.15	Pit. Sub-oval in plan. Orientated NW–SE. Two fills were noted. The upper fill (0.06m in thickness) consisted of friable greyish brown clayish sand that contained moderate charcoal inclusions. The lower fill was friable mid-brown clayish sand that contained occasional charcoal (0.09m in thickness).
25	52	1	0.97	0.09	Pit. Sub-circular in plan. It consisted of pale brown clayish sand of friable compaction. A concentration of charcoal was noted in the centre of the feature.
26	50	16	0.96	0.25	Shallow ditch. Possibly remains of a field boundary. Orientated ESE. The fill consisted of a mid-brown clayish sand of friable compaction. It contained inclusions of occasional charcoal, occasion stone (0.05m d.) and moderate roots. The cut comprised of concave sides and base.

CONTEXT NO.	TRENCH NO.	LENGTH (m)	WIDTH (m)	DEPTH (m)	DESCRIPTION
27	5	2.6	1.25	N/A	Large pit. It extended into E baulk. It was mid-greyish brown silty clay of firm compaction. It contained occasional charcoal inclusions.
28	5	0.33	0.22	N/A	Pit. Oval in plan. Orientated NW–SE. The fill consisted of mid brown sandy clay of friable compaction. Concentrations of charcoal and occasional scorched clay were also noted. The cut comprised of concave sides and base.
29	6	2.15	1.15	0.52	Ditch. Orientated NW–SE. It consisted of pale brown silty clay that contained occasional charcoal inclusions. The cut comprised of concave sides and base.
30	7	2.15	1.63	0.28	Ditch. Orientated NNW–SSE. The fill was composed of firm mid-brown sandy clay. Occasional charcoal and occasional to moderate sub-round and sub-angular stones (0.03m–0.15m d.) were also noted. The cut comprised of concave sides and a straight base. <b>C30</b> possibly represents the continuation of <b>C29</b> at a point where the ditch faded out.
31	7	0.65	0.45–0.6	N/A	Possible furrow. Orientated NE–SW. It consisted of friable mid-brown clayish sand containing occasional charcoal and stone inclusions (0.05m–0.08m d.).
32	8	2.5	1.83	N/A	Large pit. Orientated ENE–WSW. Extended into E and W baulks. It consisted of firm mid-brown sandy clay which contained occasional to moderate charcoal inclusions.
33	12	20.1	1.55–2.04	0.49	Ditch. Orientated NNW–SSE. Three fills were identified. The upper fill consisted of pale brown stony sandy clay and measured 0.16m in thickness. The middle fill was composed of plastic pale grey silty clay which contained occasional charcoal inclusions and measured 0.24m in thickness. The lower fill was composed of gritty brownish grey clayish sand that measured 0.09m in thickness. A section revealed that its western side was concave and a concave base. <b>C33</b> appeared to cut <b>C34</b> .
34	12	c. 42.4	0.95–1.25	0.26	Ring ditch. Circular in plan. The fill was composed of friable pale brown clayish sand. It contained occasional burnt bone and charcoal inclusions. It appeared to have been truncated by <b>C33</b> . Its cut comprised of concave sides and base.
35	13	0.7	0.6	N/A	Possible pit. It was filled with pale brownish grey sand which contained occasional charcoal inclusions.
36	13	3	0.58	N/A	Linear feature. Orientated E–W. It was filled with friable greyish brown silty sand which contained occasional charcoal inclusions.
37	16	1	0.95	N/A	Pit. Subcircular in plan. It contained a friable mid-brown sandy clay fill.
38	16	0.96	0.7	N/A	Pit. Oval in plan. Its fill consisted of dark brown friable sandy clay which contained occasional charcoal inclusions.

CONTEXT NO.	TRENCH NO.	LENGTH (m)	WIDTH (m)	DEPTH (m)	DESCRIPTION
39	15	2.15	0.7	0.6	Linear feature. Orientated E–W Its fill consisted of friable pale brown sandy clay which contained occasional charcoal inclusions. The cut comprised of concave sides and base.
40	14	2	0.52	N/A	Pit. Irregular in plan. It consisted of firm pale brown sandy clay which contained occasional charcoal inclusions.
41	17	c. 40.2 (length of circumference) c. 12.5 d.	0.8–1.58	N/A	Ring ditch. Circular in plan. Its fill consisted of gritty dark greyish brown silty clay. It contained inclusions of occasional to moderate charcoal, occasional burnt bone, scorched clay and moderate stone (c. 0.03m–0.42m d.).
42	17	0.31 d.	N/A	N/A	Small pit. Circular in plan. Its fill consisted of dark brown charcoal rich clay.
43	17	0.24 d.	N/A	N/A	Small pit. Circular in plan. Its fill consisted of dark brown charcoal rich clay.
44	17	0.28 d.	N/A	N/A	Small pit. Circular in plan. Its fill consisted of dark brown charcoal rich clay.
45	X1	c. 6.15	1.05	0.75	Ditch. Orientated NNE–SSW. Its fill consisted of mid to dark brown stony clay with charcoal inclusions. A grey silt was identified overlying the base. The cut comprised of steep sides that tapered into a concave base. <b>C45</b> appeared to truncate the ditch <b>C46</b> .
46	14, 15, 16, X1	18.1	2.4	1.3	Large ditch. Arcing ENE–WSW clockwise to SSE–NNW. Three fills were identified in Trench 15. The upper fill consisted of pale brown sandy clay which occasional charcoal and moderate stone inclusions. It measured 0.5m in thickness. The middle fill was pale grey silty sand with occasional to moderate stone inclusions. It measured 0.5m in thickness. The lower fill was pale brown sandy clay and measured 0.3m in thickness. In Trench 16 the upper fill consisted of mid brown sandy clay with concentrations of charcoal running along the inside edge on its opposing sides. In Trench 15 the cut comprised of concave sides and a flattish base. A slight stepping noted along top of the northern side.

## APPENDIX 2 FINDS REGISTER

FIND NUMBER	CONTEXT	FULL NAME	MATERIAL	DESCRIPTION
17E0292:1:1	C1	Flint blade	Flint	Flint blade.
17E0292:1:2	C1	Flint flake	Flint	Flint flake
17E0292:29:1	C29	Pivot stone	Stone	Possible pivot stone

### APPENDIX 3 RMP SITES WITHIN THE SURROUNDING AREA

RMP NO.	TOWNLAND:	CLASSIFICATION	DISTANCE TO SITE
WI013-076	Charlesland	Habitation site	c. 190m east
WI013-097	Charlesland	Excavation - miscellaneous	c. 290m east
WI013-112	Charlesland	Urn burial	c. 360m southeast
WI013-098	Charlesland	Kiln - corn-drying	c. 380m east
WI013-111	Charlesland	Excavation - miscellaneous	c. 400m east
WI013-104	Farrankelly	Excavation - miscellaneous	c. 460m south
WI013-105	Priestsnewtown	Ring-ditch	c. 450m south
WI013-110	Charlesland	Fulacht Fiadh	c. 470m east-southeast
WI013-113	Charlesland	Cremation pit	c. 490m south
WI013-114	Charlesland	Structure	c. 490m south
WI013-115	Charlesland	Structure	c. 490m south
WI013-077	Charlesland	Ring-ditch	c. 490m south
WI013-073	Farrankelly	Habitation site	c. 500m south

## APPENDIX 4 STRAY FINDS WITHIN THE SURROUNDING AREA

Information on artefact finds from the study area in County Wicklow has been recorded by the National Museum of Ireland since the late 18th century. Location information relating to these finds is important in establishing prehistoric and historic activity in the study area.

<b>MUSEUM NO</b>	1988:236
<b>TOWNLAND</b>	Killincarrig
<b>PARISH</b>	Greystones
<b>BARONY</b>	Rathdown
<b>FIND</b>	Decorated Viking Ring Pin
<b>FIND PLACE</b>	During metal detecting
<b>DESCRIPTION</b>	No information in file
<b>REFERENCE</b>	NMI

<b>MUSEUM NO</b>	1988:237
<b>TOWNLAND</b>	Killincarrig
<b>PARISH</b>	Greystones
<b>BARONY</b>	Rathdown
<b>FIND</b>	Decorated ring of a small ring brooch
<b>FIND PLACE</b>	During metal detecting
<b>DESCRIPTION</b>	No information in file
<b>REFERENCE</b>	NMI

<b>MUSEUM NO</b>	1988:238
<b>TOWNLAND</b>	Killincarrig
<b>PARISH</b>	Greystones
<b>BARONY</b>	Rathdown
<b>FIND</b>	Bronze Palstave
<b>FIND PLACE</b>	During metal detecting
<b>DESCRIPTION</b>	No information in file
<b>REFERENCE</b>	NMI

<b>MUSEUM NO</b>	1988:239
<b>TOWNLAND</b>	Killincarrig
<b>PARISH</b>	Greystones
<b>BARONY</b>	Rathdown
<b>FIND</b>	Socketed axe
<b>FIND PLACE</b>	During metal detecting
<b>DESCRIPTION</b>	Incomplete bronze socketed axe
<b>REFERENCE</b>	NMI



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## **APPENDIX 5    LEGISLATION                                    PROTECTING                                    THE ARCHAEOLOGICAL RESOURCE**

### **PROTECTION OF CULTURAL HERITAGE**

The cultural heritage in Ireland is safeguarded through national and international policy designed to secure the protection of the cultural heritage resource to the fullest possible extent (Department of Arts, Heritage, Gaeltacht and the Islands 1999, 35). This is undertaken in accordance with the provisions of the *European Convention on the Protection of the Archaeological Heritage* (Valletta Convention), ratified by Ireland in 1997.

### **THE ARCHAEOLOGICAL RESOURCE**

The *National Monuments Act 1930 to 2014* and relevant provisions of the *National Cultural Institutions Act 1997* are the primary means of ensuring the satisfactory protection of archaeological remains, which includes all man-made structures of whatever form or date except buildings habitually used for ecclesiastical purposes. A National Monument is described as 'a monument or the remains of a monument the preservation of which is a matter of national importance by reason of the historical, architectural, traditional, artistic or archaeological interest attaching thereto' (National Monuments Act 1930 Section 2).

A number of mechanisms under the National Monuments Act are applied to secure the protection of archaeological monuments. These include the Register of Historic Monuments, the Record of Monuments and Places, and the placing of Preservation Orders and Temporary Preservation Orders on endangered sites.

### **OWNERSHIP AND GUARDIANSHIP OF NATIONAL MONUMENTS**

The Minister may acquire national monuments by agreement or by compulsory order. The state or local authority may assume guardianship of any national monument (other than dwellings). The owners of national monuments (other than dwellings) may also appoint the Minister or the local authority as guardian of that monument if the state or local authority agrees. Once the site is in ownership or guardianship of the state, it may not be interfered with without the written consent of the Minister.

### **REGISTER OF HISTORIC MONUMENTS**

Section 5 of the 1987 Act requires the Minister to establish and maintain a Register of Historic Monuments. Historic monuments and archaeological areas present on the register are afforded statutory protection under the 1987 Act. Any interference with sites recorded on the register is illegal without the permission of the Minister. Two months notice in writing is required prior to any work being undertaken on or in the vicinity of a registered monument. The register also includes sites under Preservation Orders and Temporary Preservation Orders. All registered monuments are included in the Record of Monuments and Places.

### **PRESERVATION ORDERS AND TEMPORARY PRESERVATION ORDERS**

Sites deemed to be in danger of injury or destruction can be allocated Preservation Orders under the 1930 Act. Preservation Orders make any interference with the site

illegal. Temporary Preservation Orders can be attached under the 1954 Act. These perform the same function as a Preservation Order but have a time limit of six months, after which the situation must be reviewed. Work may only be undertaken on or in the vicinity of sites under Preservation Orders with the written consent, and at the discretion, of the Minister.

### **RECORD OF MONUMENTS AND PLACES**

Section 12(1) of the 1994 Act requires the Minister for Arts, Heritage, Gaeltacht and the Islands (now the Minister for Arts, Heritage, Regional, Rural and Gaeltacht Affairs) to establish and maintain a record of monuments and places where the Minister believes that such monuments exist. The record comprises a list of monuments and relevant places and a map/s showing each monument and relevant place in respect of each county in the state. All sites recorded on the Record of Monuments and Places receive statutory protection under the National Monuments Act 1994. All recorded monuments on the proposed development site are represented on the accompanying maps.

Section 12(3) of the 1994 Act provides that ‘where the owner or occupier (other than the Minister for Arts, Heritage, Gaeltacht and the Islands) of a monument or place included in the Record, or any other person, proposes to carry out, or to cause or permit the carrying out of, any work at or in relation to such a monument or place, he or she shall give notice in writing to the Minister of Arts, Heritage, Gaeltacht and the Islands to carry out work and shall not, except in the case of urgent necessity and with the consent of the Minister, commence the work until two months after the giving of notice’.

Under the National Monuments (Amendment) Act 2004, anyone who demolishes or in any way interferes with a recorded site is liable to a fine not exceeding €3,000 or imprisonment for up to 6 months. On summary conviction and on conviction of indictment, a fine not exceeding €10,000 or imprisonment for up to 5 years is the penalty. In addition they are liable for costs for the repair of the damage caused.

In addition to this, under the *European Communities (Environmental Impact Assessment) Regulations 1989*, Environmental Impact Statements (EIS) are required for various classes and sizes of development project to assess the impact the proposed development will have on the existing environment, which includes the cultural, archaeological and built heritage resources. These document’s recommendations are typically incorporated into the conditions under which the proposed development must proceed, and thus offer an additional layer of protection for monuments which have not been listed on the RMP.

### **THE PLANNING AND DEVELOPMENT ACT 2000**

Under planning legislation, each local authority is obliged to draw up a Development Plan setting out their aims and policies with regard to the growth of the area over a five-year period. They cover a range of issues including archaeology and built heritage, setting out their policies and objectives with regard to the protection and enhancement of both. These policies can vary from county to county. The Planning

and Development Act 2000 recognises that proper planning and sustainable development includes the protection of the archaeological heritage. Conditions relating to archaeology may be attached to individual planning permissions.

## **APPENDIX 6    IMPACT ASSESSMENT & THE CULTURAL HERITAGE RESOURCE**

### **POTENTIAL IMPACTS ON ARCHAEOLOGICAL AND HISTORICAL REMAINS**

Impacts are defined as ‘the degree of change in an environment resulting from a development’ (Environmental Protection Agency 2003: 31). They are described as profound, significant or slight impacts on archaeological remains. They may be negative, positive or neutral, direct, indirect or cumulative, temporary or permanent.

Impacts can be identified from detailed information about a project, the nature of the area affected and the range of archaeological and historical resources potentially affected. Development can affect the archaeological and historical resource of a given landscape in a number of ways.

- Permanent and temporary land-take, associated structures, landscape mounding, and their construction may result in damage to or loss of archaeological remains and deposits, or physical loss to the setting of historic monuments and to the physical coherence of the landscape.
- Archaeological sites can be affected adversely in a number of ways: disturbance by excavation, topsoil stripping and the passage of heavy machinery; disturbance by vehicles working in unsuitable conditions; or burial of sites, limiting accessibility for future archaeological investigation.
- Hydrological changes in groundwater or surface water levels can result from construction activities such as de-watering and spoil disposal, or longer-term changes in drainage patterns. These may desiccate archaeological remains and associated deposits.
- Visual impacts on the historic landscape sometimes arise from construction traffic and facilities, built earthworks and structures, landscape mounding and planting, noise, fences and associated works. These features can impinge directly on historic monuments and historic landscape elements as well as their visual amenity value.
- Landscape measures such as tree planting can damage sub-surface archaeological features, due to topsoil stripping and through the root action of trees and shrubs as they grow.
- Ground consolidation by construction activities or the weight of permanent embankments can cause damage to buried archaeological remains, especially in colluviums or peat deposits.
- Disruption due to construction also offers in general the potential for adversely affecting archaeological remains. This can include machinery, site offices, and service trenches.

*Although not widely appreciated, positive impacts can accrue from developments. These can include positive resource management policies, improved maintenance and access to archaeological monuments, and the increased level of knowledge of a site or historic landscape as a result of archaeological assessment and fieldwork.*

### **PREDICTED IMPACTS**

The severity of a given level of land-take or visual intrusion varies with the type of monument, site or landscape features and its existing environment. Severity of impact can be judged taking the following into account:

- The proportion of the feature affected and how far physical characteristics fundamental to the understanding of the feature would be lost;
- Consideration of the type, date, survival/condition, fragility/vulnerability, rarity, potential and amenity value of the feature affected;
- Assessment of the levels of noise, visual and hydrological impacts, either in general or site specific terms, as may be provided by other specialists.

## **APPENDIX 7 MITIGATION MEASURES & THE CULTURAL HERITAGE RESOURCE**

### **POTENTIAL MITIGATION STRATEGIES FOR CULTURAL HERITAGE REMAINS**

Mitigation is defined as features of the design or other measures of the proposed development that can be adopted to avoid, prevent, reduce or offset negative effects.

The best opportunities for avoiding damage to archaeological remains or intrusion on their setting and amenity arise when the site options for the development are being considered. Damage to the archaeological resource immediately adjacent to developments may be prevented by the selection of appropriate construction methods. Reducing adverse effects can be achieved by good design, for example by screening historic buildings or upstanding archaeological monuments or by burying archaeological sites undisturbed rather than destroying them. Offsetting adverse effects is probably best illustrated by the full investigation and recording of archaeological sites that cannot be preserved *in-situ*.

### **DEFINITION OF MITIGATION STRATEGIES**

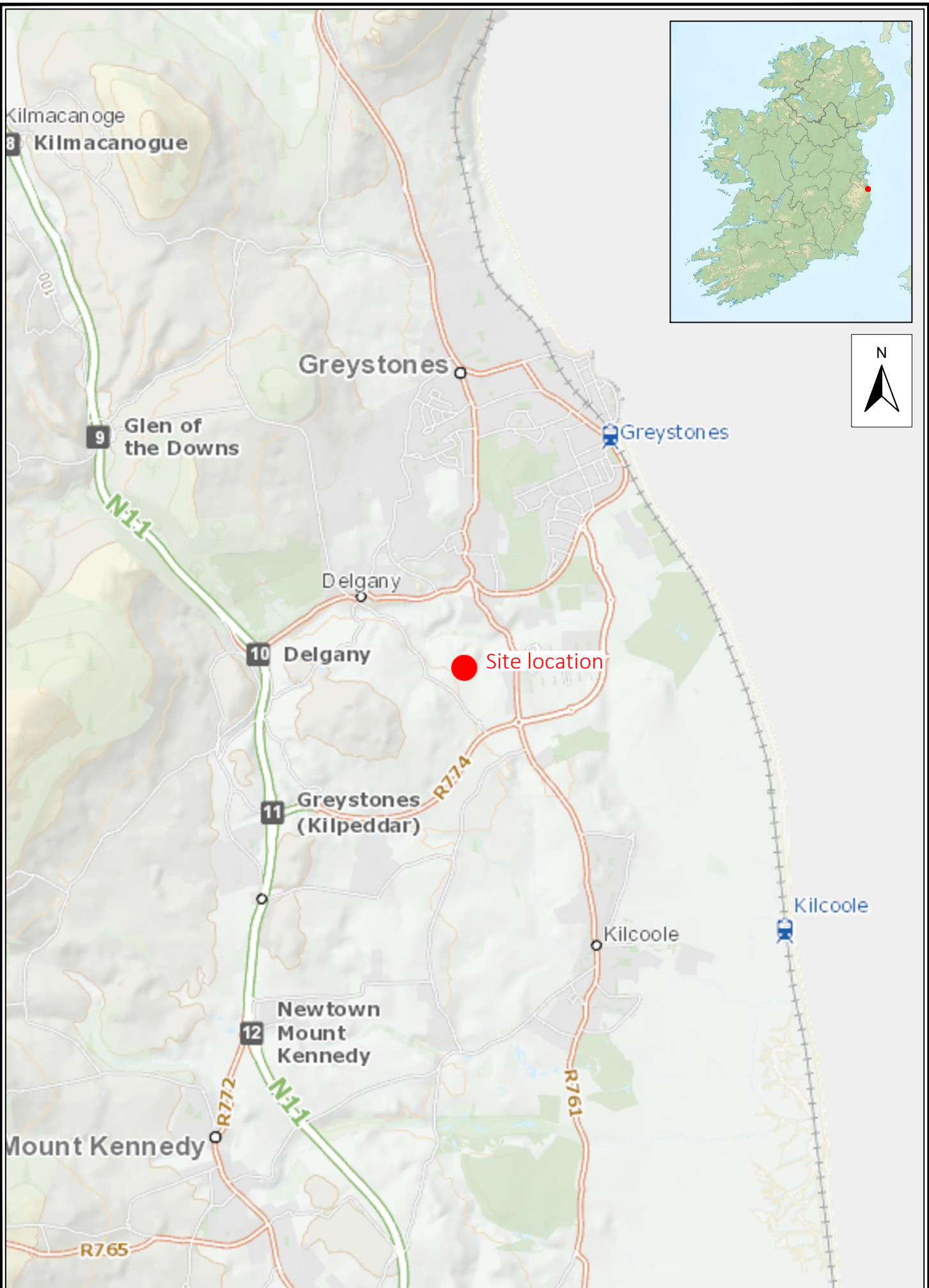
#### **ARCHAEOLOGICAL RESOURCE**

The ideal mitigation for all archaeological sites is preservation *in-situ*. This is not always a practical solution, however. Therefore a series of recommendations are offered to provide ameliorative measures where avoidance and preservation *in-situ* are not possible.

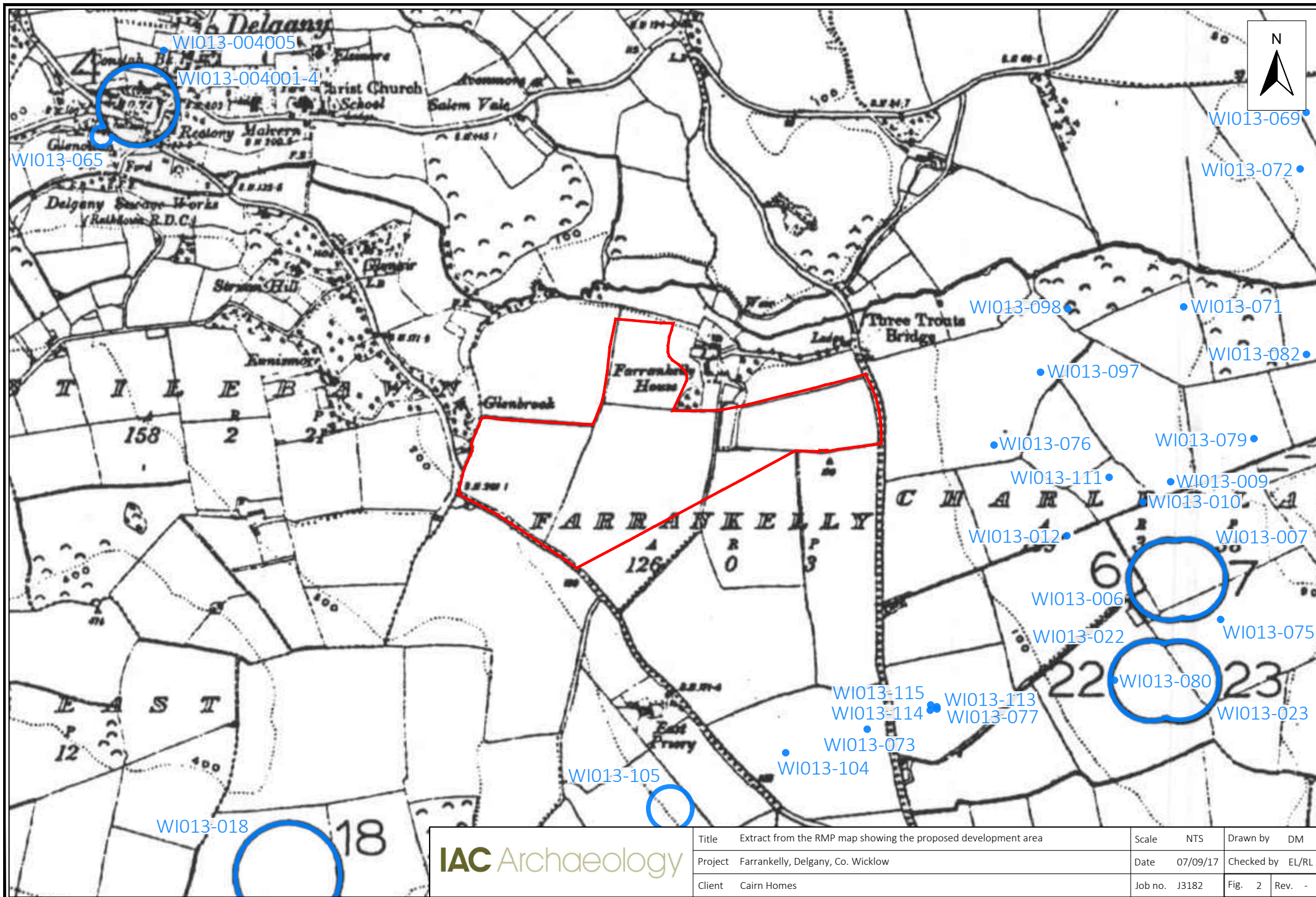
*Archaeological Test Trenching* can be defined as ‘a limited programme... of intrusive fieldwork which determines the presence or absence of archaeological features, structures, deposits, artefacts or ecofacts within a specified area or site on land or underwater. If such archaeological remains are present test trenching defines their character and extent and relative quality.’ (IFA 2014a).

*Full Archaeological Excavation* involves the scientific removal and recording of all archaeological features, deposits and objects to the level of geological strata or the base level of any given development. Full archaeological excavation is recommended where initial investigation has uncovered evidence of archaeologically significant material or structures and where avoidance of the site is not possible. (IFA 2014b).

*Archaeological Monitoring* can be defined as a ‘formal programme of observation and investigation conducted during any operation carried out for non-archaeological reasons within a specified area or site on land or underwater, where there is possibility that archaeological deposits may be disturbed or destroyed. The programme will result in the preparation of a report and ordered archive.’ (IFA 2014c).

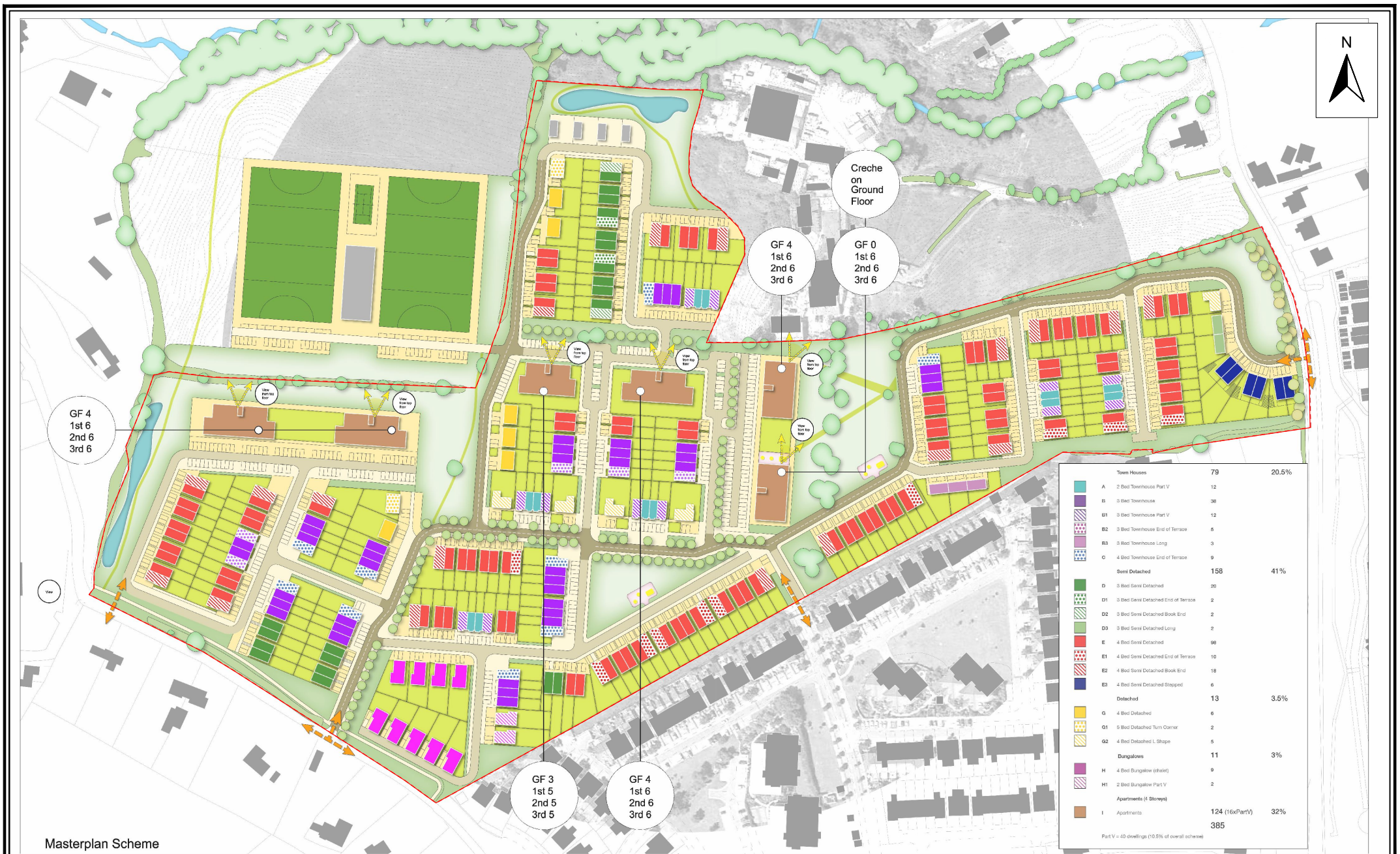


Title	Site location	Scale	NTS	Drawn by	DM
Project	Farrankelly, Delgany, Co. Wicklow	Date	07/09/17	Checked by	EL/RL
Client	Cairn Homes	Job no.	J3182	Fig.	1
				Rev.	-



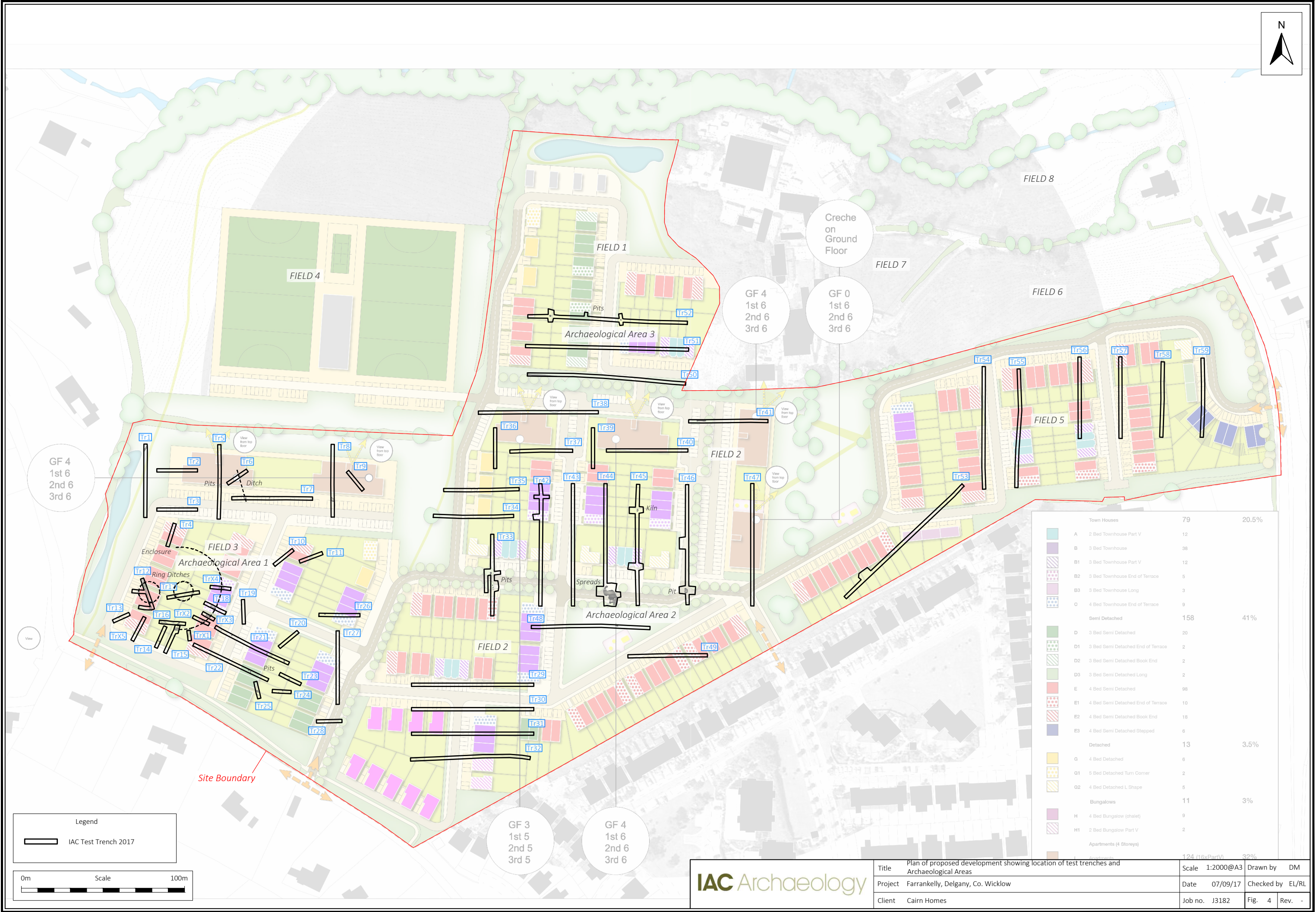
	Title	Extract from the RMP map showing the proposed development area	Scale	NTS	Drawn by	DM	
	Project	Farrankelly, Delgany, Co. Wicklow	Date	07/09/17	Checked by	EL/RL	
	Client	Cairn Homes	Job no.	J3182	Fig.	2	Rev.





Masterplan Scheme

Title	Plan of proposed development	Scale	NTS	Drawn by	DM
Project	Farrankelly, Delgany, Co. Wicklow	Date	07/09/17	Checked by	EL/RL
Client	Cairn Homes	Job no.	J3182	Fig.	2
				Rev.	-



GF 4  
1st 6  
2nd 6  
3rd 6

GF 4  
1st 6  
2nd 6  
3rd 6

GF 0  
1st 6  
2nd 6  
3rd 6

GF 3  
1st 5  
2nd 5  
3rd 5

GF 4  
1st 6  
2nd 6  
3rd 6

Town Houses	79	20.5%
A 2 Bed Townhouse Part V	12	
B 3 Bed Townhouse	38	
B1 3 Bed Townhouse Part V	12	
B2 3 Bed Townhouse End of Terrace	5	
B3 3 Bed Townhouse Long	3	
C 4 Bed Townhouse End of Terrace	9	
Semi Detached	158	41%
D 3 Bed Semi Detached	20	
D1 3 Bed Semi Detached End of Terrace	2	
D2 3 Bed Semi Detached Book End	2	
D3 3 Bed Semi Detached Long	2	
E 4 Bed Semi Detached	98	
E1 4 Bed Semi Detached End of Terrace	10	
E2 4 Bed Semi Detached Book End	18	
E3 4 Bed Semi Detached Stepped	6	
Detached	13	3.5%
G 4 Bed Detached	6	
G1 5 Bed Detached Turn Corner	2	
G2 4 Bed Detached L Shape	5	
Bungalows	11	3%
H 4 Bed Bungalow (shale)	9	
H1 2 Bed Bungalow Part V	2	
Apartments (4 Storeys)	124 (16xPartV)	32%

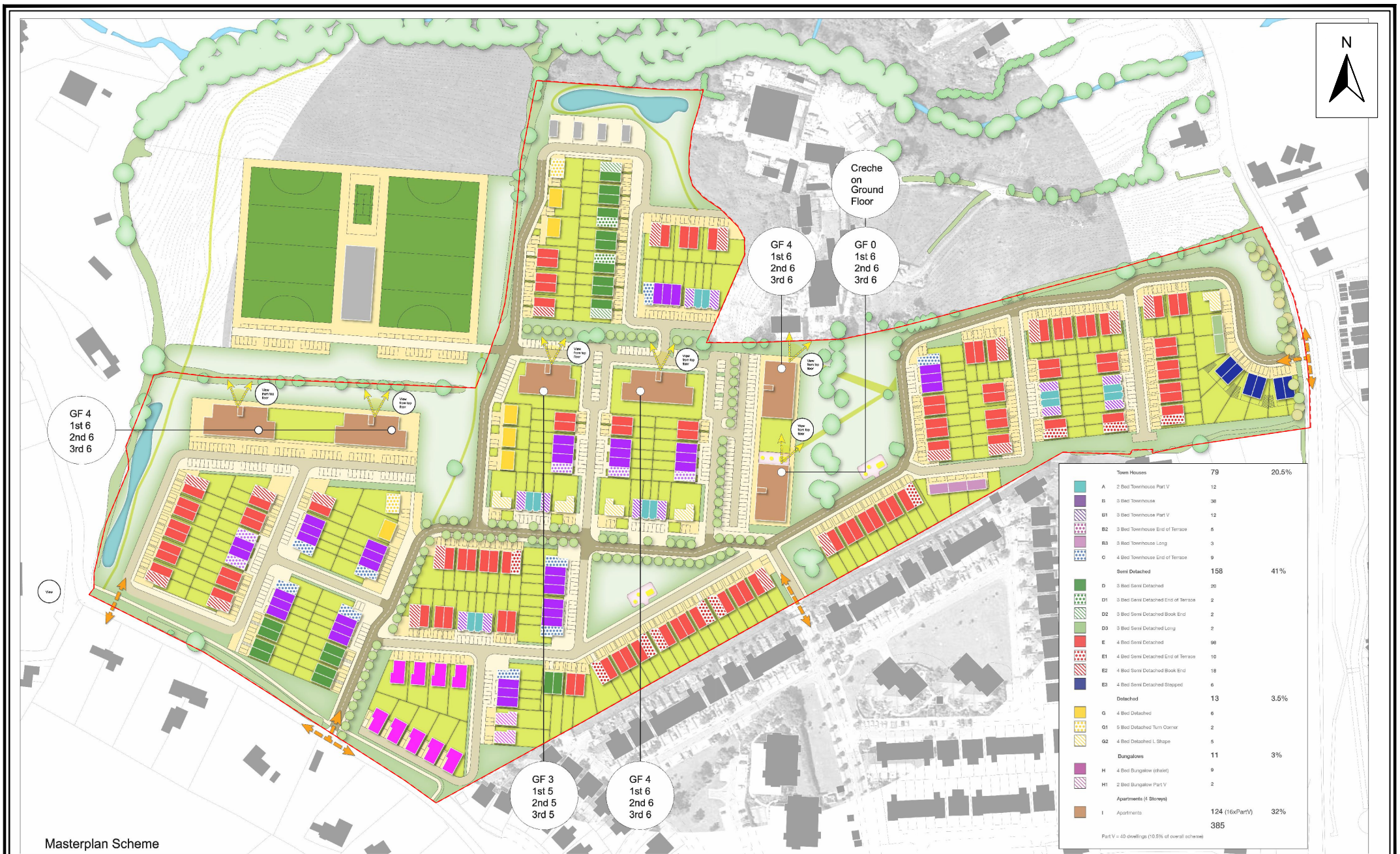
**Legend**

— IAC Test Trench 2017

0m Scale 100m

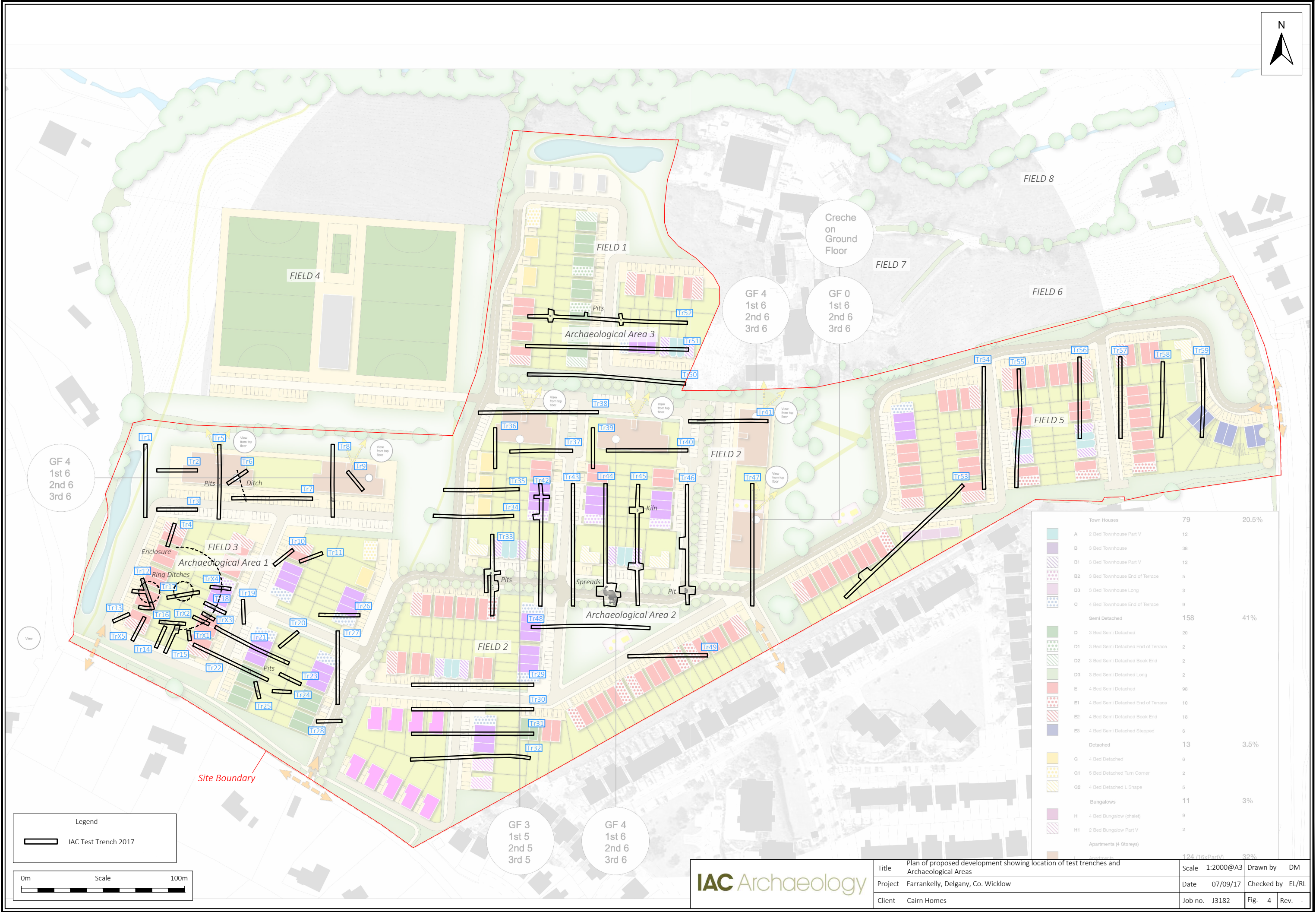
**IAC Archaeology**

Title	Plan of proposed development showing location of test trenches and Archaeological Areas	Scale	1:2000@A3	Drawn by	DM
Project	Farrankelly, Delgany, Co. Wicklow	Date	07/09/17	Checked by	EL/RL
Client	Cairn Homes	Job no.	J3182	Fig.	4
		Rev.			-



Masterplan Scheme

Title	Plan of proposed development	Scale	NTS	Drawn by	DM
Project	Farrankelly, Delgany, Co. Wicklow	Date	07/09/17	Checked by	EL/RL
Client	Cairn Homes	Job no.	J3182	Fig.	2
				Rev.	-



GF 4  
1st 6  
2nd 6  
3rd 6

GF 4  
1st 6  
2nd 6  
3rd 6

GF 0  
1st 6  
2nd 6  
3rd 6

GF 3  
1st 5  
2nd 5  
3rd 5

GF 4  
1st 6  
2nd 6  
3rd 6

Town Houses	79	20.5%
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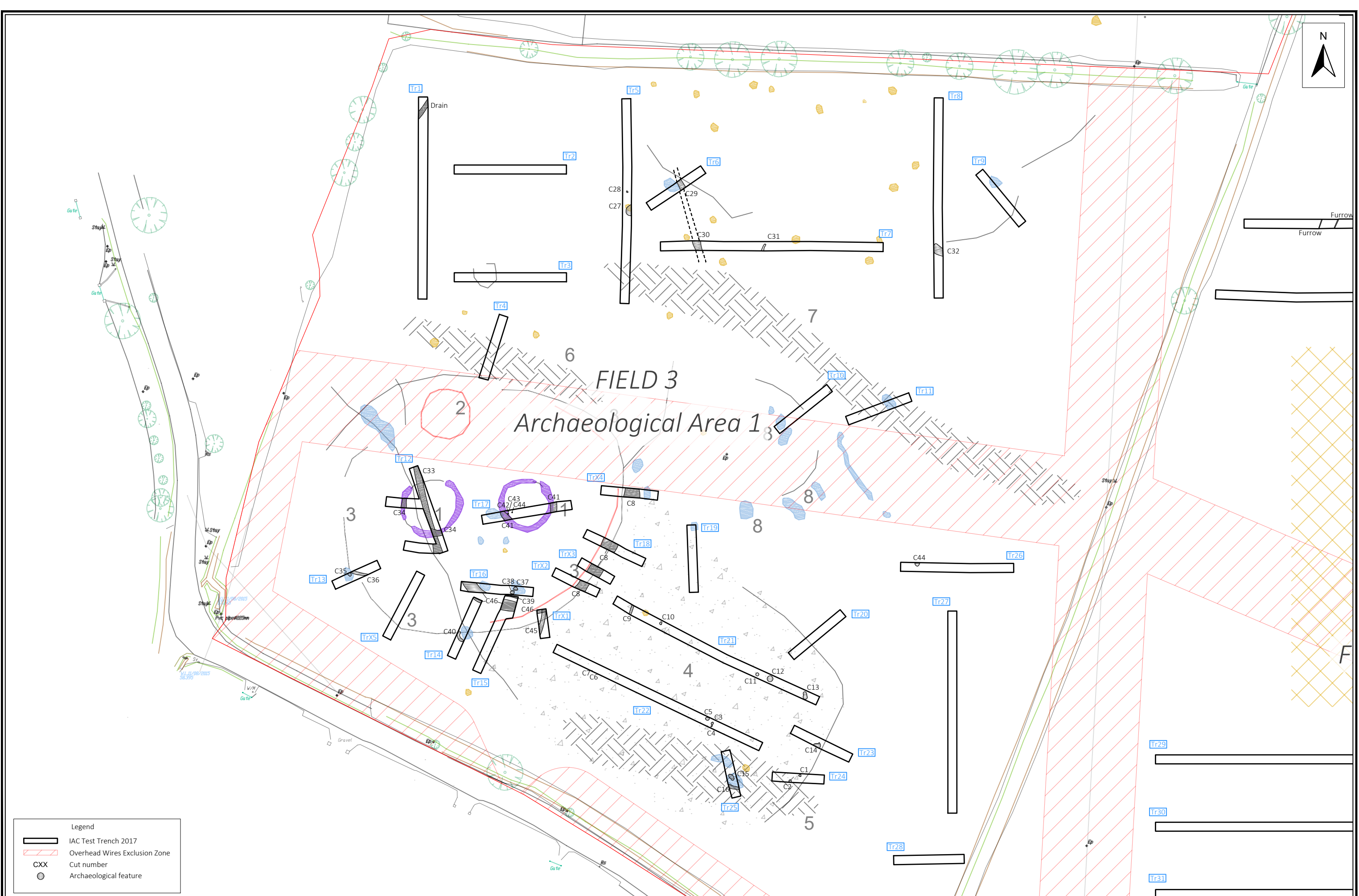
**Legend**

— IAC Test Trench 2017

0m Scale 100m

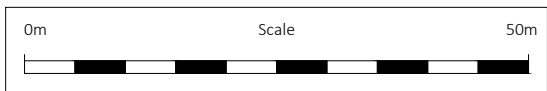
**IAC Archaeology**

Title	Plan of proposed development showing location of test trenches and Archaeological Areas	Scale	1:2000@A3	Drawn by	DM
Project	Farrankelly, Delgany, Co. Wicklow	Date	07/09/17	Checked by	EL/RL
Client	Cairn Homes	Job no.	J3182	Fig.	4
				Rev.	-



**Legend**

- IAC Test Trench 2017
- Overhead Wires Exclusion Zone
- CXX Cut number
- Archaeological feature



**Geophys Legend**

- Archaeology - Ditch feature
- Archaeology - ?Ditches & Pits
- Trend
- Ploughing
- ?Former Field boundary
- Modern Ferrous response
- Magnetic disturbance

**IAC Archaeology**

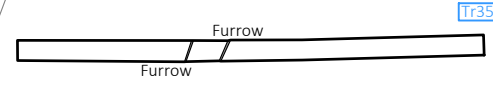
Title	Detail of Field 3, Archaeological Area 1 with geophysical survey background	Scale	1:750@A3	Drawn by	DM
Project	Farrankelly, Delgany, Co. Wicklow	Date	07/09/17	Checked by	EL/RL
Client	Cairn Homes	Job no.	J3182	Fig.	5
		Rev.			-

FIELD 2

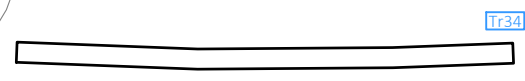


Tr9

B2

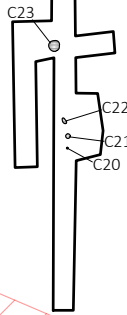


Tr35



Tr34

Tr33



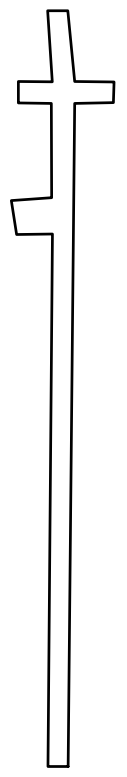
C23

C22

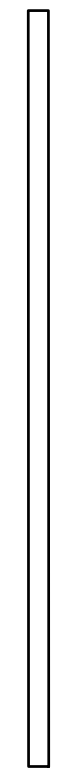
C21

C20

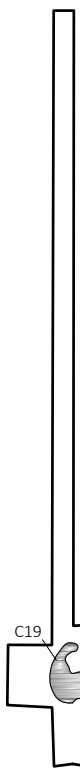
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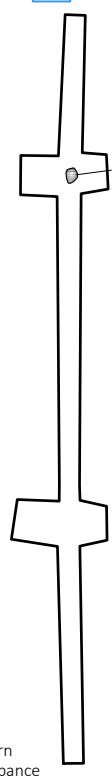
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Tr44

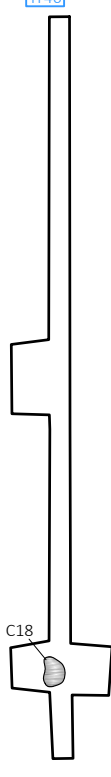


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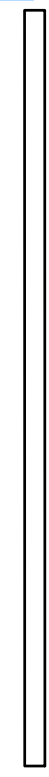
C17 - Kiln

Tr46



C18

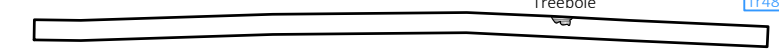
Tr47



Archaeological Area 2

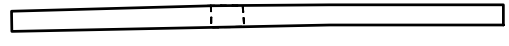
Treebole

Tr48



FIELD 2

Tr49

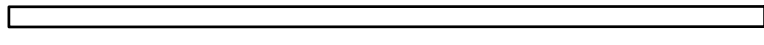


Tarmac

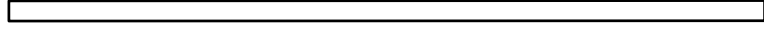
Gate

Gate

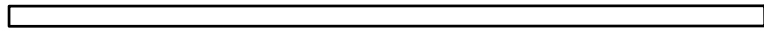
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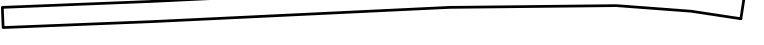
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Tr31







Tr32



Gravel

Legend

-  IAC Test Trench 2017
-  Overhead Wires Exclusion Zone
-  Cut number
-  Archaeological feature



IAC Archaeology

Title	Detail of Field 2, Archaeological Area 2	Scale	1:750@A3	Drawn by	DM
Project	Farrankelly, Delgany, Co. Wicklow	Date	07/09/17	Checked by	EL/RL
Client	Cairn Homes	Job no.	J3182	Fig.	6
				Rev.	-



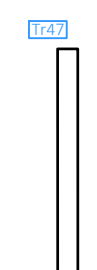
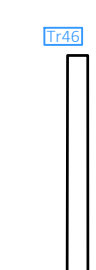
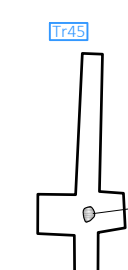
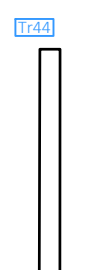
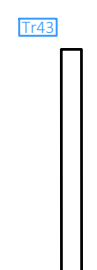
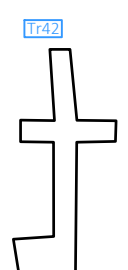
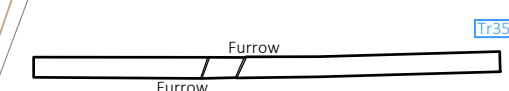
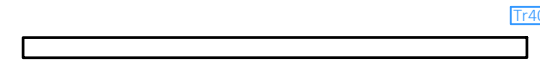
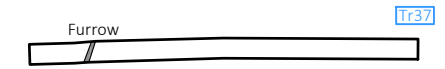
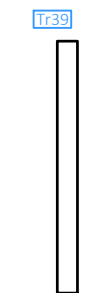
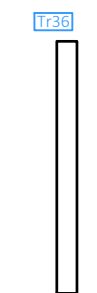
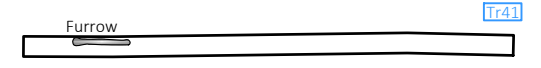
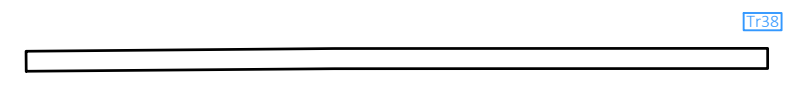
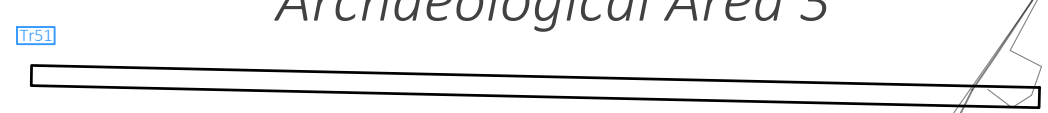
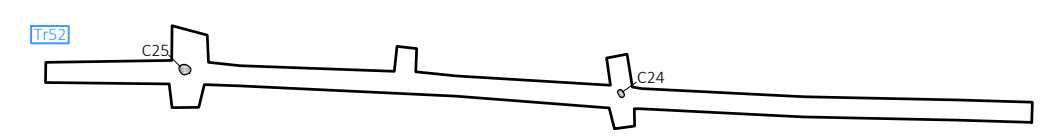
FIELD 1

Farrankelly House

Garage




Archaeological Area 3

FIELD 2




C17 - Kiln

**Legend**

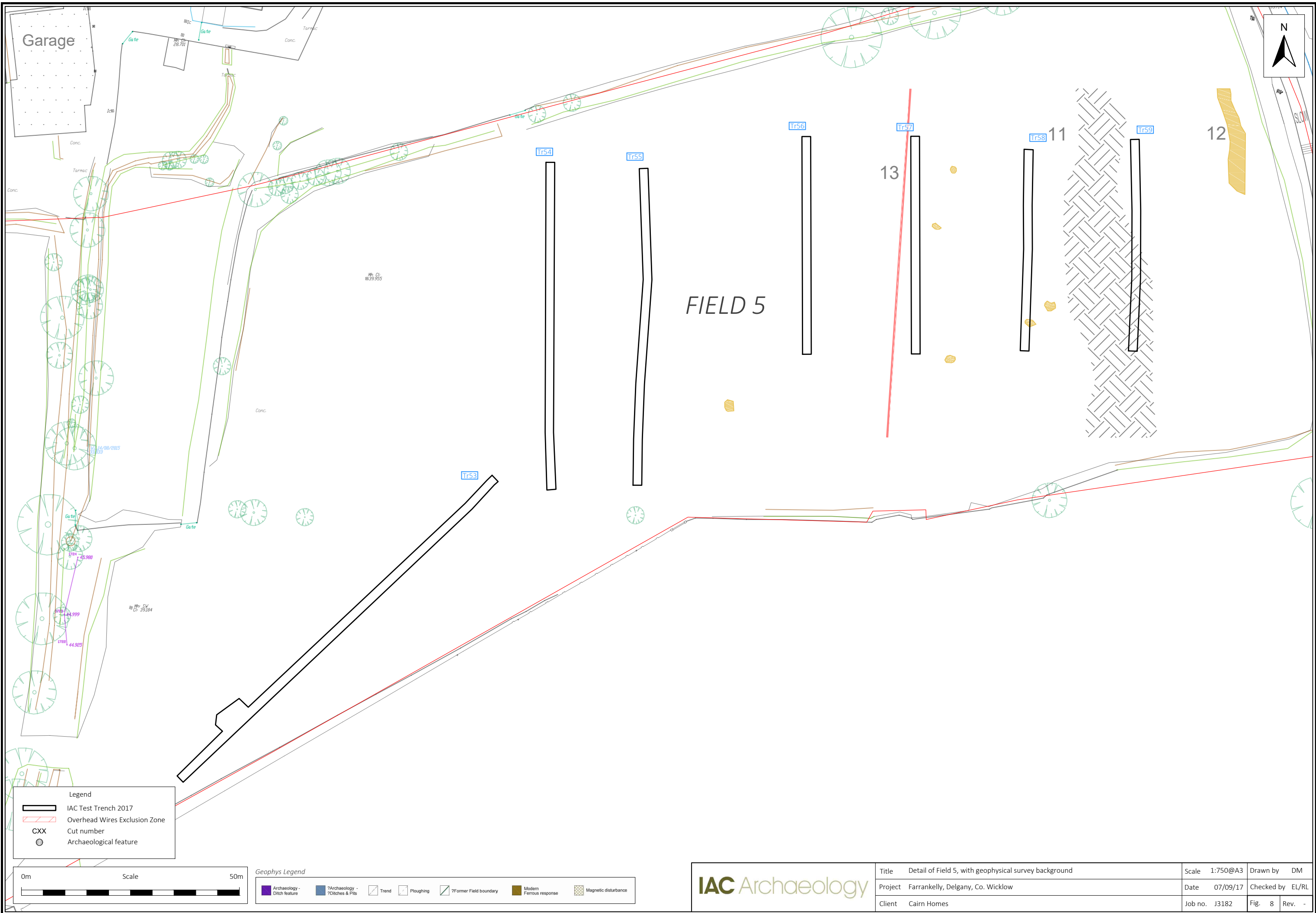
-  IAC Test Trench 2017
-  Overhead Wires Exclusion Zone
- CXX** Cut number
-  Archaeological feature

0m Scale 50m



IAC Archaeology

Title	Detail of Field 1, Archaeological Area 3	Scale	1:750@A3	Drawn by	DM
Project	Farrankelly, Delgany, Co. Wicklow	Date	07/09/17	Checked by	EL/RL
Client	Cairn Homes	Job no.	J3182	Fig.	7
				Rev.	-



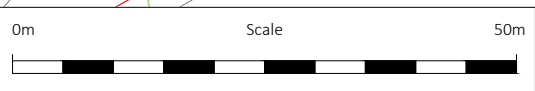
Garage



FIELD 5

**Legend**

- IAC Test Trench 2017
- Overhead Wires Exclusion Zone
- Cut number
- Archaeological feature



**Geophys Legend**

Archaeology - Ditch feature	?Archaeology - ?Ditches & Pits	Trend	Ploughing	?Former Field boundary	Modern Ferrous response	Magnetic disturbance
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**IAC Archaeology**

Title	Detail of Field 5, with geophysical survey background	Scale	1:750@A3	Drawn by	DM
Project	Farrankelly, Delgany, Co. Wicklow	Date	07/09/17	Checked by	EL/RL
Client	Cairn Homes	Job no.	J3182	Fig.	8
				Rev.	-





Plate 1: Testing area, facing northwest



Plate 2: Testing area, facing northeast



Plate 3: Testing area, facing northeast



Plate 4: Testing area, Field 5, facing east



Plate 5: Archaeological Area (AA)1, Trench 1, facing south



Plate 6: AA1, Trench 6, Ditch C29, facing northwest



Plate 7: AA1, Trench 8, facing south



Plate 8: AA1, Trench 12, Ditch C33, facing south-southeast



Plate 9: AA1, Trench 12, Ditch C33 and C34, facing northwest



Plate 10: AA1, Trench 12, Ring-Ditch C34, facing north



Plate 11: AA1, Trench 13, facing southwest



Plate 12: AA1, Trench 15, Ditch C46, facing west



Plate 13: AA1, Trench 16, Ditch C46, facing southeast



Plate 14: AA1, Trench 16, C37, facing west



Plate 15: AA1, Trench 17, Ditch C41 and Pits C42, C43 and C44 facing north-northwest



Plate 16: AA1, Trench 17, Ring-Ditch C41 (northeast side of trench), facing northeast



Plate 17: AA1, Trench 18, Ditch C8, facing northwest



Plate 18: AA1, Trench 20, facing northeast



Plate 19: AA1, Trench 22, C3 and C4, facing northwest



Plate 20: AA1, Trench 24, C2, facing west-northwest



Plate 21: AA2, Trench 29, facing west



Plate 22: AA2, Trench 33, C23, facing west



Plate 23: AA2, Trench 44, Spread C19, facing northwest



Plate 24: AA2, Trench 45, Kiln C17, facing north



Plate 25: AA3, Trench 52, C24, facing east



Plate 26: AA3, Trench 52, C25, facing northwest



Plate 27: AA3, Trench 50, Ditch C26, facing east-southeast



Plate 28: AA1, Trench X2, Ditch C8, facing southwest

### **Appendix 13.3: Recorded Monuments within the Surrounding Area**



<b>RMP No.:</b>	WI013-076
<b>Townland:</b>	Charlesland
<b>Parish:</b>	Kilcoole
<b>Barony:</b>	Newcastle
<b>NGR:</b>	729133, 710271
<b>Classification:</b>	Habitation site
<b>Dist. from development:</b>	c. 190m east
<b>Description:</b>	Two Bronze Age structures were excavated here in 2003, prior to the construction of the dual carriageway from the R671 to Greystones (Excavation Licence 03E0146 (Site D)). 'Structure I' (diam. 10m) was defined by a double ring of post-holes some of which contained cremation deposits and sherds of Bronze Age pottery. 'Structure II' (diam. 10m) was defined by a single row of post-holes and its northern limit was truncated by a series of pits and post-holes. Three linear ditches were located at the eastern extent of the site forming a probable enclosure with an east-facing entrance. A large number of associated pits, post-holes, hearths and a possible metallised surface were also excavated and yielded a fragment of bronze, Early Neolithic and Bronze Age pottery and six saddle querns. Two kilns were also excavated and a rotary quern was found in the larger one. (Molloy 2006, 546)
<b>Reference:</b>	RMP file

<b>RMP No.:</b>	WI013-097
<b>Townland:</b>	Charlesland
<b>Parish:</b>	Kilcoole
<b>Barony:</b>	Newcastle
<b>NGR:</b>	729213, 710401
<b>Classification:</b>	Excavation - miscellaneous
<b>Dist. from development:</b>	c. 290m east
<b>Description:</b>	A series of pits, post holes, stake holes, hearths, troughs and burnt spreads were uncovered here during topsoil stripping in 2004 (Excavation Licence 04E0118). A cereal-drying kiln was uncovered to the NE (see WI013-098). (Molloy 2007, 479-480).
<b>Reference:</b>	RMP file

<b>RMP No.:</b>	WI013-098
<b>Townland:</b>	Charlesland
<b>Parish:</b>	Kilcoole
<b>Barony:</b>	Newcastle
<b>NGR:</b>	729257, 710514
<b>Classification:</b>	Kiln - corn-drying
<b>Dist. from development:</b>	c. 380m east
<b>Description:</b>	A cereal-drying kiln was uncovered in close proximity to a series of pits, post holes, stake holes, troughs and burnt spreads (see WI013-097) during topsoil stripping in 2004 (Excavation Licence 04E0118). (Molloy 2007, 479-480).
<b>Reference:</b>	RMP file

<b>RMP No.:</b>	WI013-105
<b>Townland:</b>	Priestsnewtown
<b>Parish:</b>	Kilcoole
<b>Barony:</b>	Newcastle
<b>NGR:</b>	728577, 709615
<b>Classification:</b>	Ring-ditch
<b>Dist. from development:</b>	c. 450m south
<b>Description:</b>	The southern half of a circular ditch (diam. c. 12m; Wth 1-1.3m; D 0.2m) was excavated here as part of the construction work associated with the Greystones Southern Access Route (Excavation Licence 04E0467). No internal features or finds were uncovered. The remaining half is preserved outside of the road-take. A stone lined hearth was excavated c. 22m to the E. (Wiggins 2007, 492-3).
<b>Reference:</b>	RMP file

<b>RMP No.:</b>	WI013-112
<b>Townland:</b>	Charlesland
<b>Parish:</b>	Kilcoole
<b>Barony:</b>	Newcastle
<b>NGR:</b>	729265, 710115

<b>Classification:</b>	Urn burial
<b>Dist. from development:</b>	c. 360m south-east
<b>Description:</b>	The remains of an isolated Bronze Age urn was excavated here as part of the construction work associated with Charlesland Residential Development (Excavation Licence 04E0387). (Phelan 2007, 480)
<b>Reference:</b>	RMP file

<b>RMP No.:</b>	WI013-111
<b>Townland:</b>	Charlesland
<b>Parish:</b>	Kilcoole
<b>Barony:</b>	Newcastle
<b>NGR:</b>	729338, 710216
<b>Classification:</b>	Excavation - miscellaneous
<b>Dist. from development:</b>	c. 400m east
<b>Description:</b>	The series of medieval pits, some of which contained Leinster Cooking Ware pottery, were excavated here as part of the construction work associated with Charlesland Residential Development (Excavation Licence 04E0387). (Phelan 2007, 480)
<b>Reference:</b>	RMP file

<b>RMP No.:</b>	WI013-104
<b>Townland:</b>	Farrankelly
<b>Parish:</b>	Kilcoole
<b>Barony:</b>	Newcastle
<b>NGR:</b>	728780, 709718
<b>Classification:</b>	Excavation - miscellaneous
<b>Dist. from development:</b>	c. 460m south
<b>Description:</b>	Twelve pits dispersed over a large area (L 160m; Wth 40m) were excavated here as part of the construction work associated with the Greystones Southern Access Route (Excavation Licence 04E0466). Six of the pits contained burnt stones. (Wiggins 2007, 483-4).
<b>Reference:</b>	RMP file

<b>RMP No.:</b>	WI013-110
<b>Townland:</b>	Charlesland
<b>Parish:</b>	Kilcoole
<b>Barony:</b>	Newcastle
<b>NGR:</b>	729398, 710175
<b>Classification:</b>	<i>Fulacht fiadh</i>
<b>Dist. from development:</b>	c. 470m ESE
<b>Description:</b>	The remains of a <i>fulacht fiadh</i> were excavated here as part of the construction work associated with Charlesland Residential Development (Excavation Licence 04E0387). (Phelan 2007, 480)
<b>Reference:</b>	RMP file

<b>RMP No.:</b>	WI013-113-115; WI013-077
<b>Townland:</b>	Charlesland
<b>Parish:</b>	Kilcoole
<b>Barony:</b>	Newcastle
<b>NGR:</b>	729045, 709804; 729034, 709799; 729033, 709806; 729043, 709801
<b>Classification:</b>	Cremation pit, ringditch and two structures
<b>Dist. from development:</b>	c. 490m south
<b>Description:</b>	A ring-ditch (WI013-077), a large cremation pit (WI013-113) and two small structures (WI013-114 and WI013-115) were excavated here in 2003, prior to the construction of the dual carriageway from the R671 to Greystones (Excavation Licence 03E0147 (Site F)). The ring-ditch (Wth 1.4m; av. D 0.6m) enclosed a circular area (diam. 5.6m N-S; 5.39m E-W). Nine flints were found in the ditch. The cremation pit was located 3.07m to the north-east of the ring-ditch and contained deposits of cremated bone, charcoal and large stones. A small circular structure (diam. 3m N-S; 2.8m E-W), 10m to the west of the ring-ditch, was defined by a narrow, circular slot-trench with two post-holes defining an entrance (Wth 0.9m). There was also a centrally placed post-hole and the slot-trench was ringed with an outer circle of post-holes in which several fragments of prehistoric pottery were found. A second, small structure, located 11m north of the former, was formed by a series of post-holes and stake-holes which defined a circular depression (diam. 2.76m; D 0.14m). (Molloy 2006, 546)
<b>Reference:</b>	RMP file

<b>RMP No.:</b>	WI013-073
<b>Townland:</b>	Farrankelly
<b>Parish:</b>	Kilcoole
<b>Barony:</b>	Newcastle
<b>NGR:</b>	728923, 709761
<b>Classification:</b>	Habitation site
<b>Dist. from development:</b>	c. 500m south
<b>Description:</b>	A curving arc of ditch (L 68m SE-NE), two slot-trenches and a number of pits and postholes were excavated here in 2003, prior to the construction of the dual carriageway from the R671 to Greystones (Excavation Licence 03E1550 (Site J)). One of the slot-trenches contained a barbed and tanged arrow head and prehistoric pottery, one of the pits contained a fragment of prehistoric pottery. (Molloy 2006, 547)
<b>Reference:</b>	RMP file

## **Appendix 13.4: RPS/NIAH Sites within the Surrounding Area**

<b>RPS No.:</b>	08-78
<b>NIAH No.:</b>	16305023
<b>Townland:</b>	Stilebawn
<b>Parish:</b>	Kilcoole
<b>Barony:</b>	Newcastle
<b>NGR:</b>	328272, 210282
<b>Classification:</b>	House 1790–1810
<b>Dist. from development:</b>	c. 10m west
<b>Description:</b>	<p>Detached three-bay two-storey house - Glenbrook House - , built c. 1800, with canted bays to sides of c. 1880, and large two-storey rear extension of 2001. The façade is finished in painted lined render with painted moulded quoins, eaves course and base course. The hipped roof is slated and has a slight overhang, with rendered chimneystacks on tall pronounced plinths. The entrance is set within a semi-circular recess with a simple moulded surround and consists of a panelled timber door with panelled stone pilaster jambs and reeded and panelled console brackets supporting a panelled entablature with cornice; above is a semi-circular fanlight with decorative petal tracery. To the west elevation there is a full-height canted bay with a similar single-storey bay to the east. A large extension has been added to the south elevation in a similar style to the original house and mainly following the footprint of the original outbuilding.</p> <p>Though in many respects this house is an archetypal hipped roof late Georgian gentleman's residence of a kind still not uncommon throughout the country, it is lifted above the ordinary by its pristine condition and by the tasteful execution of the large early 21st-century rear extension, which compliments rather than detracts from the original. According to the current owner the house was built c. 1800 and may have served as a manse or rectory at some point. It was also once the home of politician John Redmond (leader of the Irish Parliamentary Party during the Home Rule Crisis of 1912–14)</p>
<b>Reference:</b>	<a href="http://www.buildingsofireland.ie">www.buildingsofireland.ie</a> , Wicklow Development Plan 2016-2022

<b>RPS No.:</b>	08-76
<b>NIAH No.:</b>	16305021
<b>Townland:</b>	Stilebawn
<b>Parish:</b>	Kilcoole
<b>Barony:</b>	Newcastle

<b>NGR:</b>	328098, 210560
<b>Classification:</b>	House 1820–1840
<b>Dist. from development:</b>	c. 220m north-west
<b>Description:</b>	Detached three-bay single-storey over basement regency style house – Glenair House - , built c. 1830, with basement storey only visible from the north. The façade is finished in painted lined render with painted moulded quoins, eaves course and a low bevelled base course. There is a full-length stepped platform to front elevation. The hipped roof is slated and has rendered chimneystacks with pronounced plinths, corbelled courses and matching octagonal clay pots. The entrance, which consists of a panelled timber door with sidelights, is set within a typical regency veranda-like open porch, with slated hipped roof and decorative pierced cast-iron supports. The windows are flat-headed with timber sash frames, six panes over six. Cast-iron rainwater goods. There is a gravel forecourt with a replacement gate screen of c. 1990 to end of drive.
<b>Reference:</b>	<a href="http://www.buildingsofireland.ie">www.buildingsofireland.ie</a> , Wicklow Development Plan 2016-2022

<b>RPS No.:</b>	08-77
<b>NIAH No.:</b>	16305022
<b>Townland:</b>	Stilebawn
<b>Parish:</b>	Kilcoole
<b>Barony:</b>	Newcastle
<b>NGR:</b>	327974, 210518
<b>Classification:</b>	House 1820–1840
<b>Dist. from development:</b>	c. 280m WNW
<b>Description:</b>	Detached four-bay part three part two-storey house (Struan Hill), built c. 1830, with porch addition of c. 1930. The front elevation consists of a central two-bay three-storey hipped roof section flanked by single-bay two-storey hipped roof sections which project slightly beyond the line of that to the centre. The central section itself has full-width flat-roofed entrance porch projection with curved ends. The façade is finished in dry dash with rusticated quoins, but is now largely obscured by ivy growth, whilst the roof is slated and has a slight overhang with dry dash rendered chimneystacks. The entrance consists of two separate partly glazed timber doors whilst the windows are flat-headed with painted stone sills. Most of these are filled with timber sash frames, six panes over six. Cast-iron rainwater goods.
<b>Reference:</b>	<a href="http://www.buildingsofireland.ie">www.buildingsofireland.ie</a> , Wicklow Development Plan 2016-2022



<b>RPS No.:</b>	n/a
<b>NIAH No.:</b>	16401315
<b>Townland:</b>	Delgany
<b>Parish:</b>	Kilcoole
<b>Barony:</b>	Newcastle
<b>NGR:</b>	328470, 210836
<b>Classification:</b>	House 1920–1940
<b>Dist. from development:</b>	c. 310m north
<b>Description:</b>	Detached three-bay two storey house in a fanciful, somewhat fairy tale style, built c. 1930. The façade is finished in painted roughcast with rendered dressings to openings and a rendered base course. The relatively steeply pitched gable-ended roof has an overhang and is covered in greenish Westmorland slate, with tall rendered chimneystacks with gabled tops. The entrance, which consists of a recessed semi-circular timber door with exaggerated keystone, is set within a two-storey curved bay with a conical slated roof. The windows are flat-headed and of various sizes with a variety of timber frames, mostly with casement openings and some with leaded lattice panes. Two of the first floor windows are set within gabled half dormers with pronounced bevelled coping to the gables. There is a projecting single-storey gable-ended garage to east side with a semi-circular headed timber vehicle doorway and pronounced bevelled coping to gable. Cast-iron rainwater goods. Large gravel covered forecourt.
<b>Reference:</b>	<a href="http://www.buildingsofireland.ie">www.buildingsofireland.ie</a> , Wicklow Development Plan 2016-2022

<b>RPS No.:</b>	n/a
<b>NIAH No.:</b>	16401316
<b>Townland:</b>	Delgany
<b>Parish:</b>	Kilcoole
<b>Barony:</b>	Newcastle
<b>NGR:</b>	328514, 210842
<b>Classification:</b>	House - 1920–1940
<b>Dist. from development:</b>	c. 330m north
<b>Description:</b>	Detached three-bay two-storey house, built c. 1930, and completely renovated in 2003. The façade is finished in dry dash with a tall base course in brick and render, whilst the overhanging hipped roof is slated and has a broad but squat centrally positioned chimneystack. The entrance is located within a small hipped roof veranda-like open

	porch, and consists of a timber door with semi-circular fanlight. The generally large flat-headed windows have uniform replacement timber casement frames and concrete sills. Single-storey hipped roof canted bay window to west elevation. Metal rainwater goods.
<b>Reference:</b>	<a href="http://www.buildingsofireland.ie">www.buildingsofireland.ie</a> , Wicklow Development Plan 2016-2022

<b>RPS No.:</b>	n/a
<b>NIAH No.:</b>	16304102
<b>Townland:</b>	Delgany
<b>Parish:</b>	Kilcoole
<b>Barony:</b>	Newcastle
<b>NGR:</b>	328446, 210862
<b>Classification:</b>	House 1650–1700
<b>Dist. from development:</b>	c. 360m north
<b>Description:</b>	Detached four-bay single-storey thatched vernacular house of pre-1700, with a later single-bay single-storey extension to the west. The rubble-built façade is whitewashed and has several large buttresses, whilst the extension is finished in painted render. The pitched roof has half-hipped ends and is thatched, as is the slightly lower gable-ended roof of the extension. Short rendered chimneystack. There are two mainly glazed doors to the front with that to the west acting as the entrance. The windows are flat-headed and have a variety of replacement timber frames. There is a small loft level window to east elevation with an original four pane fixed light frame. uPVC rainwater goods. Small garden to front enclosed tall rendered wall with gateway.
<b>Reference:</b>	<a href="http://www.buildingsofireland.ie">www.buildingsofireland.ie</a> , Wicklow Development Plan 2016-2022

<b>RPS No.:</b>	n/a
<b>NIAH No.:</b>	16305028
<b>Townland:</b>	Delgany
<b>Parish:</b>	Kilcoole
<b>Barony:</b>	Newcastle
<b>NGR:</b>	328029, 210797
<b>Classification:</b>	Gate Lodge 1840–1860
<b>Dist. from development:</b>	c. 440m north-west

<b>Description:</b>	Detached three-bay single-storey gate lodge, built c. 1850 to serve nearby Elsinore house. The façade is finished in unpainted render and the hipped roof is slated, with rendered chimneystacks. The entrance is now accessed via a mainly glazed flat-roofed porch of c. 1970. The windows, which may have been enlarged, have replacement timber windows with casement and top-hung openers. Gable-ended pitched roof return to rear. Cast-iron rainwater goods.
<b>Reference:</b>	<a href="http://www.buildingsofireland.ie">www.buildingsofireland.ie</a> , Wicklow Development Plan 2016-2022

<b>RPS No.:</b>	08-11
<b>NIAH No.:</b>	16305027
<b>Townland:</b>	Delgany
<b>Parish:</b>	Kilcoole
<b>Barony:</b>	Newcastle
<b>NGR:</b>	328011, 210807
<b>Classification:</b>	School
<b>Dist. from development:</b>	c. 460m north-west
<b>Description:</b>	Detached four-bay single storey school house, built 1839, extended to the north in the later 19th-century and again in the late 20th-century. The façade is finished in unpainted render with the hipped roof slated. The entrance is now located within the extension. The windows to the south roadside elevation are set within recesses and have segmental heads, six over six timber sash frames and stone sills. To the west elevation there is a pointed arch window with a timber sash frame with Gothick tracery. Cast-iron rainwater goods. Low rubble wall to the roadside with concrete coping and wrought-iron railings and gate.
<b>Reference:</b>	<a href="http://www.buildingsofireland.ie">www.buildingsofireland.ie</a> , Wicklow Development Plan 2016-2022

## **Appendix 13.5: Stray Finds within the Surrounding Area**

Information on artefact finds from the study area in County Wicklow has been recorded by the National Museum of Ireland since the late 18th century. Location information relating to these finds is important in establishing prehistoric and historic activity in the study area.

Townlands: Delgany; Charlesland; Farrankelly; Stilebawn.

<b>Museum No:</b>	1988:236
<b>Townland:</b>	Killincarrig
<b>Parish:</b>	Greystones
<b>Barony:</b>	Rathdown
<b>Find:</b>	Decorated Viking Ring Pin
<b>Find place:</b>	During metal detecting
<b>Description:</b>	No information in file
<b>Reference:</b>	NMI
<b>Museum No:</b>	1988:237
<b>Townland:</b>	Killincarrig
<b>Parish:</b>	Greystones
<b>Barony:</b>	Rathdown
<b>Find:</b>	Decorated ring of a small ring brooch
<b>Find place:</b>	During metal detecting
<b>Description:</b>	No information in file
<b>Reference:</b>	NMI
<b>Museum No:</b>	1988:238
<b>Townland:</b>	Killincarrig
<b>Parish:</b>	Greystones
<b>Barony:</b>	Rathdown
<b>Find:</b>	Bronze Palstave
<b>Find place:</b>	During metal detecting
<b>Description:</b>	No information in file

<b>Reference:</b>	NMI
<b>Museum No:</b>	1988:239
<b>Townland:</b>	Killincarrig
<b>Parish:</b>	Greystones
<b>Barony:</b>	Rathdown
<b>Find:</b>	Socketed axe
<b>Find place:</b>	During metal detecting
<b>Description:</b>	Incomplete bronze socketed axe
<b>Reference:</b>	NMI

## **Appendix 13.6: Legislative Framework Protecting the archaeological Resource**

## Protection of Cultural Heritage

The cultural heritage in Ireland is safeguarded through national and international policy designed to secure the protection of the cultural heritage resource to the fullest possible extent (Department of Culture, Heritage and the Gaeltacht 1999, 35). This is undertaken in accordance with the provisions of the European Convention on the Protection of the Archaeological Heritage (Valletta Convention), ratified by Ireland in 1997.

## The Archaeological Resource

The National Monuments Act 1930 to 2014 and relevant provisions of the National Cultural Institutions Act 1997 are the primary means of ensuring the satisfactory protection of archaeological remains, which includes all man-made structures of whatever form or date except buildings habitually used for ecclesiastical purposes. A National Monument is described as ‘a monument or the remains of a monument the preservation of which is a matter of national importance by reason of the historical, architectural, traditional, artistic or archaeological interest attaching thereto’ (National Monuments Act 1930 Section 2).

A number of mechanisms under the National Monuments Act are applied to secure the protection of archaeological monuments. These include the Register of Historic Monuments, the Record of Monuments and Places, and the placing of Preservation Orders and Temporary Preservation Orders on endangered sites.

## Ownership and Guardianship of National Monuments

The Minister may acquire national monuments by agreement or by compulsory order. The state or local authority may assume guardianship of any national monument (other than dwellings). The owners of national monuments (other than dwellings) may also appoint the Minister or the local authority as guardian of that monument if the state or local authority agrees. Once the site is in ownership or guardianship of the state, it may not be interfered with without the written consent of the Minister.

## Register of Historic Monuments

Section 5 of the 1987 Act requires the Minister to establish and maintain a Register of Historic Monuments. Historic monuments and archaeological areas present on the register are afforded statutory protection under the 1987 Act. Any interference with sites recorded on the register is illegal without the permission of the Minister. Two months notice in writing is required prior to any work being undertaken on or in the vicinity of a registered monument. The register also includes sites under Preservation Orders and Temporary Preservation Orders. All registered monuments are included in the Record of Monuments and Places.

## Preservation Orders and Temporary Preservation Orders

Sites deemed to be in danger of injury or destruction can be allocated Preservation Orders under the 1930 Act. Preservation Orders make any interference with the site illegal. Temporary Preservation Orders can be attached under the 1954 Act. These perform the same function as a Preservation Order but have a time limit of six months, after which the situation must be reviewed. Work may only be undertaken on or in the vicinity of sites under Preservation Orders with the written consent, and at the discretion, of the Minister.

## Record of Monuments and Places

Section 12(1) of the 1994 Act requires the Minister for Arts, Heritage, Gaeltacht and the Islands (now the Minister for the Environment, Heritage and Local Government) to establish and maintain a record of monuments and



places where the Minister believes that such monuments exist. The record comprises a list of monuments and relevant places and a map/s showing each monument and relevant place in respect of each county in the state. All sites recorded on the Record of Monuments and Places receive statutory protection under the National Monuments Act 1994. All recorded monuments on the proposed development site are represented on the accompanying maps.

Section 12(3) of the 1994 Act provides that ‘where the owner or occupier (other than the Minister for Arts, Heritage, Gaeltacht and the Islands) of a monument or place included in the Record, or any other person, proposes to carry out, or to cause or permit the carrying out of, any work at or in relation to such a monument or place, he or she shall give notice in writing to the Minister of Arts, Heritage, Gaeltacht and the Islands to carry out work and shall not, except in the case of urgent necessity and with the consent of the Minister, commence the work until two months after the giving of notice’.

Under the National Monuments (Amendment) Act 2004, anyone who demolishes or in any way interferes with a recorded site is liable to a fine not exceeding €3,000 or imprisonment for up to 6 months. On summary conviction and on conviction of indictment, a fine not exceeding €10,000 or imprisonment for up to 5 years is the penalty. In addition they are liable for costs for the repair of the damage caused.

In addition to this, under the European Communities (Environmental Impact Assessment) Regulations 1989, Environmental Impact Assessment Reports (EIAR) are required for various classes and sizes of development project to assess the impact the proposed development will have on the existing environment, which includes the cultural, archaeological and built heritage resources. These document’s recommendations are typically incorporated into the conditions under which the proposed development must proceed, and thus offer an additional layer of protection for monuments which have not been listed on the RMP.

#### The Planning and Development Act 2000

Under planning legislation, each local authority is obliged to draw up a Development Plan setting out their aims and policies with regard to the growth of the area over a five-year period. They cover a range of issues including archaeology and built heritage, setting out their policies and objectives with regard to the protection and enhancement of both. These policies can vary from county to county. The Planning and Development Act 2000 recognises that proper planning and sustainable development includes the protection of the archaeological heritage. Conditions relating to archaeology may be attached to individual planning permissions.

**APPENDIX 13.7: LEGISLATION FRAMEWORK PROTECTING THE ARCHITECTURAL RESOURCE**

The main laws protecting the built heritage are the *Architectural Heritage (National Inventory) and National Monuments (Miscellaneous Provisions) Act 1999* and the *Local Government (Planning and Development) Acts 1963-1999*, which has now been superseded by the *Planning and Development Act, 2000*. The Architectural Heritage Act requires the Minister to establish a survey to identify, record and assess the architectural heritage of the country. The background to this legislation derives from Article 2 of the 1985 Convention for the Protection of Architectural Heritage (Granada Convention). This states that:

*For the purpose of precise identification of the monuments, groups of structures and sites to be protected, each member state will undertake to maintain inventories of that architectural heritage.*

The National Inventory of Architectural Heritage (NIAH) was established in 1990 to fulfil Ireland's obligation under the Granada Convention, through the establishment and maintenance of a central record, documenting and evaluating the architecture of Ireland (NIAH Handbook 2005:2). As inclusion in the inventory does not provide statutory protection, the survey information is used in conjunction with the *Architectural Heritage Protection Guidelines for Planning Authorities* to advise local authorities on compilation of a Record of Protected Structures as required by the *Planning and Development Act, 2000*.

### **Protection under the Record of Protected Structures and County Development Plan**

Structures of architectural, cultural, social, scientific, historical, technical or archaeological interest can be protected under the Planning and Development Act, 2000, where the conditions relating to the protection of the architectural heritage are set out in Part IV of the act. This act superseded the Local Government (Planning and Development) Act, 1999, and came into force on 1<sup>st</sup> January 2000.

The act provides for the inclusion of Protected Structures into the planning authorities' development plans and sets out statutory regulations regarding works affecting such structures. Under new legislation, no distinction is made between buildings formerly classified under development plans as List 1 and List 2. Such buildings are now all regarded as 'Protected Structures' and enjoy equal statutory protection. Under the act the entire structure is protected, including a structure's interior, exterior, attendant grounds and also any structures within the attendant grounds.

The act defines a Protected Structure as (a) a structure, or (b) a specified part of a structure which is included in a Record of Protected Structures (RPS), and, where that record so indicates, includes any specified feature which is in the attendant grounds of the structure and which would not otherwise be included in this definition. Protection of the structure, or part thereof, includes conservation, preservation, and improvement compatible with maintaining its character and interest. Part IV of the act deals with architectural heritage, and Section 57 deals specifically with works affecting the character of Protected Structures or proposed Protected Structures and states that no works should materially affect the character of the structure or any element of the structure that contributes to its special architectural, historical, archaeological, artistic, cultural, scientific, social or technical interest. The act does not provide specific criteria for assigning a special interest to a structure. However, the National Inventory of Architectural Heritage (NIAH) offers guidelines to its field workers as to how to designate a building with a special interest, which are not mutually exclusive. This offers guidance by example rather than by definition:

### **Archaeological**

It is to be noted that the NIAH is biased towards post-1700 structures. Structures that have archaeological features may be recorded, providing the archaeological features are incorporated within post-1700 elements. Industrial fabric is considered to have technical significance, and should only be attributed archaeological significance if the structure has pre-1700 features.

### **Architectural**

A structure may be considered of special architectural interest under the following criteria:

- Good quality or well executed architectural design
- The work of a known and distinguished architect, engineer, designer, craftsman
- A structure that makes a positive contribution to a setting, such as a streetscape or rural setting
- Modest or vernacular structures may be considered to be of architectural interest, as they are part of the history of the built heritage of Ireland.
- Well designed decorative features, externally and/or internally

### **Historical**

A structure may be considered of special historical interest under the following criteria:

- A significant historical event associated with the structure
- An association with a significant historical figure
- Has a known interesting and/or unusual change of use, e.g. a former workhouse now in use as a hotel
- A memorial to a historical event.

### **Technical**

A structure may be considered of special technical interest under the following criteria:

- Incorporates building materials of particular interest, i.e. the materials or the technology used for construction
- It is the work of a known or distinguished engineer
- Incorporates innovative engineering design, e.g. bridges, canals or mill weirs
- A structure which has an architectural interest may also merit a technical interest due to the structural techniques used in its construction, e.g. a curvilinear glasshouse, early use of concrete, cast-iron prefabrication.
- Mechanical fixtures relating to a structure may be considered of technical significance.

### **Cultural**

A structure may be considered of special cultural interest under the following criteria:

- An association with a known fictitious character or event, e.g. Sandycove Martello Tower, which featured in Ulysses.
- Other structure that illustrate the development of society, such as early schoolhouses, swimming baths or printworks.

### **Scientific**

A structure may be considered of special scientific interest under the following criteria:

- A structure or place which is considered to be an extraordinary or pioneering scientific or technical achievement in the Irish context, e.g. Mizen Head Bridge, Birr Telescope.

## **Social**

A structure may be considered of special social interest under the following criteria:

- A focal point of spiritual, political, national or other cultural sentiment to a group of people, e.g. a place of worship, a meeting point, assembly rooms.
- Developed or constructed by a community or organisation, e.g. the construction of the railways or the building of a church through the patronage of the local community
- Illustrates a particular lifestyle, philosophy, or social condition of the past, e.g. the hierarchical accommodation in a country house, philanthropic housing, vernacular structures.

## **Artistic**

A structure may be considered of special artistic interest under the following criteria:

- Work of a skilled craftsman or artist, e.g. plasterwork, wrought-iron work, carved elements or details, stained glass, stations of the cross.
- Well designed mass produced structures or elements may also be considered of artistic interest.

(From the NIAH Handbook 2003 & 2005 pages 15-20)

The Local Authority has the power to order conservation and restoration works to be undertaken by the owner of the protected structure if it considers the building to be in need of repair. Similarly, an owner or developer must make a written request to the Local Authority to carry out any works on a protected structure and its environs, which will be reviewed within three months of application. Failure to do so may result in prosecution.

## **APPENDIX 13.8: IMPACT ASSESSMENT AND THE CULTURAL HERITAGE RESOURCE**

### **Potential Impacts on Archaeological and Historical Remains**

Impacts are defined as ‘the degree of change in an environment resulting from a development’ (Environmental Protection Agency 2003: 31). They are described as profound, significant or slight impacts on archaeological remains. They may be negative, positive or neutral, direct, indirect or cumulative, temporary or permanent.

Impacts can be identified from detailed information about a project, the nature of the area affected and the range of archaeological and historical resources potentially affected. Development can affect the archaeological and historical resource of a given landscape in a number of ways.

- Permanent and temporary land-take, associated structures, landscape mounding, and their construction may result in damage to or loss of archaeological remains and deposits, or physical loss to the setting of historic monuments and to the physical coherence of the landscape.
- Archaeological sites can be affected adversely in a number of ways: disturbance by excavation, topsoil stripping and the passage of heavy machinery; disturbance by vehicles working in unsuitable conditions; or burial of sites, limiting accessibility for future archaeological investigation.
- Hydrological changes in groundwater or surface water levels can result from construction activities such as de-watering and spoil disposal, or longer-term changes in drainage patterns. These may desiccate archaeological remains and associated deposits.
- Visual impacts on the historic landscape sometimes arise from construction traffic and facilities, built earthworks and structures, landscape mounding and planting, noise, fences and associated works. These features can impinge directly on historic monuments and historic landscape elements as well as their visual amenity value.
- Landscape measures such as tree planting can damage sub-surface archaeological features, due to topsoil stripping and through the root action of trees and shrubs as they grow.
- Ground consolidation by construction activities or the weight of permanent embankments can cause damage to buried archaeological remains, especially in colluviums or peat deposits.
- Disruption due to construction also offers in general the potential for adversely affecting archaeological remains. This can include machinery, site offices, and service trenches.

*Although not widely appreciated, positive impacts can accrue from developments. These can include positive resource management policies, improved maintenance and access to archaeological monuments, and the increased level of knowledge of a site or historic landscape as a result of archaeological assessment and fieldwork.*

## **Predicted Impacts**

The severity of a given level of land-take or visual intrusion varies with the type of monument, site or landscape features and its existing environment. Severity of impact can be judged taking the following into account:

- The proportion of the feature affected and how far physical characteristics fundamental to the understanding of the feature would be lost;
- Consideration of the type, date, survival/condition, fragility/vulnerability, rarity, potential and amenity value of the feature affected;
- Assessment of the levels of noise, visual and hydrological impacts, either in general or site specific terms, as may be provided by other specialists.

## **Appendix 13.9: Mitigation Measures and the Cultural Heritage Resource**



## Potential Mitigation Strategies for Cultural Heritage Remains

Mitigation is defined as features of the design or other measures of the proposed development that can be adopted to avoid, prevent, reduce or offset negative effects.

The best opportunities for avoiding damage to archaeological remains or intrusion on their setting and amenity arise when the site options for the development are being considered. Damage to the archaeological resource immediately adjacent to developments may be prevented by the selection of appropriate construction methods. Reducing adverse effects can be achieved by good design, for example by screening historic buildings or upstanding archaeological monuments or by burying archaeological sites undisturbed rather than destroying them. Offsetting adverse effects is probably best illustrated by the full investigation and recording of archaeological sites that cannot be preserved in situ.

## Definition of Mitigation Strategies

### Archaeological Resource

The ideal mitigation for all archaeological sites is preservation in situ. This is not always a practical solution, however. Therefore a series of recommendations are offered to provide ameliorative measures where avoidance and preservation in situ are not possible.

Archaeological Test Trenching can be defined as ‘a limited programme of intrusive fieldwork which determines the presence or absence of archaeological features, structures, deposits, artefacts or ecofacts within a specified area or site on land, inter-tidal zone or underwater. If such archaeological remains are present field evaluation defines their character, extent, quality and preservation, and enables an assessment of their worth in a local, regional, national or international context as appropriate’ (ClfA 2014a).

Full Archaeological Excavation can be defined as ‘a programme of controlled, intrusive fieldwork with defined research objectives which examines, records and interprets archaeological deposits, features and structures and, as appropriate, retrieves artefacts, ecofacts and other remains within a specified area or site on land, inter-tidal zone or underwater. The records made and objects gathered during fieldwork are studied and the results of that study published in detail appropriate to the project design’ (ClfA 2014b).

Archaeological Monitoring can be defined as ‘a formal programme of observation and investigation conducted during any operation carried out for non-archaeological reasons. This will be within a specified area or site on land, inter-tidal zone or underwater, where there is a possibility that archaeological deposits may be disturbed or destroyed. The programme will result in the preparation of a report and ordered archive (ClfA 2014c).

Underwater Archaeological Assessment consists of a programme of works carried out by a specialist underwater archaeologist, which can involve wade surveys, metal detection surveys and the excavation of test pits within the sea or riverbed. These assessments are able to access and assess the potential of an underwater environment to a much higher degree than terrestrial based assessments.

### Architectural Resource

The architectural resource is generally subject to a greater degree of change than archaeological sites, as structures may survive for many years but their usage may change continually. This can be reflected in the fabric of the building, with the addition and removal of doors, windows and extensions. Due to their often more visible presence within the landscape than archaeological sites, the removal of such structures can sometimes leave a discernable 'gap' with the cultural identity of a population. However, a number of mitigation measures are available to ensure a record is made of any structure that is deemed to be of special interest, which may be removed or altered as part of a proposed development.

Conservation Assessment consists of a detailed study of the history of a building and can include the surveying of elevations to define the exact condition of the structure. These assessments are carried out by Conservation Architects and would commonly be carried out in association with proposed alterations or renovations on a Recorded Structure.

Building Survey may involve making an accurate record of elevations (internal and external), internal floor plans and external sections. This is carried out using a EDM (Electronic Distance Measurer) and GPS technology to create scaled drawings that provide a full record of the appearance of a building at the time of the survey.

Historic Building Assessment is generally specific to one building, which may have historic significance, but is not a Protected Structure or listed within the NIAH. A full historical background for the structure is researched and the site is visited to assess the standing remains and make a record of any architectural features of special interest. These assessments can also be carried out in conjunction with a building survey.

Written and Photographic record provides a basic record of features such as stone walls, which may have a small amount of cultural heritage importance and are recorded for prosperity. Dimensions of the feature are recorded with a written description and photographs as well as some cartographic reference, which may help to date a feature.

**Appendix 13.10: Plates**



Plate 13.1: Cropmarks in southwest of Field 3



Plate 13.2: Field 1, facing northeast along gravel



Plate 13.3: Field 2, with cereal crop, facing northeast



Plate 13.4: View at location of pond feature in Field,



Plate 13.5: Location of cropmarks in Field 3, facing west



Plate 13.6 Field 4, facing north



Plate 13.7: Steep cutaway along the northern extent of



Plate 13.8: Deposit of stones along the break of



Plate 13.9: Field 5, facing west



Plate 13.10: Steeply sloping ground in Field 6



Plate 13.11: Field 7, adjacent to the Three Trouts River,



Plate 13.12: Field 8, small enclosed area, facing



Plate 13.13: Farrankelly House, facing northwest



Plate 13.14: BH 1, rounded corner and uncoursed



Plate 13.15 BH 1, slate roof and brick detail, facing



Plate 13.16: BH 2, facing southwest



Plate 13.17: BH 3, northern gable showing stone footing,



Plate 13.18: Eastern wall of BH 3, rebuilt in stone



Plate 13.19: BH 3, width of cob wall where western wall



Plate 13.20: BH 4, cob walled west gable with two



Plate 13.21: BH 4, cob-walled eastern gable, facing west



Plate 13.22: BH 4, showing thickness of the walling on the floor of the western



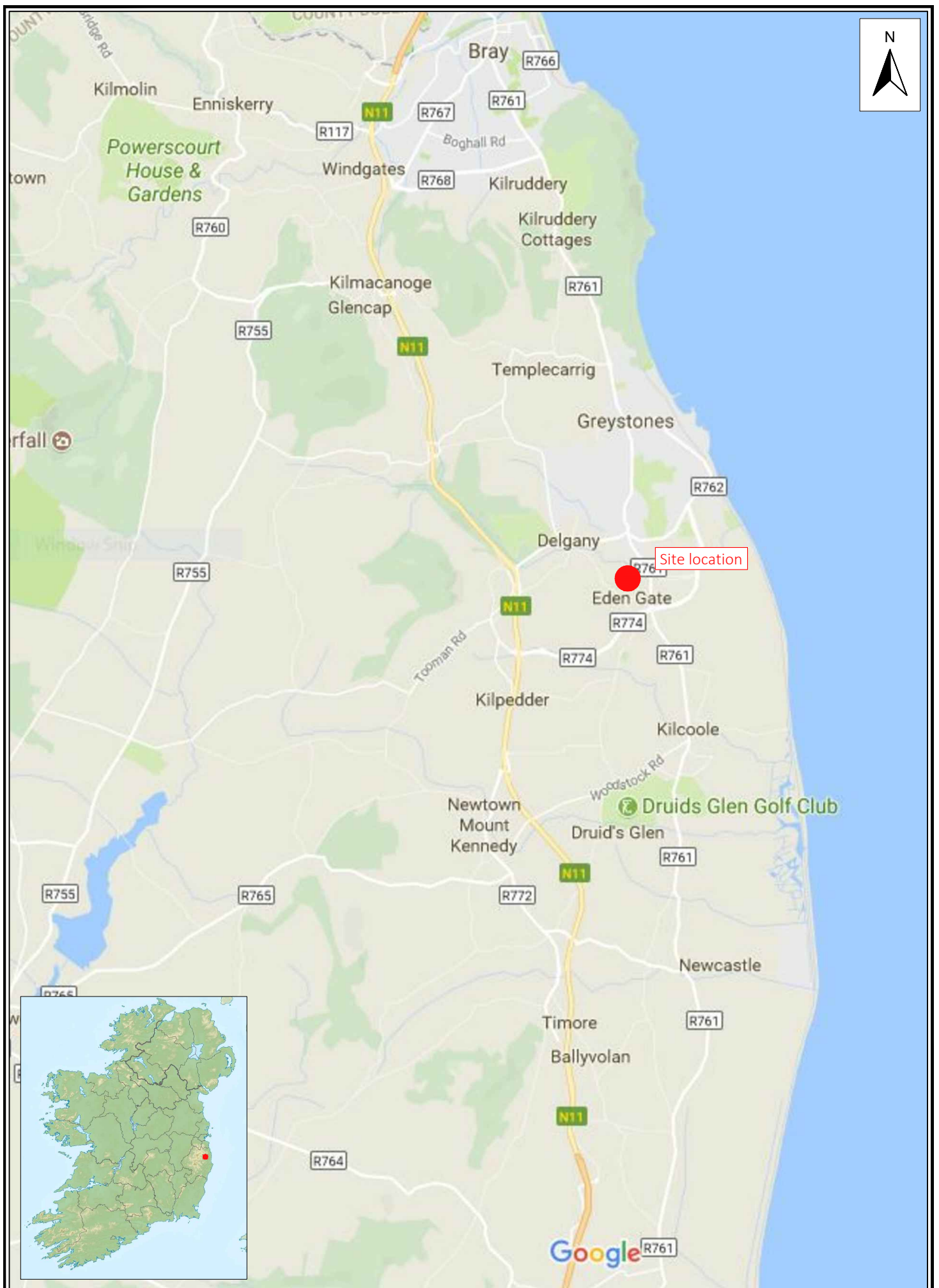
Plate 13.23: BH 4 with the surviving stone wall of BH5



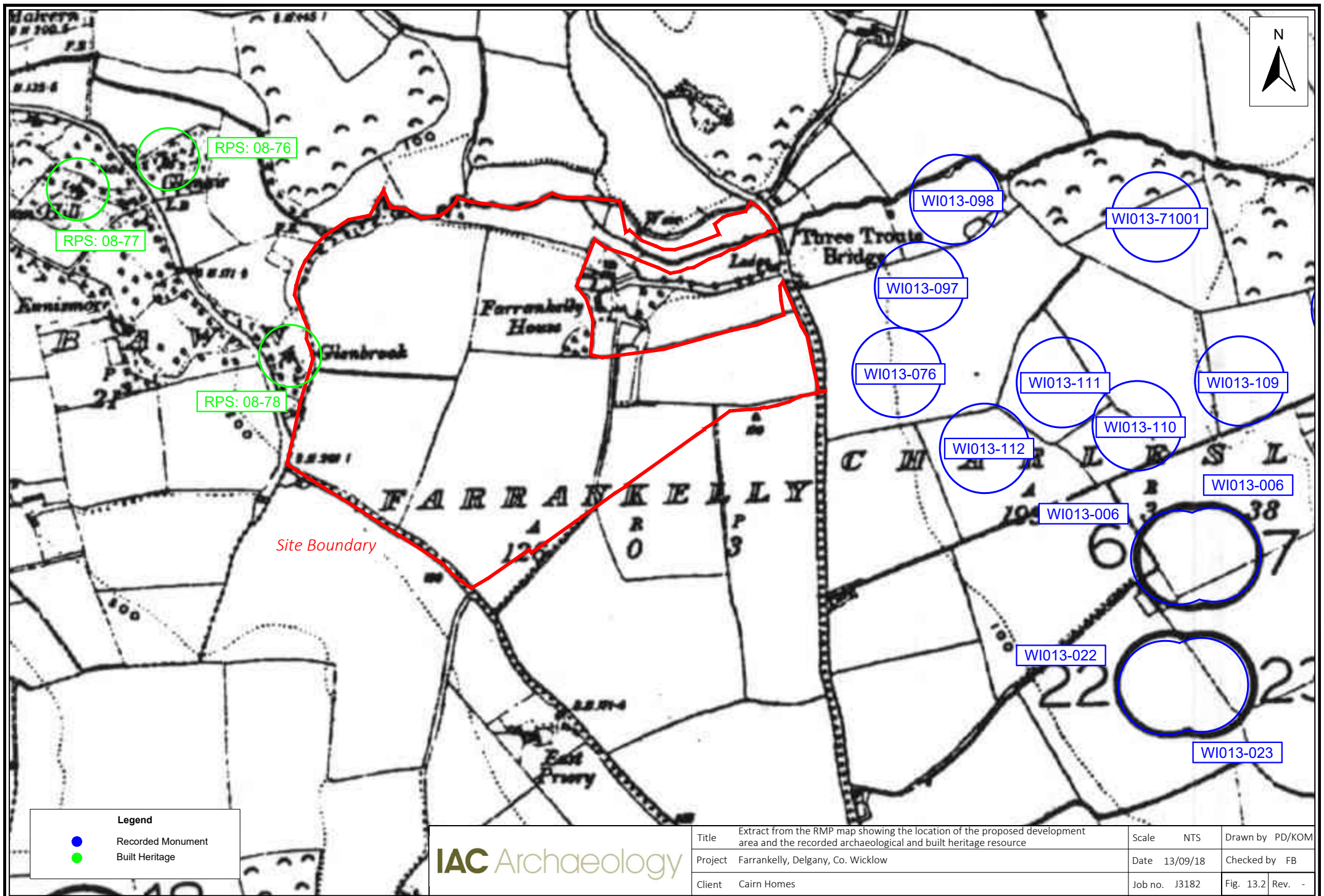
Plate 13.24: BH 5, rebuilt block wall and modern

**Appendix 13.3: Figures 13.1-3.6**





Title	Site location	Scale	NTS	Drawn by	KOM
Project	Farrankelly, Delgany, Co. Wicklow	Date	13/09/18	Checked by	FB
Client	Cairn Homes	Job no.	J3182	Fig.	13.1
		Rev.	-		-



RPS: 08-76

RPS: 08-77

RPS: 08-78

WI013-098

WI013-71001

WI013-097

WI013-076

WI013-111

WI013-109

WI013-112

WI013-110

WI013-006

WI013-006

WI013-022

WI013-023

Site Boundary

FARRANKELLY

Farrankelly House

Three Troia Bridge

Glenbrook

**Legend**

- Recorded Monument
- Built Heritage

**IAC Archaeology**

Title	Extract from the RMP map showing the location of the proposed development area and the recorded archaeological and built heritage resource	Scale	NTS	Drawn by	PD/KOM
Project	Farrankelly, Delgany, Co. Wicklow	Date	13/09/18	Checked by	FB
Client	Cairn Homes	Job no.	J3182	Fig. 13.2	Rev. -



Sheet 3

Sheet 4

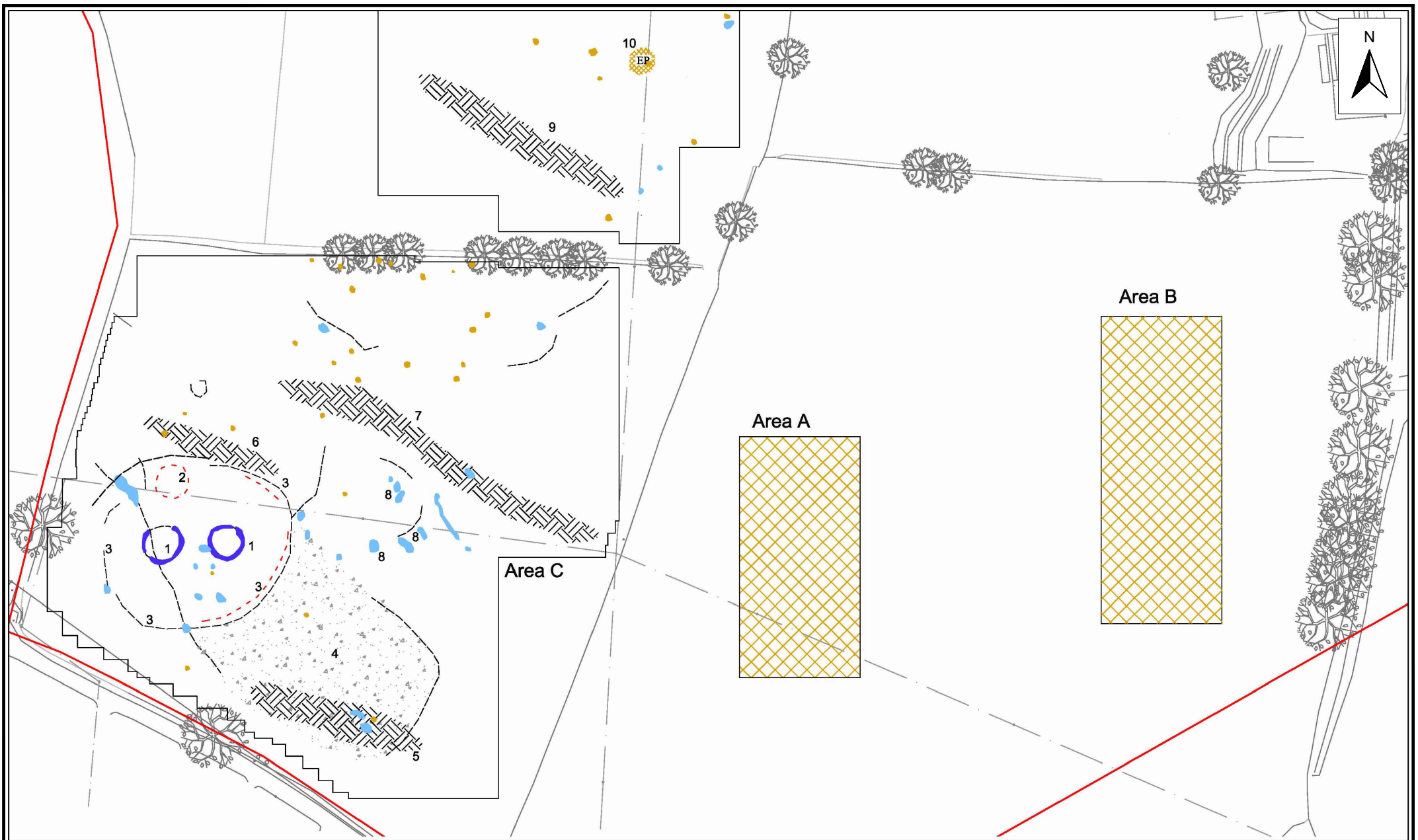


Sheet 2

Sheet 1

**IAC** Archaeology

Title	Plan of the proposed development	Scale	NTS	Drawn by	PD/KOM
Project	Farrankelly, Delgany, Co. Wicklow	Date	13/12/18	Checked by	FB
Client	Cairn Homes	Job no.	J3182	Fig. 13.3	Rev. -



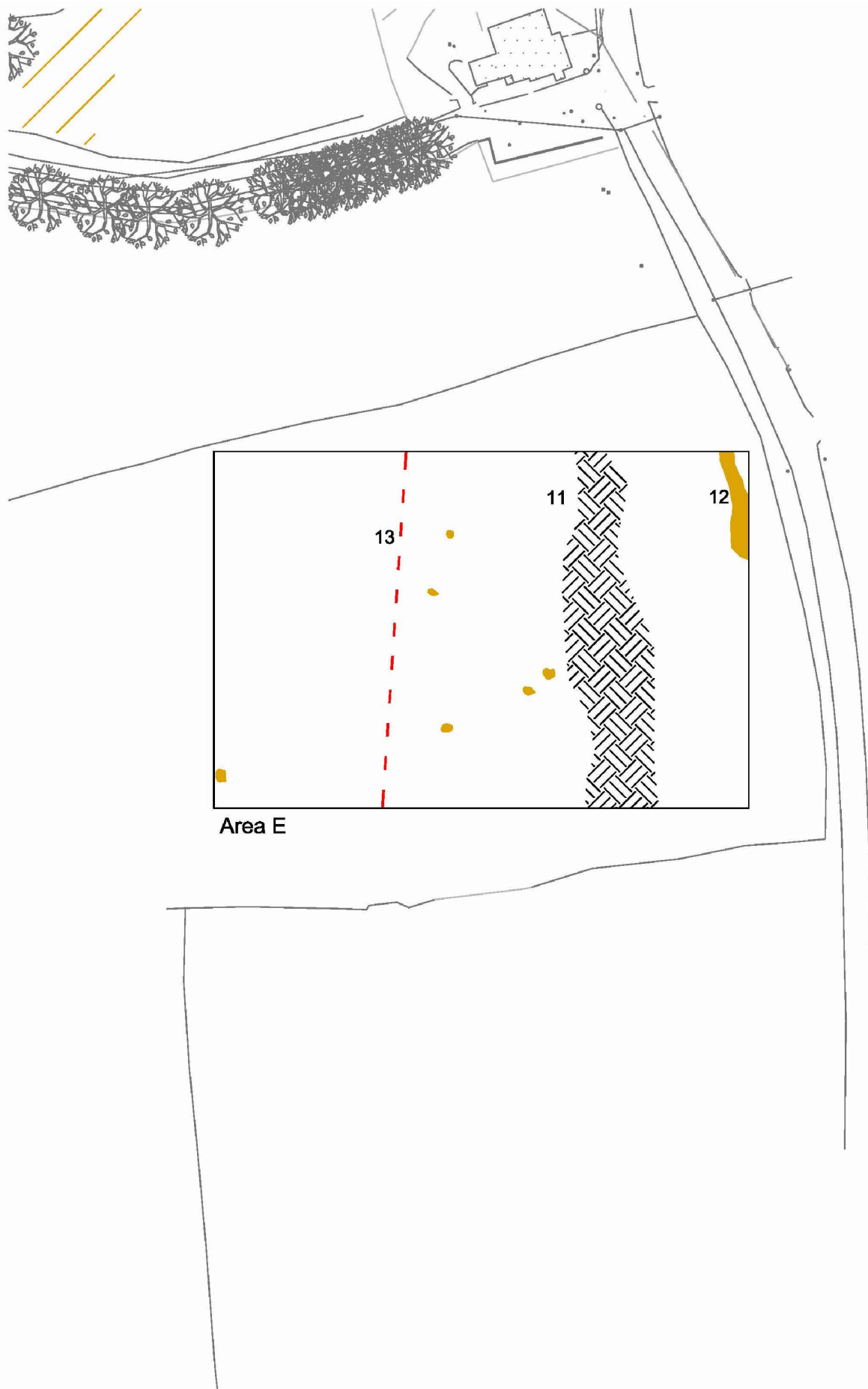
- Archaeology - Ditch
- ?Archaeology - Pit / Ditch
- Positive trend
- Negative trend
- Increased magnetic response
- ? Natural variation
- Modern magnetic disturbance
- Modern Ferrous

0 metres 50



IAC Archaeology

Title	Geophysical Survey: Summary interpretation Areas A-D (J.M. Leigh Surveys)	Scale	as shown	Drawn by	KOM
Project	Farrankelly, Delgany, Co. Wicklow	Date	13/09/18	Checked by	FB
Client	Cairn Homes	Job no.	J3182	Fig. 13.4	Rev. -



Area E



Negative trend - Plastic Pipe



? Natural variation

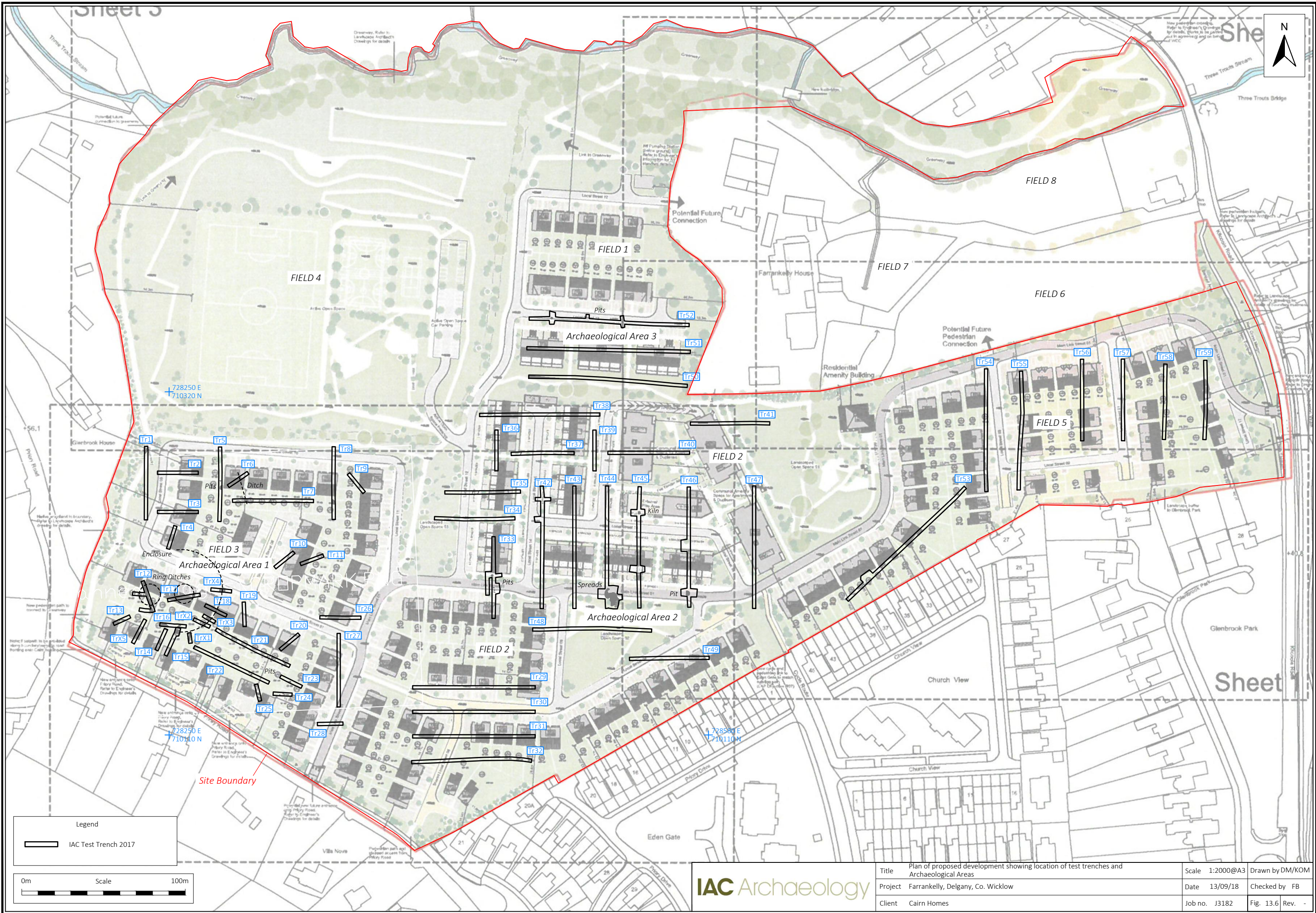


Modern Ferrous



0 metres 50

Title	Geophysical Survey: Summary interpretation Area E (J.M. Leigh Surveys)	Scale	as shown	Drawn by	KOM
Project	Farrankelly, Delgany, Co. Wicklow	Date	13/09/18	Checked by	FB
Client	Cairn Homes	Job no.	J3182	Fig.	13.5
				Rev.	-

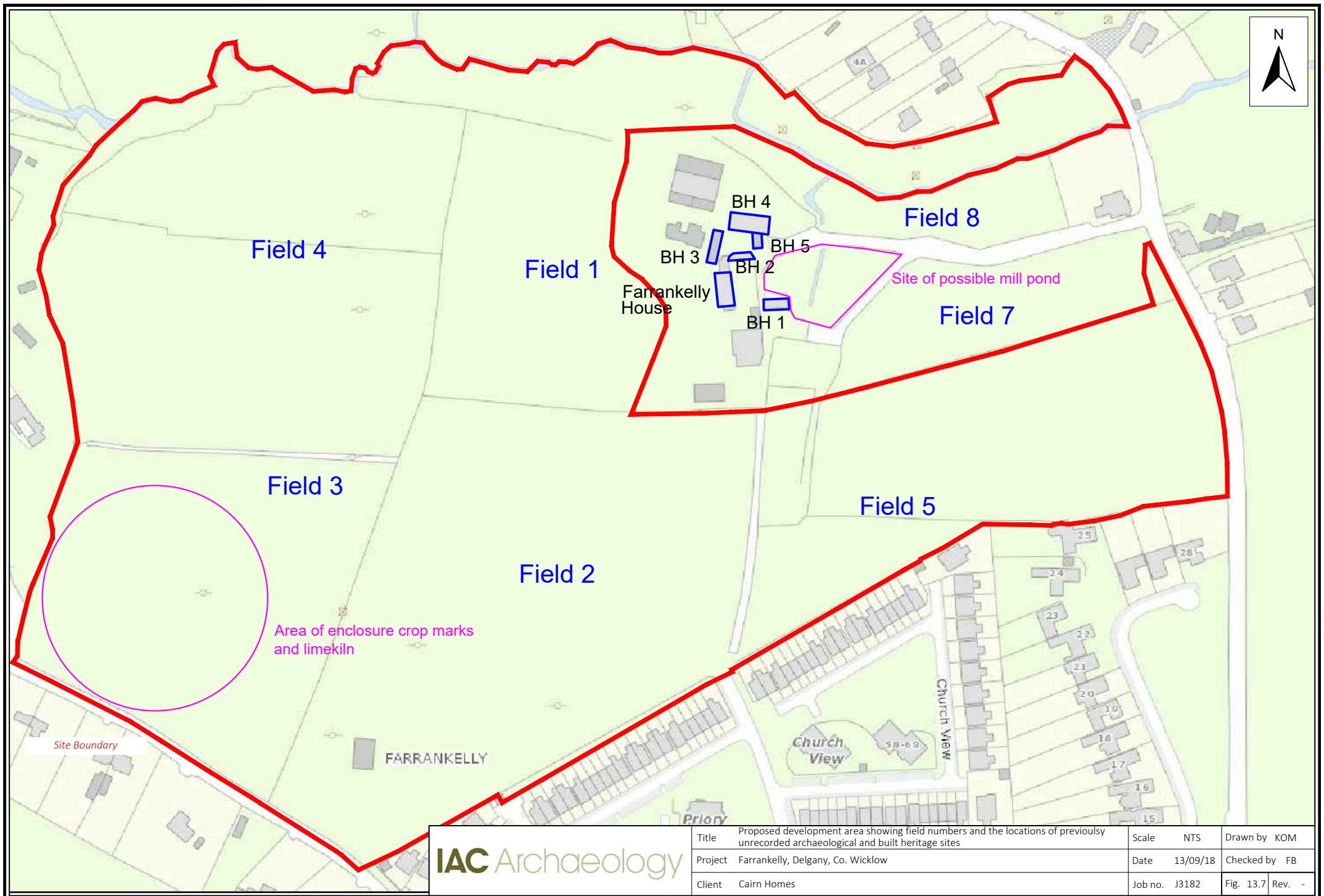


Legend  
 IAC Test Trench 2017



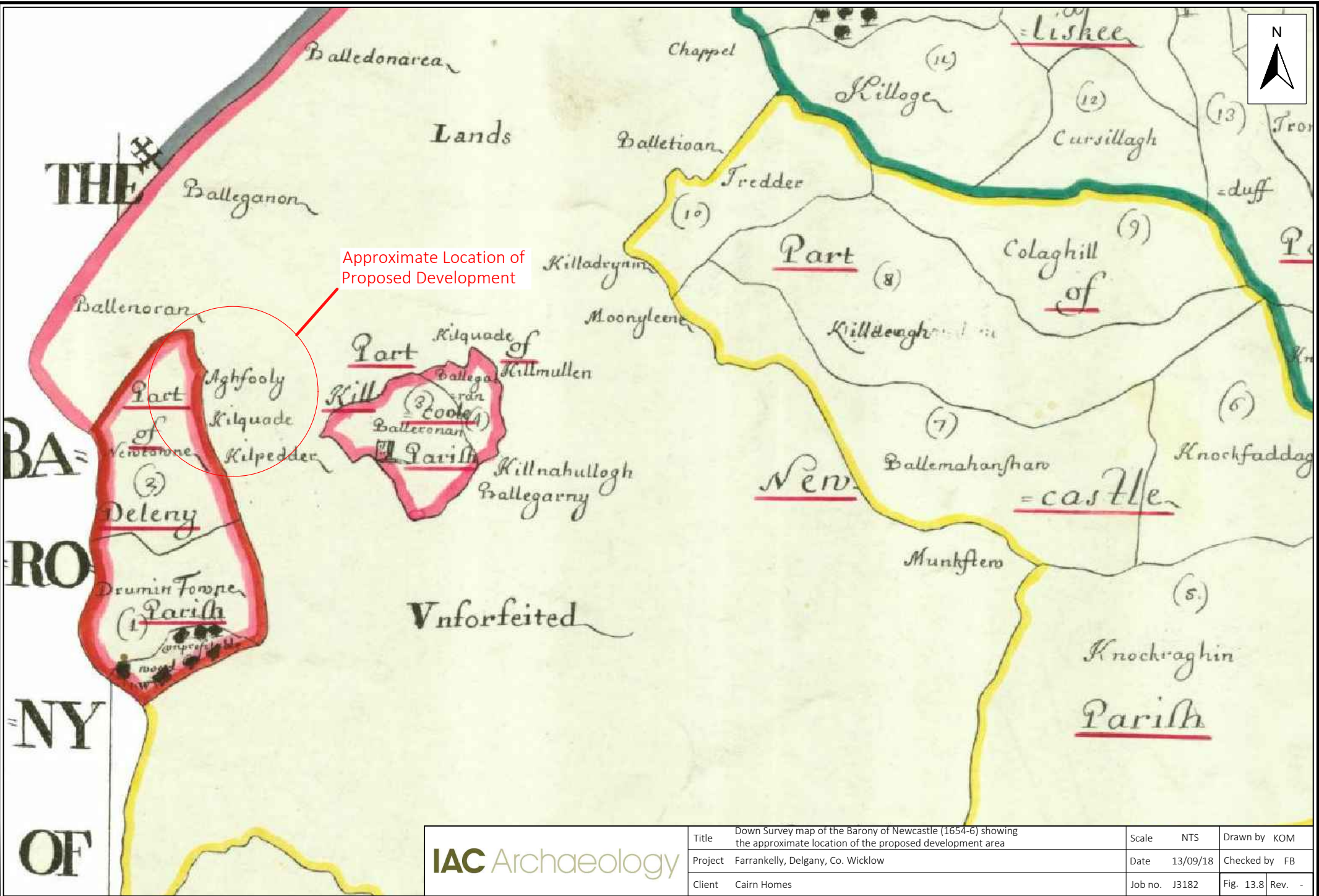
IAC Archaeology

Title	Plan of proposed development showing location of test trenches and Archaeological Areas	Scale	1:2000@A3	Drawn by	DM/KOM
Project	Farrankelly, Delgany, Co. Wicklow	Date	13/09/18	Checked by	FB
Client	Cairn Homes	Job no.	J3182	Fig. 13.6 Rev.	-



**IAC** Archaeology

Title	Proposed development area showing field numbers and the locations of previously unrecorded archaeological and built heritage sites	Scale	NTS	Drawn by	KOM
Project	Farrankelly, Delgany, Co. Wicklow	Date	13/09/18	Checked by	FB
Client	Cairn Homes	Job no.	J3182	Fig. 13.7	Rev. -



Approximate Location of Proposed Development

IAC Archaeology

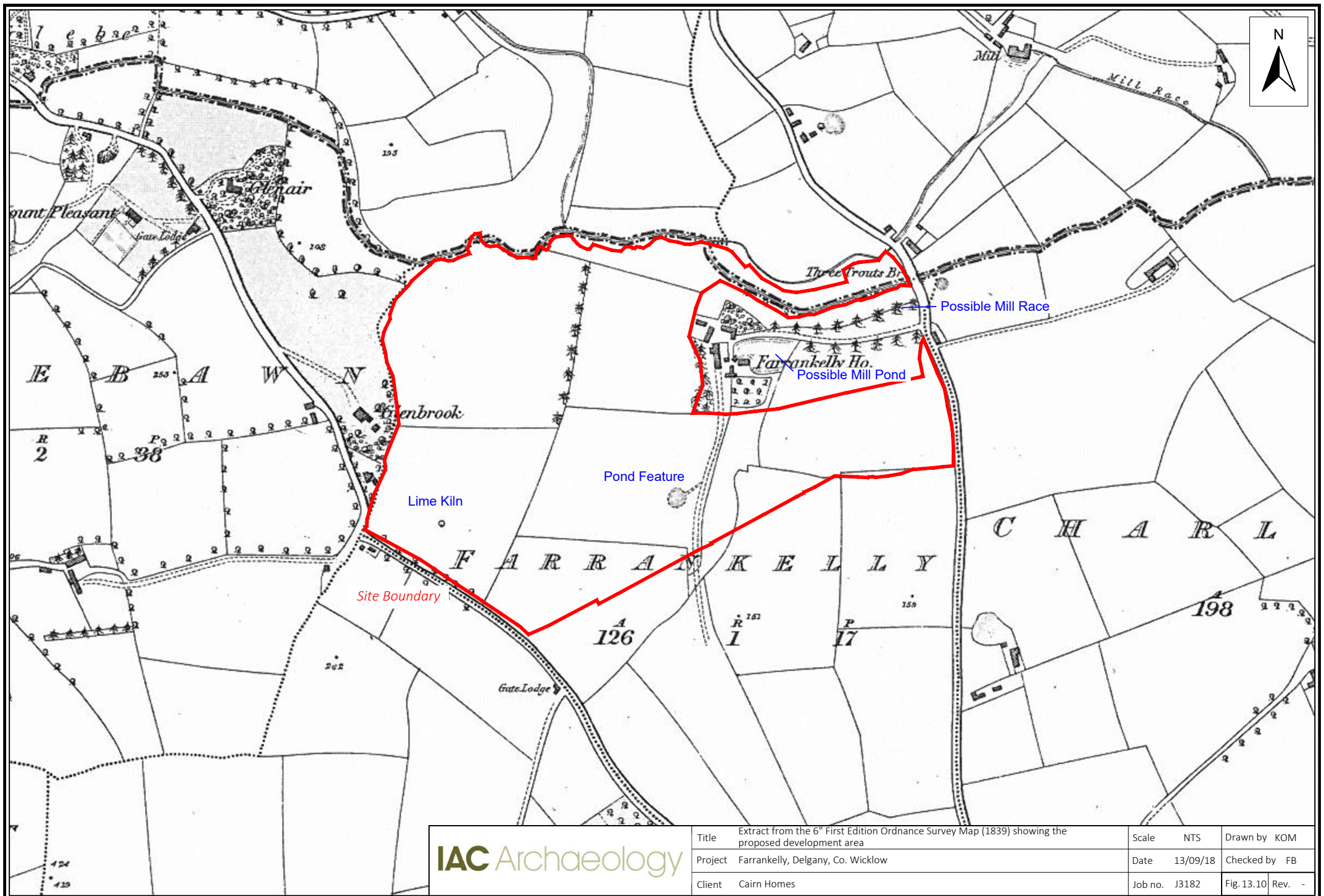
Title	Down Survey map of the Barony of Newcastle (1654-6) showing the approximate location of the proposed development area	Scale	NTS	Drawn by	KOM
Project	Farrankelly, Delgany, Co. Wicklow	Date	13/09/18	Checked by	FB
Client	Cairn Homes	Job no.	J3182	Fig. 13.8	Rev. -





**IAC** Archaeology

Title	Extract from Jacob Nevill's Map of County Wicklow (1760) showing the approximate location of the proposed development area	Scale	NTS	Drawn by	KOM
Project	Farrankelly, Delgany, Co. Wicklow	Date	13/09/18	Checked by	FB
Client	Cairn Homes	Job no.	J3182	Fig.	13.9
				Rev.	-

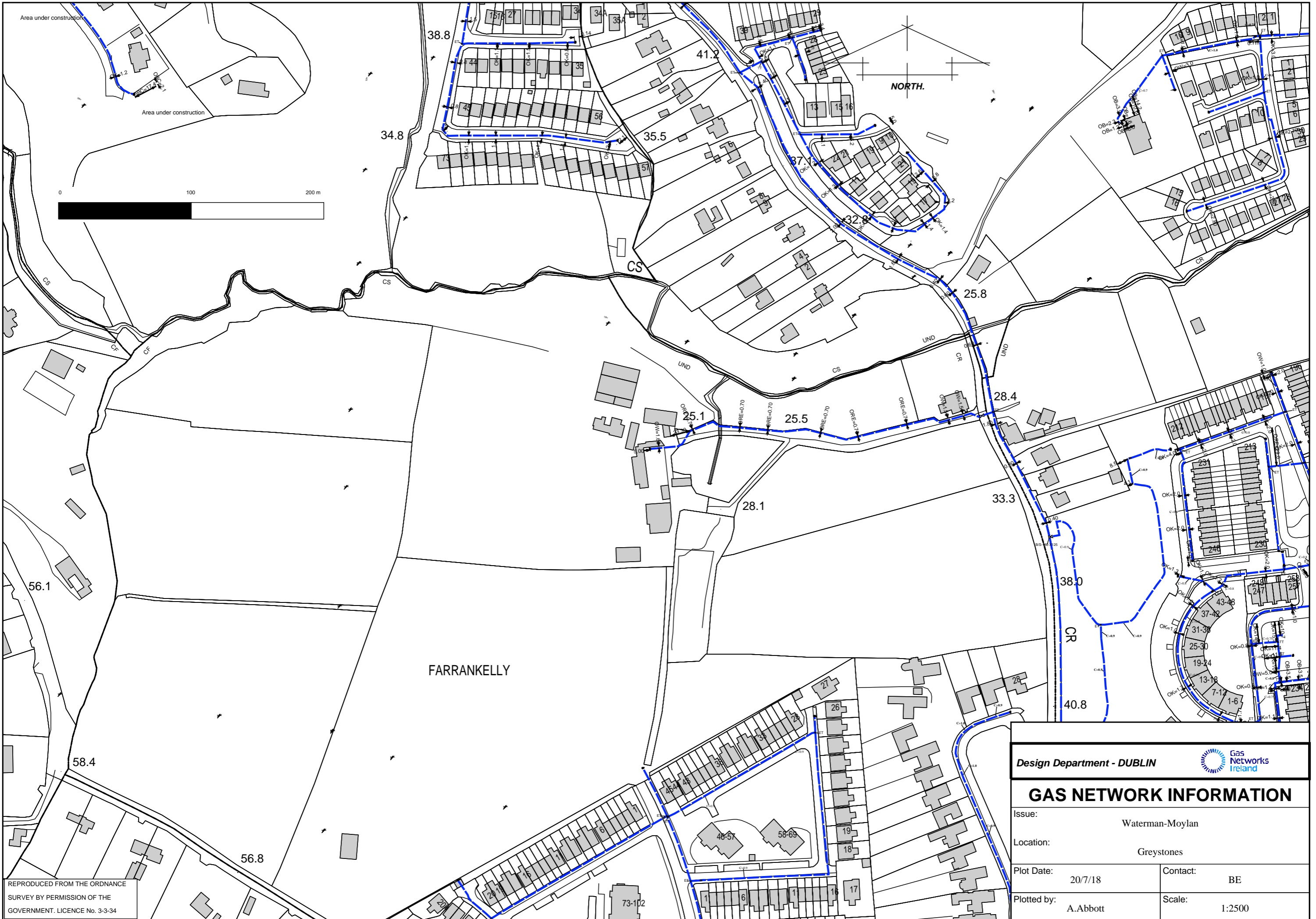


**IAC Archaeology**


Title	Extract from the 6 <sup>th</sup> First Edition Ordnance Survey Map (1839) showing the proposed development area	Scale	NTS	Drawn by	KOM
Project	Farrankelly, Delgany, Co. Wicklow	Date	13/09/18	Checked by	FB
Client	Cairn Homes	Job no.	J3182	Fig. 13.10	Rev. -

## **APPENDIX B – UTILITIES**

Utility Maps



REPRODUCED FROM THE ORDNANCE SURVEY BY PERMISSION OF THE GOVERNMENT. LICENCE No. 3-3-34

Design Department - DUBLIN			
<b>GAS NETWORK INFORMATION</b>			
Issue:	Waterman-Moylan		
Location:	Greystones		
Plot Date:	20/7/18	Contact:	BE
Plotted by:	A.Abbott	Scale:	1:2500



TITLE: 20180724-044\_A3

COLOUR CODE:

- BLACK - 38KV & HIGHER VOLTAGE OVERHEAD LINES
- GREEN - MV(10KV/20KV) OVERHEAD LINES
- BLUE - LV (400V/230V) OVERHEAD LINES
- CYAN - 38KV & HIGHER VOLTAGE UNDERGROUND CABLE ROUTES
- RED - MV/LV (10KV/20KV/400V/230V) UNDERGROUND CABLE ROUTES

DATE: 24-Jul-2018

**\*\* SCALE: 1:2500**

\*\* SCALE WHEN PRINTED ON AN A3 PAGE  
XY COORDINATES DISPLAYED IN IRISH GRID COORDINATE SYSTEM

### WARNING

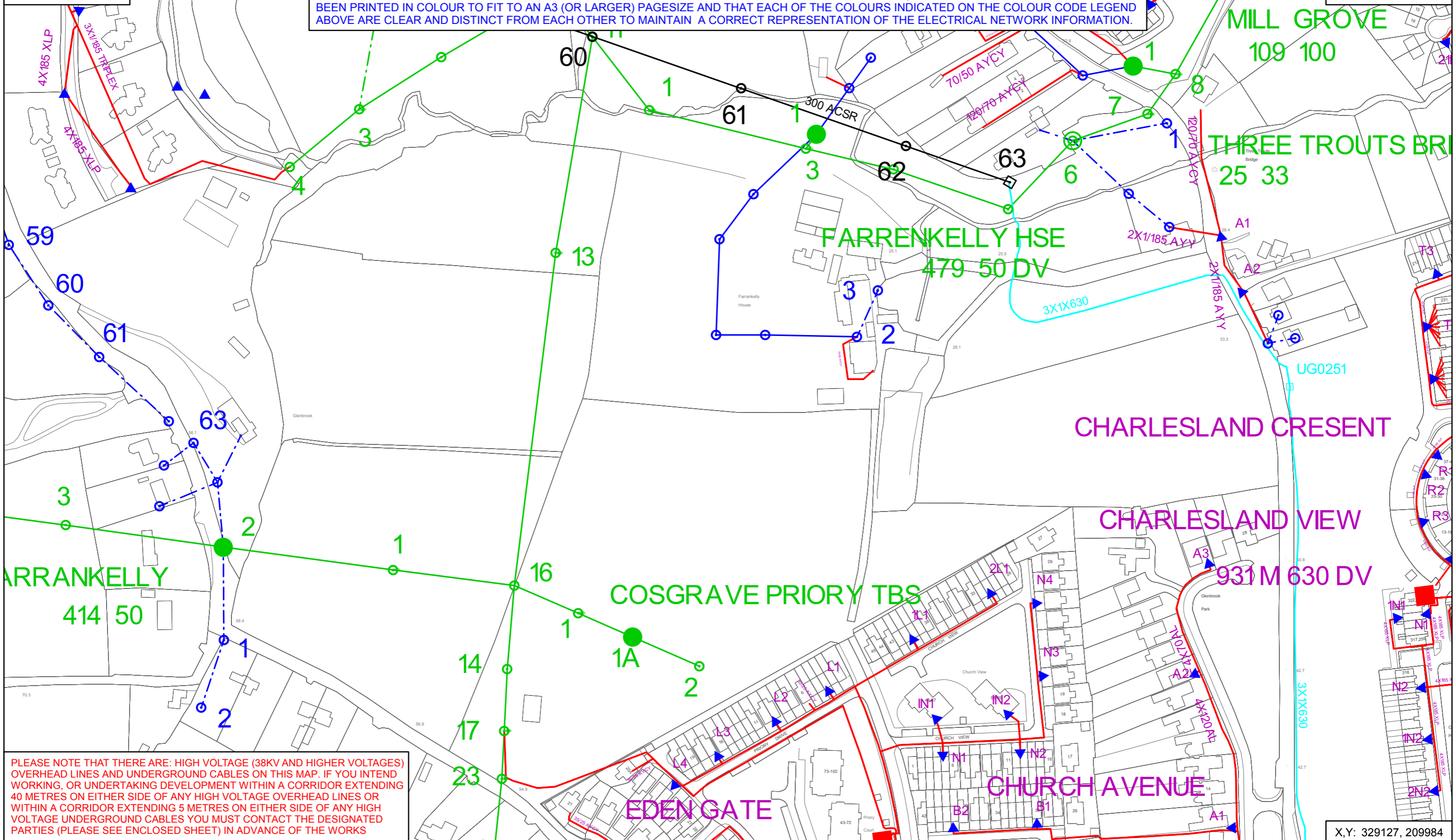
THIS MAP INDICATES THE APPROXIMATE LOCATION OF ESB TRANSMISSION (400KV, 220KV, 110KV, 38KV) AND DISTRIBUTION (20KV, 10KV, 230V/400V) UNDERGROUND CABLES AND OVERHEAD LINES IN THE GENERAL AREA OF THE PROPOSED WORKS. ESB NETWORKS TAKES NO RESPONSIBILITY FOR THE ACCURACY OR COMPLETENESS OF THE MAP. IT IS THE USER'S RESPONSIBILITY TO INDEPENDENTLY VERIFY THE INFORMATION AND THE LOCATION OF UNDERGROUND CABLES AND OVERHEAD LINES. LOW VOLTAGE (230V/400V) SERVICE CABLES (E.G. HOUSE SERVICES, FACTORY/SHOP SERVICES, PUBLIC LIGHTING LAMP SERVICES, ETC) ARE NOT INCLUDED BUT THEIR PRESENCE SHOULD BE ANTICIPATED. THE DEPTHS OF UNDERGROUND CABLES MUST NEVER BE ASSUMED. ADDITIONAL MORE DETAILED INFORMATION IS AVAILABLE FOR HIGH VOLTAGE TRANSMISSION UNDERGROUND CABLES (38KV, 110KV, 220KV, 400KV) FROM THE LOCAL ESB NETWORKS TRANSMISSION REPRESENTATIVE - SEE ATTACHED LIST FOR CONTACT DETAILS OR CALL 1850 372 757. NO WORK SHOULD BE CARRIED OUT IN THE VICINITY OF 38KV OR HIGHER VOLTAGE UNDERGROUND CABLES WITHOUT PRIOR CONSULTATION WITH ESB NETWORKS. BEFORE ANY MECHANICAL EXCAVATION IS UNDERTAKEN, THE ACTUAL LOCATION OF ALL UNDERGROUND ELECTRICITY CABLES MUST BE ESTABLISHED AND VERIFIED ON THE SITE USING: (A) UP-TO-DATE MAP RECORDS; (B) CABLE LOCATER EQUIPMENT OPERATED IN BOTH POWER AND RADIO MODES; (C) CAREFUL HAND DIGGING OF TRIAL HOLES USING 'SAFE DIGGING PRACTICE'. REFER ALSO TO 'HSA CODE OF PRACTICE FOR AVOIDING DANGER FROM UNDERGROUND SERVICES'. ESB TAKES NO RESPONSIBILITY FOR AND SHALL BEAR NO LIABILITY, HOWSOEVER ARISING, IN RELATION TO ANY DAMAGE, INJURY/DEATH OR LOSS OF SUPPLY AS A RESULT OF DAMAGE OR INTERFERENCE WITH ITS NETWORKS.

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X,Y: 328107, 210589

ESB NETWORKS HAS ISSUED THIS MAP AS A PDF DOCUMENT. IF VIEWING A PAPER VERSION OF THIS MAP, THE VIEWER MUST ENSURE THAT IT HAS BEEN PRINTED IN COLOUR TO FIT TO AN A3 (OR LARGER) PAGESIZE AND THAT EACH OF THE COLOURS INDICATED ON THE COLOUR CODE LEGEND ABOVE ARE CLEAR AND DISTINCT FROM EACH OTHER TO MAINTAIN A CORRECT REPRESENTATION OF THE ELECTRICAL NETWORK INFORMATION.

X,Y: 329127, 210589



PLEASE NOTE THAT THERE ARE: HIGH VOLTAGE (38KV AND HIGHER VOLTAGES) OVERHEAD LINES AND UNDERGROUND CABLES ON THIS MAP. IF YOU INTEND WORKING, OR UNDERTAKING DEVELOPMENT WITHIN A CORRIDOR EXTENDING 40 METRES ON EITHER SIDE OF ANY HIGH VOLTAGE OVERHEAD LINES OR WITHIN A CORRIDOR EXTENDING 5 METRES ON EITHER SIDE OF ANY HIGH VOLTAGE UNDERGROUND CABLES YOU MUST CONTACT THE DESIGNATED PARTIES (PLEASE SEE ENCLOSED SHEET) IN ADVANCE OF THE WORKS

X,Y: 329127, 209984



**PLANT REQUESTED FROM eircom emaps CBYD SERVICE**

<https://cbyd.emaps.eircom.ie/>

Scale: 1:1250  
 Date: 20/07/2018

Irish National Grid Co-Ordinates  
 Centre XY: 328814 m, 210389 m

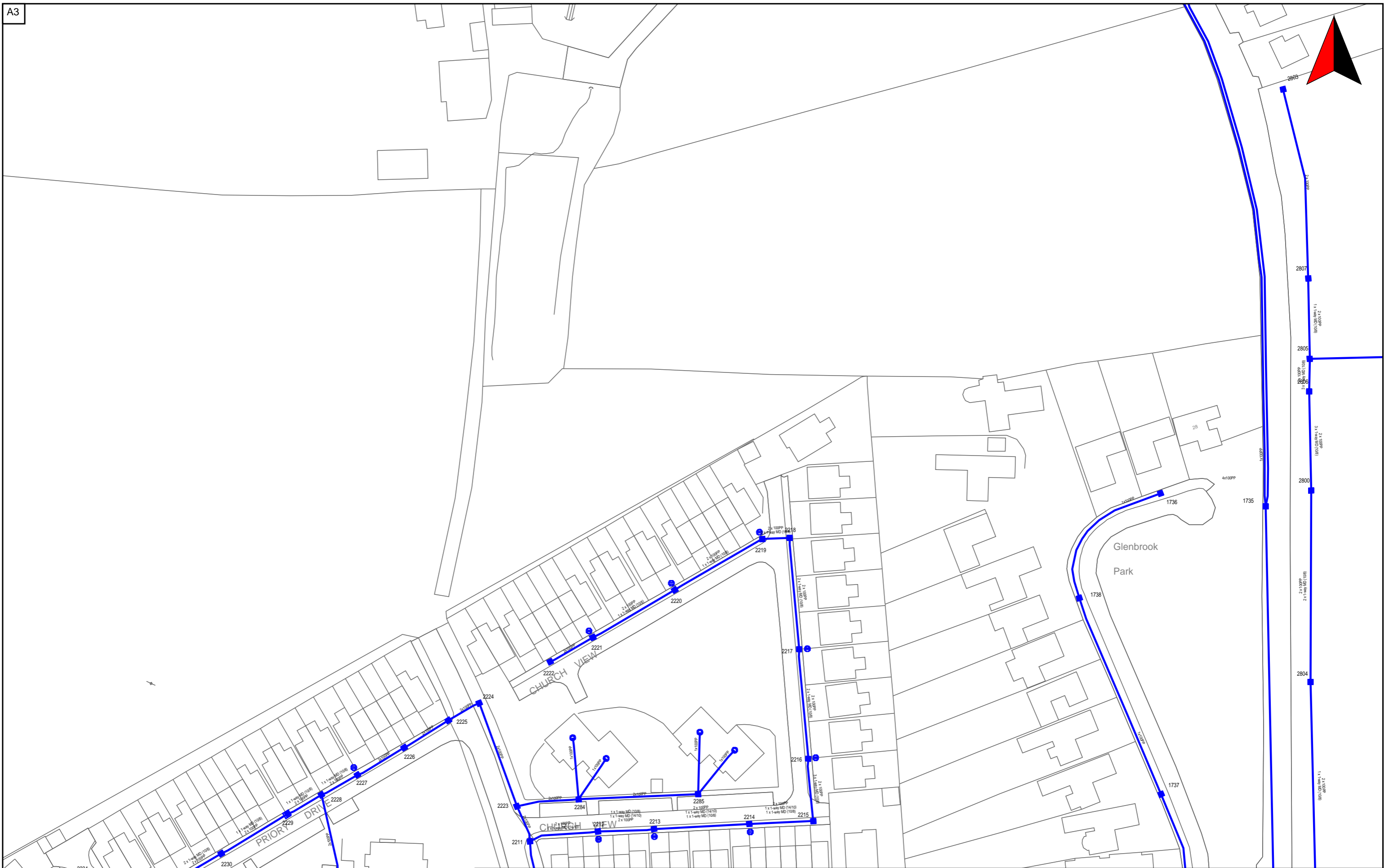
**emaps CBYD**

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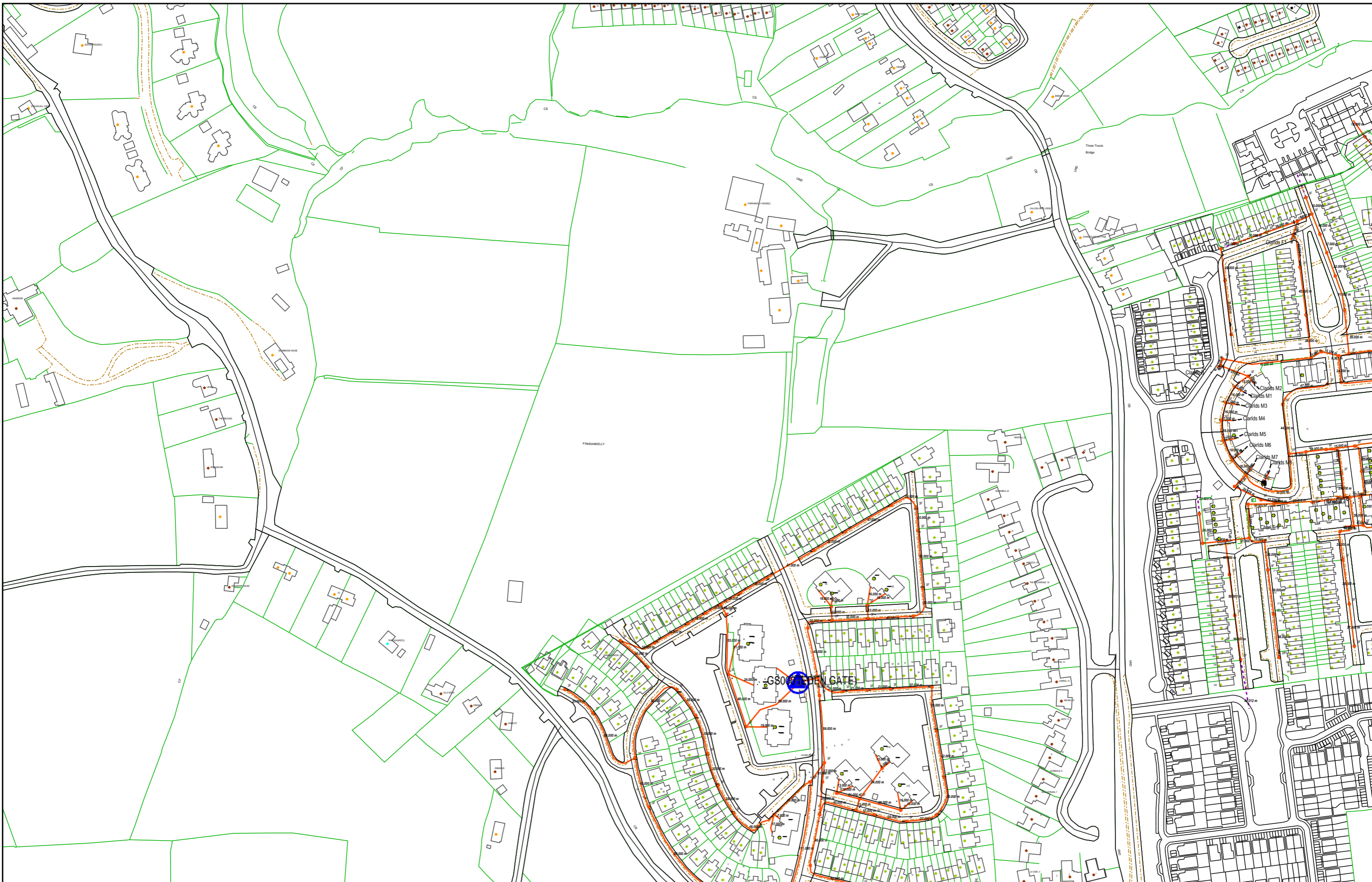
<https://cbyd.emaps.eircom.ie/>

Scale: 1:1250	Irish National Grid Co-Ordinates Centre XY: 328796 m, 210180 m
Date 20/07/2018	<b>emaps CBYD</b>

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Virgin Media  
Unit 6 & 7  
Broomhill Business Park  
Tallaght 24

PROJECT NAME  
DESIGNED BY:

Ordnance Survey Ireland Licence No. EN0023805  
(c) Ordnance Survey Ireland and Government of Ireland

Produced on: 23/07/2018



@ A3



## **APPENDIX C – MATERIAL ASSETS - TRAFFIC**

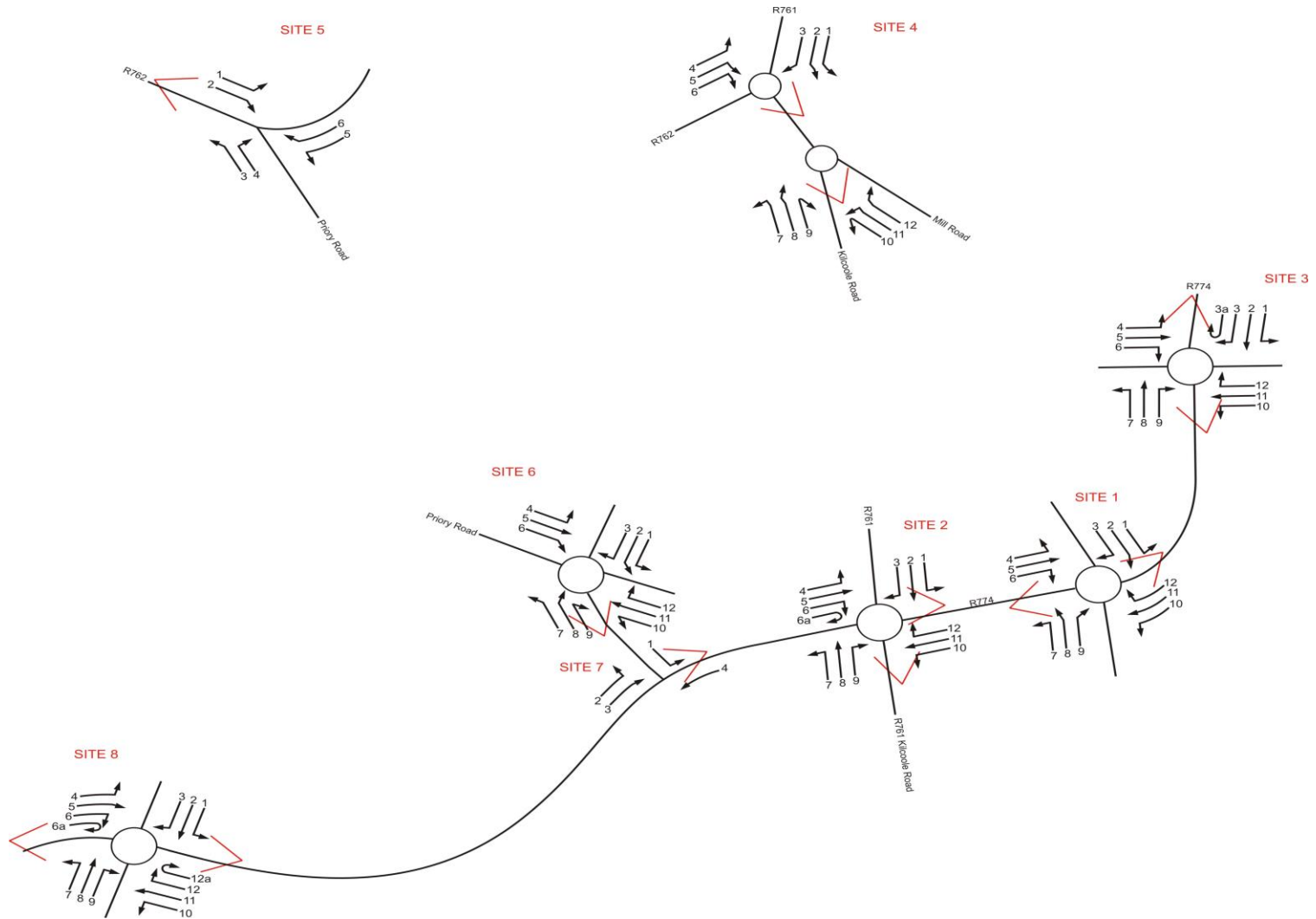
EIA TTA Appendix A Traffic Surveys

EIA TTA Appendix B Traffic Generation & Distribution

EIA TTA Appendix C Junction Capacity Analysis

EIA TTA Appendix D DMURS Compliance

# Site Numbers/Movement Directions



Job number:  
Ath/16/036  
Client:  
Roughan & O'Donovan

Job date:  
28<sup>th</sup> April 2016  
Job day  
Thursday

Drawing No:  
Ath/16/036-2  
Author:  
SPW



## ABACUS TRANSPORTATION SURVEYS

**GREYSTONES TRAFFIC COUNTS  
MANUAL CLASSIFIED JUNCTION TURNING COUNTS**

**APRIL 2016  
ATH/16/036**

SITE: 01

DATE: 28th April 2016

LOCATION: R774/Go Gym (Charlesland Leisure Centre)

DAY: Thursday

TIME	MOVEMENT 1					TOT	PCU	MOVEMENT 2					TOT	PCU	MOVEMENT 3					TOT	PCU				
	CAR	LGV	OGV1	OGV2	BUS			CAR	LGV	OGV1	OGV2	BUS			CAR	LGV	OGV1	OGV2	BUS						
07:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1
<b>H/TOT</b>	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1
08:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1
08:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:45	2	0	0	0	0	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>H/TOT</b>	2	0	0	0	0	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1
09:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
09:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
09:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
09:45	1	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>H/TOT</b>	1	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>H/TOT</b>	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>H/TOT</b>	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>H/TOT</b>	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

## ABACUS TRANSPORTATION SURVEYS

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**APRIL 2016  
ATH/16/036**

SITE: 01

DATE: 28th April 2016

LOCATION: R774/Go Gym (Charlesland Leisure Centre)

DAY: Thursday

TIME	MOVEMENT 1					TOT	PCU	MOVEMENT 2					TOT	PCU	MOVEMENT 3					TOT	PCU		
	CAR	LGV	OGV1	OGV2	BUS			CAR	LGV	OGV1	OGV2	BUS			CAR	LGV	OGV1	OGV2	BUS				
13:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>H/TOT</b>	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14:15	1	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>H/TOT</b>	1	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15:00	1	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>H/TOT</b>	1	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	2	0	0	0
16:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>H/TOT</b>	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	2	0	0	0
17:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>H/TOT</b>	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18:00	1	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18:45	1	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>H/TOT</b>	2	0	0	0	0	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>P/TOT</b>	7	0	0	0	0	7	7	0	0	0	0	0	0	0	1	1	1	0	0	3	4	0	0

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TIME	MOVEMENT 4					TOT	PCU	MOVEMENT 5					TOT	PCU	MOVEMENT 6					TOT	PCU
	CAR	LGV	OGV1	OGV2	BUS			CAR	LGV	OGV1	OGV2	BUS			CAR	LGV	OGV1	OGV2	BUS		
07:00	0	0	0	0	0	0	0	56	2	1	0	0	59	60	2	0	0	0	0	2	2
07:15	0	0	0	0	0	0	0	73	8	1	1	0	83	85	1	0	0	0	0	1	1
07:30	0	0	1	0	0	1	2	116	6	2	0	1	125	127	0	0	0	0	0	0	0
07:45	0	0	0	0	0	0	0	97	7	1	1	1	107	110	0	0	0	0	0	0	0
<b>H/TOT</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>2</b>	<b>342</b>	<b>23</b>	<b>5</b>	<b>2</b>	<b>2</b>	<b>374</b>	<b>381</b>	<b>3</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>3</b>	<b>3</b>
08:00	0	0	0	0	0	0	0	67	8	2	0	3	80	84	2	0	0	0	1	3	4
08:15	0	1	0	0	0	1	1	96	10	5	0	1	112	116	4	0	0	0	0	4	4
08:30	0	0	0	0	0	0	0	156	8	1	0	0	165	166	1	0	0	0	0	1	1
08:45	1	0	0	0	0	1	1	87	13	3	0	1	104	107	5	0	0	0	1	6	7
<b>H/TOT</b>	<b>1</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>2</b>	<b>2</b>	<b>406</b>	<b>39</b>	<b>11</b>	<b>0</b>	<b>5</b>	<b>461</b>	<b>472</b>	<b>12</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>2</b>	<b>14</b>	<b>16</b>
09:00	0	0	0	0	0	0	0	94	10	2	0	0	106	107	3	0	0	0	0	3	3
09:15	0	0	0	0	0	0	0	85	7	2	0	1	95	97	3	0	0	0	0	3	3
09:30	2	0	0	0	0	2	2	65	12	2	0	1	80	82	9	0	0	0	0	9	9
09:45	0	0	0	0	0	0	0	63	10	2	0	0	75	76	10	0	0	0	0	10	10
<b>H/TOT</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>2</b>	<b>2</b>	<b>307</b>	<b>39</b>	<b>8</b>	<b>0</b>	<b>2</b>	<b>356</b>	<b>362</b>	<b>25</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>25</b>	<b>25</b>
10:00	0	0	0	0	0	0	0	46	11	5	1	1	64	69	10	0	0	0	0	10	10
10:15	0	0	0	0	0	0	0	57	8	3	0	0	68	70	9	1	0	0	0	10	10
10:30	0	0	0	0	0	0	0	67	6	1	1	0	75	77	4	0	0	0	0	4	4
10:45	0	0	0	0	0	0	0	77	9	1	1	0	88	90	6	0	0	0	0	6	6
<b>H/TOT</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>247</b>	<b>34</b>	<b>10</b>	<b>3</b>	<b>1</b>	<b>295</b>	<b>305</b>	<b>29</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>30</b>	<b>30</b>
11:00	0	0	0	0	0	0	0	50	17	1	0	0	68	69	4	1	0	0	0	5	5
11:15	0	0	0	0	0	0	0	68	7	0	0	0	75	75	1	0	0	0	0	1	1
11:30	0	0	0	0	0	0	0	60	9	2	0	1	72	74	5	0	0	1	0	6	7
11:45	0	0	0	0	0	0	0	64	8	1	1	1	75	78	7	0	0	0	1	8	9
<b>H/TOT</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>242</b>	<b>41</b>	<b>4</b>	<b>1</b>	<b>2</b>	<b>290</b>	<b>295</b>	<b>17</b>	<b>1</b>	<b>0</b>	<b>1</b>	<b>1</b>	<b>20</b>	<b>22</b>
12:00	0	0	0	0	0	0	0	77	12	1	2	0	92	95	5	0	0	0	0	5	5
12:15	0	0	0	0	0	0	0	54	5	1	0	0	60	61	3	0	0	0	0	3	3
12:30	0	0	0	0	0	0	0	71	18	4	1	0	94	97	2	0	0	0	0	2	2
12:45	0	0	0	0	0	0	0	74	6	2	0	0	82	83	3	0	0	0	0	3	3
<b>H/TOT</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>276</b>	<b>41</b>	<b>8</b>	<b>3</b>	<b>0</b>	<b>328</b>	<b>336</b>	<b>13</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>13</b>	<b>13</b>

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	CAR	LGV	OGV1	OGV2	BUS			CAR	LGV	OGV1	OGV2	BUS			CAR	LGV	OGV1	OGV2	BUS		
13:00	0	0	0	0	0	0	0	91	10	4	0	0	105	107	9	0	0	0	0	9	9
13:15	0	0	0	0	0	0	0	65	5	0	0	0	70	70	3	1	0	0	0	4	4
13:30	0	0	0	0	0	0	0	84	7	2	0	1	94	96	7	2	0	0	0	9	9
13:45	0	0	0	0	0	0	0	98	10	0	1	2	111	114	5	1	0	0	0	6	6
<b>H/TOT</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>338</b>	<b>32</b>	<b>6</b>	<b>1</b>	<b>3</b>	<b>380</b>	<b>387</b>	<b>24</b>	<b>4</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>28</b>	<b>28</b>
14:00	0	0	0	0	0	0	0	99	12	0	0	1	112	113	5	0	0	0	0	5	5
14:15	0	0	0	0	0	0	0	104	14	0	0	0	118	118	9	0	0	0	0	9	9
14:30	0	0	0	0	0	0	0	96	6	1	0	0	103	104	4	0	0	0	0	4	4
14:45	0	0	0	0	0	0	0	99	13	0	0	1	113	114	13	0	0	0	0	13	13
<b>H/TOT</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>398</b>	<b>45</b>	<b>1</b>	<b>0</b>	<b>2</b>	<b>446</b>	<b>449</b>	<b>31</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>31</b>	<b>31</b>
15:00	1	0	0	0	0	1	1	81	9	0	1	1	92	94	13	0	0	0	0	13	13
15:15	0	0	0	0	0	0	0	91	14	2	0	0	107	108	11	0	0	0	0	11	11
15:30	0	0	0	0	0	0	0	126	7	2	0	1	136	138	9	0	0	0	0	9	9
15:45	0	0	0	0	0	0	0	80	9	1	0	1	91	93	11	0	0	0	0	11	11
<b>H/TOT</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>1</b>	<b>378</b>	<b>39</b>	<b>5</b>	<b>1</b>	<b>3</b>	<b>426</b>	<b>433</b>	<b>44</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>44</b>	<b>44</b>
16:00	0	0	0	0	0	0	0	85	10	1	0	1	97	99	9	0	0	0	0	9	9
16:15	0	0	0	0	0	0	0	107	4	1	0	4	116	121	5	0	0	0	0	5	5
16:30	0	0	0	0	0	0	0	79	16	0	1	1	97	99	5	1	0	0	0	6	6
16:45	0	0	0	0	0	0	0	98	6	0	0	0	104	104	13	1	0	0	0	14	14
<b>H/TOT</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>369</b>	<b>36</b>	<b>2</b>	<b>1</b>	<b>6</b>	<b>414</b>	<b>422</b>	<b>32</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>34</b>	<b>34</b>
17:00	0	0	0	0	0	0	0	89	13	0	0	0	102	102	13	0	0	0	0	13	13
17:15	0	0	0	0	0	0	0	95	3	0	0	0	98	98	8	1	0	0	0	9	9
17:30	0	0	0	0	0	0	0	156	11	1	0	0	168	169	9	1	0	0	0	10	10
17:45	1	0	0	0	0	1	1	275	28	7	1	2	313	320	12	0	0	0	0	12	12
<b>H/TOT</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>1</b>	<b>615</b>	<b>55</b>	<b>8</b>	<b>1</b>	<b>2</b>	<b>681</b>	<b>688</b>	<b>42</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>44</b>	<b>44</b>
18:00	0	0	0	0	0	0	0	129	5	2	1	1	138	141	13	1	0	0	0	14	14
18:15	0	0	0	0	0	0	0	170	19	0	1	0	190	191	32	1	0	0	0	33	33
18:30	1	0	0	0	0	1	1	115	13	0	0	0	128	128	16	3	0	0	0	19	19
18:45	0	0	0	0	0	0	0	125	5	1	0	1	132	134	23	1	0	0	0	24	24
<b>H/TOT</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>1</b>	<b>539</b>	<b>42</b>	<b>3</b>	<b>2</b>	<b>2</b>	<b>588</b>	<b>594</b>	<b>84</b>	<b>6</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>90</b>	<b>90</b>
<b>P/TOT</b>	<b>6</b>	<b>1</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>8</b>	<b>9</b>	<b>4457</b>	<b>466</b>	<b>71</b>	<b>15</b>	<b>30</b>	<b>5039</b>	<b>5124</b>	<b>356</b>	<b>16</b>	<b>0</b>	<b>1</b>	<b>3</b>	<b>376</b>	<b>380</b>

## ABACUS TRANSPORTATION SURVEYS

**GREYSTONES TRAFFIC COUNTS**  
**MANUAL CLASSIFIED JUNCTION TURNING COUNTS**

**APRIL 2016**  
**ATH/16/036**

SITE: 01

DATE: 28th April 2016

LOCATION: R774/Go Gym (Charlesland Leisure Centre)

DAY: Thursday

TIME	MOVEMENT 7					TOT	PCU	MOVEMENT 8					TOT	PCU	MOVEMENT 9					TOT	PCU
	CAR	LGV	OGV1	OGV2	BUS			CAR	LGV	OGV1	OGV2	BUS			CAR	LGV	OGV1	OGV2	BUS		
07:00	2	0	0	0	0	2	2	0	0	0	0	0	0	0	1	0	0	0	0	1	1
07:15	2	0	0	0	0	2	2	0	0	0	0	0	0	0	1	0	0	0	0	1	1
07:30	3	0	0	0	0	3	3	0	0	0	0	0	0	0	1	0	0	0	0	1	1
07:45	2	1	0	0	0	3	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>H/TOT</b>	<b>9</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>10</b>	<b>10</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>3</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>3</b>	<b>3</b>	
08:00	2	0	0	0	0	2	2	0	0	0	0	0	0	0	0	0	0	0	1	1	2
08:15	2	0	0	0	0	2	2	0	0	0	0	0	0	0	1	0	0	0	0	1	1
08:30	1	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:45	5	0	0	0	0	5	5	0	0	0	0	0	0	1	0	0	0	0	1	1	1
<b>H/TOT</b>	<b>10</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>10</b>	<b>10</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>3</b>	<b>4</b>	
09:00	3	0	0	0	0	3	3	0	0	0	0	0	0	1	0	0	0	1	2	3	3
09:15	1	0	0	0	0	1	1	0	0	0	0	0	0	3	0	0	0	0	3	3	3
09:30	2	0	0	0	0	2	2	0	0	0	0	0	0	1	0	0	0	0	1	1	1
09:45	1	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>H/TOT</b>	<b>7</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>7</b>	<b>7</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>5</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>6</b>	<b>7</b>	
10:00	3	0	1	0	0	4	5	0	0	0	0	0	0	1	0	0	0	1	2	3	3
10:15	4	0	0	0	0	4	4	0	0	0	0	0	0	0	1	0	0	0	1	1	1
10:30	3	0	0	0	0	3	3	0	0	0	0	0	0	2	0	0	0	0	2	2	2
10:45	4	0	0	0	0	4	4	0	0	0	0	0	0	1	0	0	0	0	1	1	1
<b>H/TOT</b>	<b>14</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>15</b>	<b>16</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>4</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>6</b>	<b>7</b>	
11:00	6	0	0	0	0	6	6	0	0	0	0	0	0	2	0	0	0	1	3	4	4
11:15	5	1	0	0	0	6	6	0	0	0	0	0	0	2	0	0	0	0	2	2	2
11:30	10	0	0	0	0	10	10	0	0	0	0	0	0	4	1	0	0	0	5	5	5
11:45	4	0	0	0	0	4	4	0	0	0	0	0	0	3	0	0	0	1	4	5	5
<b>H/TOT</b>	<b>25</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>26</b>	<b>26</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>11</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>2</b>	<b>14</b>	<b>16</b>	
12:00	7	0	0	0	0	7	7	0	0	0	0	0	0	4	0	0	0	0	4	4	4
12:15	4	0	0	0	0	4	4	0	0	0	0	0	0	2	0	0	0	0	2	2	2
12:30	6	0	0	0	0	6	6	0	0	0	0	0	0	2	0	0	0	0	2	2	2
12:45	3	0	0	0	0	3	3	0	0	0	0	0	0	1	0	0	0	0	1	1	1
<b>H/TOT</b>	<b>20</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>20</b>	<b>20</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>9</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>9</b>	<b>9</b>	

## ABACUS TRANSPORTATION SURVEYS

**GREYSTONES TRAFFIC COUNTS**  
**MANUAL CLASSIFIED JUNCTION TURNING COUNTS**

**APRIL 2016**  
**ATH/16/036**

SITE: 01

DATE: 28th April 2016

LOCATION: R774/Go Gym (Charlesland Leisure Centre)

DAY: Thursday

TIME	MOVEMENT 7					TOT	PCU	MOVEMENT 8					TOT	PCU	MOVEMENT 9					TOT	PCU
	CAR	LGV	OGV1	OGV2	BUS			CAR	LGV	OGV1	OGV2	BUS			CAR	LGV	OGV1	OGV2	BUS		
13:00	3	0	0	0	0	3	3	0	0	0	0	0	0	0	2	0	0	0	1	3	4
13:15	4	0	0	0	0	4	4	0	0	0	0	0	0	0	1	1	0	0	0	2	2
13:30	8	1	0	0	0	9	9	0	0	0	0	0	0	0	1	0	0	0	0	1	1
13:45	6	0	0	0	0	6	6	0	0	0	0	0	0	0	3	0	0	0	0	3	3
<b>H/TOT</b>	<b>21</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>22</b>	<b>22</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>7</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>9</b>	<b>10</b>	
14:00	10	1	0	0	0	11	11	0	0	0	0	0	0	10	0	0	0	1	11	12	
14:15	7	1	0	0	0	8	8	1	0	0	0	0	1	4	0	0	0	0	4	4	
14:30	3	0	0	0	0	3	3	0	0	0	0	0	0	2	0	0	0	0	2	2	
14:45	7	0	0	0	0	7	7	0	0	0	0	0	0	5	0	0	0	0	5	5	
<b>H/TOT</b>	<b>27</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>29</b>	<b>29</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>1</b>	<b>21</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>22</b>	<b>23</b>	
15:00	20	1	0	0	0	21	21	0	0	0	0	0	0	16	0	0	0	2	18	20	
15:15	9	0	0	0	1	10	11	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15:30	8	0	0	0	0	8	8	0	0	0	0	0	0	3	0	0	0	0	3	3	
15:45	10	0	0	0	0	10	10	0	0	0	0	0	0	3	1	0	0	0	4	4	
<b>H/TOT</b>	<b>47</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>49</b>	<b>50</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>22</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>2</b>	<b>25</b>	<b>27</b>	
16:00	10	1	1	0	0	12	13	0	0	0	0	0	0	16	0	0	0	1	17	18	
16:15	9	0	0	0	0	9	9	0	0	0	0	0	0	2	0	0	0	0	2	2	
16:30	6	1	0	0	0	7	7	0	0	0	0	0	0	2	0	0	0	0	2	2	
16:45	8	0	0	0	0	8	8	0	0	0	0	0	0	6	0	0	0	0	6	6	
<b>H/TOT</b>	<b>33</b>	<b>2</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>36</b>	<b>37</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>26</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>27</b>	<b>28</b>	
17:00	18	0	0	0	0	18	18	0	0	0	0	0	0	8	0	0	0	1	9	10	
17:15	13	1	0	0	0	14	14	0	0	0	0	0	0	1	0	0	0	0	1	1	
17:30	9	0	0	0	0	9	9	0	0	0	0	0	0	3	1	0	0	0	4	4	
17:45	12	0	0	0	0	12	12	0	0	0	0	0	0	6	0	0	0	0	6	6	
<b>H/TOT</b>	<b>52</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>53</b>	<b>53</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>18</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>20</b>	<b>21</b>	
18:00	17	1	0	0	0	18	18	0	0	0	0	0	0	9	0	0	0	1	10	11	
18:15	5	1	0	0	0	6	6	0	0	0	0	0	0	8	0	0	0	0	8	8	
18:30	16	0	0	0	0	16	16	0	0	0	0	0	0	5	0	0	0	0	5	5	
18:45	9	1	0	0	0	10	10	0	0	0	0	0	0	4	1	0	0	0	5	5	
<b>H/TOT</b>	<b>47</b>	<b>3</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>50</b>	<b>50</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>26</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>28</b>	<b>29</b>	
<b>P/TOT</b>	<b>312</b>	<b>12</b>	<b>2</b>	<b>0</b>	<b>1</b>	<b>327</b>	<b>329</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>1</b>	<b>154</b>	<b>6</b>	<b>0</b>	<b>0</b>	<b>12</b>	<b>172</b>	<b>184</b>	



## ABACUS TRANSPORTATION SURVEYS

**GREYSTONES TRAFFIC COUNTS  
MANUAL CLASSIFIED JUNCTION TURNING COUNTS**

**APRIL 2016  
ATH/16/036**

SITE: 01

DATE: 28th April 2016

LOCATION: R774/Go Gym (Charlesland Leisure Centre)

DAY: Thursday

TIME	MOVEMENT 10					TOT	PCU	MOVEMENT 11					TOT	PCU	MOVEMENT 12					TOT	PCU			
	CAR	LGV	OGV1	OGV2	BUS			CAR	LGV	OGV1	OGV2	BUS			CAR	LGV	OGV1	OGV2	BUS					
07:00	0	0	0	0	0	0	0	51	13	0	0	1	65	66	0	0	0	0	0	0	0	0	0	0
07:15	1	0	0	0	0	1	1	67	9	0	0	0	76	76	0	0	0	0	0	0	0	0	0	0
07:30	0	0	0	0	0	0	0	74	9	2	0	1	86	88	0	0	0	0	0	0	0	0	0	0
07:45	2	0	0	0	1	3	4	73	8	2	0	1	84	86	1	0	0	0	0	0	1	1	1	1
<b>H/TOT</b>	<b>3</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>4</b>	<b>5</b>	<b>265</b>	<b>39</b>	<b>4</b>	<b>0</b>	<b>3</b>	<b>311</b>	<b>316</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>1</b>
08:00	1	0	0	0	0	1	1	104	10	0	0	0	114	114	0	0	0	0	0	0	0	0	0	0
08:15	1	0	0	0	0	1	1	70	10	1	0	0	81	82	0	0	0	0	0	0	0	0	0	0
08:30	0	0	0	0	0	0	0	87	16	0	1	1	105	107	0	0	0	0	0	0	0	0	0	0
08:45	4	0	0	0	0	4	4	93	11	1	0	2	107	110	1	0	0	0	0	0	1	1	1	1
<b>H/TOT</b>	<b>6</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>6</b>	<b>6</b>	<b>354</b>	<b>47</b>	<b>2</b>	<b>1</b>	<b>3</b>	<b>407</b>	<b>412</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>1</b>
09:00	2	0	0	0	0	2	2	93	10	1	1	0	105	107	0	0	0	0	0	0	0	0	0	0
09:15	0	0	0	0	0	0	0	73	7	1	0	1	82	84	0	0	0	0	0	0	0	0	0	0
09:30	0	0	0	0	0	0	0	56	11	1	0	1	69	71	0	0	0	0	0	0	0	0	0	0
09:45	2	0	0	0	0	2	2	60	8	3	0	0	71	73	0	0	0	0	0	0	0	0	0	0
<b>H/TOT</b>	<b>4</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>4</b>	<b>4</b>	<b>282</b>	<b>36</b>	<b>6</b>	<b>1</b>	<b>2</b>	<b>327</b>	<b>333</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
10:00	2	0	1	0	1	4	6	50	8	3	0	0	61	63	0	0	0	0	0	0	0	0	0	0
10:15	3	0	0	0	0	3	3	43	10	2	1	0	56	58	0	0	0	0	0	0	0	0	0	0
10:30	1	0	0	0	0	1	1	49	10	0	0	0	59	59	0	0	0	0	0	0	0	0	0	0
10:45	3	1	0	0	0	4	4	39	9	3	0	1	52	55	0	0	0	0	0	0	0	0	0	0
<b>H/TOT</b>	<b>9</b>	<b>1</b>	<b>1</b>	<b>0</b>	<b>1</b>	<b>12</b>	<b>14</b>	<b>181</b>	<b>37</b>	<b>8</b>	<b>1</b>	<b>1</b>	<b>228</b>	<b>234</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
11:00	1	0	0	0	0	1	1	52	11	2	1	1	67	70	0	0	0	0	0	0	0	0	0	0
11:15	3	0	0	0	0	3	3	41	9	3	0	1	54	57	0	0	0	0	0	0	0	0	0	0
11:30	3	0	0	0	0	3	3	64	14	6	0	0	84	87	0	0	0	0	0	0	0	0	0	0
11:45	2	0	0	0	0	2	2	53	14	0	0	0	67	67	0	0	0	0	0	0	0	0	0	0
<b>H/TOT</b>	<b>9</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>9</b>	<b>9</b>	<b>210</b>	<b>48</b>	<b>11</b>	<b>1</b>	<b>2</b>	<b>272</b>	<b>281</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
12:00	4	0	0	0	0	4	4	55	11	1	0	2	69	72	0	0	0	0	0	0	0	0	0	0
12:15	2	0	0	0	0	2	2	66	14	3	3	0	86	91	0	0	0	0	0	0	0	0	0	0
12:30	3	0	0	0	0	3	3	77	13	4	0	0	94	96	0	0	0	0	0	0	0	0	0	0
12:45	2	0	0	0	1	3	4	74	5	2	0	0	81	82	0	0	0	0	0	0	0	0	0	0
<b>H/TOT</b>	<b>11</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>12</b>	<b>13</b>	<b>272</b>	<b>43</b>	<b>10</b>	<b>3</b>	<b>2</b>	<b>330</b>	<b>341</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>

## ABACUS TRANSPORTATION SURVEYS

**GREYSTONES TRAFFIC COUNTS  
MANUAL CLASSIFIED JUNCTION TURNING COUNTS**

**APRIL 2016  
ATH/16/036**

SITE: 01

DATE: 28th April 2016

LOCATION: R774/Go Gym (Charlesland Leisure Centre)

DAY: Thursday

TIME	MOVEMENT 10					TOT	PCU	MOVEMENT 11					TOT	PCU	MOVEMENT 12					TOT	PCU		
	CAR	LGV	OGV1	OGV2	BUS			CAR	LGV	OGV1	OGV2	BUS			CAR	LGV	OGV1	OGV2	BUS				
13:00	3	0	0	0	0	3	3	72	10	2	1	0	85	87	0	0	0	0	0	0	0	0	0
13:15	2	0	0	0	0	2	2	45	7	4	1	1	58	62	0	0	0	0	0	0	0	0	0
13:30	0	0	0	0	0	0	0	91	3	1	0	0	95	96	0	0	0	0	0	0	0	0	0
13:45	21	0	0	0	1	22	23	43	19	1	1	0	64	66	0	0	0	0	0	0	0	0	0
<b>H/TOT</b>	<b>26</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>27</b>	<b>28</b>	<b>251</b>	<b>39</b>	<b>8</b>	<b>3</b>	<b>1</b>	<b>302</b>	<b>311</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
14:00	3	0	0	0	0	3	3	57	9	0	1	1	68	70	1	0	0	0	0	1	1	1	1
14:15	3	1	0	0	0	4	4	73	9	0	0	1	83	84	0	0	0	0	0	0	0	0	0
14:30	5	0	0	0	0	5	5	72	13	1	0	1	87	89	0	0	0	0	0	0	0	0	0
14:45	14	1	0	0	0	15	15	74	11	0	1	1	87	89	0	0	0	0	0	0	0	0	0
<b>H/TOT</b>	<b>25</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>27</b>	<b>27</b>	<b>276</b>	<b>42</b>	<b>1</b>	<b>2</b>	<b>4</b>	<b>325</b>	<b>332</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>1</b>
15:00	9	0	0	0	2	11	13	48	6	5	0	1	60	64	0	0	0	0	0	0	0	0	0
15:15	1	0	0	0	0	1	1	46	19	4	0	0	69	71	0	0	0	0	0	0	0	0	0
15:30	6	0	0	0	0	6	6	65	9	2	0	1	77	79	0	0	0	0	0	0	0	0	0
15:45	7	1	0	0	0	8	8	73	13	5	0	1	92	96	0	0	0	0	0	0	0	0	0
<b>H/TOT</b>	<b>23</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>2</b>	<b>26</b>	<b>28</b>	<b>232</b>	<b>47</b>	<b>16</b>	<b>0</b>	<b>3</b>	<b>298</b>	<b>309</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
16:00	7	0	1	0	1	9	11	72	25	3	0	1	101	104	0	0	0	0	0	0	0	0	0
16:15	1	0	0	0	0	1	1	54	21	1	1	1	78	81	0	0	0	0	0	0	0	0	0
16:30	4	0	0	0	0	4	4	111	22	0	1	2	136	139	0	0	0	0	0	0	0	0	0
16:45	6	0	0	0	0	6	6	93	16	2	0	1	112	114	0	0	0	0	0	0	0	0	0
<b>H/TOT</b>	<b>18</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>1</b>	<b>20</b>	<b>22</b>	<b>330</b>	<b>84</b>	<b>6</b>	<b>2</b>	<b>5</b>	<b>427</b>	<b>438</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
17:00	5	0	0	0	1	6	7	90	24	1	1	2	118	122	0	0	0	0	0	0	0	0	0
17:15	3	0	0	0	0	3	3	104	15	1	0	1	121	123	0	0	0	0	0	0	0	0	0
17:30	4	0	0	0	0	4	4	108	13	0	0	2	123	125	0	0	0	0	0	0	0	0	0
17:45	6	0	0	0	0	6	6	98	12	0	0	0	110	110	0	0	0	0	0	0	0	0	0
<b>H/TOT</b>	<b>18</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>19</b>	<b>20</b>	<b>400</b>	<b>64</b>	<b>2</b>	<b>1</b>	<b>5</b>	<b>472</b>	<b>479</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
18:00	9	0	0	0	0	9	9	107	17	0	0	0	124	124	0	0	0	0	0	0	0	0	0
18:15	9	0	0	0	1	10	11	98	22	1	0	0	121	122	0	0	0	0	0	0	0	0	0
18:30	9	0	0	0	0	9	9	94	21	2	0	1	118	120	0	0	0	0	0	0	0	0	0
18:45	10	1	0	0	0	11	11	61	16	0	1	0	78	79	0	0	0	0	0	0	0	0	0
<b>H/TOT</b>	<b>37</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>39</b>	<b>40</b>	<b>360</b>	<b>76</b>	<b>3</b>	<b>1</b>	<b>1</b>	<b>441</b>	<b>445</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
<b>P/TOT</b>	<b>189</b>	<b>5</b>	<b>2</b>	<b>0</b>	<b>9</b>	<b>205</b>	<b>215</b>	<b>3413</b>	<b>602</b>	<b>77</b>	<b>16</b>	<b>32</b>	<b>4140</b>	<b>4231</b>	<b>3</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>3</b>

## ABACUS TRANSPORTATION SURVEYS

**GREYSTONES TRAFFIC COUNTS  
MANUAL CLASSIFIED JUNCTION TURNING COUNTS**

**APRIL 2016  
ATH/16/036**

SITE: 02

DATE: 28th April 2016

LOCATION: R774/R761 Kilcoole Road

DAY: Thursday

TIME	MOVEMENT 1					TOT	PCU	MOVEMENT 2					TOT	PCU	MOVEMENT 3					TOT	PCU
	CAR	LGV	OGV1	OGV2	BUS			CAR	LGV	OGV1	OGV2	BUS			CAR	LGV	OGV1	OGV2	BUS		
07:00	2	0	0	0	0	2	2	4	1	0	0	1	6	7	9	2	0	0	0	11	11
07:15	1	0	0	0	0	1	1	10	0	0	0	0	10	10	3	2	0	0	0	5	5
07:30	1	0	0	0	0	1	1	6	6	2	0	2	16	19	7	0	1	0	0	8	9
07:45	5	0	0	0	0	5	5	14	4	0	0	0	18	18	10	3	0	0	1	14	15
<b>H/TOT</b>	<b>9</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>9</b>	<b>9</b>	<b>34</b>	<b>11</b>	<b>2</b>	<b>0</b>	<b>3</b>	<b>50</b>	<b>54</b>	<b>29</b>	<b>7</b>	<b>1</b>	<b>0</b>	<b>1</b>	<b>38</b>	<b>40</b>
08:00	5	0	0	0	0	5	5	14	1	1	0	1	17	19	10	2	3	0	0	15	17
08:15	6	1	0	0	0	7	7	20	2	1	0	0	23	24	13	2	2	0	0	17	18
08:30	6	0	0	0	0	6	6	41	5	1	0	0	47	48	17	0	1	0	1	19	21
08:45	4	1	0	0	1	6	7	44	3	0	0	1	48	49	22	1	0	0	0	23	23
<b>H/TOT</b>	<b>21</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>24</b>	<b>25</b>	<b>119</b>	<b>11</b>	<b>3</b>	<b>0</b>	<b>2</b>	<b>135</b>	<b>139</b>	<b>62</b>	<b>5</b>	<b>6</b>	<b>0</b>	<b>1</b>	<b>74</b>	<b>78</b>
09:00	10	1	0	0	0	11	11	59	5	1	0	2	67	70	12	5	0	0	0	17	17
09:15	6	0	0	0	0	6	6	24	4	1	0	0	29	30	22	1	0	0	1	24	25
09:30	8	0	0	0	0	8	8	25	6	0	0	0	31	31	10	2	0	0	0	12	12
09:45	3	0	0	0	0	3	3	29	2	0	0	1	32	33	15	0	1	0	0	16	17
<b>H/TOT</b>	<b>27</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>28</b>	<b>28</b>	<b>137</b>	<b>17</b>	<b>2</b>	<b>0</b>	<b>3</b>	<b>159</b>	<b>163</b>	<b>59</b>	<b>8</b>	<b>1</b>	<b>0</b>	<b>1</b>	<b>69</b>	<b>71</b>
10:00	7	0	0	0	0	7	7	22	1	2	0	1	26	28	8	2	1	0	0	11	12
10:15	5	1	0	0	0	6	6	28	5	1	0	0	34	35	15	3	0	0	0	18	18
10:30	2	0	0	0	0	2	2	24	3	1	1	0	29	31	8	2	2	0	0	12	13
10:45	6	0	0	0	0	6	6	24	6	1	0	1	32	34	16	1	0	0	0	17	17
<b>H/TOT</b>	<b>20</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>21</b>	<b>21</b>	<b>98</b>	<b>15</b>	<b>5</b>	<b>1</b>	<b>2</b>	<b>121</b>	<b>127</b>	<b>47</b>	<b>8</b>	<b>3</b>	<b>0</b>	<b>0</b>	<b>58</b>	<b>60</b>
11:00	6	0	0	0	0	6	6	29	4	1	0	0	34	35	16	0	0	0	0	16	16
11:15	4	1	0	0	0	5	5	19	1	2	0	0	22	23	10	2	2	2	0	16	20
11:30	2	0	0	0	0	2	2	36	2	1	0	1	40	42	15	0	1	1	0	17	19
11:45	6	0	0	0	0	6	6	30	2	1	0	1	34	36	17	0	0	0	0	17	17
<b>H/TOT</b>	<b>18</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>19</b>	<b>19</b>	<b>114</b>	<b>9</b>	<b>5</b>	<b>0</b>	<b>2</b>	<b>130</b>	<b>135</b>	<b>58</b>	<b>2</b>	<b>3</b>	<b>3</b>	<b>0</b>	<b>66</b>	<b>71</b>
12:00	6	0	0	0	0	6	6	30	5	0	0	0	35	35	14	1	1	0	1	17	19
12:15	5	0	0	0	0	5	5	34	2	3	0	0	39	41	22	2	0	0	0	24	24
12:30	4	1	0	0	0	5	5	29	3	1	0	0	33	34	16	3	2	0	1	22	24
12:45	3	0	0	0	0	3	3	29	2	2	0	1	34	36	17	3	0	0	0	20	20
<b>H/TOT</b>	<b>18</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>19</b>	<b>19</b>	<b>122</b>	<b>12</b>	<b>6</b>	<b>0</b>	<b>1</b>	<b>141</b>	<b>145</b>	<b>69</b>	<b>9</b>	<b>3</b>	<b>0</b>	<b>2</b>	<b>83</b>	<b>87</b>

## ABACUS TRANSPORTATION SURVEYS

**GREYSTONES TRAFFIC COUNTS**  
**MANUAL CLASSIFIED JUNCTION TURNING COUNTS**

**APRIL 2016**  
**ATH/16/036**

SITE: 02

DATE: 28th April 2016

LOCATION: R774/R761 Kilcoole Road

DAY: Thursday

TIME	MOVEMENT 1					TOT	PCU	MOVEMENT 2					TOT	PCU	MOVEMENT 3					TOT	PCU
	CAR	LGV	OGV1	OGV2	BUS			CAR	LGV	OGV1	OGV2	BUS			CAR	LGV	OGV1	OGV2	BUS		
13:00	10	1	0	0	0	11	11	25	5	1	0	2	33	36	13	3	0	1	0	17	18
13:15	3	0	0	0	0	3	3	41	3	2	0	0	46	47	16	2	2	0	0	20	21
13:30	5	0	0	0	0	5	5	30	6	0	0	0	36	36	15	2	0	0	0	17	17
13:45	8	1	0	0	0	9	9	39	5	2	0	1	47	49	14	3	2	0	0	19	20
<b>H/TOT</b>	<b>26</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>28</b>	<b>28</b>	<b>135</b>	<b>19</b>	<b>5</b>	<b>0</b>	<b>3</b>	<b>162</b>	<b>168</b>	<b>58</b>	<b>10</b>	<b>4</b>	<b>1</b>	<b>0</b>	<b>73</b>	<b>76</b>
14:00	7	1	0	0	0	8	8	23	6	2	0	0	31	32	16	3	2	0	0	21	22
14:15	5	0	0	0	0	5	5	34	6	0	0	0	40	40	15	2	1	0	1	19	21
14:30	11	0	0	0	0	11	11	55	2	0	0	0	57	57	22	2	2	0	0	26	27
14:45	11	2	0	0	0	13	13	56	5	0	1	1	63	65	16	2	0	0	0	18	18
<b>H/TOT</b>	<b>34</b>	<b>3</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>37</b>	<b>37</b>	<b>168</b>	<b>19</b>	<b>2</b>	<b>1</b>	<b>1</b>	<b>191</b>	<b>194</b>	<b>69</b>	<b>9</b>	<b>5</b>	<b>0</b>	<b>1</b>	<b>84</b>	<b>88</b>
15:00	9	1	0	0	1	11	12	47	6	0	0	2	55	57	25	5	2	0	0	32	33
15:15	12	2	1	0	0	15	16	21	1	2	0	1	25	27	24	5	1	0	1	31	33
15:30	9	0	0	0	0	9	9	28	6	1	0	1	36	38	16	2	1	0	0	19	20
15:45	8	0	0	0	1	9	10	32	2	1	0	1	36	38	19	5	1	0	2	27	30
<b>H/TOT</b>	<b>38</b>	<b>3</b>	<b>1</b>	<b>0</b>	<b>2</b>	<b>44</b>	<b>47</b>	<b>128</b>	<b>15</b>	<b>4</b>	<b>0</b>	<b>5</b>	<b>152</b>	<b>159</b>	<b>84</b>	<b>17</b>	<b>5</b>	<b>0</b>	<b>3</b>	<b>109</b>	<b>115</b>
16:00	5	0	0	0	0	5	5	41	6	0	1	1	49	51	19	5	2	1	2	29	33
16:15	9	0	0	0	0	9	9	26	11	0	0	0	37	37	16	3	1	0	0	20	21
16:30	6	0	0	0	0	6	6	45	5	1	0	0	51	52	25	6	1	0	0	32	33
16:45	17	0	0	0	0	17	17	35	9	0	0	0	44	44	28	4	0	0	0	32	32
<b>H/TOT</b>	<b>37</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>37</b>	<b>37</b>	<b>147</b>	<b>31</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>181</b>	<b>184</b>	<b>88</b>	<b>18</b>	<b>4</b>	<b>1</b>	<b>2</b>	<b>113</b>	<b>118</b>
17:00	11	1	0	0	0	12	12	61	2	0	0	2	65	67	24	6	1	0	0	31	32
17:15	7	0	0	0	0	7	7	56	5	1	0	0	62	63	29	5	0	0	0	34	34
17:30	10	1	0	0	0	11	11	32	3	1	0	0	36	37	22	2	2	0	1	27	29
17:45	10	1	0	0	0	11	11	45	1	0	0	1	47	48	22	2	0	0	0	24	24
<b>H/TOT</b>	<b>38</b>	<b>3</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>41</b>	<b>41</b>	<b>194</b>	<b>11</b>	<b>2</b>	<b>0</b>	<b>3</b>	<b>210</b>	<b>214</b>	<b>97</b>	<b>15</b>	<b>3</b>	<b>0</b>	<b>1</b>	<b>116</b>	<b>119</b>
18:00	5	1	0	0	0	6	6	66	0	0	0	1	67	68	15	0	0	0	0	15	15
18:15	7	1	0	0	0	8	8	60	2	1	0	1	64	66	21	1	0	0	0	22	22
18:30	11	0	0	0	0	11	11	50	5	1	0	0	56	57	27	1	0	0	0	28	28
18:45	12	1	0	0	0	13	13	27	2	0	0	0	29	29	16	1	0	0	0	17	17
<b>H/TOT</b>	<b>35</b>	<b>3</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>38</b>	<b>38</b>	<b>203</b>	<b>9</b>	<b>2</b>	<b>0</b>	<b>2</b>	<b>216</b>	<b>219</b>	<b>79</b>	<b>3</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>82</b>	<b>82</b>
<b>P/TOT</b>	<b>321</b>	<b>20</b>	<b>1</b>	<b>0</b>	<b>3</b>	<b>345</b>	<b>349</b>	<b>1599</b>	<b>179</b>	<b>39</b>	<b>3</b>	<b>28</b>	<b>1848</b>	<b>1899</b>	<b>799</b>	<b>111</b>	<b>38</b>	<b>5</b>	<b>12</b>	<b>965</b>	<b>1003</b>

## ABACUS TRANSPORTATION SURVEYS

**GREYSTONES TRAFFIC COUNTS  
MANUAL CLASSIFIED JUNCTION TURNING COUNTS**

**APRIL 2016  
ATH/16/036**

SITE: 02

DATE: 8th April 2016

LOCATION: R774/R761 Kilcoole Road

DAY: Thursday

TIME	MOVEMENT 4					TOT	PCU	MOVEMENT 5					TOT	PCU	MOVEMENT 6					TOT	PCU	MOVEMENT 6a					TOT	PCU
	CAR	LGV	OGV1	OGV2	BUS			CAR	LGV	OGV1	OGV2	BUS			CAR	LGV	OGV1	OGV2	BUS			CAR	LGV	OGV1	OGV2	BUS		
07:00	8	1	0	0	0	9	9	35	2	1	0	0	38	39	19	5	0	0	1	25	26	8	1	0	0	0	9	9
07:15	16	3	0	0	2	21	23	38	7	1	0	0	46	47	12	3	4	0	1	20	23	7	0	0	0	0	7	7
07:30	23	4	1	0	1	29	31	91	5	3	0	0	99	101	11	6	0	0	2	19	21	4	0	0	0	0	4	4
07:45	19	8	4	0	3	34	39	56	7	1	1	0	65	67	18	9	3	0	1	31	34	6	2	0	0	0	8	8
<b>H/TOT</b>	<b>66</b>	<b>16</b>	<b>5</b>	<b>0</b>	<b>6</b>	<b>93</b>	<b>102</b>	<b>220</b>	<b>21</b>	<b>6</b>	<b>1</b>	<b>0</b>	<b>248</b>	<b>252</b>	<b>60</b>	<b>23</b>	<b>7</b>	<b>0</b>	<b>5</b>	<b>95</b>	<b>104</b>	<b>25</b>	<b>3</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>28</b>	<b>28</b>
08:00	24	6	2	0	0	32	33	45	8	2	0	1	56	58	31	3	0	1	0	35	36	4	0	0	0	0	4	4
08:15	38	7	1	1	0	47	49	60	8	4	0	1	73	76	29	6	1	0	0	36	37	7	0	0	0	0	7	7
08:30	37	4	0	0	0	41	41	117	6	0	0	0	123	123	27	3	1	0	0	31	32	4	0	1	0	0	5	6
08:45	42	1	0	0	0	43	43	50	10	2	0	1	63	65	44	4	1	0	3	52	56	9	2	0	0	0	11	11
<b>H/TOT</b>	<b>141</b>	<b>18</b>	<b>3</b>	<b>1</b>	<b>0</b>	<b>163</b>	<b>166</b>	<b>272</b>	<b>32</b>	<b>8</b>	<b>0</b>	<b>3</b>	<b>315</b>	<b>322</b>	<b>131</b>	<b>16</b>	<b>3</b>	<b>1</b>	<b>3</b>	<b>154</b>	<b>160</b>	<b>24</b>	<b>2</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>27</b>	<b>28</b>
09:00	29	3	0	0	0	32	32	50	3	1	0	0	54	55	37	4	2	0	1	44	46	6	1	1	0	0	8	9
09:15	14	1	1	0	0	16	17	43	4	2	0	0	49	50	28	3	4	0	0	35	37	2	1	0	0	0	3	3
09:30	17	0	2	0	0	19	20	40	11	1	0	1	53	55	14	3	1	0	3	21	25	1	0	0	0	0	1	1
09:45	21	0	1	0	1	23	25	44	7	2	0	0	53	54	29	4	3	1	2	39	44	5	0	0	0	0	5	5
<b>H/TOT</b>	<b>81</b>	<b>4</b>	<b>4</b>	<b>0</b>	<b>1</b>	<b>90</b>	<b>93</b>	<b>177</b>	<b>25</b>	<b>6</b>	<b>0</b>	<b>1</b>	<b>209</b>	<b>213</b>	<b>108</b>	<b>14</b>	<b>10</b>	<b>1</b>	<b>6</b>	<b>139</b>	<b>151</b>	<b>14</b>	<b>2</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>17</b>	<b>18</b>
10:00	15	2	3	0	0	20	22	27	5	4	0	1	37	40	24	5	2	0	1	32	34	3	1	0	0	0	4	4
10:15	17	1	1	0	0	19	20	34	6	3	0	0	43	45	18	4	2	0	1	25	27	5	1	0	0	0	6	6
10:30	15	1	3	0	0	19	21	32	5	1	1	0	39	41	21	3	2	0	0	26	27	5	2	0	0	0	7	7
10:45	20	0	0	0	0	20	20	37	8	1	1	0	47	49	17	4	2	1	0	24	26	1	1	0	0	0	2	2
<b>H/TOT</b>	<b>67</b>	<b>4</b>	<b>7</b>	<b>0</b>	<b>0</b>	<b>78</b>	<b>82</b>	<b>130</b>	<b>24</b>	<b>9</b>	<b>2</b>	<b>1</b>	<b>166</b>	<b>174</b>	<b>80</b>	<b>16</b>	<b>8</b>	<b>1</b>	<b>2</b>	<b>107</b>	<b>114</b>	<b>14</b>	<b>5</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>19</b>	<b>19</b>
11:00	15	0	1	0	0	16	17	29	14	1	0	0	44	45	23	4	0	1	0	28	29	4	2	0	0	0	6	6
11:15	20	0	1	0	0	21	22	34	5	0	0	0	39	39	15	9	1	1	0	26	28	5	0	0	0	0	5	5
11:30	18	2	2	0	0	22	23	36	6	2	0	1	45	47	23	6	2	0	0	31	32	2	2	0	0	0	4	4
11:45	21	2	1	0	0	24	25	33	4	1	0	1	39	41	22	5	1	0	1	29	31	3	1	0	0	0	4	4
<b>H/TOT</b>	<b>74</b>	<b>4</b>	<b>5</b>	<b>0</b>	<b>0</b>	<b>83</b>	<b>86</b>	<b>132</b>	<b>29</b>	<b>4</b>	<b>0</b>	<b>2</b>	<b>167</b>	<b>171</b>	<b>83</b>	<b>24</b>	<b>4</b>	<b>2</b>	<b>1</b>	<b>114</b>	<b>120</b>	<b>14</b>	<b>5</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>19</b>	<b>19</b>
12:00	23	4	0	0	0	27	27	55	10	1	1	0	67	69	28	3	3	1	0	35	38	4	1	0	0	0	5	5
12:15	21	2	2	0	0	25	26	29	2	1	0	0	32	33	23	7	1	0	0	31	32	2	0	0	0	0	2	2
12:30	16	2	1	0	0	19	20	40	14	3	1	0	58	61	27	3	4	0	1	35	38	1	0	0	0	0	1	1
12:45	21	3	0	1	0	25	26	41	4	1	0	0	46	47	30	4	3	0	0	37	39	5	2	0	0	0	7	7
<b>H/TOT</b>	<b>81</b>	<b>11</b>	<b>3</b>	<b>1</b>	<b>0</b>	<b>96</b>	<b>99</b>	<b>165</b>	<b>30</b>	<b>6</b>	<b>2</b>	<b>0</b>	<b>203</b>	<b>209</b>	<b>108</b>	<b>17</b>	<b>11</b>	<b>1</b>	<b>1</b>	<b>138</b>	<b>146</b>	<b>12</b>	<b>3</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>15</b>	<b>15</b>

## ABACUS TRANSPORTATION SURVEYS

**GREYSTONES TRAFFIC COUNTS  
MANUAL CLASSIFIED JUNCTION TURNING COUNTS**

**APRIL 2016  
ATH/16/036**

SITE: 02

DATE: 8th April 2016

LOCATION: R774/R761 Kilcoole Road

DAY: Thursday

TIME	MOVEMENT 4					TOT	PCU	MOVEMENT 5					TOT	PCU	MOVEMENT 6					TOT	PCU	MOVEMENT 6a					TOT	PCU
	CAR	LGV	OGV	OGV2	BUS			CAR	LGV	OGV	OGV2	BUS			CAR	LGV	OGV	OGV2	BUS			CAR	LGV	OGV	OGV2	BUS		
13:00	19	2	2	0	0	23	24	56	7	4	0	0	67	69	18	2	4	0	0	24	26	1	1	0	0	0	2	2
13:15	14	3	2	0	0	19	20	42	1	0	0	0	43	43	23	5	3	1	0	32	35	4	0	0	0	0	4	4
13:30	19	2	2	0	1	24	26	65	7	2	0	0	74	75	26	9	2	0	0	37	38	3	0	0	0	0	3	3
13:45	17	4	1	0	0	22	23	60	8	0	0	1	69	70	19	6	2	0	0	27	28	4	1	0	0	0	5	5
<b>H/TOT</b>	<b>69</b>	<b>11</b>	<b>7</b>	<b>0</b>	<b>1</b>	<b>88</b>	<b>93</b>	<b>223</b>	<b>23</b>	<b>6</b>	<b>0</b>	<b>1</b>	<b>253</b>	<b>257</b>	<b>86</b>	<b>22</b>	<b>11</b>	<b>1</b>	<b>0</b>	<b>120</b>	<b>127</b>	<b>12</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>14</b>	<b>14</b>
14:00	10	1	1	1	0	13	15	65	10	0	0	1	76	77	25	1	0	0	0	26	26	3	2	0	0	0	5	5
14:15	12	0	0	0	0	12	12	75	12	0	0	0	87	87	23	4	1	0	0	28	29	2	1	0	0	0	3	3
14:30	11	1	1	0	0	13	14	65	5	0	0	0	70	70	34	6	0	0	0	40	40	5	1	0	0	0	6	6
14:45	16	1	1	0	0	18	19	70	7	0	0	0	77	77	30	5	3	1	2	41	46	7	0	0	0	0	7	7
<b>H/TOT</b>	<b>49</b>	<b>3</b>	<b>3</b>	<b>1</b>	<b>0</b>	<b>56</b>	<b>59</b>	<b>275</b>	<b>34</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>310</b>	<b>311</b>	<b>112</b>	<b>16</b>	<b>4</b>	<b>1</b>	<b>2</b>	<b>135</b>	<b>140</b>	<b>17</b>	<b>4</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>21</b>	<b>21</b>
15:00	9	1	2	0	0	12	13	48	4	0	1	0	53	54	31	2	1	0	0	34	35	1	1	0	0	0	2	2
15:15	14	1	1	0	0	16	17	64	9	0	0	0	73	73	26	4	2	0	1	33	35	5	1	1	0	0	7	8
15:30	15	1	3	2	0	21	25	95	3	2	0	1	101	103	29	13	2	1	0	45	47	2	0	0	0	0	2	2
15:45	18	3	0	0	0	21	21	46	8	1	0	0	55	56	38	8	3	1	1	51	55	5	1	0	0	0	6	6
<b>H/TOT</b>	<b>56</b>	<b>6</b>	<b>6</b>	<b>2</b>	<b>0</b>	<b>70</b>	<b>76</b>	<b>253</b>	<b>24</b>	<b>3</b>	<b>1</b>	<b>1</b>	<b>282</b>	<b>286</b>	<b>124</b>	<b>27</b>	<b>8</b>	<b>2</b>	<b>2</b>	<b>163</b>	<b>172</b>	<b>13</b>	<b>3</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>17</b>	<b>18</b>
16:00	19	2	0	0	0	21	21	59	5	1	0	1	66	68	33	4	0	0	0	37	37	4	0	0	0	0	4	4
16:15	15	3	2	0	0	20	21	69	4	1	0	3	77	81	32	4	3	0	2	41	45	7	0	0	0	0	7	7
16:30	24	2	1	0	1	28	30	58	16	0	0	1	75	76	45	8	1	0	0	54	55	1	0	0	0	0	1	1
16:45	21	0	0	0	1	22	23	70	6	0	0	0	76	76	43	4	2	0	0	49	50	4	0	0	0	0	4	4
<b>H/TOT</b>	<b>79</b>	<b>7</b>	<b>3</b>	<b>0</b>	<b>2</b>	<b>91</b>	<b>95</b>	<b>256</b>	<b>31</b>	<b>2</b>	<b>0</b>	<b>5</b>	<b>294</b>	<b>300</b>	<b>153</b>	<b>20</b>	<b>6</b>	<b>0</b>	<b>2</b>	<b>181</b>	<b>186</b>	<b>16</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>16</b>	<b>16</b>
17:00	17	3	0	0	0	20	20	37	9	0	0	0	46	46	52	3	1	0	0	56	57	5	0	1	0	0	6	7
17:15	22	2	0	0	0	24	24	56	3	0	0	0	59	59	66	4	0	0	0	70	70	7	1	0	0	0	8	8
17:30	23	0	2	0	0	25	26	114	9	0	0	0	123	123	39	5	0	0	1	45	46	7	0	0	0	0	7	7
17:45	16	6	0	0	0	22	22	231	25	6	1	2	265	271	41	4	3	0	2	50	54	9	1	0	0	0	10	10
<b>H/TOT</b>	<b>78</b>	<b>11</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>91</b>	<b>92</b>	<b>438</b>	<b>46</b>	<b>6</b>	<b>1</b>	<b>2</b>	<b>493</b>	<b>499</b>	<b>198</b>	<b>16</b>	<b>4</b>	<b>0</b>	<b>3</b>	<b>221</b>	<b>226</b>	<b>28</b>	<b>2</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>31</b>	<b>32</b>
18:00	15	3	1	0	0	19	20	106	4	2	1	0	113	115	47	8	2	0	0	57	58	7	0	0	0	0	7	7
18:15	13	0	0	0	0	13	13	131	15	0	1	0	147	148	32	5	1	1	0	39	41	3	2	0	0	0	5	5
18:30	15	3	0	0	0	18	18	77	14	0	0	0	91	91	63	3	2	0	0	68	69	8	0	0	0	0	8	8
18:45	19	0	1	0	0	20	21	83	5	1	0	1	90	92	32	8	0	0	0	40	40	6	0	0	0	0	6	6
<b>H/TOT</b>	<b>62</b>	<b>6</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>70</b>	<b>71</b>	<b>397</b>	<b>38</b>	<b>3</b>	<b>2</b>	<b>1</b>	<b>441</b>	<b>446</b>	<b>174</b>	<b>24</b>	<b>5</b>	<b>1</b>	<b>0</b>	<b>204</b>	<b>208</b>	<b>24</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>26</b>	<b>26</b>
<b>P/TOT</b>	<b>903</b>	<b>101</b>	<b>50</b>	<b>5</b>	<b>10</b>	<b>1069</b>	<b>1111</b>	<b>2938</b>	<b>357</b>	<b>59</b>	<b>9</b>	<b>18</b>	<b>3381</b>	<b>3440</b>	<b>1417</b>	<b>235</b>	<b>81</b>	<b>11</b>	<b>27</b>	<b>1771</b>	<b>1853</b>	<b>213</b>	<b>33</b>	<b>4</b>	<b>0</b>	<b>0</b>	<b>250</b>	<b>252</b>

## ABACUS TRANSPORTATION SURVEYS

**GREYSTONES TRAFFIC COUNTS  
MANUAL CLASSIFIED JUNCTION TURNING COUNTS**

**APRIL 2016  
ATH/16/036**

SITE: 02

DATE: 28th April 2016

LOCATION: R774/R761 Kilcoole Road

DAY: Thursday

TIME	MOVEMENT 7					TOT	PCU	MOVEMENT 8					TOT	PCU	MOVEMENT 9					TOT	PCU
	CAR	LGV	OGV1	OGV2	BUS			CAR	LGV	OGV1	OGV2	BUS			CAR	LGV	OGV1	OGV2	BUS		
07:00	81	9	3	0	0	93	95	17	5	1	0	2	25	28	21	0	0	0	0	21	21
07:15	74	9	2	0	0	85	86	25	4	1	0	2	32	35	35	1	0	1	0	37	38
07:30	46	9	3	0	1	59	62	34	6	2	0	4	46	51	24	1	0	0	1	26	27
07:45	53	5	0	1	1	60	62	43	3	1	0	4	51	56	36	0	0	0	1	37	38
<b>H/TOT</b>	<b>254</b>	<b>32</b>	<b>8</b>	<b>1</b>	<b>2</b>	<b>297</b>	<b>304</b>	<b>119</b>	<b>18</b>	<b>5</b>	<b>0</b>	<b>12</b>	<b>154</b>	<b>169</b>	<b>116</b>	<b>2</b>	<b>0</b>	<b>1</b>	<b>2</b>	<b>121</b>	<b>124</b>
08:00	53	5	3	0	1	62	65	51	6	1	0	1	59	61	19	0	0	0	3	22	25
08:15	50	4	2	0	3	59	63	64	3	0	0	0	67	67	34	2	1	0	0	37	38
08:30	55	2	1	0	0	58	59	57	8	1	0	0	66	67	34	2	1	0	0	37	38
08:45	46	7	1	0	1	55	57	46	3	0	0	1	50	51	39	2	1	0	0	42	43
<b>H/TOT</b>	<b>204</b>	<b>18</b>	<b>7</b>	<b>0</b>	<b>5</b>	<b>234</b>	<b>243</b>	<b>218</b>	<b>20</b>	<b>2</b>	<b>0</b>	<b>2</b>	<b>242</b>	<b>245</b>	<b>126</b>	<b>6</b>	<b>3</b>	<b>0</b>	<b>3</b>	<b>138</b>	<b>143</b>
09:00	47	5	2	0	0	54	55	32	5	1	0	0	38	39	37	6	1	0	0	44	45
09:15	55	6	1	0	0	62	63	40	4	0	0	2	46	48	39	3	0	0	1	43	44
09:30	53	7	3	0	0	63	65	32	3	1	0	0	36	37	28	1	1	0	0	30	31
09:45	42	6	2	0	1	51	53	19	3	1	0	0	23	24	26	3	0	0	0	29	29
<b>H/TOT</b>	<b>197</b>	<b>24</b>	<b>8</b>	<b>0</b>	<b>1</b>	<b>230</b>	<b>235</b>	<b>123</b>	<b>15</b>	<b>3</b>	<b>0</b>	<b>2</b>	<b>143</b>	<b>147</b>	<b>130</b>	<b>13</b>	<b>2</b>	<b>0</b>	<b>1</b>	<b>146</b>	<b>148</b>
10:00	26	6	1	0	0	33	34	25	0	2	0	1	28	30	22	6	1	1	0	30	32
10:15	27	5	3	0	0	35	37	17	5	1	0	1	24	26	27	2	0	0	0	29	29
10:30	22	2	2	0	0	26	27	25	3	0	0	1	29	30	37	1	0	0	0	38	38
10:45	22	7	2	0	0	31	32	22	3	1	0	1	27	29	40	1	0	0	0	41	41
<b>H/TOT</b>	<b>97</b>	<b>20</b>	<b>8</b>	<b>0</b>	<b>0</b>	<b>125</b>	<b>129</b>	<b>89</b>	<b>11</b>	<b>4</b>	<b>0</b>	<b>4</b>	<b>108</b>	<b>114</b>	<b>126</b>	<b>10</b>	<b>1</b>	<b>1</b>	<b>0</b>	<b>138</b>	<b>140</b>
11:00	23	3	3	0	0	29	31	29	3	1	0	0	33	34	19	4	0	0	0	23	23
11:15	26	1	1	0	0	28	29	31	1	0	0	1	33	34	31	1	0	0	0	32	32
11:30	21	7	2	0	0	30	31	25	1	0	0	0	26	26	27	3	0	1	0	31	32
11:45	31	4	1	0	0	36	37	27	1	1	0	0	29	30	32	4	0	1	1	38	40
<b>H/TOT</b>	<b>101</b>	<b>15</b>	<b>7</b>	<b>0</b>	<b>0</b>	<b>123</b>	<b>127</b>	<b>112</b>	<b>6</b>	<b>2</b>	<b>0</b>	<b>1</b>	<b>121</b>	<b>123</b>	<b>109</b>	<b>12</b>	<b>0</b>	<b>2</b>	<b>1</b>	<b>124</b>	<b>128</b>
12:00	33	3	2	0	2	40	43	20	4	1	0	0	25	26	21	2	0	1	0	24	25
12:15	24	6	1	0	0	31	32	27	2	0	0	1	30	31	23	3	0	0	0	26	26
12:30	21	8	2	1	1	33	36	25	3	2	0	0	30	31	29	3	1	0	0	33	34
12:45	24	4	1	1	0	30	32	39	3	0	0	1	43	44	33	2	1	0	0	36	37
<b>H/TOT</b>	<b>102</b>	<b>21</b>	<b>6</b>	<b>2</b>	<b>3</b>	<b>134</b>	<b>143</b>	<b>111</b>	<b>12</b>	<b>3</b>	<b>0</b>	<b>2</b>	<b>128</b>	<b>132</b>	<b>106</b>	<b>10</b>	<b>2</b>	<b>1</b>	<b>0</b>	<b>119</b>	<b>121</b>

## ABACUS TRANSPORTATION SURVEYS

**GREYSTONES TRAFFIC COUNTS  
MANUAL CLASSIFIED JUNCTION TURNING COUNTS**

**APRIL 2016  
ATH/16/036**

SITE: 02

DATE: 28th April 2016

LOCATION: R774/R761 Kilcoole Road

DAY: Thursday

TIME	MOVEMENT 7					TOT	PCU	MOVEMENT 8					TOT	PCU	MOVEMENT 9					TOT	PCU
	CAR	LGV	OGV1	OGV2	BUS			CAR	LGV	OGV1	OGV2	BUS			CAR	LGV	OGV1	OGV2	BUS		
13:00	28	4	3	0	0	35	37	42	3	0	0	0	45	45	34	2	0	0	0	36	36
13:15	18	5	1	0	1	25	27	26	4	1	0	2	33	36	23	5	0	0	0	28	28
13:30	26	7	0	0	0	33	33	30	1	0	1	1	33	35	21	2	0	0	1	24	25
13:45	21	4	2	0	0	27	28	40	3	1	0	0	44	45	35	2	0	1	1	39	41
<b>H/TOT</b>	<b>93</b>	<b>20</b>	<b>6</b>	<b>0</b>	<b>1</b>	<b>120</b>	<b>124</b>	<b>138</b>	<b>11</b>	<b>2</b>	<b>1</b>	<b>3</b>	<b>155</b>	<b>160</b>	<b>113</b>	<b>11</b>	<b>0</b>	<b>1</b>	<b>2</b>	<b>127</b>	<b>130</b>
14:00	24	5	2	0	0	31	32	48	2	0	1	0	51	52	32	1	0	0	0	33	33
14:15	36	2	2	0	0	40	41	42	3	0	0	2	47	49	33	2	0	0	0	35	35
14:30	26	5	4	1	0	36	39	29	2	2	0	0	33	34	24	1	1	0	0	26	27
14:45	24	3	5	1	0	33	37	28	2	0	0	0	30	30	31	4	0	0	1	36	37
<b>H/TOT</b>	<b>110</b>	<b>15</b>	<b>13</b>	<b>2</b>	<b>0</b>	<b>140</b>	<b>149</b>	<b>147</b>	<b>9</b>	<b>2</b>	<b>1</b>	<b>2</b>	<b>161</b>	<b>165</b>	<b>120</b>	<b>8</b>	<b>1</b>	<b>0</b>	<b>1</b>	<b>130</b>	<b>132</b>
15:00	39	5	2	0	1	47	49	45	1	1	0	1	48	50	38	4	0	0	0	42	42
15:15	28	4	1	0	0	33	34	25	2	1	0	1	29	31	26	3	1	0	0	30	31
15:30	36	2	1	1	0	40	42	39	3	0	0	1	43	44	31	4	0	0	0	35	35
15:45	32	7	2	0	1	42	44	38	7	0	0	1	46	47	37	1	0	0	0	38	38
<b>H/TOT</b>	<b>135</b>	<b>18</b>	<b>6</b>	<b>1</b>	<b>2</b>	<b>162</b>	<b>168</b>	<b>147</b>	<b>13</b>	<b>2</b>	<b>0</b>	<b>4</b>	<b>166</b>	<b>171</b>	<b>132</b>	<b>12</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>145</b>	<b>146</b>
16:00	36	7	2	0	0	45	46	34	5	0	0	2	41	43	30	5	0	0	0	35	35
16:15	39	5	1	0	0	45	46	28	3	1	0	0	32	33	34	0	0	0	1	35	36
16:30	26	3	3	1	2	35	40	39	1	1	0	1	42	44	20	1	0	1	0	22	23
16:45	30	8	1	0	0	39	40	39	6	0	0	0	45	45	24	1	0	0	0	25	25
<b>H/TOT</b>	<b>131</b>	<b>23</b>	<b>7</b>	<b>1</b>	<b>2</b>	<b>164</b>	<b>171</b>	<b>140</b>	<b>15</b>	<b>2</b>	<b>0</b>	<b>3</b>	<b>160</b>	<b>164</b>	<b>108</b>	<b>7</b>	<b>0</b>	<b>1</b>	<b>1</b>	<b>117</b>	<b>119</b>
17:00	47	2	0	0	0	49	49	34	2	1	0	0	37	38	54	3	0	0	0	57	57
17:15	36	3	2	1	0	42	44	32	0	0	0	1	33	34	40	1	0	0	0	41	41
17:30	37	6	0	0	0	43	43	38	5	0	0	1	44	45	41	2	1	0	0	44	45
17:45	25	3	0	0	0	28	28	31	5	0	0	1	37	38	47	2	1	0	0	50	51
<b>H/TOT</b>	<b>145</b>	<b>14</b>	<b>2</b>	<b>1</b>	<b>0</b>	<b>162</b>	<b>164</b>	<b>135</b>	<b>12</b>	<b>1</b>	<b>0</b>	<b>3</b>	<b>151</b>	<b>155</b>	<b>182</b>	<b>8</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>192</b>	<b>193</b>
18:00	25	4	0	0	1	30	31	33	3	0	0	0	36	36	31	1	0	0	1	33	34
18:15	33	1	1	0	0	35	36	33	0	0	0	1	34	35	64	4	0	0	0	68	68
18:30	21	0	1	0	2	24	27	29	2	0	0	0	31	31	44	2	0	0	0	46	46
18:45	24	1	0	0	0	25	25	33	4	0	0	0	37	37	53	0	0	0	0	53	53
<b>H/TOT</b>	<b>103</b>	<b>6</b>	<b>2</b>	<b>0</b>	<b>3</b>	<b>114</b>	<b>118</b>	<b>128</b>	<b>9</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>138</b>	<b>139</b>	<b>192</b>	<b>7</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>200</b>	<b>201</b>
<b>P/TOT</b>	<b>1672</b>	<b>226</b>	<b>80</b>	<b>8</b>	<b>19</b>	<b>2005</b>	<b>2074</b>	<b>1607</b>	<b>151</b>	<b>28</b>	<b>2</b>	<b>39</b>	<b>1827</b>	<b>1883</b>	<b>1560</b>	<b>106</b>	<b>12</b>	<b>7</b>	<b>12</b>	<b>1697</b>	<b>1724</b>



## ABACUS TRANSPORTATION SURVEYS

**GREYSTONES TRAFFIC COUNTS**  
**MANUAL CLASSIFIED JUNCTION TURNING COUNTS**

**APRIL 2016**  
**ATH/16/036**

SITE: 02

DATE: 28th April 2016

LOCATION: R774/R761 Kilcoole Road

DAY: Thursday

TIME	MOVEMENT 10					TOT	PCU	MOVEMENT 11					TOT	PCU	MOVEMENT 12					TOT	PCU				
	CAR	LGV	OGV1	OGV2	BUS			CAR	LGV	OGV1	OGV2	BUS			CAR	LGV	OGV1	OGV2	BUS						
07:00	7	1	0	0	0	8	8	46	12	0	0	1	59	60	0	0	0	0	0	0	0	0	0	0	0
07:15	12	2	0	0	0	14	14	52	7	0	0	0	59	59	5	0	0	0	0	0	0	0	0	5	5
07:30	15	4	0	0	0	19	19	60	5	2	0	1	68	70	2	0	0	0	0	0	0	0	2	2	
07:45	14	2	0	0	0	16	16	59	7	2	0	1	69	71	3	0	0	0	0	0	0	0	3	3	
<b>H/TOT</b>	<b>48</b>	<b>9</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>57</b>	<b>57</b>	<b>217</b>	<b>31</b>	<b>4</b>	<b>0</b>	<b>3</b>	<b>255</b>	<b>260</b>	<b>10</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>10</b>	<b>10</b>		
08:00	27	2	0	0	0	29	29	72	8	0	0	0	80	80	7	0	0	0	0	0	0	0	7	7	
08:15	13	1	0	0	0	14	14	56	10	1	0	0	67	68	3	0	0	0	0	0	0	0	3	3	
08:30	27	2	0	0	1	30	31	55	13	0	1	0	69	70	6	1	0	0	0	0	0	0	7	7	
08:45	34	3	0	0	2	39	41	58	8	1	0	0	67	68	6	0	0	0	0	0	0	0	6	6	
<b>H/TOT</b>	<b>101</b>	<b>8</b>	<b>0</b>	<b>0</b>	<b>3</b>	<b>112</b>	<b>115</b>	<b>241</b>	<b>39</b>	<b>2</b>	<b>1</b>	<b>0</b>	<b>283</b>	<b>285</b>	<b>22</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>23</b>	<b>23</b>		
09:00	40	3	1	0	0	44	45	51	6	0	1	0	58	59	5	1	0	0	0	0	0	0	6	6	
09:15	30	0	1	0	1	32	34	42	7	0	0	0	49	49	2	0	0	0	0	0	0	0	2	2	
09:30	21	3	1	0	1	26	28	36	8	0	0	0	44	44	1	0	0	0	0	0	0	0	1	1	
09:45	17	2	0	0	0	19	19	43	5	3	0	0	51	53	1	1	0	0	0	0	0	0	2	2	
<b>H/TOT</b>	<b>108</b>	<b>8</b>	<b>3</b>	<b>0</b>	<b>2</b>	<b>121</b>	<b>125</b>	<b>172</b>	<b>26</b>	<b>3</b>	<b>1</b>	<b>0</b>	<b>202</b>	<b>205</b>	<b>9</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>11</b>	<b>11</b>		
10:00	20	1	0	0	0	21	21	33	7	4	0	0	44	46	0	0	0	0	0	0	0	0	0	0	
10:15	24	3	1	0	0	28	29	20	7	1	1	0	29	31	3	0	0	0	0	0	0	0	3	3	
10:30	21	1	0	0	0	22	22	29	9	0	0	0	38	38	2	0	0	0	0	0	0	0	2	2	
10:45	18	4	1	0	0	23	24	23	5	2	0	1	31	33	2	0	0	0	0	0	0	0	2	2	
<b>H/TOT</b>	<b>83</b>	<b>9</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>94</b>	<b>95</b>	<b>105</b>	<b>28</b>	<b>7</b>	<b>1</b>	<b>1</b>	<b>142</b>	<b>148</b>	<b>7</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>7</b>	<b>7</b>		
11:00	22	3	1	0	0	26	27	30	8	1	1	1	41	44	6	0	0	0	0	0	0	0	6	6	
11:15	17	1	1	0	0	19	20	27	9	2	0	1	39	41	2	0	0	0	0	0	0	0	2	2	
11:30	30	1	1	0	0	32	33	43	13	5	0	0	61	64	1	0	0	0	0	0	0	0	1	1	
11:45	24	5	0	0	0	29	29	26	9	0	0	0	35	35	7	0	0	0	0	0	0	0	7	7	
<b>H/TOT</b>	<b>93</b>	<b>10</b>	<b>3</b>	<b>0</b>	<b>0</b>	<b>106</b>	<b>108</b>	<b>126</b>	<b>39</b>	<b>8</b>	<b>1</b>	<b>2</b>	<b>176</b>	<b>183</b>	<b>16</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>16</b>	<b>16</b>		
12:00	38	4	0	0	1	43	44	20	7	1	0	1	29	31	4	0	0	0	0	0	0	0	4	4	
12:15	34	6	0	0	0	40	40	34	8	3	3	0	48	53	2	0	0	0	0	0	0	0	2	2	
12:30	32	4	1	0	0	37	38	48	9	3	0	0	60	62	3	0	0	0	0	0	0	0	3	3	
12:45	33	0	1	0	0	34	35	43	5	1	0	0	49	50	1	0	0	0	0	0	0	0	1	1	
<b>H/TOT</b>	<b>137</b>	<b>14</b>	<b>2</b>	<b>0</b>	<b>1</b>	<b>154</b>	<b>156</b>	<b>145</b>	<b>29</b>	<b>8</b>	<b>3</b>	<b>1</b>	<b>186</b>	<b>195</b>	<b>10</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>10</b>	<b>10</b>		

## ABACUS TRANSPORTATION SURVEYS

**GREYSTONES TRAFFIC COUNTS  
MANUAL CLASSIFIED JUNCTION TURNING COUNTS**

**APRIL 2016  
ATH/16/036**

SITE: 02

DATE: 28th April 2016

LOCATION: R774/R761 Kilcoole Road

DAY: Thursday

TIME	MOVEMENT 10					TOT	PCU	MOVEMENT 11					TOT	PCU	MOVEMENT 12					TOT	PCU
	CAR	LGV	OGV1	OGV2	BUS			CAR	LGV	OGV1	OGV2	BUS			CAR	LGV	OGV1	OGV2	BUS		
13:00	37	3	0	0	0	40	40	31	7	2	1	0	41	43	7	0	0	0	0	7	7
13:15	21	1	0	0	0	22	22	23	6	4	1	1	35	39	5	0	0	0	0	5	5
13:30	36	2	0	0	0	38	38	59	2	1	0	0	62	63	4	0	0	0	0	4	4
13:45	21	6	1	0	0	28	29	25	13	0	1	0	39	40	3	0	0	0	0	3	3
<b>H/TOT</b>	<b>115</b>	<b>12</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>128</b>	<b>129</b>	<b>138</b>	<b>28</b>	<b>7</b>	<b>3</b>	<b>1</b>	<b>177</b>	<b>185</b>	<b>19</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>19</b>	<b>19</b>
14:00	30	5	0	0	0	35	35	34	5	0	1	1	41	43	3	0	0	0	0	3	3
14:15	29	4	0	0	0	33	33	45	4	0	0	1	50	51	6	2	0	0	0	8	8
14:30	39	2	1	0	1	43	45	33	11	0	0	0	44	44	3	0	0	0	0	3	3
14:45	33	6	0	0	0	39	39	47	5	0	1	1	54	56	1	0	0	0	0	1	1
<b>H/TOT</b>	<b>131</b>	<b>17</b>	<b>1</b>	<b>0</b>	<b>1</b>	<b>150</b>	<b>152</b>	<b>159</b>	<b>25</b>	<b>0</b>	<b>2</b>	<b>3</b>	<b>189</b>	<b>195</b>	<b>13</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>15</b>	<b>15</b>
15:00	31	3	0	0	0	34	34	27	3	5	0	1	36	40	10	1	0	0	0	11	11
15:15	22	4	0	0	1	27	28	28	15	4	0	0	47	49	5	0	0	0	0	5	5
15:30	30	1	1	0	1	33	35	37	8	1	0	0	46	47	6	0	0	0	0	6	6
15:45	40	6	0	0	0	46	46	38	7	5	0	1	51	55	5	0	0	0	0	5	5
<b>H/TOT</b>	<b>123</b>	<b>14</b>	<b>1</b>	<b>0</b>	<b>2</b>	<b>140</b>	<b>143</b>	<b>130</b>	<b>33</b>	<b>15</b>	<b>0</b>	<b>2</b>	<b>180</b>	<b>190</b>	<b>26</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>27</b>	<b>27</b>
16:00	47	8	1	0	1	57	59	27	16	4	0	0	47	49	8	2	0	0	0	10	10
16:15	35	1	1	0	0	37	38	24	20	0	1	1	46	48	4	0	0	0	0	4	4
16:30	63	5	0	0	1	69	70	48	18	0	1	1	68	70	6	0	0	0	0	6	6
16:45	44	3	1	0	0	48	49	51	13	1	0	1	66	68	6	0	0	0	0	6	6
<b>H/TOT</b>	<b>189</b>	<b>17</b>	<b>3</b>	<b>0</b>	<b>2</b>	<b>211</b>	<b>215</b>	<b>150</b>	<b>67</b>	<b>5</b>	<b>2</b>	<b>3</b>	<b>227</b>	<b>235</b>	<b>24</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>26</b>	<b>26</b>
17:00	36	0	1	0	0	37	38	62	24	0	1	2	89	92	10	0	0	0	0	10	10
17:15	44	3	1	0	0	48	49	69	13	0	0	1	83	84	4	0	0	0	0	4	4
17:30	47	0	0	0	0	47	47	61	13	0	0	2	76	78	9	0	0	0	0	9	9
17:45	41	2	0	0	0	43	43	66	10	0	0	0	76	76	3	0	0	0	0	3	3
<b>H/TOT</b>	<b>168</b>	<b>5</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>175</b>	<b>176</b>	<b>258</b>	<b>60</b>	<b>0</b>	<b>1</b>	<b>5</b>	<b>324</b>	<b>330</b>	<b>26</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>26</b>	<b>26</b>
18:00	50	3	0	0	0	53	53	66	15	0	0	0	81	81	8	0	0	0	0	8	8
18:15	35	3	0	0	0	38	38	62	20	1	0	0	83	84	6	0	0	0	0	6	6
18:30	57	3	0	0	0	60	60	50	18	2	0	1	71	73	3	0	0	0	0	3	3
18:45	34	1	0	0	0	35	35	31	13	0	1	0	45	46	5	3	0	0	0	8	8
<b>H/TOT</b>	<b>176</b>	<b>10</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>186</b>	<b>186</b>	<b>209</b>	<b>66</b>	<b>3</b>	<b>1</b>	<b>1</b>	<b>280</b>	<b>284</b>	<b>22</b>	<b>3</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>25</b>	<b>25</b>
<b>P/TOT</b>	<b>1472</b>	<b>133</b>	<b>18</b>	<b>0</b>	<b>11</b>	<b>1634</b>	<b>1654</b>	<b>2050</b>	<b>471</b>	<b>62</b>	<b>16</b>	<b>22</b>	<b>2621</b>	<b>2695</b>	<b>204</b>	<b>11</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>215</b>	<b>215</b>

## ABACUS TRANSPORTATION SURVEYS

**GREYSTONES TRAFFIC COUNTS  
MANUAL CLASSIFIED JUNCTION TURNING COUNTS**

**APRIL 2016  
ATH/16/036**

SITE: 03

DATE: 28th April 2016

LOCATION: R774/Charlesland Wood/Grove Estate

DAY: Thursday

TIME	MOVEMENT 1						MOVEMENT 2						MOVEMENT 3						MOVEMENT 3a										
	CAR	LGV	OGV1	OGV2	BUS	TOT	PCU	CAR	LGV	OGV1	OGV2	BUS	TOT	PCU	CAR	LGV	OGV1	OGV2	BUS	TOT	PCU	CAR	LGV	OGV1	OGV2	BUS	TOT	PCU	
07:00	0	0	0	0	0	0	0	10	7	0	0	1	18	19	1	1	0	0	0	0	2	2	0	0	0	0	1	1	2
07:15	1	0	0	0	0	1	1	26	7	0	0	0	33	33	4	0	0	0	0	0	4	4	0	0	0	0	3	3	6
07:30	1	0	0	0	0	1	1	24	6	1	0	0	31	32	10	0	0	0	0	0	10	10	0	0	0	0	2	2	4
07:45	4	0	0	0	0	4	4	28	5	2	0	2	37	40	10	0	0	0	0	0	10	10	0	0	0	0	3	3	6
<b>H/TOT</b>	<b>6</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>6</b>	<b>6</b>	<b>88</b>	<b>25</b>	<b>3</b>	<b>0</b>	<b>3</b>	<b>119</b>	<b>124</b>	<b>25</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>26</b>	<b>26</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>9</b>	<b>9</b>	<b>18</b>
08:00	2	0	0	0	0	2	2	45	6	0	0	0	51	51	16	2	0	0	0	0	18	18	0	0	0	0	1	1	2
08:15	1	0	0	0	0	1	1	24	7	1	0	0	32	33	22	1	0	0	0	0	23	23	0	0	0	0	2	2	4
08:30	1	1	0	0	1	3	4	31	12	0	0	0	43	43	20	0	1	0	0	2	23	26	0	0	0	0	0	0	0
08:45	5	0	0	0	0	5	5	49	8	1	0	1	59	61	42	4	1	0	0	0	47	48	0	0	0	0	2	2	4
<b>H/TOT</b>	<b>9</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>11</b>	<b>12</b>	<b>149</b>	<b>33</b>	<b>2</b>	<b>0</b>	<b>1</b>	<b>185</b>	<b>187</b>	<b>100</b>	<b>7</b>	<b>2</b>	<b>0</b>	<b>2</b>	<b>111</b>	<b>114</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>5</b>	<b>5</b>	<b>10</b>	
09:00	2	0	0	0	0	2	2	48	5	1	1	0	55	57	61	0	0	0	0	0	61	61	0	0	0	0	0	0	0
09:15	4	0	0	0	0	4	4	43	7	0	0	1	51	52	50	2	0	0	0	0	52	52	0	0	0	0	2	2	4
09:30	2	0	0	0	0	2	2	19	7	1	0	0	27	28	17	0	1	0	0	1	19	21	1	0	0	0	0	1	1
09:45	3	0	0	0	0	3	3	31	4	3	0	0	38	40	17	3	0	0	0	0	20	20	0	0	0	0	2	2	4
<b>H/TOT</b>	<b>11</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>11</b>	<b>11</b>	<b>141</b>	<b>23</b>	<b>5</b>	<b>1</b>	<b>1</b>	<b>171</b>	<b>176</b>	<b>145</b>	<b>5</b>	<b>1</b>	<b>0</b>	<b>1</b>	<b>152</b>	<b>154</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>4</b>	<b>5</b>	<b>9</b>	
10:00	1	0	0	0	0	1	1	27	2	2	0	1	32	34	16	3	1	0	0	0	20	21	0	0	0	0	0	0	0
10:15	2	0	0	0	0	2	2	18	6	0	1	0	25	26	16	2	0	0	0	0	18	18	0	0	0	0	2	2	4
10:30	3	0	0	0	0	3	3	24	7	0	0	0	31	31	25	3	0	0	0	0	28	28	0	0	0	0	1	1	2
10:45	0	0	0	0	0	0	0	24	6	2	0	1	33	35	20	4	0	0	0	0	24	24	0	0	0	0	2	2	4
<b>H/TOT</b>	<b>6</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>6</b>	<b>6</b>	<b>93</b>	<b>21</b>	<b>4</b>	<b>1</b>	<b>2</b>	<b>121</b>	<b>126</b>	<b>77</b>	<b>12</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>90</b>	<b>91</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>5</b>	<b>5</b>	<b>10</b>	
11:00	0	0	0	0	0	0	0	25	8	1	1	1	36	39	24	0	0	0	0	0	24	24	0	0	0	0	1	1	2
11:15	2	0	0	0	0	2	2	27	7	3	0	1	38	41	17	3	0	0	0	0	20	20	0	0	0	0	1	1	2
11:30	3	0	0	0	0	3	3	44	9	6	0	0	59	62	17	1	0	0	0	0	18	18	0	0	0	0	1	1	2
11:45	7	0	0	0	0	7	7	29	13	0	0	0	42	42	28	1	1	0	0	0	30	31	0	0	0	0	1	1	2
<b>H/TOT</b>	<b>12</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>12</b>	<b>12</b>	<b>125</b>	<b>37</b>	<b>10</b>	<b>1</b>	<b>2</b>	<b>175</b>	<b>183</b>	<b>86</b>	<b>5</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>92</b>	<b>93</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>4</b>	<b>4</b>	<b>8</b>	
12:00	2	0	0	0	0	2	2	39	10	0	0	2	51	53	19	1	1	0	0	0	21	22	1	0	0	0	0	1	1
12:15	2	0	0	0	0	2	2	37	10	3	3	0	53	58	23	2	0	0	0	0	25	25	0	0	0	0	2	2	4
12:30	3	0	0	0	0	3	3	55	11	0	0	0	66	66	33	2	1	0	0	0	36	37	0	0	0	0	1	1	2
12:45	2	0	0	0	0	2	2	48	4	2	0	1	55	57	23	2	0	0	0	0	25	25	0	0	0	0	1	1	2
<b>H/TOT</b>	<b>9</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>9</b>	<b>9</b>	<b>179</b>	<b>35</b>	<b>5</b>	<b>3</b>	<b>3</b>	<b>225</b>	<b>234</b>	<b>98</b>	<b>7</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>107</b>	<b>108</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>4</b>	<b>5</b>	<b>9</b>	

## ABACUS TRANSPORTATION SURVEYS

**GREYSTONES TRAFFIC COUNTS  
MANUAL CLASSIFIED JUNCTION TURNING COUNTS**

**APRIL 2016  
ATH/16/036**

SITE: 03

DATE: 28th April 2016

LOCATION: R774/Charlesland Wood/Grove Estate

DAY: Thursday

TIME	MOVEMENT 1					TOT	PCU	MOVEMENT 2					TOT	PCU	MOVEMENT 3					TOT	PCU	MOVEMENT 3a					TOT	PCU	
	CAR	LGV	OGV1	OGV2	BUS			CAR	LGV	OGV1	OGV2	BUS			CAR	LGV	OGV1	OGV2	BUS			CAR	LGV	OGV1	OGV2	BUS			
13:00	4	0	1	0	1	6	8	39	8	2	1	0	50	52	24	1	0	0	0	0	25	25	0	0	0	0	2	2	4
13:15	3	0	1	0	0	4	5	23	3	3	1	1	31	35	30	1	0	0	0	0	31	31	0	0	0	0	1	1	2
13:30	1	0	0	0	0	1	1	61	2	1	0	0	64	65	29	3	0	0	0	0	32	32	0	0	0	0	2	2	4
13:45	2	2	0	0	0	4	4	29	15	1	0	1	46	48	45	3	1	0	0	0	49	50	0	0	0	0	1	1	2
<b>H/TOT</b>	<b>10</b>	<b>2</b>	<b>2</b>	<b>0</b>	<b>1</b>	<b>15</b>	<b>17</b>	<b>152</b>	<b>28</b>	<b>7</b>	<b>2</b>	<b>2</b>	<b>191</b>	<b>199</b>	<b>128</b>	<b>8</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>137</b>	<b>138</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>6</b>	<b>6</b>	<b>12</b>
14:00	2	0	0	0	0	2	2	42	4	0	1	0	47	48	24	2	0	0	0	1	27	28	0	0	0	0	1	1	2
14:15	2	0	1	0	0	3	4	52	9	0	0	0	61	61	32	0	0	0	0	1	33	34	0	0	1	0	1	2	4
14:30	6	0	0	0	0	6	6	43	10	1	0	1	55	57	32	0	0	0	0	0	32	32	0	0	0	0	1	1	2
14:45	4	0	0	0	0	4	4	65	9	0	1	1	76	78	63	4	1	0	0	0	68	69	0	0	0	0	1	1	2
<b>H/TOT</b>	<b>14</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>15</b>	<b>16</b>	<b>202</b>	<b>32</b>	<b>1</b>	<b>2</b>	<b>2</b>	<b>239</b>	<b>244</b>	<b>151</b>	<b>6</b>	<b>1</b>	<b>0</b>	<b>2</b>	<b>160</b>	<b>163</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>4</b>	<b>5</b>	<b>10</b>	
15:00	0	0	0	0	0	0	0	31	2	1	0	2	36	39	42	0	2	0	0	1	45	47	0	0	0	0	0	0	0
15:15	3	0	0	0	0	3	3	14	12	2	0	0	28	29	43	2	1	0	0	0	46	47	0	0	0	0	2	2	4
15:30	4	0	0	0	0	4	4	48	7	1	0	0	56	57	19	1	0	0	0	1	21	22	0	0	0	0	1	1	2
15:45	6	0	0	0	0	6	6	50	12	4	0	1	67	70	34	2	0	1	0	0	37	38	0	0	0	0	1	1	2
<b>H/TOT</b>	<b>13</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>13</b>	<b>13</b>	<b>143</b>	<b>33</b>	<b>8</b>	<b>0</b>	<b>3</b>	<b>187</b>	<b>194</b>	<b>138</b>	<b>5</b>	<b>3</b>	<b>1</b>	<b>2</b>	<b>149</b>	<b>154</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>4</b>	<b>4</b>	<b>8</b>	
16:00	6	0	0	0	0	6	6	56	22	3	0	1	82	85	42	1	0	0	0	1	44	45	0	0	0	0	0	0	0
16:15	2	1	0	0	0	3	3	32	19	1	1	1	54	57	40	1	0	0	0	0	41	41	0	0	0	0	2	2	4
16:30	5	0	0	0	0	5	5	76	21	0	0	1	98	99	39	4	1	0	0	0	44	45	1	0	0	0	0	1	1
16:45	3	0	0	0	0	3	3	53	15	2	0	1	71	73	33	1	0	0	0	0	34	34	0	0	0	0	3	3	6
<b>H/TOT</b>	<b>16</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>17</b>	<b>17</b>	<b>217</b>	<b>77</b>	<b>6</b>	<b>1</b>	<b>4</b>	<b>305</b>	<b>313</b>	<b>154</b>	<b>7</b>	<b>1</b>	<b>0</b>	<b>1</b>	<b>163</b>	<b>165</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>5</b>	<b>6</b>	<b>11</b>	
17:00	5	0	0	0	0	5	5	69	23	1	1	3	97	102	52	5	1	0	0	1	59	61	0	0	0	0	1	1	2
17:15	4	2	0	0	0	6	6	68	11	0	0	0	79	79	45	1	1	0	0	0	47	48	0	0	0	0	2	2	4
17:30	3	0	0	0	0	3	3	68	10	0	0	2	80	82	47	1	0	0	0	0	48	48	0	0	0	0	0	0	0
17:45	6	1	0	0	0	7	7	66	9	0	0	0	75	75	48	2	0	0	0	0	50	50	0	0	0	0	3	3	6
<b>H/TOT</b>	<b>18</b>	<b>3</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>21</b>	<b>21</b>	<b>271</b>	<b>53</b>	<b>1</b>	<b>1</b>	<b>5</b>	<b>331</b>	<b>338</b>	<b>192</b>	<b>9</b>	<b>2</b>	<b>0</b>	<b>1</b>	<b>204</b>	<b>206</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>6</b>	<b>6</b>	<b>12</b>	
18:00	2	0	0	0	0	2	2	79	15	0	0	0	94	94	65	0	0	0	0	0	65	65	0	0	0	0	2	2	4
18:15	2	1	0	0	0	3	3	72	20	1	0	1	94	96	35	2	0	0	0	1	38	39	0	0	0	0	2	2	4
18:30	6	0	0	0	0	6	6	67	17	2	0	0	86	87	60	1	0	0	0	0	61	61	0	0	0	0	1	1	2
18:45	2	0	1	0	0	3	4	27	14	0	1	0	42	43	32	1	0	0	0	0	33	33	0	0	0	0	2	2	4
<b>H/TOT</b>	<b>12</b>	<b>1</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>14</b>	<b>15</b>	<b>245</b>	<b>66</b>	<b>3</b>	<b>1</b>	<b>1</b>	<b>316</b>	<b>320</b>	<b>192</b>	<b>4</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>197</b>	<b>198</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>7</b>	<b>7</b>	<b>14</b>	
<b>P/TOT</b>	<b>136</b>	<b>8</b>	<b>4</b>	<b>0</b>	<b>2</b>	<b>150</b>	<b>154</b>	<b>2005</b>	<b>463</b>	<b>55</b>	<b>13</b>	<b>29</b>	<b>2565</b>	<b>2638</b>	<b>1486</b>	<b>76</b>	<b>15</b>	<b>1</b>	<b>10</b>	<b>1588</b>	<b>1607</b>	<b>3</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>63</b>	<b>67</b>	<b>131</b>	

## ABACUS TRANSPORTATION SURVEYS

**GREYSTONES TRAFFIC COUNTS  
MANUAL CLASSIFIED JUNCTION TURNING COUNTS**

**APRIL 2016  
ATH/16/036**

SITE: 03

DATE: 28th April 2016

LOCATION: R774/Charlesland Wood/Grove Estate

DAY: Thursday

TIME	MOVEMENT 4						MOVEMENT 5						MOVEMENT 6								
	CAR	LGV	OGV1	OGV2	BUS	TOT	PCU	CAR	LGV	OGV1	OGV2	BUS	TOT	PCU	CAR	LGV	OGV1	OGV2	BUS	TOT	PCU
07:00	17	1	1	0	0	19	20	1	0	0	0	0	1	1	36	5	0	0	0	41	41
07:15	42	2	0	0	0	44	44	0	0	0	0	0	0	0	36	2	0	0	0	38	38
07:30	48	4	1	0	0	53	54	1	0	0	0	0	1	1	42	3	1	0	1	47	49
07:45	55	1	0	0	0	56	56	0	0	0	0	0	0	0	42	3	0	0	0	45	45
<b>H/TOT</b>	<b>162</b>	<b>8</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>172</b>	<b>173</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>2</b>	<b>2</b>	<b>156</b>	<b>13</b>	<b>1</b>	<b>0</b>	<b>1</b>	<b>171</b>	<b>173</b>
08:00	51	0	0	0	1	52	53	2	0	0	0	0	2	2	57	4	0	0	0	61	61
08:15	78	1	0	0	3	82	85	2	0	0	0	0	2	2	40	3	0	0	0	43	43
08:30	102	3	0	0	1	106	107	2	0	0	0	0	2	2	43	4	0	1	1	49	51
08:45	89	2	1	0	0	92	93	1	0	0	0	0	1	1	43	3	0	0	1	47	48
<b>H/TOT</b>	<b>320</b>	<b>6</b>	<b>1</b>	<b>0</b>	<b>5</b>	<b>332</b>	<b>338</b>	<b>7</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>7</b>	<b>7</b>	<b>183</b>	<b>14</b>	<b>0</b>	<b>1</b>	<b>2</b>	<b>200</b>	<b>203</b>
09:00	57	1	0	0	0	58	58	0	1	0	0	0	1	1	40	3	0	0	0	43	43
09:15	26	0	0	0	0	26	26	1	0	0	0	0	1	1	27	0	1	0	0	28	29
09:30	23	3	0	0	1	27	28	4	1	0	0	0	5	5	29	3	0	0	1	33	34
09:45	20	1	0	0	0	21	21	0	0	0	0	0	0	0	25	4	0	0	0	29	29
<b>H/TOT</b>	<b>126</b>	<b>5</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>132</b>	<b>133</b>	<b>5</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>7</b>	<b>7</b>	<b>121</b>	<b>10</b>	<b>1</b>	<b>0</b>	<b>1</b>	<b>133</b>	<b>135</b>
10:00	17	1	1	0	0	19	20	1	0	0	0	0	1	1	23	6	2	0	0	31	32
10:15	27	5	0	0	0	32	32	3	1	0	0	0	4	4	24	4	2	0	0	30	31
10:30	19	0	0	0	0	19	19	1	0	0	0	0	1	1	19	2	0	0	0	21	21
10:45	18	4	0	0	0	22	22	0	0	0	0	0	0	0	16	4	1	0	0	21	22
<b>H/TOT</b>	<b>81</b>	<b>10</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>92</b>	<b>93</b>	<b>5</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>6</b>	<b>6</b>	<b>82</b>	<b>16</b>	<b>5</b>	<b>0</b>	<b>0</b>	<b>103</b>	<b>106</b>
11:00	17	2	0	0	0	19	19	1	1	0	0	0	2	2	24	2	1	0	0	27	28
11:15	16	2	0	0	0	18	18	0	0	1	0	0	1	2	15	2	0	0	0	17	17
11:30	24	0	0	0	0	24	24	0	0	0	0	0	0	0	21	4	0	0	0	25	25
11:45	19	2	0	0	0	21	21	0	1	0	0	0	1	1	24	1	0	0	0	25	25
<b>H/TOT</b>	<b>76</b>	<b>6</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>82</b>	<b>82</b>	<b>1</b>	<b>2</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>4</b>	<b>5</b>	<b>84</b>	<b>9</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>94</b>	<b>95</b>
12:00	18	1	0	0	0	19	19	1	0	0	0	0	1	1	18	1	1	0	0	20	21
12:15	30	3	0	0	0	33	33	0	0	0	0	0	0	0	28	3	0	0	0	31	31
12:30	26	1	0	0	0	27	27	0	0	0	0	0	0	0	22	2	4	0	0	28	30
12:45	42	5	0	0	0	47	47	3	1	0	0	0	4	4	25	1	0	0	0	26	26
<b>H/TOT</b>	<b>116</b>	<b>10</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>126</b>	<b>126</b>	<b>4</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>5</b>	<b>5</b>	<b>93</b>	<b>7</b>	<b>5</b>	<b>0</b>	<b>0</b>	<b>105</b>	<b>108</b>

## ABACUS TRANSPORTATION SURVEYS

**GREYSTONES TRAFFIC COUNTS  
MANUAL CLASSIFIED JUNCTION TURNING COUNTS**

**APRIL 2016  
ATH/16/036**

SITE: 03

DATE: 28th April 2016

LOCATION: R774/Charlesland Wood/Grove Estate

DAY: Thursday

TIME	MOVEMENT 4						MOVEMENT 5						MOVEMENT 6								
	CAR	LGV	OGV1	OGV2	BUS	TOT	PCU	CAR	LGV	OGV1	OGV2	BUS	TOT	PCU	CAR	LGV	OGV1	OGV2	BUS	TOT	PCU
13:00	33	2	0	0	1	36	37	0	0	0	0	0	0	0	34	2	0	0	0	36	36
13:15	44	0	0	0	1	45	46	5	0	0	0	0	5	5	20	3	1	0	0	24	25
13:30	37	1	0	0	0	38	38	0	0	0	0	0	0	0	30	1	0	0	0	31	31
13:45	37	2	0	0	0	39	39	2	0	0	0	0	2	2	30	4	0	1	0	35	36
<b>H/TOT</b>	151	5	0	0	2	158	160	7	0	0	0	0	7	7	114	10	1	1	0	126	128
14:00	45	1	1	0	0	47	48	1	0	0	0	0	1	1	16	4	0	0	1	21	22
14:15	45	2	1	0	1	49	51	2	0	0	0	0	2	2	22	1	0	0	1	24	25
14:30	40	0	0	0	0	40	40	1	0	0	0	0	1	1	30	3	0	0	0	33	33
14:45	20	0	0	0	0	20	20	1	0	0	0	0	1	1	21	3	0	0	0	24	24
<b>H/TOT</b>	150	3	2	0	1	156	158	5	0	0	0	0	5	5	89	11	0	0	2	102	104
15:00	34	3	0	0	1	38	39	1	0	0	0	0	1	1	26	3	2	0	1	32	34
15:15	33	3	0	0	1	37	38	5	1	0	0	0	6	6	30	6	2	0	0	38	39
15:30	26	2	0	0	0	28	28	1	0	0	0	0	1	1	23	0	1	0	1	25	27
15:45	25	1	0	0	0	26	26	0	0	0	0	0	0	0	27	2	1	0	0	30	31
<b>H/TOT</b>	118	9	0	0	2	129	131	7	1	0	0	0	8	8	106	11	6	0	2	125	130
16:00	27	1	0	0	0	28	28	1	0	0	0	0	1	1	22	3	1	0	1	27	29
16:15	29	2	0	0	1	32	33	3	0	0	0	0	3	3	22	2	0	0	0	24	24
16:30	22	1	1	0	0	24	25	3	0	0	0	0	3	3	35	1	0	1	1	38	40
16:45	26	4	0	1	0	31	32	0	1	0	0	0	1	1	42	1	0	0	0	43	43
<b>H/TOT</b>	104	8	1	1	1	115	118	7	1	0	0	0	8	8	121	7	1	1	2	132	136
17:00	36	1	0	0	0	37	37	3	0	0	0	0	3	3	24	1	0	0	0	25	25
17:15	37	0	1	0	0	38	39	5	0	0	0	0	5	5	36	4	1	0	1	42	44
17:30	37	3	0	0	0	40	40	2	0	0	0	0	2	2	44	3	0	0	0	47	47
17:45	34	1	0	0	0	35	35	4	0	0	0	0	4	4	37	2	0	0	0	39	39
<b>H/TOT</b>	144	5	1	0	0	150	151	14	0	0	0	0	14	14	141	10	1	0	1	153	155
18:00	39	1	0	0	0	40	40	1	0	0	0	0	1	1	33	2	0	0	0	35	35
18:15	29	0	0	0	0	29	29	3	0	0	0	0	3	3	31	2	0	0	0	33	33
18:30	34	1	0	0	0	35	35	5	0	0	0	0	5	5	32	4	0	0	1	37	38
18:45	50	2	0	0	0	52	52	6	0	0	0	0	6	6	40	3	0	0	0	43	43
<b>H/TOT</b>	152	4	0	0	0	156	156	15	0	0	0	0	15	15	136	11	0	0	1	148	149
<b>P/TOT</b>	1700	79	8	1	12	1800	1817	79	8	1	0	0	88	89	1426	129	22	3	12	1592	1619

## ABACUS TRANSPORTATION SURVEYS

**GREYSTONES TRAFFIC COUNTS  
MANUAL CLASSIFIED JUNCTION TURNING COUNTS**

**APRIL 2016  
ATH/16/036**

SITE: 03

DATE: 28th April 2016

LOCATION: R774/Charlesland Wood/Grove Estate

DAY: Thursday

TIME	MOVEMENT 7						MOVEMENT 8						MOVEMENT 9								
	CAR	LGV	OGV1	OGV2	BUS	TOT	PCU	CAR	LGV	OGV1	OGV2	BUS	TOT	PCU	CAR	LGV	OGV1	OGV2	BUS	TOT	PCU
07:00	7	0	0	0	0	7	7	50	2	1	0	0	53	54	0	0	0	0	0	0	0
07:15	12	1	1	0	0	14	15	62	7	0	1	0	70	71	0	0	0	0	0	0	0
07:30	13	0	1	0	0	14	15	104	6	1	0	1	112	114	0	0	0	0	0	0	0
07:45	22	1	0	1	1	25	27	74	5	1	0	0	80	81	1	1	0	0	0	2	2
<b>H/TOT</b>	<b>54</b>	<b>2</b>	<b>2</b>	<b>1</b>	<b>1</b>	<b>60</b>	<b>63</b>	<b>290</b>	<b>20</b>	<b>3</b>	<b>1</b>	<b>1</b>	<b>315</b>	<b>319</b>	<b>1</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>2</b>	<b>2</b>
08:00	24	2	0	0	2	28	30	43	6	2	0	2	53	56	0	0	0	0	0	0	0
08:15	19	2	1	0	1	23	25	78	8	4	0	0	90	92	0	0	0	0	0	0	0
08:30	12	1	0	0	0	13	13	143	7	1	0	0	151	152	1	0	0	0	0	1	1
08:45	21	2	2	0	0	25	26	68	11	1	0	1	81	83	1	0	0	0	0	1	1
<b>H/TOT</b>	<b>76</b>	<b>7</b>	<b>3</b>	<b>0</b>	<b>3</b>	<b>89</b>	<b>94</b>	<b>332</b>	<b>32</b>	<b>8</b>	<b>0</b>	<b>3</b>	<b>375</b>	<b>382</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>2</b>	<b>2</b>
09:00	23	3	0	0	0	26	26	72	7	2	0	1	82	84	0	0	0	0	0	0	0
09:15	22	3	0	0	0	25	25	64	4	2	0	1	71	73	2	0	0	0	0	2	2
09:30	18	2	0	0	1	21	22	47	10	2	0	0	59	60	1	0	0	0	0	1	1
09:45	14	3	1	0	0	18	19	48	7	1	0	0	56	57	2	0	0	0	0	2	2
<b>H/TOT</b>	<b>77</b>	<b>11</b>	<b>1</b>	<b>0</b>	<b>1</b>	<b>90</b>	<b>92</b>	<b>231</b>	<b>28</b>	<b>7</b>	<b>0</b>	<b>2</b>	<b>268</b>	<b>274</b>	<b>5</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>5</b>	<b>5</b>
10:00	17	3	1	0	0	21	22	28	8	2	1	2	41	45	2	0	2	0	0	4	5
10:15	16	3	1	0	0	20	21	38	6	2	0	0	46	47	3	0	0	0	0	3	3
10:30	9	1	0	0	0	10	10	56	4	1	1	0	62	64	4	1	0	0	0	5	5
10:45	18	4	0	1	0	23	24	58	5	1	0	0	64	65	2	0	0	0	0	2	2
<b>H/TOT</b>	<b>60</b>	<b>11</b>	<b>2</b>	<b>1</b>	<b>0</b>	<b>74</b>	<b>76</b>	<b>180</b>	<b>23</b>	<b>6</b>	<b>2</b>	<b>2</b>	<b>213</b>	<b>221</b>	<b>11</b>	<b>1</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>14</b>	<b>15</b>
11:00	10	2	0	0	0	12	12	39	15	1	0	1	56	58	3	0	0	0	0	3	3
11:15	29	1	0	0	0	30	30	40	6	0	0	0	46	46	1	0	0	0	0	1	1
11:30	11	2	0	0	0	13	13	52	8	2	0	1	63	65	1	0	0	0	0	1	1
11:45	19	0	0	0	0	19	19	45	7	1	1	2	56	60	3	1	0	0	0	4	4
<b>H/TOT</b>	<b>69</b>	<b>5</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>74</b>	<b>74</b>	<b>176</b>	<b>36</b>	<b>4</b>	<b>1</b>	<b>4</b>	<b>221</b>	<b>228</b>	<b>8</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>9</b>	<b>9</b>
12:00	26	3	0	0	0	29	29	55	8	1	2	0	66	69	0	1	0	0	0	1	1
12:15	25	2	1	0	0	28	29	31	3	0	0	0	34	34	0	0	0	0	0	0	0
12:30	27	3	0	0	0	30	30	43	14	4	1	0	62	65	3	1	0	0	0	4	4
12:45	33	1	0	0	0	34	34	40	5	2	0	0	47	48	2	0	0	0	0	2	2
<b>H/TOT</b>	<b>111</b>	<b>9</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>121</b>	<b>122</b>	<b>169</b>	<b>30</b>	<b>7</b>	<b>3</b>	<b>0</b>	<b>209</b>	<b>216</b>	<b>5</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>7</b>	<b>7</b>

## ABACUS TRANSPORTATION SURVEYS

**GREYSTONES TRAFFIC COUNTS  
MANUAL CLASSIFIED JUNCTION TURNING COUNTS**

**APRIL 2016  
ATH/16/036**

SITE: 03

DATE: 28th April 2016

LOCATION: R774/Charlesland Wood/Grove Estate

DAY: Thursday

TIME	MOVEMENT 7						MOVEMENT 8						MOVEMENT 9								
	CAR	LGV	OGV1	OGV2	BUS	TOT	PCU	CAR	LGV	OGV1	OGV2	BUS	TOT	PCU	CAR	LGV	OGV1	OGV2	BUS	TOT	PCU
13:00	34	2	1	0	0	37	38	56	7	3	0	1	67	70	3	1	0	0	0	4	4
13:15	32	1	0	0	0	33	33	31	4	0	0	0	35	35	3	1	0	0	0	4	4
13:30	31	0	0	0	0	31	31	54	5	2	0	1	62	64	0	2	0	0	0	2	2
13:45	32	1	0	0	1	34	35	68	8	0	1	1	78	80	1	1	0	0	0	2	2
<b>H/TOT</b>	<b>129</b>	<b>4</b>	<b>1</b>	<b>0</b>	<b>1</b>	<b>135</b>	<b>137</b>	<b>209</b>	<b>24</b>	<b>5</b>	<b>1</b>	<b>3</b>	<b>242</b>	<b>249</b>	<b>7</b>	<b>5</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>12</b>	<b>12</b>
14:00	41	1	0	0	1	43	44	63	11	0	0	1	75	76	5	0	0	0	0	5	5
14:15	29	0	0	0	0	29	29	79	14	0	0	0	93	93	1	0	0	0	0	1	1
14:30	21	2	0	0	0	23	23	72	4	1	0	0	77	78	5	0	0	0	0	5	5
14:45	40	3	0	0	1	44	45	60	10	0	0	0	70	70	4	0	0	0	0	4	4
<b>H/TOT</b>	<b>131</b>	<b>6</b>	<b>0</b>	<b>0</b>	<b>2</b>	<b>139</b>	<b>141</b>	<b>274</b>	<b>39</b>	<b>1</b>	<b>0</b>	<b>1</b>	<b>315</b>	<b>317</b>	<b>15</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>15</b>	<b>15</b>
15:00	48	4	0	0	1	53	54	48	5	0	1	2	56	59	2	0	0	0	0	2	2
15:15	28	5	1	0	0	34	35	59	9	1	0	0	69	70	4	0	0	0	0	4	4
15:30	23	2	1	0	0	26	27	106	5	1	0	1	113	115	0	0	0	0	0	0	0
15:45	28	3	0	0	1	32	33	52	7	1	0	0	60	61	3	0	0	0	0	3	3
<b>H/TOT</b>	<b>127</b>	<b>14</b>	<b>2</b>	<b>0</b>	<b>2</b>	<b>145</b>	<b>148</b>	<b>265</b>	<b>26</b>	<b>3</b>	<b>1</b>	<b>3</b>	<b>298</b>	<b>304</b>	<b>9</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>9</b>	<b>9</b>
16:00	33	5	0	0	0	38	38	64	5	1	0	2	72	75	4	0	0	0	0	4	4
16:15	53	2	0	0	1	56	57	48	2	1	0	3	54	58	8	0	0	0	0	8	8
16:30	45	1	0	0	0	46	46	32	13	0	1	1	47	49	4	2	0	0	0	6	6
16:45	46	1	0	0	0	47	47	54	4	0	0	0	58	58	4	1	0	0	0	5	5
<b>H/TOT</b>	<b>177</b>	<b>9</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>187</b>	<b>188</b>	<b>198</b>	<b>24</b>	<b>2</b>	<b>1</b>	<b>6</b>	<b>231</b>	<b>239</b>	<b>20</b>	<b>3</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>23</b>	<b>23</b>
17:00	64	6	0	0	0	70	70	24	7	0	0	1	32	33	9	0	0	0	0	9	9
17:15	60	2	0	0	0	62	62	29	1	0	0	0	30	30	7	0	0	0	0	7	7
17:30	70	4	0	0	0	74	74	86	8	1	0	0	95	96	3	0	0	0	0	3	3
17:45	73	7	0	0	1	81	82	205	19	7	1	1	233	239	3	2	0	0	0	5	5
<b>H/TOT</b>	<b>267</b>	<b>19</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>287</b>	<b>288</b>	<b>344</b>	<b>35</b>	<b>8</b>	<b>1</b>	<b>2</b>	<b>390</b>	<b>397</b>	<b>22</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>24</b>	<b>24</b>
18:00	56	3	1	0	0	60	61	79	2	1	1	2	85	89	4	0	0	0	0	4	4
18:15	82	5	0	0	0	87	87	88	13	0	1	0	102	103	8	1	0	0	0	9	9
18:30	63	6	0	0	0	69	69	49	6	0	0	0	55	55	8	1	0	0	0	9	9
18:45	58	2	0	0	0	60	60	63	4	1	0	1	69	71	9	0	0	0	0	9	9
<b>H/TOT</b>	<b>259</b>	<b>16</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>276</b>	<b>277</b>	<b>279</b>	<b>25</b>	<b>2</b>	<b>2</b>	<b>3</b>	<b>311</b>	<b>318</b>	<b>29</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>31</b>	<b>31</b>
<b>P/TOT</b>	<b>1537</b>	<b>113</b>	<b>13</b>	<b>2</b>	<b>12</b>	<b>1677</b>	<b>1698</b>	<b>2947</b>	<b>342</b>	<b>56</b>	<b>13</b>	<b>30</b>	<b>3388</b>	<b>3463</b>	<b>134</b>	<b>17</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>153</b>	<b>154</b>



## ABACUS TRANSPORTATION SURVEYS

**GREYSTONES TRAFFIC COUNTS  
MANUAL CLASSIFIED JUNCTION TURNING COUNTS**

**APRIL 2016  
ATH/16/036**

SITE: 03

DATE: 28th April 2016

LOCATION: R774/Charlesland Wood/Grove Estate

DAY: Thursday

TIME	MOVEMENT 10						MOVEMENT 11						MOVEMENT 12								
	CAR	LGV	OGV1	OGV2	BUS	TOT	PCU	CAR	LGV	OGV1	OGV2	BUS	TOT	PCU	CAR	LGV	OGV1	OGV2	BUS	TOT	PCU
07:00	5	1	0	0	0	6	6	0	0	0	0	0	0	0	3	2	0	0	0	5	5
07:15	6	0	0	0	0	6	6	0	0	0	0	0	0	0	5	0	0	0	0	5	5
07:30	8	0	0	0	0	8	8	4	0	0	0	0	4	4	4	0	0	0	0	4	4
07:45	6	0	0	0	0	6	6	1	0	0	0	0	1	1	7	2	0	0	0	9	9
<b>H/TOT</b>	<b>25</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>26</b>	<b>26</b>	<b>5</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>5</b>	<b>5</b>	<b>19</b>	<b>4</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>23</b>	<b>23</b>
08:00	3	0	0	0	0	3	3	2	1	0	0	0	3	3	8	0	0	0	0	8	8
08:15	7	0	0	0	0	7	7	2	0	0	0	0	2	2	4	0	0	0	0	4	4
08:30	13	0	0	0	0	13	13	1	0	0	0	0	1	1	12	1	0	0	0	13	13
08:45	6	0	0	0	0	6	6	2	0	0	0	0	2	2	9	2	0	0	0	11	11
<b>H/TOT</b>	<b>29</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>29</b>	<b>29</b>	<b>7</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>8</b>	<b>8</b>	<b>33</b>	<b>3</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>36</b>	<b>36</b>
09:00	7	2	0	0	0	9	9	0	0	0	0	0	0	0	0	0	1	0	0	1	2
09:15	3	0	0	0	0	3	3	0	0	0	0	0	0	0	4	0	0	0	0	4	4
09:30	8	1	0	0	0	9	9	2	0	0	0	0	2	2	5	0	0	0	0	5	5
09:45	6	0	0	0	0	6	6	1	0	0	0	0	1	1	5	0	0	0	0	5	5
<b>H/TOT</b>	<b>24</b>	<b>3</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>27</b>	<b>27</b>	<b>3</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>3</b>	<b>3</b>	<b>14</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>15</b>	<b>16</b>
10:00	2	0	0	0	0	2	2	0	1	0	0	0	1	1	2	0	0	0	0	2	2
10:15	4	0	0	0	0	4	4	2	1	0	0	0	3	3	1	0	0	0	0	1	1
10:30	7	1	0	0	0	8	8	1	0	0	0	0	1	1	1	0	0	0	0	1	1
10:45	2	0	0	0	0	2	2	0	2	0	0	0	2	2	5	0	0	0	0	5	5
<b>H/TOT</b>	<b>15</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>16</b>	<b>16</b>	<b>3</b>	<b>4</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>7</b>	<b>7</b>	<b>9</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>9</b>	<b>9</b>
11:00	4	1	0	0	0	5	5	1	0	0	0	0	1	1	4	0	0	0	0	4	4
11:15	2	0	0	0	0	2	2	1	0	0	0	0	1	1	6	0	0	0	0	6	6
11:30	2	1	0	0	0	3	3	0	0	0	0	0	0	0	2	0	0	0	0	2	2
11:45	2	0	0	0	0	2	2	0	0	0	0	0	0	0	1	1	0	0	0	2	2
<b>H/TOT</b>	<b>10</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>12</b>	<b>12</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>2</b>	<b>2</b>	<b>13</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>14</b>	<b>14</b>
12:00	2	0	0	0	0	2	2	0	0	0	0	0	0	0	2	0	0	0	0	2	2
12:15	3	1	0	0	0	4	4	0	0	0	0	0	0	0	3	0	0	0	0	3	3
12:30	3	0	0	0	0	3	3	1	0	0	0	0	1	1	2	0	0	0	0	2	2
12:45	3	0	0	0	0	3	3	2	1	0	0	0	3	3	3	0	1	0	0	4	5
<b>H/TOT</b>	<b>11</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>12</b>	<b>12</b>	<b>3</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>4</b>	<b>4</b>	<b>10</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>11</b>	<b>12</b>

## ABACUS TRANSPORTATION SURVEYS

**GREYSTONES TRAFFIC COUNTS  
MANUAL CLASSIFIED JUNCTION TURNING COUNTS**

**APRIL 2016  
ATH/16/036**

SITE: 03

DATE: 28th April 2016

LOCATION: R774/Charlesland Wood/Grove Estate

DAY: Thursday

TIME	MOVEMENT 10						MOVEMENT 11						MOVEMENT 12								
	CAR	LGV	OGV1	OGV2	BUS	TOT	PCU	CAR	LGV	OGV1	OGV2	BUS	TOT	PCU	CAR	LGV	OGV1	OGV2	BUS	TOT	PCU
13:00	2	0	0	0	0	2	2	0	0	0	0	1	1	2	4	0	0	0	0	4	4
13:15	4	1	0	0	0	5	5	1	0	0	0	0	1	1	3	0	1	0	0	4	5
13:30	0	0	0	0	0	0	0	0	1	1	0	0	2	3	4	0	1	0	0	5	6
13:45	5	0	0	0	0	5	5	1	0	0	0	0	1	1	3	0	0	0	0	3	3
<b>H/TOT</b>	<b>11</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>12</b>	<b>12</b>	<b>2</b>	<b>1</b>	<b>1</b>	<b>0</b>	<b>1</b>	<b>5</b>	<b>7</b>	<b>14</b>	<b>0</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>16</b>	<b>17</b>
14:00	3	1	0	0	0	4	4	1	1	0	0	0	2	2	4	1	0	0	0	5	5
14:15	2	0	0	0	0	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14:30	4	0	0	0	0	4	4	5	0	0	0	0	5	5	2	0	0	0	0	2	2
14:45	2	0	0	0	0	2	2	1	0	0	0	0	1	1	2	0	0	0	0	2	2
<b>H/TOT</b>	<b>11</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>12</b>	<b>12</b>	<b>7</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>8</b>	<b>8</b>	<b>8</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>9</b>	<b>9</b>
15:00	0	1	2	0	0	3	4	2	0	0	0	0	2	2	2	0	0	0	0	2	2
15:15	3	1	0	0	0	4	4	2	1	0	0	0	3	3	3	0	0	0	0	3	3
15:30	0	2	0	0	0	2	2	1	0	0	0	0	1	1	5	0	0	0	0	5	5
15:45	3	0	0	0	0	3	3	0	0	0	0	0	0	0	2	0	0	0	0	2	2
<b>H/TOT</b>	<b>6</b>	<b>4</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>12</b>	<b>13</b>	<b>5</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>6</b>	<b>6</b>	<b>12</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>12</b>	<b>12</b>
16:00	1	0	0	0	0	1	1	2	0	0	0	0	2	2	1	1	0	0	0	2	2
16:15	1	0	0	0	0	1	1	3	0	0	0	0	3	3	0	0	0	0	0	0	0
16:30	4	0	0	0	0	4	4	3	1	0	0	0	4	4	2	1	0	0	0	3	3
16:45	4	0	0	0	0	4	4	6	1	0	0	0	7	7	1	0	0	0	0	1	1
<b>H/TOT</b>	<b>10</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>10</b>	<b>10</b>	<b>14</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>16</b>	<b>16</b>	<b>4</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>6</b>	<b>6</b>
17:00	2	0	0	0	0	2	2	3	1	0	0	0	4	4	4	0	0	0	0	4	4
17:15	3	0	0	0	0	3	3	2	0	0	0	0	2	2	2	0	0	0	0	2	2
17:30	0	0	0	0	0	0	0	1	0	0	0	0	1	1	5	0	0	0	0	5	5
17:45	1	1	0	0	0	2	2	2	0	0	0	0	2	2	2	0	0	0	0	2	2
<b>H/TOT</b>	<b>6</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>7</b>	<b>7</b>	<b>8</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>9</b>	<b>9</b>	<b>13</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>13</b>	<b>13</b>
18:00	4	0	0	0	0	4	4	3	0	0	0	0	3	3	2	0	0	0	0	2	2
18:15	4	0	0	0	0	4	4	2	0	0	0	0	2	2	0	0	1	0	0	1	2
18:30	4	0	0	0	0	4	4	1	1	0	0	0	2	2	2	0	0	0	0	2	2
18:45	4	0	0	0	0	4	4	0	0	0	0	0	0	0	5	1	0	0	0	6	6
<b>H/TOT</b>	<b>16</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>16</b>	<b>16</b>	<b>6</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>7</b>	<b>7</b>	<b>9</b>	<b>1</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>11</b>	<b>12</b>
<b>P/TOT</b>	<b>174</b>	<b>15</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>191</b>	<b>192</b>	<b>65</b>	<b>13</b>	<b>1</b>	<b>0</b>	<b>1</b>	<b>80</b>	<b>82</b>	<b>158</b>	<b>12</b>	<b>5</b>	<b>0</b>	<b>0</b>	<b>175</b>	<b>178</b>

## ABACUS TRANSPORTATION SURVEYS

**GREYSTONES TRAFFIC COUNTS  
MANUAL CLASSIFIED JUNCTION TURNING COUNTS**

**APRIL 2016  
ATH/16/036**

SITE: 04

DATE: 28th April 2016

LOCATION: R761/R762

DAY: Thursday

TIME	MOVEMENT 1					TOT	PCU	MOVEMENT 2					TOT	PCU	MOVEMENT 3					TOT	PCU
	CAR	LGV	OGV1	OGV2	BUS			CAR	LGV	OGV1	OGV2	BUS			CAR	LGV	OGV1	OGV2	BUS		
07:00	9	0	0	0	0	9	9	7	3	0	0	1	11	12	10	1	1	0	0	12	13
07:15	10	0	0	0	0	10	10	14	0	0	0	0	14	14	14	1	0	0	0	15	15
07:30	11	1	0	0	0	12	12	9	5	3	0	2	19	23	6	0	1	0	0	7	8
07:45	24	1	0	0	1	26	27	29	7	0	0	0	36	36	21	3	0	0	0	24	24
<b>H/TOT</b>	<b>54</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>57</b>	<b>58</b>	<b>59</b>	<b>15</b>	<b>3</b>	<b>0</b>	<b>3</b>	<b>80</b>	<b>85</b>	<b>51</b>	<b>5</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>58</b>	<b>59</b>
08:00	22	2	1	0	0	25	26	26	4	1	0	0	31	32	25	4	0	0	0	29	29
08:15	14	1	0	0	1	16	17	32	2	1	0	0	35	36	27	0	0	0	0	27	27
08:30	30	6	0	0	0	36	36	45	5	1	0	1	52	54	35	1	2	0	1	39	41
08:45	24	1	1	0	1	27	29	42	5	1	0	0	48	49	32	4	0	0	0	36	36
<b>H/TOT</b>	<b>90</b>	<b>10</b>	<b>2</b>	<b>0</b>	<b>2</b>	<b>104</b>	<b>107</b>	<b>145</b>	<b>16</b>	<b>4</b>	<b>0</b>	<b>1</b>	<b>166</b>	<b>169</b>	<b>119</b>	<b>9</b>	<b>2</b>	<b>0</b>	<b>1</b>	<b>131</b>	<b>133</b>
09:00	36	0	2	0	0	38	39	55	5	1	0	3	64	68	29	4	0	0	0	33	33
09:15	29	1	1	0	0	31	32	43	6	0	0	0	49	49	25	4	1	0	0	30	31
09:30	23	0	0	0	1	24	25	26	3	0	0	0	29	29	19	3	0	0	0	22	22
09:45	34	1	0	0	0	35	35	28	1	0	1	0	30	31	18	1	2	0	0	21	22
<b>H/TOT</b>	<b>122</b>	<b>2</b>	<b>3</b>	<b>0</b>	<b>1</b>	<b>128</b>	<b>131</b>	<b>152</b>	<b>15</b>	<b>1</b>	<b>1</b>	<b>3</b>	<b>172</b>	<b>177</b>	<b>91</b>	<b>12</b>	<b>3</b>	<b>0</b>	<b>0</b>	<b>106</b>	<b>108</b>
10:00	18	0	0	0	0	18	18	23	3	1	0	0	27	28	13	3	0	0	0	16	16
10:15	21	1	0	0	0	22	22	27	9	1	0	0	37	38	16	3	2	0	0	21	22
10:30	23	2	0	0	0	25	25	23	1	1	0	0	25	26	18	1	1	0	0	20	21
10:45	14	2	0	0	0	16	16	28	7	2	0	0	37	38	15	0	0	0	0	15	15
<b>H/TOT</b>	<b>76</b>	<b>5</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>81</b>	<b>81</b>	<b>101</b>	<b>20</b>	<b>5</b>	<b>0</b>	<b>0</b>	<b>126</b>	<b>129</b>	<b>62</b>	<b>7</b>	<b>3</b>	<b>0</b>	<b>0</b>	<b>72</b>	<b>74</b>
11:00	19	0	0	0	0	19	19	35	3	0	0	0	38	38	14	1	0	0	0	15	15
11:15	14	4	0	0	0	18	18	28	2	1	0	0	31	32	9	0	1	0	0	10	11
11:30	22	3	0	0	0	25	25	38	1	1	0	0	40	41	8	2	0	0	0	10	10
11:45	27	1	0	0	0	28	28	21	3	1	0	1	26	28	9	1	0	0	0	10	10
<b>H/TOT</b>	<b>82</b>	<b>8</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>90</b>	<b>90</b>	<b>122</b>	<b>9</b>	<b>3</b>	<b>0</b>	<b>1</b>	<b>135</b>	<b>138</b>	<b>40</b>	<b>4</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>45</b>	<b>46</b>
12:00	23	0	0	0	0	23	23	39	4	0	0	0	43	43	21	1	1	1	0	24	26
12:15	17	0	0	0	0	17	17	42	3	1	0	0	46	47	19	1	0	0	0	20	20
12:30	21	0	2	0	0	23	24	32	5	1	0	1	39	41	17	1	0	0	0	18	18
12:45	26	0	0	0	0	26	26	30	3	1	0	0	34	35	15	2	0	0	0	17	17
<b>H/TOT</b>	<b>87</b>	<b>0</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>89</b>	<b>90</b>	<b>143</b>	<b>15</b>	<b>3</b>	<b>0</b>	<b>1</b>	<b>162</b>	<b>165</b>	<b>72</b>	<b>5</b>	<b>1</b>	<b>1</b>	<b>0</b>	<b>79</b>	<b>81</b>

**ABACUS TRANSPORTATION SURVEYS**

**GREYSTONES TRAFFIC COUNTS  
MANUAL CLASSIFIED JUNCTION TURNING COUNTS**

**APRIL 2016  
ATH/16/036**

SITE: 04

DATE: 28th April 2016

LOCATION: R761/R762

DAY: Thursday

TIME	MOVEMENT 1						MOVEMENT 2						MOVEMENT 3								
	CAR	LGV	OGV1	OGV2	BUS	TOT	PCU	CAR	LGV	OGV1	OGV2	BUS	TOT	PCU	CAR	LGV	OGV1	OGV2	BUS	TOT	PCU
13:00	20	1	0	0	0	21	21	28	3	0	0	1	32	33	15	2	0	0	0	17	17
13:15	30	2	0	0	0	32	32	42	0	1	0	0	43	44	18	1	0	0	0	19	19
13:30	23	1	0	0	0	24	24	35	3	0	0	0	38	38	13	0	0	0	0	13	13
13:45	28	3	0	0	0	31	31	43	6	2	0	0	51	52	17	4	0	0	0	21	21
<b>H/TOT</b>	<b>101</b>	<b>7</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>108</b>	<b>108</b>	<b>148</b>	<b>12</b>	<b>3</b>	<b>0</b>	<b>1</b>	<b>164</b>	<b>167</b>	<b>63</b>	<b>7</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>70</b>	<b>70</b>
14:00	19	1	0	0	1	21	22	43	4	1	0	0	48	49	20	1	0	0	0	21	21
14:15	25	2	0	0	1	28	29	40	4	2	0	0	46	47	18	1	0	0	0	19	19
14:30	34	2	0	0	0	36	36	55	5	2	1	0	63	65	16	2	0	0	0	18	18
14:45	34	1	0	0	0	35	35	55	4	2	1	0	62	64	23	1	1	0	1	26	28
<b>H/TOT</b>	<b>112</b>	<b>6</b>	<b>0</b>	<b>0</b>	<b>2</b>	<b>120</b>	<b>122</b>	<b>193</b>	<b>17</b>	<b>7</b>	<b>2</b>	<b>0</b>	<b>219</b>	<b>225</b>	<b>77</b>	<b>5</b>	<b>1</b>	<b>0</b>	<b>1</b>	<b>84</b>	<b>86</b>
15:00	25	2	0	0	1	28	29	56	8	0	0	3	67	70	14	3	0	0	0	17	17
15:15	29	3	0	0	0	32	32	42	4	1	0	1	48	50	14	2	0	0	0	16	16
15:30	27	1	0	0	0	28	28	41	7	1	0	1	50	52	13	0	0	0	0	13	13
15:45	32	3	1	0	0	36	37	50	2	2	0	4	58	63	13	3	0	0	0	16	16
<b>H/TOT</b>	<b>113</b>	<b>9</b>	<b>1</b>	<b>0</b>	<b>1</b>	<b>124</b>	<b>126</b>	<b>189</b>	<b>21</b>	<b>4</b>	<b>0</b>	<b>9</b>	<b>223</b>	<b>234</b>	<b>54</b>	<b>8</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>62</b>	<b>62</b>
16:00	38	2	1	0	1	42	44	57	8	2	2	1	70	75	22	2	0	0	0	24	24
16:15	21	1	0	0	0	22	22	35	8	1	0	0	44	45	18	3	0	0	0	21	21
16:30	27	1	0	0	0	28	28	34	10	1	0	0	45	46	18	3	1	0	0	22	23
16:45	35	4	0	0	0	39	39	54	10	0	0	0	64	64	22	2	0	0	0	24	24
<b>H/TOT</b>	<b>121</b>	<b>8</b>	<b>1</b>	<b>0</b>	<b>1</b>	<b>131</b>	<b>133</b>	<b>180</b>	<b>36</b>	<b>4</b>	<b>2</b>	<b>1</b>	<b>223</b>	<b>229</b>	<b>80</b>	<b>10</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>91</b>	<b>92</b>
17:00	30	1	0	0	1	32	33	60	6	0	0	0	66	66	22	4	0	0	0	26	26
17:15	27	1	0	0	0	28	28	53	5	0	0	0	58	58	12	1	0	0	0	13	13
17:30	35	5	0	0	0	40	40	51	4	2	0	0	57	58	22	0	0	0	0	22	22
17:45	27	1	0	0	0	28	28	46	4	0	0	0	50	50	27	0	0	0	0	27	27
<b>H/TOT</b>	<b>119</b>	<b>8</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>128</b>	<b>129</b>	<b>210</b>	<b>19</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>231</b>	<b>232</b>	<b>83</b>	<b>5</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>88</b>	<b>88</b>
18:00	26	2	0	0	0	28	28	60	1	0	0	0	61	61	17	1	0	0	0	18	18
18:15	29	3	0	0	0	32	32	60	2	2	0	0	64	65	19	2	1	0	0	22	23
18:30	25	3	0	0	0	28	28	37	6	1	0	0	44	45	20	1	0	0	0	21	21
18:45	34	4	0	0	0	38	38	32	2	0	0	0	34	34	12	0	0	0	0	12	12
<b>H/TOT</b>	<b>114</b>	<b>12</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>126</b>	<b>126</b>	<b>189</b>	<b>11</b>	<b>3</b>	<b>0</b>	<b>0</b>	<b>203</b>	<b>205</b>	<b>68</b>	<b>4</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>73</b>	<b>74</b>
<b>P/TOT</b>	<b>1191</b>	<b>77</b>	<b>9</b>	<b>0</b>	<b>9</b>	<b>1286</b>	<b>1300</b>	<b>1831</b>	<b>206</b>	<b>42</b>	<b>5</b>	<b>20</b>	<b>2104</b>	<b>2152</b>	<b>860</b>	<b>81</b>	<b>15</b>	<b>1</b>	<b>2</b>	<b>959</b>	<b>970</b>

## ABACUS TRANSPORTATION SURVEYS

**GREYSTONES TRAFFIC COUNTS  
MANUAL CLASSIFIED JUNCTION TURNING COUNTS**

**APRIL 2016  
ATH/16/036**

SITE: 04

DATE: 28th April 2016

LOCATION: R761/R762

DAY: Thursday

TIME	MOVEMENT 4					TOT	PCU	MOVEMENT 5					TOT	PCU	MOVEMENT 6					TOT	PCU
	CAR	LGV	OGV1	OGV2	BUS			CAR	LGV	OGV1	OGV2	BUS			CAR	LGV	OGV1	OGV2	BUS		
07:00	5	1	0	0	0	6	6	10	2	0	0	0	12	12	1	0	0	0	0	1	1
07:15	9	3	0	0	0	12	12	20	5	1	0	1	27	29	1	0	0	0	0	1	1
07:30	4	1	0	0	0	5	5	14	3	0	0	1	18	19	2	2	0	0	0	4	4
07:45	11	1	0	0	0	12	12	26	6	0	0	1	33	34	4	0	0	0	0	4	4
<b>H/TOT</b>	<b>29</b>	<b>6</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>35</b>	<b>35</b>	<b>70</b>	<b>16</b>	<b>1</b>	<b>0</b>	<b>3</b>	<b>90</b>	<b>94</b>	<b>8</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>10</b>	<b>10</b>
08:00	5	1	0	0	0	6	6	18	1	0	0	0	19	19	2	0	0	0	0	2	2
08:15	11	5	0	0	1	17	18	27	4	0	0	1	32	33	7	0	2	0	1	10	12
08:30	24	1	0	0	0	25	25	44	4	0	0	0	48	48	21	0	1	0	0	22	23
08:45	22	4	1	0	0	27	28	44	4	1	0	1	50	52	12	1	0	0	0	13	13
<b>H/TOT</b>	<b>62</b>	<b>11</b>	<b>1</b>	<b>0</b>	<b>1</b>	<b>75</b>	<b>77</b>	<b>133</b>	<b>13</b>	<b>1</b>	<b>0</b>	<b>2</b>	<b>149</b>	<b>152</b>	<b>42</b>	<b>1</b>	<b>3</b>	<b>0</b>	<b>1</b>	<b>47</b>	<b>50</b>
09:00	15	2	0	0	0	17	17	44	2	0	0	0	46	46	18	4	0	0	0	22	22
09:15	19	0	0	0	0	19	19	31	3	3	0	1	38	41	3	2	0	0	0	5	5
09:30	22	2	0	0	0	24	24	25	0	2	0	0	27	28	6	0	0	0	1	7	8
09:45	13	1	0	0	0	14	14	29	0	0	0	1	30	31	5	0	1	0	0	6	7
<b>H/TOT</b>	<b>69</b>	<b>5</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>74</b>	<b>74</b>	<b>129</b>	<b>5</b>	<b>5</b>	<b>0</b>	<b>2</b>	<b>141</b>	<b>146</b>	<b>32</b>	<b>6</b>	<b>1</b>	<b>0</b>	<b>1</b>	<b>40</b>	<b>42</b>
10:00	17	0	2	0	0	19	20	15	1	1	0	0	17	18	7	0	0	0	0	7	7
10:15	12	1	0	0	0	13	13	23	2	0	0	1	26	27	6	0	1	0	0	7	8
10:30	9	3	0	0	0	12	12	20	2	0	0	0	22	22	7	1	1	0	0	9	10
10:45	15	4	1	1	0	21	23	28	2	2	0	1	33	35	3	0	0	0	0	3	3
<b>H/TOT</b>	<b>53</b>	<b>8</b>	<b>3</b>	<b>1</b>	<b>0</b>	<b>65</b>	<b>68</b>	<b>86</b>	<b>7</b>	<b>3</b>	<b>0</b>	<b>2</b>	<b>98</b>	<b>102</b>	<b>23</b>	<b>1</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>26</b>	<b>27</b>
11:00	16	1	1	0	0	18	19	20	2	0	0	0	22	22	3	1	1	0	0	5	6
11:15	18	2	0	0	0	20	20	25	1	1	0	1	28	30	5	1	2	1	0	9	11
11:30	8	0	0	0	0	8	8	28	4	0	0	0	32	32	5	1	0	1	0	7	8
11:45	9	0	1	0	0	10	11	24	2	0	0	1	27	28	4	2	0	0	0	6	6
<b>H/TOT</b>	<b>51</b>	<b>3</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>56</b>	<b>57</b>	<b>97</b>	<b>9</b>	<b>1</b>	<b>0</b>	<b>2</b>	<b>109</b>	<b>112</b>	<b>17</b>	<b>5</b>	<b>3</b>	<b>2</b>	<b>0</b>	<b>27</b>	<b>31</b>
12:00	24	0	1	0	0	25	26	25	7	1	0	0	33	34	8	1	1	0	0	10	11
12:15	8	0	1	0	0	9	10	24	2	1	0	1	28	30	5	0	1	0	0	6	7
12:30	9	3	0	0	0	12	12	17	2	0	0	0	19	19	4	0	1	0	0	5	6
12:45	21	5	1	0	0	27	28	31	1	0	0	1	33	34	6	3	1	0	0	10	11
<b>H/TOT</b>	<b>62</b>	<b>8</b>	<b>3</b>	<b>0</b>	<b>0</b>	<b>73</b>	<b>75</b>	<b>97</b>	<b>12</b>	<b>2</b>	<b>0</b>	<b>2</b>	<b>113</b>	<b>116</b>	<b>23</b>	<b>4</b>	<b>4</b>	<b>0</b>	<b>0</b>	<b>31</b>	<b>33</b>

## ABACUS TRANSPORTATION SURVEYS

**GREYSTONES TRAFFIC COUNTS  
MANUAL CLASSIFIED JUNCTION TURNING COUNTS**

**APRIL 2016  
ATH/16/036**

SITE: 04

DATE: 28th April 2016

LOCATION: R761/R762

DAY: Thursday

TIME	MOVEMENT 4						MOVEMENT 5						MOVEMENT 6								
	CAR	LGV	OGV1	OGV2	BUS	TOT	PCU	CAR	LGV	OGV1	OGV2	BUS	TOT	PCU	CAR	LGV	OGV1	OGV2	BUS	TOT	PCU
13:00	27	0	3	0	0	30	32	34	1	0	0	0	35	35	7	1	0	0	0	8	8
13:15	22	2	0	0	0	24	24	24	3	0	1	2	30	33	8	0	0	0	0	8	8
13:30	13	2	0	0	0	15	15	40	3	0	0	0	43	43	8	1	1	0	0	10	11
13:45	26	2	1	0	0	29	30	28	0	0	0	1	29	30	10	0	0	0	0	10	10
<b>H/TOT</b>	<b>88</b>	<b>6</b>	<b>4</b>	<b>0</b>	<b>0</b>	<b>98</b>	<b>100</b>	<b>126</b>	<b>7</b>	<b>0</b>	<b>1</b>	<b>3</b>	<b>137</b>	<b>141</b>	<b>33</b>	<b>2</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>36</b>	<b>37</b>
14:00	37	1	0	0	2	40	42	31	3	0	0	0	34	34	10	3	2	0	0	15	16
14:15	29	1	0	0	0	30	30	33	1	2	0	1	37	39	13	2	0	0	1	16	17
14:30	20	0	0	0	0	20	20	51	2	0	0	0	53	53	12	0	0	0	0	12	12
14:45	17	1	0	0	0	18	18	34	1	0	0	1	36	37	21	3	1	0	0	25	26
<b>H/TOT</b>	<b>103</b>	<b>3</b>	<b>0</b>	<b>0</b>	<b>2</b>	<b>108</b>	<b>110</b>	<b>149</b>	<b>7</b>	<b>2</b>	<b>0</b>	<b>2</b>	<b>160</b>	<b>163</b>	<b>56</b>	<b>8</b>	<b>3</b>	<b>0</b>	<b>1</b>	<b>68</b>	<b>71</b>
15:00	19	2	0	0	0	21	21	28	0	0	0	1	29	30	5	2	0	0	0	7	7
15:15	18	4	0	0	0	22	22	32	4	0	0	1	37	38	8	0	1	0	0	9	10
15:30	22	3	1	0	0	26	27	57	1	1	0	0	59	60	9	2	0	0	0	11	11
15:45	21	0	1	0	0	22	23	43	2	1	0	1	47	49	5	2	0	0	0	7	7
<b>H/TOT</b>	<b>80</b>	<b>9</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>91</b>	<b>92</b>	<b>160</b>	<b>7</b>	<b>2</b>	<b>0</b>	<b>3</b>	<b>172</b>	<b>176</b>	<b>27</b>	<b>6</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>34</b>	<b>35</b>
16:00	21	3	1	0	0	25	26	34	2	0	0	0	36	36	9	2	1	0	0	12	13
16:15	31	3	0	0	0	34	34	50	9	0	0	1	60	61	7	4	0	0	0	11	11
16:30	32	1	0	0	0	33	33	47	1	0	0	0	48	48	11	1	2	0	0	14	15
16:45	30	2	0	0	0	32	32	35	3	0	0	1	39	40	4	1	0	0	0	5	5
<b>H/TOT</b>	<b>114</b>	<b>9</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>124</b>	<b>125</b>	<b>166</b>	<b>15</b>	<b>0</b>	<b>0</b>	<b>2</b>	<b>183</b>	<b>185</b>	<b>31</b>	<b>8</b>	<b>3</b>	<b>0</b>	<b>0</b>	<b>42</b>	<b>44</b>
17:00	23	1	0	0	0	24	24	24	2	1	0	0	27	28	8	0	0	0	0	8	8
17:15	27	2	3	0	0	32	34	41	1	0	0	1	43	44	6	2	1	0	1	10	12
17:30	34	0	0	0	0	34	34	58	2	0	0	0	60	60	9	1	0	0	0	10	10
17:45	37	2	0	0	0	39	39	45	3	0	0	1	49	50	11	0	0	0	0	11	11
<b>H/TOT</b>	<b>121</b>	<b>5</b>	<b>3</b>	<b>0</b>	<b>0</b>	<b>129</b>	<b>131</b>	<b>168</b>	<b>8</b>	<b>1</b>	<b>0</b>	<b>2</b>	<b>179</b>	<b>182</b>	<b>34</b>	<b>3</b>	<b>1</b>	<b>0</b>	<b>1</b>	<b>39</b>	<b>41</b>
18:00	31	1	0	0	0	32	32	40	0	1	0	0	41	42	5	0	0	0	0	5	5
18:15	32	1	2	0	0	35	36	59	4	0	0	1	64	65	8	0	0	0	0	8	8
18:30	23	1	0	0	0	24	24	46	4	0	0	0	50	50	7	0	0	0	0	7	7
18:45	23	3	0	0	0	26	26	61	1	0	0	1	63	64	5	1	0	0	0	6	6
<b>H/TOT</b>	<b>109</b>	<b>6</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>117</b>	<b>118</b>	<b>206</b>	<b>9</b>	<b>1</b>	<b>0</b>	<b>2</b>	<b>218</b>	<b>221</b>	<b>25</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>26</b>	<b>26</b>
<b>P/TOT</b>	<b>941</b>	<b>79</b>	<b>21</b>	<b>1</b>	<b>3</b>	<b>1045</b>	<b>1060</b>	<b>1587</b>	<b>115</b>	<b>19</b>	<b>1</b>	<b>27</b>	<b>1749</b>	<b>1787</b>	<b>351</b>	<b>47</b>	<b>22</b>	<b>2</b>	<b>4</b>	<b>426</b>	<b>444</b>

## ABACUS TRANSPORTATION SURVEYS

**GREYSTONES TRAFFIC COUNTS  
MANUAL CLASSIFIED JUNCTION TURNING COUNTS**

**APRIL 2016  
ATH/16/036**

SITE: 04

DATE: 28th April 2016

LOCATION: R761/R762

DAY: Thursday

TIME	MOVEMENT 7					TOT	PCU	MOVEMENT 8					TOT	PCU	MOVEMENT 9					TOT	PCU
	CAR	LGV	OGV1	OGV2	BUS			CAR	LGV	OGV1	OGV2	BUS			CAR	LGV	OGV1	OGV2	BUS		
07:00	5	0	0	0	0	5	5	24	6	0	0	0	30	30	4	1	0	0	2	7	9
07:15	9	1	0	0	0	10	10	32	8	1	0	0	41	42	3	0	0	0	2	5	7
07:30	13	3	0	0	0	16	16	56	10	2	1	5	74	81	4	0	0	0	3	7	10
07:45	23	1	1	0	0	25	26	44	6	2	0	3	55	59	7	4	2	0	3	16	20
<b>H/TOT</b>	<b>50</b>	<b>5</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>56</b>	<b>57</b>	<b>156</b>	<b>30</b>	<b>5</b>	<b>1</b>	<b>8</b>	<b>200</b>	<b>212</b>	<b>18</b>	<b>5</b>	<b>2</b>	<b>0</b>	<b>10</b>	<b>35</b>	<b>46</b>
08:00	30	0	3	0	0	33	35	32	6	0	0	0	38	38	8	6	1	0	2	17	20
08:15	32	3	1	0	0	36	37	66	6	0	1	0	73	74	4	1	1	0	0	6	7
08:30	43	3	0	0	1	47	48	55	8	1	0	0	64	65	10	4	0	0	0	14	14
08:45	46	0	0	0	0	46	46	77	6	0	0	1	84	85	4	0	0	0	0	4	4
<b>H/TOT</b>	<b>151</b>	<b>6</b>	<b>4</b>	<b>0</b>	<b>1</b>	<b>162</b>	<b>165</b>	<b>230</b>	<b>26</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>259</b>	<b>262</b>	<b>26</b>	<b>11</b>	<b>2</b>	<b>0</b>	<b>2</b>	<b>41</b>	<b>44</b>
09:00	18	1	0	0	0	19	19	43	4	1	0	0	48	49	6	3	0	0	0	9	9
09:15	9	0	0	0	0	9	9	38	5	1	0	1	45	47	11	2	0	0	1	14	15
09:30	7	0	2	1	0	10	12	38	3	0	2	0	43	46	7	1	0	0	0	8	8
09:45	8	1	1	0	0	10	11	34	1	1	0	1	37	39	6	1	0	0	0	7	7
<b>H/TOT</b>	<b>42</b>	<b>2</b>	<b>3</b>	<b>1</b>	<b>0</b>	<b>48</b>	<b>51</b>	<b>153</b>	<b>13</b>	<b>3</b>	<b>2</b>	<b>2</b>	<b>173</b>	<b>179</b>	<b>30</b>	<b>7</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>38</b>	<b>39</b>
10:00	5	1	1	1	0	8	10	31	1	1	1	1	35	38	7	0	0	0	0	7	7
10:15	8	1	1	0	0	10	11	25	5	1	0	0	31	32	11	1	0	0	1	13	14
10:30	11	0	0	1	0	12	13	29	3	2	0	1	35	37	14	1	1	0	0	16	17
10:45	11	2	0	0	0	13	13	28	2	1	0	0	31	32	14	1	0	0	1	16	17
<b>H/TOT</b>	<b>35</b>	<b>4</b>	<b>2</b>	<b>2</b>	<b>0</b>	<b>43</b>	<b>47</b>	<b>113</b>	<b>11</b>	<b>5</b>	<b>1</b>	<b>2</b>	<b>132</b>	<b>138</b>	<b>46</b>	<b>3</b>	<b>1</b>	<b>0</b>	<b>2</b>	<b>52</b>	<b>55</b>
11:00	7	1	0	0	0	8	8	36	1	1	0	0	38	39	12	1	0	0	0	13	13
11:15	4	0	0	0	0	4	4	42	1	0	0	0	43	43	6	0	0	0	1	7	8
11:30	3	1	2	0	0	6	7	36	1	1	0	0	38	39	7	0	0	0	0	7	7
11:45	8	0	0	0	0	8	8	36	3	1	0	0	40	41	13	1	0	0	0	14	14
<b>H/TOT</b>	<b>22</b>	<b>2</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>26</b>	<b>27</b>	<b>150</b>	<b>6</b>	<b>3</b>	<b>0</b>	<b>0</b>	<b>159</b>	<b>161</b>	<b>38</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>41</b>	<b>42</b>
12:00	10	0	0	0	0	10	10	32	5	0	0	0	37	37	9	3	1	0	0	13	14
12:15	4	0	0	0	0	4	4	33	2	0	1	0	36	37	18	1	0	0	2	21	23
12:30	9	1	0	0	0	10	10	35	5	2	0	0	42	43	10	0	0	0	0	10	10
12:45	16	0	0	0	0	16	16	50	2	0	0	1	53	54	8	1	0	0	1	10	11
<b>H/TOT</b>	<b>39</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>40</b>	<b>40</b>	<b>150</b>	<b>14</b>	<b>2</b>	<b>1</b>	<b>1</b>	<b>168</b>	<b>171</b>	<b>45</b>	<b>5</b>	<b>1</b>	<b>0</b>	<b>3</b>	<b>54</b>	<b>58</b>

## ABACUS TRANSPORTATION SURVEYS

**GREYSTONES TRAFFIC COUNTS  
MANUAL CLASSIFIED JUNCTION TURNING COUNTS**

**APRIL 2016  
ATH/16/036**

SITE: 04

DATE: 28th April 2016

LOCATION: R761/R762

DAY: Thursday

TIME	MOVEMENT 7					TOT	PCU	MOVEMENT 8					TOT	PCU	MOVEMENT 9					TOT	PCU
	CAR	LGV	OGV1	OGV2	BUS			CAR	LGV	OGV1	OGV2	BUS			CAR	LGV	OGV1	OGV2	BUS		
13:00	11	3	0	0	0	14	14	39	2	0	0	0	41	41	14	1	0	0	0	15	15
13:15	9	1	2	0	0	12	13	31	3	1	0	1	36	38	8	1	0	0	1	10	11
13:30	6	1	0	1	0	8	9	39	3	1	0	1	44	46	9	1	1	0	1	12	14
13:45	21	0	1	0	0	22	23	45	3	1	0	0	49	50	12	1	1	0	0	14	15
<b>H/TOT</b>	<b>47</b>	<b>5</b>	<b>3</b>	<b>1</b>	<b>0</b>	<b>56</b>	<b>59</b>	<b>154</b>	<b>11</b>	<b>3</b>	<b>0</b>	<b>2</b>	<b>170</b>	<b>174</b>	<b>43</b>	<b>4</b>	<b>2</b>	<b>0</b>	<b>2</b>	<b>51</b>	<b>54</b>
14:00	23	2	0	0	0	25	25	40	2	1	2	0	45	48	16	1	0	0	0	17	17
14:15	15	0	0	0	0	15	15	36	4	0	0	1	41	42	11	3	0	0	1	15	16
14:30	10	0	0	0	0	10	10	40	2	3	0	1	46	49	12	3	0	0	0	15	15
14:45	7	0	1	0	0	8	9	34	2	0	0	0	36	36	11	2	0	0	0	13	13
<b>H/TOT</b>	<b>55</b>	<b>2</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>58</b>	<b>59</b>	<b>150</b>	<b>10</b>	<b>4</b>	<b>2</b>	<b>2</b>	<b>168</b>	<b>175</b>	<b>50</b>	<b>9</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>60</b>	<b>61</b>
15:00	8	0	0	1	0	9	10	55	1	1	1	1	59	62	13	1	0	0	0	14	14
15:15	16	1	0	0	0	17	17	32	5	0	0	0	37	37	12	0	0	0	1	13	14
15:30	11	1	0	0	0	12	12	41	4	0	4	1	50	56	8	0	2	0	0	10	11
15:45	6	2	0	0	0	8	8	39	7	0	0	1	47	48	14	1	0	0	0	15	15
<b>H/TOT</b>	<b>41</b>	<b>4</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>46</b>	<b>47</b>	<b>167</b>	<b>17</b>	<b>1</b>	<b>5</b>	<b>3</b>	<b>193</b>	<b>203</b>	<b>47</b>	<b>2</b>	<b>2</b>	<b>0</b>	<b>1</b>	<b>52</b>	<b>54</b>
16:00	8	3	1	1	0	13	15	36	4	0	0	1	41	42	21	0	0	0	1	22	23
16:15	8	1	0	0	0	9	9	31	5	2	0	0	38	39	11	2	0	0	0	13	13
16:30	7	0	0	0	0	7	7	44	3	0	0	0	47	47	14	0	1	0	2	17	20
16:45	7	2	0	0	0	9	9	52	3	1	0	1	57	59	19	0	0	0	0	19	19
<b>H/TOT</b>	<b>30</b>	<b>6</b>	<b>1</b>	<b>1</b>	<b>0</b>	<b>38</b>	<b>40</b>	<b>163</b>	<b>15</b>	<b>3</b>	<b>0</b>	<b>2</b>	<b>183</b>	<b>187</b>	<b>65</b>	<b>2</b>	<b>1</b>	<b>0</b>	<b>3</b>	<b>71</b>	<b>75</b>
17:00	7	1	0	0	0	8	8	53	2	1	0	0	56	57	10	0	1	0	0	11	12
17:15	10	0	0	0	0	10	10	50	3	0	0	0	53	53	13	1	0	0	1	15	16
17:30	14	0	0	0	0	14	14	43	6	1	0	0	50	51	13	0	0	0	1	14	15
17:45	8	0	0	0	0	8	8	44	9	0	0	2	55	57	10	3	0	0	0	13	13
<b>H/TOT</b>	<b>39</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>40</b>	<b>40</b>	<b>190</b>	<b>20</b>	<b>2</b>	<b>0</b>	<b>2</b>	<b>214</b>	<b>217</b>	<b>46</b>	<b>4</b>	<b>1</b>	<b>0</b>	<b>2</b>	<b>53</b>	<b>56</b>
18:00	9	1	0	0	0	10	10	50	1	1	0	0	52	53	15	1	0	0	0	16	16
18:15	11	0	0	0	0	11	11	41	4	1	0	0	46	47	15	1	0	0	1	17	18
18:30	6	1	0	0	0	7	7	38	5	0	0	0	43	43	13	0	0	0	0	13	13
18:45	7	3	0	0	0	10	10	32	7	1	0	0	40	41	12	1	0	0	0	13	13
<b>H/TOT</b>	<b>33</b>	<b>5</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>38</b>	<b>38</b>	<b>161</b>	<b>17</b>	<b>3</b>	<b>0</b>	<b>0</b>	<b>181</b>	<b>183</b>	<b>55</b>	<b>3</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>59</b>	<b>60</b>
<b>P/TOT</b>	<b>584</b>	<b>43</b>	<b>17</b>	<b>6</b>	<b>1</b>	<b>651</b>	<b>668</b>	<b>1937</b>	<b>190</b>	<b>35</b>	<b>13</b>	<b>25</b>	<b>2200</b>	<b>2259</b>	<b>509</b>	<b>57</b>	<b>12</b>	<b>0</b>	<b>29</b>	<b>607</b>	<b>642</b>



## ABACUS TRANSPORTATION SURVEYS

**GREYSTONES TRAFFIC COUNTS  
MANUAL CLASSIFIED JUNCTION TURNING COUNTS**

**APRIL 2016  
ATH/16/036**

SITE: 04

DATE: 28th April 2016

LOCATION: R761/R762

DAY: Thursday

TIME	MOVEMENT 10					TOT	PCU	MOVEMENT 11					TOT	PCU	MOVEMENT 12					TOT	PCU
	CAR	LGV	OGV1	OGV2	BUS			CAR	LGV	OGV1	OGV2	BUS			CAR	LGV	OGV1	OGV2	BUS		
07:00	3	0	0	0	0	3	3	14	1	0	0	0	15	15	7	0	1	0	0	8	9
07:15	2	1	0	0	0	3	3	21	4	0	0	0	25	25	13	2	2	0	0	17	18
07:30	3	1	0	0	1	5	6	28	4	0	0	1	33	34	13	2	1	0	1	17	19
07:45	5	0	0	0	0	5	5	37	3	1	0	1	42	44	17	1	0	0	0	18	18
<b>H/TOT</b>	<b>13</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>16</b>	<b>17</b>	<b>100</b>	<b>12</b>	<b>1</b>	<b>0</b>	<b>2</b>	<b>115</b>	<b>118</b>	<b>50</b>	<b>5</b>	<b>4</b>	<b>0</b>	<b>1</b>	<b>60</b>	<b>63</b>
08:00	4	0	0	0	0	4	4	52	3	0	0	1	56	57	17	0	0	0	0	17	17
08:15	4	0	0	0	0	4	4	37	1	0	0	1	39	40	22	0	1	0	0	23	24
08:30	5	1	0	0	0	6	6	46	4	2	0	1	53	55	15	2	0	0	0	17	17
08:45	9	0	0	0	1	10	11	38	2	2	0	0	42	43	26	2	0	0	1	29	30
<b>H/TOT</b>	<b>22</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>24</b>	<b>25</b>	<b>173</b>	<b>10</b>	<b>4</b>	<b>0</b>	<b>3</b>	<b>190</b>	<b>195</b>	<b>80</b>	<b>4</b>	<b>1</b>	<b>0</b>	<b>1</b>	<b>86</b>	<b>88</b>
09:00	10	1	0	0	0	11	11	46	1	0	0	1	48	49	22	2	0	0	0	24	24
09:15	10	1	0	0	0	11	11	45	1	1	0	0	47	48	26	0	0	0	1	27	28
09:30	17	2	0	0	0	19	19	35	2	1	0	1	39	41	20	0	0	1	0	21	22
09:45	9	1	0	0	1	11	12	21	4	0	0	1	26	27	12	2	0	0	0	14	14
<b>H/TOT</b>	<b>46</b>	<b>5</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>52</b>	<b>53</b>	<b>147</b>	<b>8</b>	<b>2</b>	<b>0</b>	<b>3</b>	<b>160</b>	<b>164</b>	<b>80</b>	<b>4</b>	<b>0</b>	<b>1</b>	<b>1</b>	<b>86</b>	<b>88</b>
10:00	9	0	2	0	0	11	12	23	1	3	0	1	28	31	17	0	1	0	0	18	19
10:15	10	3	0	0	0	13	13	30	1	1	0	0	32	33	22	3	0	0	0	25	25
10:30	10	0	0	0	0	10	10	33	3	1	0	3	40	44	16	1	0	0	0	17	17
10:45	14	3	0	0	1	18	19	19	3	1	0	0	23	24	8	1	0	0	0	9	9
<b>H/TOT</b>	<b>43</b>	<b>6</b>	<b>2</b>	<b>0</b>	<b>1</b>	<b>52</b>	<b>54</b>	<b>105</b>	<b>8</b>	<b>6</b>	<b>0</b>	<b>4</b>	<b>123</b>	<b>130</b>	<b>63</b>	<b>5</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>69</b>	<b>70</b>
11:00	8	1	0	0	0	9	9	27	2	0	0	2	31	33	16	0	0	0	0	16	16
11:15	12	1	0	0	0	13	13	29	1	0	0	0	30	30	25	1	0	0	1	27	28
11:30	10	0	0	0	1	11	12	18	1	0	0	2	21	23	29	2	1	0	0	32	33
11:45	17	1	0	0	0	18	18	22	3	1	0	0	26	27	20	0	1	0	0	21	22
<b>H/TOT</b>	<b>47</b>	<b>3</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>51</b>	<b>52</b>	<b>96</b>	<b>7</b>	<b>1</b>	<b>0</b>	<b>4</b>	<b>108</b>	<b>113</b>	<b>90</b>	<b>3</b>	<b>2</b>	<b>0</b>	<b>1</b>	<b>96</b>	<b>98</b>
12:00	12	1	0	0	1	14	15	21	5	0	0	0	26	26	17	2	0	0	0	19	19
12:15	20	1	0	0	0	21	21	22	2	0	0	1	25	26	19	0	1	0	0	20	21
12:30	21	1	1	0	0	23	24	23	3	0	0	0	26	26	20	0	0	0	0	20	20
12:45	11	0	0	0	1	12	13	31	2	1	0	1	35	37	25	4	0	0	0	29	29
<b>H/TOT</b>	<b>64</b>	<b>3</b>	<b>1</b>	<b>0</b>	<b>2</b>	<b>70</b>	<b>73</b>	<b>97</b>	<b>12</b>	<b>1</b>	<b>0</b>	<b>2</b>	<b>112</b>	<b>115</b>	<b>81</b>	<b>6</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>88</b>	<b>89</b>

## ABACUS TRANSPORTATION SURVEYS

**GREYSTONES TRAFFIC COUNTS  
MANUAL CLASSIFIED JUNCTION TURNING COUNTS**

**APRIL 2016  
ATH/16/036**

SITE: 04

DATE: 28th April 2016

LOCATION: R761/R762

DAY: Thursday

TIME	MOVEMENT 10						MOVEMENT 11						MOVEMENT 12								
	CAR	LGV	OGV1	OGV2	BUS	TOT	PCU	CAR	LGV	OGV1	OGV2	BUS	TOT	PCU	CAR	LGV	OGV1	OGV2	BUS	TOT	PCU
13:00	7	2	0	0	1	10	11	35	1	0	0	1	37	38	27	1	0	0	2	30	32
13:15	10	4	2	0	0	16	17	39	3	2	1	1	46	49	24	2	0	0	0	26	26
13:30	9	1	0	0	0	10	10	26	6	1	0	0	33	34	25	2	0	0	0	27	27
13:45	20	3	1	0	1	25	27	33	0	0	0	1	34	35	13	1	0	0	0	14	14
<b>H/TOT</b>	<b>46</b>	<b>10</b>	<b>3</b>	<b>0</b>	<b>2</b>	<b>61</b>	<b>65</b>	<b>133</b>	<b>10</b>	<b>3</b>	<b>1</b>	<b>3</b>	<b>150</b>	<b>156</b>	<b>89</b>	<b>6</b>	<b>0</b>	<b>0</b>	<b>2</b>	<b>97</b>	<b>99</b>
14:00	13	0	0	0	0	13	13	34	3	0	0	1	38	39	32	2	0	0	0	34	34
14:15	18	2	0	0	0	20	20	38	2	0	0	1	41	42	15	1	0	0	1	17	18
14:30	15	3	0	0	1	19	20	23	2	2	0	0	27	28	28	1	1	0	1	31	33
14:45	17	0	0	0	1	18	19	26	0	0	1	2	29	32	15	1	0	0	0	16	16
<b>H/TOT</b>	<b>63</b>	<b>5</b>	<b>0</b>	<b>0</b>	<b>2</b>	<b>70</b>	<b>72</b>	<b>121</b>	<b>7</b>	<b>2</b>	<b>1</b>	<b>4</b>	<b>135</b>	<b>141</b>	<b>90</b>	<b>5</b>	<b>1</b>	<b>0</b>	<b>2</b>	<b>98</b>	<b>101</b>
15:00	16	4	0	0	1	21	22	33	2	1	0	0	36	37	22	3	0	0	0	25	25
15:15	11	1	0	0	1	13	14	29	4	1	0	1	35	37	23	0	0	0	2	25	27
15:30	9	0	1	0	1	11	13	24	5	0	0	1	30	31	20	0	0	0	0	20	20
15:45	19	2	1	0	0	22	23	37	5	1	0	0	43	44	23	0	0	0	0	23	23
<b>H/TOT</b>	<b>55</b>	<b>7</b>	<b>2</b>	<b>0</b>	<b>3</b>	<b>67</b>	<b>71</b>	<b>123</b>	<b>16</b>	<b>3</b>	<b>0</b>	<b>2</b>	<b>144</b>	<b>148</b>	<b>88</b>	<b>3</b>	<b>0</b>	<b>0</b>	<b>2</b>	<b>93</b>	<b>95</b>
16:00	16	3	0	0	1	20	21	34	1	0	0	0	35	35	23	1	1	0	0	25	26
16:15	17	2	0	0	0	19	19	34	11	0	0	1	46	47	17	2	1	0	1	21	23
16:30	20	0	0	0	0	20	20	42	4	1	0	1	48	50	20	0	0	0	0	20	20
16:45	18	0	1	0	1	20	22	25	5	0	0	1	31	32	22	0	0	0	0	22	22
<b>H/TOT</b>	<b>71</b>	<b>5</b>	<b>1</b>	<b>0</b>	<b>2</b>	<b>79</b>	<b>82</b>	<b>135</b>	<b>21</b>	<b>1</b>	<b>0</b>	<b>3</b>	<b>160</b>	<b>164</b>	<b>82</b>	<b>3</b>	<b>2</b>	<b>0</b>	<b>1</b>	<b>88</b>	<b>90</b>
17:00	17	0	0	0	1	18	19	42	4	0	0	0	46	46	27	1	0	0	0	28	28
17:15	26	1	0	0	0	27	27	34	3	0	1	1	39	41	38	0	0	0	0	38	38
17:30	14	1	0	0	0	15	15	40	1	0	0	1	42	43	26	3	0	0	0	29	29
17:45	23	1	0	0	1	25	26	32	0	0	0	0	32	32	20	3	0	0	0	23	23
<b>H/TOT</b>	<b>80</b>	<b>3</b>	<b>0</b>	<b>0</b>	<b>2</b>	<b>85</b>	<b>87</b>	<b>148</b>	<b>8</b>	<b>0</b>	<b>1</b>	<b>2</b>	<b>159</b>	<b>162</b>	<b>111</b>	<b>7</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>118</b>	<b>118</b>
18:00	19	1	0	0	2	22	24	49	1	0	0	0	50	50	30	2	0	0	0	32	32
18:15	13	4	0	0	1	18	19	35	1	0	0	1	37	38	20	2	0	0	0	22	22
18:30	31	1	0	0	0	32	32	38	4	0	0	0	42	42	33	0	0	0	0	33	33
18:45	11	1	0	0	1	13	14	25	0	1	0	1	27	29	20	1	0	0	0	21	21
<b>H/TOT</b>	<b>74</b>	<b>7</b>	<b>0</b>	<b>0</b>	<b>4</b>	<b>85</b>	<b>89</b>	<b>147</b>	<b>6</b>	<b>1</b>	<b>0</b>	<b>2</b>	<b>156</b>	<b>159</b>	<b>103</b>	<b>5</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>108</b>	<b>108</b>
<b>P/TOT</b>	<b>624</b>	<b>57</b>	<b>9</b>	<b>0</b>	<b>22</b>	<b>712</b>	<b>739</b>	<b>1525</b>	<b>125</b>	<b>25</b>	<b>3</b>	<b>34</b>	<b>1712</b>	<b>1762</b>	<b>1007</b>	<b>56</b>	<b>12</b>	<b>1</b>	<b>11</b>	<b>1087</b>	<b>1105</b>

## ABACUS TRANSPORTATION SURVEYS

**GREYSTONES TRAFFIC COUNTS  
MANUAL CLASSIFIED JUNCTION TURNING COUNTS**

**APRIL 2016  
ATH/16/036**

SITE: 05

DATE: 28th April 2016

LOCATION: R762/Priory Road

DAY: Thursday

TIME	MOVEMENT 1					TOT	PCU	MOVEMENT 2					TOT	PCU	MOVEMENT 3					TOT	PCU
	CAR	LGV	OGV1	OGV2	BUS			CAR	LGV	OGV1	OGV2	BUS			CAR	LGV	OGV1	OGV2	BUS		
07:00	13	8	0	0	0	21	21	0	0	0	0	0	0	0	22	0	0	0	0	22	22
07:15	25	20	3	0	1	49	52	4	0	0	0	0	4	4	23	0	0	0	0	23	23
07:30	25	8	0	0	1	34	35	2	0	0	0	0	2	2	20	0	0	0	0	20	20
07:45	27	13	1	0	1	42	44	2	1	0	0	0	3	3	21	1	1	0	0	23	24
<b>H/TOT</b>	<b>90</b>	<b>49</b>	<b>4</b>	<b>0</b>	<b>3</b>	<b>146</b>	<b>151</b>	<b>8</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>9</b>	<b>9</b>	<b>86</b>	<b>1</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>88</b>	<b>89</b>
08:00	47	11	1	0	1	60	62	3	1	0	0	0	4	4	30	1	0	0	0	31	31
08:15	56	9	1	1	3	70	75	4	0	0	0	0	4	4	22	1	0	0	0	23	23
08:30	65	13	0	0	0	78	78	0	0	0	0	0	0	0	16	1	1	0	0	18	19
08:45	63	10	2	0	1	76	78	3	1	0	0	0	4	4	7	1	1	0	0	9	10
<b>H/TOT</b>	<b>231</b>	<b>43</b>	<b>4</b>	<b>1</b>	<b>5</b>	<b>284</b>	<b>292</b>	<b>10</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>12</b>	<b>12</b>	<b>75</b>	<b>4</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>81</b>	<b>82</b>
09:00	38	7	0	0	0	45	45	4	0	0	0	0	4	4	13	1	0	0	0	14	14
09:15	51	9	6	0	1	67	71	3	1	0	0	0	4	4	5	0	0	0	0	5	5
09:30	41	1	3	0	1	46	49	4	0	0	0	0	4	4	7	0	0	0	0	7	7
09:45	48	2	0	0	1	51	52	7	0	0	0	0	7	7	6	0	0	0	0	6	6
<b>H/TOT</b>	<b>178</b>	<b>19</b>	<b>9</b>	<b>0</b>	<b>3</b>	<b>209</b>	<b>217</b>	<b>18</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>19</b>	<b>19</b>	<b>31</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>32</b>	<b>32</b>
10:00	31	2	2	0	0	35	36	2	0	0	0	0	2	2	3	0	0	0	0	3	3
10:15	29	6	1	0	1	37	39	5	0	0	0	0	5	5	10	0	0	0	0	10	10
10:30	34	5	1	2	0	42	45	4	0	0	0	0	4	4	7	1	0	0	0	8	8
10:45	38	7	2	0	1	48	50	3	0	1	0	0	4	5	9	0	0	0	0	9	9
<b>H/TOT</b>	<b>132</b>	<b>20</b>	<b>6</b>	<b>2</b>	<b>2</b>	<b>162</b>	<b>170</b>	<b>14</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>15</b>	<b>16</b>	<b>29</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>30</b>	<b>30</b>
11:00	45	9	3	0	1	58	61	3	0	0	0	0	3	3	1	0	0	0	0	1	1
11:15	38	9	0	0	0	47	47	3	0	1	0	0	4	5	7	0	0	0	0	7	7
11:30	42	5	0	0	0	47	47	2	0	0	0	0	2	2	11	0	0	0	0	11	11
11:45	32	6	2	0	1	41	43	7	0	0	0	0	7	7	4	0	0	0	0	4	4
<b>H/TOT</b>	<b>157</b>	<b>29</b>	<b>5</b>	<b>0</b>	<b>2</b>	<b>193</b>	<b>198</b>	<b>15</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>16</b>	<b>17</b>	<b>23</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>23</b>	<b>23</b>
12:00	56	13	2	0	0	71	72	5	0	0	0	0	5	5	1	0	0	0	0	1	1
12:15	38	8	3	0	1	50	53	6	0	0	0	0	6	6	7	0	0	0	0	7	7
12:30	37	8	3	1	1	50	54	2	1	0	0	0	3	3	3	0	0	0	0	3	3
12:45	59	6	1	0	1	67	69	3	1	0	0	0	4	4	2	0	0	0	0	2	2
<b>H/TOT</b>	<b>190</b>	<b>35</b>	<b>9</b>	<b>1</b>	<b>3</b>	<b>238</b>	<b>247</b>	<b>16</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>18</b>	<b>18</b>	<b>13</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>13</b>	<b>13</b>

## ABACUS TRANSPORTATION SURVEYS

**GREYSTONES TRAFFIC COUNTS  
MANUAL CLASSIFIED JUNCTION TURNING COUNTS**

**APRIL 2016  
ATH/16/036**

SITE: 05

DATE: 28th April 2016

LOCATION: R762/Priory Road

DAY: Thursday

TIME	MOVEMENT 1					TOT	PCU	MOVEMENT 2					TOT	PCU	MOVEMENT 3					TOT	PCU
	CAR	LGV	OGV1	OGV2	BUS			CAR	LGV	OGV1	OGV2	BUS			CAR	LGV	OGV1	OGV2	BUS		
13:00	76	7	0	0	0	83	83	7	1	1	0	0	9	10	6	0	0	0	0	6	6
13:15	59	7	0	0	2	68	70	3	3	0	0	0	6	6	5	0	0	0	0	5	5
13:30	49	8	1	0	0	58	59	7	1	0	0	0	8	8	2	0	0	0	0	2	2
13:45	66	8	0	0	2	76	78	6	0	0	1	0	7	8	5	0	0	0	0	5	5
<b>H/TOT</b>	<b>250</b>	<b>30</b>	<b>1</b>	<b>0</b>	<b>4</b>	<b>285</b>	<b>290</b>	<b>23</b>	<b>5</b>	<b>1</b>	<b>1</b>	<b>0</b>	<b>30</b>	<b>32</b>	<b>18</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>18</b>	<b>18</b>
14:00	76	9	1	0	0	86	87	3	0	1	0	0	4	5	8	0	2	0	0	10	11
14:15	74	5	0	0	2	81	83	7	1	0	0	0	8	8	6	0	0	0	0	6	6
14:30	65	4	0	0	0	69	69	2	0	0	0	0	2	2	9	0	0	0	0	9	9
14:45	45	6	1	0	3	55	59	6	0	0	0	0	6	6	3	0	0	0	0	3	3
<b>H/TOT</b>	<b>260</b>	<b>24</b>	<b>2</b>	<b>0</b>	<b>5</b>	<b>291</b>	<b>297</b>	<b>18</b>	<b>1</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>20</b>	<b>21</b>	<b>26</b>	<b>0</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>28</b>	<b>29</b>
15:00	63	7	0	0	1	71	72	5	0	0	0	0	5	5	6	0	0	0	0	6	6
15:15	75	9	1	0	0	85	86	3	0	0	0	0	3	3	2	1	0	0	0	3	3
15:30	86	6	2	0	2	96	99	9	1	0	0	0	10	10	5	0	0	0	0	5	5
15:45	61	5	1	0	0	67	68	6	0	0	0	0	6	6	3	0	0	0	0	3	3
<b>H/TOT</b>	<b>285</b>	<b>27</b>	<b>4</b>	<b>0</b>	<b>3</b>	<b>319</b>	<b>324</b>	<b>23</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>24</b>	<b>24</b>	<b>16</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>17</b>	<b>17</b>
16:00	82	10	0	0	0	92	92	9	0	0	0	0	9	9	0	0	1	0	0	1	2
16:15	88	14	1	0	1	104	106	13	0	0	0	0	13	13	3	1	0	0	0	4	4
16:30	99	8	1	0	1	109	111	9	1	0	0	0	10	10	1	0	0	0	0	1	1
16:45	64	9	0	0	0	73	73	4	0	1	0	0	5	6	1	0	0	0	0	1	1
<b>H/TOT</b>	<b>333</b>	<b>41</b>	<b>2</b>	<b>0</b>	<b>2</b>	<b>378</b>	<b>381</b>	<b>35</b>	<b>1</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>37</b>	<b>38</b>	<b>5</b>	<b>1</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>7</b>	<b>8</b>
17:00	66	9	3	0	0	78	80	7	0	0	0	0	7	7	5	0	0	0	0	5	5
17:15	90	9	2	0	2	103	106	18	1	0	0	0	19	19	2	2	0	0	0	4	4
17:30	118	4	1	0	1	124	126	9	0	0	0	0	9	9	8	0	0	0	0	8	8
17:45	101	3	0	0	0	104	104	12	0	0	0	0	12	12	2	0	0	0	0	2	2
<b>H/TOT</b>	<b>375</b>	<b>25</b>	<b>6</b>	<b>0</b>	<b>3</b>	<b>409</b>	<b>415</b>	<b>46</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>47</b>	<b>47</b>	<b>17</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>19</b>	<b>19</b>
18:00	104	4	1	0	1	110	112	5	0	0	0	0	5	5	6	0	0	0	0	6	6
18:15	106	11	3	0	0	120	122	14	0	0	0	0	14	14	1	0	0	0	0	1	1
18:30	90	8	0	0	1	99	100	12	0	0	0	0	12	12	7	0	0	0	0	7	7
18:45	98	3	0	0	0	101	101	10	0	0	0	0	10	10	4	0	0	0	0	4	4
<b>H/TOT</b>	<b>398</b>	<b>26</b>	<b>4</b>	<b>0</b>	<b>2</b>	<b>430</b>	<b>434</b>	<b>41</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>41</b>	<b>41</b>	<b>18</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>18</b>	<b>18</b>
<b>P/TOT</b>	<b>2879</b>	<b>368</b>	<b>56</b>	<b>4</b>	<b>37</b>	<b>3344</b>	<b>3414</b>	<b>267</b>	<b>15</b>	<b>5</b>	<b>1</b>	<b>0</b>	<b>288</b>	<b>292</b>	<b>357</b>	<b>11</b>	<b>6</b>	<b>0</b>	<b>0</b>	<b>374</b>	<b>377</b>

## ABACUS TRANSPORTATION SURVEYS

**GREYSTONES TRAFFIC COUNTS  
MANUAL CLASSIFIED JUNCTION TURNING COUNTS**

**APRIL 2016  
ATH/16/036**

SITE: 05

DATE: 28th April 2016

LOCATION: R762/Priory Road

DAY: Thursday

TIME	MOVEMENT 4					TOT	PCU	MOVEMENT 5					TOT	PCU	MOVEMENT 6					TOT	PCU
	CAR	LGV	OGV1	OGV2	BUS			CAR	LGV	OGV1	OGV2	BUS			CAR	LGV	OGV1	OGV2	BUS		
07:00	0	0	0	0	0	0	0	3	0	0	0	0	3	3	56	4	1	0	1	62	64
07:15	3	2	0	0	0	5	5	5	1	0	0	0	6	6	72	6	0	0	0	78	78
07:30	4	1	0	0	0	5	5	7	0	0	0	0	7	7	81	5	1	0	1	88	90
07:45	9	0	0	0	0	9	9	6	0	0	0	0	6	6	99	12	2	0	1	114	116
<b>H/TOT</b>	<b>16</b>	<b>3</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>19</b>	<b>19</b>	<b>21</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>22</b>	<b>22</b>	<b>308</b>	<b>27</b>	<b>4</b>	<b>0</b>	<b>3</b>	<b>342</b>	<b>347</b>
08:00	5	0	0	0	0	5	5	4	1	0	0	0	5	5	125	6	0	0	1	132	133
08:15	7	1	0	0	0	8	8	8	0	0	0	0	8	8	100	2	3	0	0	105	107
08:30	22	0	0	0	0	22	22	19	2	0	0	0	21	21	127	9	3	1	4	144	151
08:45	12	0	1	0	0	13	14	19	1	0	0	0	20	20	117	9	3	0	0	129	131
<b>H/TOT</b>	<b>46</b>	<b>1</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>48</b>	<b>49</b>	<b>50</b>	<b>4</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>54</b>	<b>54</b>	<b>469</b>	<b>26</b>	<b>9</b>	<b>1</b>	<b>5</b>	<b>510</b>	<b>521</b>
09:00	6	2	0	0	0	8	8	14	0	1	0	0	15	16	144	5	0	0	1	150	151
09:15	3	0	0	0	0	3	3	8	1	0	0	0	9	9	95	11	1	0	0	107	108
09:30	4	0	0	0	0	4	4	5	0	0	0	0	5	5	83	9	2	0	1	95	97
09:45	4	0	0	0	0	4	4	6	1	0	0	0	7	7	66	9	3	0	0	78	80
<b>H/TOT</b>	<b>17</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>19</b>	<b>19</b>	<b>33</b>	<b>2</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>36</b>	<b>37</b>	<b>388</b>	<b>34</b>	<b>6</b>	<b>0</b>	<b>2</b>	<b>430</b>	<b>435</b>
10:00	0	0	0	0	0	0	0	4	3	0	0	0	7	7	53	6	2	0	2	63	66
10:15	1	0	0	0	0	1	1	6	0	0	0	0	6	6	47	4	5	0	0	56	59
10:30	1	0	0	0	0	1	1	5	1	0	0	0	6	6	60	6	2	0	0	68	69
10:45	0	0	0	0	0	0	0	7	1	0	0	0	8	8	41	8	1	0	1	51	53
<b>H/TOT</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>2</b>	<b>2</b>	<b>22</b>	<b>5</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>27</b>	<b>27</b>	<b>201</b>	<b>24</b>	<b>10</b>	<b>0</b>	<b>3</b>	<b>238</b>	<b>246</b>
11:00	1	1	0	0	0	2	2	3	0	0	0	0	3	3	56	8	1	0	1	66	68
11:15	3	0	0	0	0	3	3	4	0	0	0	0	4	4	33	6	0	0	0	39	39
11:30	3	0	0	0	0	3	3	6	0	0	0	0	6	6	43	3	1	0	0	47	48
11:45	1	0	0	0	0	1	1	5	1	0	0	0	6	6	36	6	2	0	1	45	47
<b>H/TOT</b>	<b>8</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>9</b>	<b>9</b>	<b>18</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>19</b>	<b>19</b>	<b>168</b>	<b>23</b>	<b>4</b>	<b>0</b>	<b>2</b>	<b>197</b>	<b>201</b>
12:00	1	0	0	0	0	1	1	4	1	0	0	0	5	5	48	10	1	1	0	60	62
12:15	4	0	0	0	0	4	4	5	2	0	0	0	7	7	44	4	0	0	1	49	50
12:30	2	0	0	0	0	2	2	8	1	0	0	0	9	9	50	6	1	0	0	57	58
12:45	3	0	0	0	0	3	3	7	0	0	0	0	7	7	55	5	0	0	1	61	62
<b>H/TOT</b>	<b>10</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>10</b>	<b>10</b>	<b>24</b>	<b>4</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>28</b>	<b>28</b>	<b>197</b>	<b>25</b>	<b>2</b>	<b>1</b>	<b>2</b>	<b>227</b>	<b>231</b>

## ABACUS TRANSPORTATION SURVEYS

**GREYSTONES TRAFFIC COUNTS  
MANUAL CLASSIFIED JUNCTION TURNING COUNTS**

**APRIL 2016  
ATH/16/036**

SITE: 05

DATE: 28th April 2016

LOCATION: R762/Priory Road

DAY: Thursday

TIME	MOVEMENT 4					TOT	PCU	MOVEMENT 5					TOT	PCU	MOVEMENT 6					TOT	PCU
	CAR	LGV	OGV1	OGV2	BUS			CAR	LGV	OGV1	OGV2	BUS			CAR	LGV	OGV1	OGV2	BUS		
13:00	4	1	0	0	0	5	5	14	1	0	0	0	15	15	44	6	1	0	0	51	52
13:15	6	0	0	0	0	6	6	12	0	0	0	0	12	12	45	4	2	1	1	53	56
13:30	4	0	0	0	0	4	4	12	0	0	0	0	12	12	37	7	1	1	0	46	48
13:45	3	0	0	0	0	3	3	11	1	0	0	0	12	12	46	1	3	0	1	51	54
<b>H/TOT</b>	<b>17</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>18</b>	<b>18</b>	<b>49</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>51</b>	<b>51</b>	<b>172</b>	<b>18</b>	<b>7</b>	<b>2</b>	<b>2</b>	<b>201</b>	<b>209</b>
14:00	9	0	0	0	0	9	9	7	1	0	0	0	8	8	53	5	0	0	0	58	58
14:15	8	1	0	0	0	9	9	12	1	0	0	0	13	13	77	7	1	0	1	86	88
14:30	4	0	0	0	0	4	4	15	2	0	0	0	17	17	63	6	1	0	0	70	71
14:45	1	0	0	0	0	1	1	18	0	0	0	0	18	18	81	3	1	1	2	88	92
<b>H/TOT</b>	<b>22</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>23</b>	<b>23</b>	<b>52</b>	<b>4</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>56</b>	<b>56</b>	<b>274</b>	<b>21</b>	<b>3</b>	<b>1</b>	<b>3</b>	<b>302</b>	<b>308</b>
15:00	1	0	0	0	0	1	1	15	3	0	0	0	18	18	45	5	0	0	0	50	50
15:15	9	0	0	0	0	9	9	19	1	0	0	0	20	20	43	10	2	0	1	56	58
15:30	3	0	0	0	0	3	3	18	0	0	0	0	18	18	60	8	1	1	0	70	72
15:45	0	0	0	0	0	0	0	14	1	0	0	0	15	15	56	12	3	0	1	72	75
<b>H/TOT</b>	<b>13</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>13</b>	<b>13</b>	<b>66</b>	<b>5</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>71</b>	<b>71</b>	<b>204</b>	<b>35</b>	<b>6</b>	<b>1</b>	<b>2</b>	<b>248</b>	<b>254</b>
16:00	1	0	0	0	0	1	1	14	0	0	0	0	14	14	48	12	0	0	0	60	60
16:15	3	0	0	0	0	3	3	9	2	0	0	0	11	11	57	12	1	0	1	71	73
16:30	0	0	0	0	0	0	0	13	0	0	0	0	13	13	60	13	2	0	1	76	78
16:45	3	0	0	0	0	3	3	9	1	0	0	0	10	10	44	6	0	0	1	51	52
<b>H/TOT</b>	<b>7</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>7</b>	<b>7</b>	<b>45</b>	<b>3</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>48</b>	<b>48</b>	<b>209</b>	<b>43</b>	<b>3</b>	<b>0</b>	<b>3</b>	<b>258</b>	<b>263</b>
17:00	7	0	0	0	0	7	7	13	1	0	0	0	14	14	63	15	1	0	0	79	80
17:15	3	0	0	0	0	3	3	9	0	0	0	0	9	9	39	6	0	0	1	46	47
17:30	2	0	0	0	0	2	2	16	0	0	0	0	16	16	63	8	1	0	0	72	73
17:45	5	0	0	0	0	5	5	17	0	0	0	0	17	17	55	4	0	0	1	60	61
<b>H/TOT</b>	<b>17</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>17</b>	<b>17</b>	<b>55</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>56</b>	<b>56</b>	<b>220</b>	<b>33</b>	<b>2</b>	<b>0</b>	<b>2</b>	<b>257</b>	<b>260</b>
18:00	6	0	0	0	0	6	6	21	0	0	0	0	21	21	41	6	0	0	0	47	47
18:15	4	0	0	0	0	4	4	10	0	0	0	0	10	10	48	1	1	0	1	51	53
18:30	4	0	0	0	0	4	4	13	1	0	0	0	14	14	62	5	0	0	0	67	67
18:45	1	0	0	0	0	1	1	6	0	0	0	0	6	6	41	3	0	0	1	45	46
<b>H/TOT</b>	<b>15</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>15</b>	<b>15</b>	<b>50</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>51</b>	<b>51</b>	<b>192</b>	<b>15</b>	<b>1</b>	<b>0</b>	<b>2</b>	<b>210</b>	<b>213</b>
<b>P/TOT</b>	<b>190</b>	<b>9</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>200</b>	<b>201</b>	<b>485</b>	<b>33</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>519</b>	<b>520</b>	<b>3002</b>	<b>324</b>	<b>57</b>	<b>6</b>	<b>31</b>	<b>3420</b>	<b>3487</b>

## ABACUS TRANSPORTATION SURVEYS

**GREYSTONES TRAFFIC COUNTS  
MANUAL CLASSIFIED JUNCTION TURNING COUNTS**

**APRIL 2016  
ATH/16/036**

SITE: 06

DATE: 28th April 2016

LOCATION: Eden Gate/Priory Avenue Estates

DAY: Thursday

TIME	MOVEMENT 1					TOT	PCU	MOVEMENT 2					TOT	PCU	MOVEMENT 3					TOT	PCU
	CAR	LGV	OGV1	OGV2	BUS			CAR	LGV	OGV1	OGV2	BUS			CAR	LGV	OGV1	OGV2	BUS		
07:00	1	0	0	0	1	2	3	16	0	0	0	0	16	16	17	0	0	0	0	17	17
07:15	0	0	0	0	0	0	0	18	1	0	0	0	19	19	21	0	0	0	0	21	21
07:30	0	0	0	0	0	0	0	18	0	0	0	0	18	18	14	0	0	0	0	14	14
07:45	5	0	0	0	0	5	5	24	1	0	0	0	25	25	21	1	1	0	0	23	24
<b>H/TOT</b>	<b>6</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>7</b>	<b>8</b>	<b>76</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>78</b>	<b>78</b>	<b>73</b>	<b>1</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>75</b>	<b>76</b>
08:00	0	0	0	0	0	0	0	20	3	0	0	0	23	23	20	0	0	0	0	20	20
08:15	2	0	0	0	0	2	2	25	1	0	0	0	26	26	21	1	0	0	0	22	22
08:30	2	0	0	0	0	2	2	31	1	0	0	0	32	32	28	0	1	0	0	29	30
08:45	4	0	0	0	0	4	4	28	2	0	0	0	30	30	13	0	0	0	0	13	13
<b>H/TOT</b>	<b>8</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>8</b>	<b>8</b>	<b>104</b>	<b>7</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>111</b>	<b>111</b>	<b>82</b>	<b>1</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>84</b>	<b>85</b>
09:00	5	0	0	0	0	5	5	16	0	0	0	0	16	16	6	2	0	0	0	8	8
09:15	1	0	0	0	0	1	1	10	0	0	0	0	10	10	5	0	0	0	0	5	5
09:30	0	0	0	0	0	0	0	6	0	0	0	0	6	6	3	0	0	0	0	3	3
09:45	1	0	0	0	0	1	1	10	2	0	0	0	12	12	3	0	0	0	0	3	3
<b>H/TOT</b>	<b>7</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>7</b>	<b>7</b>	<b>42</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>44</b>	<b>44</b>	<b>17</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>19</b>	<b>19</b>
10:00	1	0	0	0	0	1	1	7	0	0	0	0	7	7	4	0	0	0	0	4	4
10:15	1	0	0	0	0	1	1	9	1	0	0	0	10	10	9	1	0	0	0	10	10
10:30	0	0	0	0	0	0	0	9	2	0	0	0	11	11	5	0	0	0	0	5	5
10:45	2	0	0	0	0	2	2	3	0	0	0	0	3	3	7	0	0	0	0	7	7
<b>H/TOT</b>	<b>4</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>4</b>	<b>4</b>	<b>28</b>	<b>3</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>31</b>	<b>31</b>	<b>25</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>26</b>	<b>26</b>
11:00	0	0	0	0	0	0	0	6	2	0	0	0	8	8	1	0	0	0	0	1	1
11:15	0	0	0	0	0	0	0	5	0	0	0	0	5	5	6	0	0	0	0	6	6
11:30	0	0	0	0	0	0	0	9	1	0	0	0	10	10	8	0	0	0	0	8	8
11:45	4	0	0	0	0	4	4	5	0	0	0	0	5	5	2	0	0	0	0	2	2
<b>H/TOT</b>	<b>4</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>4</b>	<b>4</b>	<b>25</b>	<b>3</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>28</b>	<b>28</b>	<b>17</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>17</b>	<b>17</b>
12:00	1	0	0	0	0	1	1	11	1	0	0	0	12	12	1	0	0	0	0	1	1
12:15	2	0	0	0	0	2	2	6	0	0	0	0	6	6	7	0	0	0	0	7	7
12:30	0	0	0	0	0	0	0	7	0	0	0	0	7	7	2	0	0	0	0	2	2
12:45	0	0	0	0	0	0	0	10	2	0	0	0	12	12	3	0	0	0	0	3	3
<b>H/TOT</b>	<b>3</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>3</b>	<b>3</b>	<b>34</b>	<b>3</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>37</b>	<b>37</b>	<b>13</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>13</b>	<b>13</b>

**ABACUS TRANSPORTATION SURVEYS**

**GREYSTONES TRAFFIC COUNTS  
MANUAL CLASSIFIED JUNCTION TURNING COUNTS**

**APRIL 2016  
ATH/16/036**

SITE: 06

DATE: 28th April 2016

LOCATION: Eden Gate/Priory Avenue Estates

DAY: Thursday

TIME	MOVEMENT 1					TOT	PCU	MOVEMENT 2					TOT	PCU	MOVEMENT 3					TOT	PCU
	CAR	LGV	OGV1	OGV2	BUS			CAR	LGV	OGV1	OGV2	BUS			CAR	LGV	OGV1	OGV2	BUS		
13:00	0	1	0	0	0	1	1	8	1	0	0	0	9	9	3	0	0	0	0	3	3
13:15	0	1	0	0	0	1	1	6	1	0	0	0	7	7	5	0	0	0	0	5	5
13:30	2	0	0	0	0	2	2	9	0	0	0	0	9	9	2	0	0	0	0	2	2
13:45	1	0	0	0	0	1	1	14	1	0	0	0	15	15	7	0	0	0	0	7	7
<b>H/TOT</b>	<b>3</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>5</b>	<b>5</b>	<b>37</b>	<b>3</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>40</b>	<b>40</b>	<b>17</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>17</b>	<b>17</b>
14:00	2	0	0	0	0	2	2	10	1	0	1	0	12	13	7	1	0	0	0	8	8
14:15	1	0	0	0	0	1	1	16	0	0	0	0	16	16	9	0	0	0	0	9	9
14:30	1	0	0	0	0	1	1	11	0	0	0	0	11	11	6	0	0	0	0	6	6
14:45	0	0	0	0	0	0	0	21	0	0	0	0	21	21	6	0	0	0	0	6	6
<b>H/TOT</b>	<b>4</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>4</b>	<b>4</b>	<b>58</b>	<b>1</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>60</b>	<b>61</b>	<b>28</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>29</b>	<b>29</b>
15:00	0	0	0	0	0	0	0	7	0	0	0	0	7	7	3	0	0	0	0	3	3
15:15	2	1	0	0	0	3	3	9	1	0	0	0	10	10	6	1	0	0	0	7	7
15:30	1	0	0	0	0	1	1	18	2	0	0	0	20	20	5	0	0	0	0	5	5
15:45	0	0	0	0	0	0	0	13	2	0	0	0	15	15	3	0	0	0	0	3	3
<b>H/TOT</b>	<b>3</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>4</b>	<b>4</b>	<b>47</b>	<b>5</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>52</b>	<b>52</b>	<b>17</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>18</b>	<b>18</b>
16:00	0	0	0	0	0	0	0	12	1	0	0	0	13	13	1	1	0	0	0	2	2
16:15	2	0	0	0	0	2	2	12	0	0	0	0	12	12	3	0	0	0	0	3	3
16:30	1	0	0	0	0	1	1	12	1	0	0	0	13	13	1	0	0	0	0	1	1
16:45	1	0	0	0	0	1	1	10	0	0	0	0	10	10	1	0	0	0	0	1	1
<b>H/TOT</b>	<b>4</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>4</b>	<b>4</b>	<b>46</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>48</b>	<b>48</b>	<b>6</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>7</b>	<b>7</b>
17:00	2	0	0	0	0	2	2	12	1	0	0	0	13	13	1	0	0	0	0	1	1
17:15	4	0	0	0	0	4	4	13	0	0	0	0	13	13	4	0	0	0	0	4	4
17:30	0	0	0	0	0	0	0	11	0	0	0	0	11	11	2	0	0	0	0	2	2
17:45	1	0	0	0	0	1	1	18	1	0	0	0	19	19	4	0	0	0	0	4	4
<b>H/TOT</b>	<b>7</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>7</b>	<b>7</b>	<b>54</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>56</b>	<b>56</b>	<b>11</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>11</b>	<b>11</b>
18:00	0	0	0	0	0	0	0	11	0	0	0	0	11	11	6	0	0	0	0	6	6
18:15	1	0	0	0	0	1	1	10	1	0	0	0	11	11	2	0	0	0	0	2	2
18:30	0	0	0	0	0	0	0	8	1	0	0	0	9	9	5	0	0	0	0	5	5
18:45	2	0	0	0	0	2	2	15	0	0	0	0	15	15	5	0	0	0	0	5	5
<b>H/TOT</b>	<b>3</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>3</b>	<b>3</b>	<b>44</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>46</b>	<b>46</b>	<b>18</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>18</b>	<b>18</b>
<b>P/TOT</b>	<b>56</b>	<b>3</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>60</b>	<b>61</b>	<b>595</b>	<b>35</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>631</b>	<b>632</b>	<b>324</b>	<b>8</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>334</b>	<b>335</b>



## ABACUS TRANSPORTATION SURVEYS

**GREYSTONES TRAFFIC COUNTS  
MANUAL CLASSIFIED JUNCTION TURNING COUNTS**

**APRIL 2016  
ATH/16/036**

SITE: 06

DATE: 28th April 2016

LOCATION: Eden Gate/Priory Avenue Estates

DAY: Thursday

TIME	MOVEMENT 4						MOVEMENT 5						MOVEMENT 6								
	CAR	LGV	OGV1	OGV2	BUS	TOT	PCU	CAR	LGV	OGV1	OGV2	BUS	TOT	PCU	CAR	LGV	OGV1	OGV2	BUS	TOT	PCU
07:00	0	0	0	0	0	0	0	4	0	0	0	0	4	4	1	0	0	0	0	1	1
07:15	2	0	0	0	0	2	2	3	0	0	0	0	3	3	0	1	0	0	0	1	1
07:30	1	0	0	0	0	1	1	6	0	0	0	0	6	6	1	0	0	0	0	1	1
07:45	1	1	0	0	0	2	2	3	0	0	0	0	3	3	1	0	0	0	0	1	1
<b>H/TOT</b>	<b>4</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>5</b>	<b>5</b>	<b>16</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>16</b>	<b>16</b>	<b>3</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>4</b>	<b>4</b>
08:00	3	0	0	0	0	3	3	2	2	0	0	0	4	4	3	1	0	0	0	4	4
08:15	5	0	0	0	0	5	5	5	0	0	0	0	5	5	1	0	0	0	0	1	1
08:30	9	2	0	0	0	11	11	10	0	0	0	0	10	10	2	0	1	0	0	3	4
08:45	14	0	0	0	0	14	14	6	0	0	0	0	6	6	1	0	0	0	0	1	1
<b>H/TOT</b>	<b>31</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>33</b>	<b>33</b>	<b>23</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>25</b>	<b>25</b>	<b>7</b>	<b>1</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>9</b>	<b>10</b>
09:00	8	0	0	0	0	8	8	6	0	1	0	0	7	8	5	0	0	0	0	5	5
09:15	5	0	0	0	0	5	5	3	1	0	0	0	4	4	3	0	0	0	0	3	3
09:30	1	0	0	0	0	1	1	3	0	0	0	0	3	3	1	0	0	0	0	1	1
09:45	4	0	0	0	0	4	4	1	0	0	0	0	1	1	6	0	0	0	0	6	6
<b>H/TOT</b>	<b>18</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>18</b>	<b>18</b>	<b>13</b>	<b>1</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>15</b>	<b>16</b>	<b>15</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>15</b>	<b>15</b>
10:00	7	1	0	0	0	8	8	1	1	0	0	0	2	2	0	0	0	0	0	0	0
10:15	6	0	0	0	0	6	6	2	0	0	0	0	2	2	2	1	0	0	0	3	3
10:30	2	0	0	0	0	2	2	1	0	0	0	0	1	1	1	1	0	0	0	2	2
10:45	4	0	0	0	0	4	4	1	0	0	0	0	1	1	2	0	1	0	0	3	4
<b>H/TOT</b>	<b>19</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>20</b>	<b>20</b>	<b>5</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>6</b>	<b>6</b>	<b>5</b>	<b>2</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>8</b>	<b>9</b>
11:00	2	1	0	0	0	3	3	2	0	0	0	0	2	2	2	0	0	0	0	2	2
11:15	3	0	0	0	0	3	3	1	0	0	0	0	1	1	3	0	0	0	0	3	3
11:30	3	0	0	0	0	3	3	1	0	0	0	0	1	1	3	0	0	0	0	3	3
11:45	2	0	0	0	0	2	2	3	2	0	0	0	5	5	5	0	0	0	0	5	5
<b>H/TOT</b>	<b>10</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>11</b>	<b>11</b>	<b>7</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>9</b>	<b>9</b>	<b>13</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>13</b>	<b>13</b>
12:00	6	1	0	0	0	7	7	0	0	0	0	0	0	0	1	0	0	0	0	1	1
12:15	6	0	0	0	0	6	6	1	1	0	0	0	2	2	1	1	0	0	0	2	2
12:30	7	0	0	0	0	7	7	3	1	0	0	0	4	4	0	0	0	0	0	0	0
12:45	5	1	0	0	0	6	6	1	0	0	0	0	1	1	3	0	0	0	0	3	3
<b>H/TOT</b>	<b>24</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>26</b>	<b>26</b>	<b>5</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>7</b>	<b>7</b>	<b>5</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>6</b>	<b>6</b>

## ABACUS TRANSPORTATION SURVEYS

**GREYSTONES TRAFFIC COUNTS  
MANUAL CLASSIFIED JUNCTION TURNING COUNTS**

**APRIL 2016  
ATH/16/036**

SITE: 06

DATE: 28th April 2016

LOCATION: Eden Gate/Priory Avenue Estates

DAY: Thursday

TIME	MOVEMENT 4					TOT	PCU	MOVEMENT 5					TOT	PCU	MOVEMENT 6					TOT	PCU
	CAR	LGV	OGV1	OGV2	BUS			CAR	LGV	OGV1	OGV2	BUS			CAR	LGV	OGV1	OGV2	BUS		
13:00	11	1	0	0	0	12	12	1	0	0	0	0	1	1	5	0	0	0	0	5	5
13:15	13	1	0	0	0	14	14	0	0	0	0	0	0	0	5	0	0	0	0	5	5
13:30	14	0	0	0	0	14	14	3	0	0	0	0	3	3	3	2	0	0	0	5	5
13:45	6	0	0	1	0	7	8	2	1	0	0	0	3	3	4	1	0	0	0	5	5
<b>H/TOT</b>	<b>44</b>	<b>2</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>47</b>	<b>48</b>	<b>6</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>7</b>	<b>7</b>	<b>17</b>	<b>3</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>20</b>	<b>20</b>
14:00	5	0	0	0	0	5	5	3	0	0	0	0	3	3	2	0	0	0	0	2	2
14:15	10	0	0	0	0	10	10	6	2	0	0	0	8	8	5	0	0	0	0	5	5
14:30	8	0	0	0	0	8	8	1	2	0	0	0	3	3	3	0	0	0	0	3	3
14:45	10	0	0	0	0	10	10	3	0	0	0	0	3	3	5	0	0	0	0	5	5
<b>H/TOT</b>	<b>33</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>33</b>	<b>33</b>	<b>13</b>	<b>4</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>17</b>	<b>17</b>	<b>15</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>15</b>	<b>15</b>
15:00	16	2	0	0	0	18	18	0	1	0	0	0	1	1	3	0	0	0	0	3	3
15:15	11	0	0	0	0	11	11	2	0	0	0	0	2	2	5	1	0	0	0	6	6
15:30	16	1	0	0	0	17	17	1	0	0	0	0	1	1	5	0	0	0	0	5	5
15:45	13	1	0	0	0	14	14	6	1	0	0	0	7	7	2	0	0	0	0	2	2
<b>H/TOT</b>	<b>56</b>	<b>4</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>60</b>	<b>60</b>	<b>9</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>11</b>	<b>11</b>	<b>15</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>16</b>	<b>16</b>
16:00	12	0	0	0	0	12	12	3	0	0	0	0	3	3	3	0	0	0	0	3	3
16:15	13	0	0	0	0	13	13	3	0	0	0	0	3	3	6	0	0	0	0	6	6
16:30	10	1	0	0	0	11	11	3	0	0	0	0	3	3	4	1	0	0	0	5	5
16:45	4	1	0	0	0	5	5	5	0	0	0	0	5	5	4	0	0	0	0	4	4
<b>H/TOT</b>	<b>39</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>41</b>	<b>41</b>	<b>14</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>14</b>	<b>14</b>	<b>17</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>18</b>	<b>18</b>
17:00	8	1	0	0	0	9	9	3	0	0	0	0	3	3	6	0	0	0	0	6	6
17:15	13	0	0	0	0	13	13	4	0	0	0	0	4	4	5	0	0	0	0	5	5
17:30	10	0	0	0	0	10	10	7	0	0	0	0	7	7	3	0	0	0	0	3	3
17:45	13	0	0	0	0	13	13	2	0	0	0	0	2	2	7	0	0	0	0	7	7
<b>H/TOT</b>	<b>44</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>45</b>	<b>45</b>	<b>16</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>16</b>	<b>16</b>	<b>21</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>21</b>	<b>21</b>
18:00	22	0	0	0	0	22	22	3	0	0	0	0	3	3	7	0	0	0	0	7	7
18:15	10	0	0	0	0	10	10	1	0	0	0	0	1	1	10	0	0	0	0	10	10
18:30	14	1	0	0	0	15	15	2	0	0	0	0	2	2	6	0	0	0	0	6	6
18:45	12	0	0	0	0	12	12	1	0	0	0	0	1	1	2	0	0	0	0	2	2
<b>H/TOT</b>	<b>58</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>59</b>	<b>59</b>	<b>7</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>7</b>	<b>7</b>	<b>25</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>25</b>	<b>25</b>
<b>P/TOT</b>	<b>380</b>	<b>17</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>398</b>	<b>399</b>	<b>134</b>	<b>15</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>150</b>	<b>151</b>	<b>158</b>	<b>10</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>170</b>	<b>171</b>

## ABACUS TRANSPORTATION SURVEYS

**GREYSTONES TRAFFIC COUNTS  
MANUAL CLASSIFIED JUNCTION TURNING COUNTS**

**APRIL 2016  
ATH/16/036**

SITE: 06

DATE: 28th April 2016

LOCATION: Eden Gate/Priory Avenue Estates

DAY: Thursday

TIME	MOVEMENT 7						MOVEMENT 8						MOVEMENT 9								
	CAR	LGV	OGV1	OGV2	BUS	TOT	PCU	CAR	LGV	OGV1	OGV2	BUS	TOT	PCU	CAR	LGV	OGV1	OGV2	BUS	TOT	PCU
07:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	1	0	0	0	5	5
07:15	2	1	0	0	0	3	3	0	1	0	0	0	1	1	3	0	0	0	0	3	3
07:30	5	0	0	0	0	5	5	2	0	0	0	0	2	2	7	0	0	0	0	7	7
07:45	4	1	0	0	0	5	5	3	0	0	0	0	3	3	7	1	0	0	0	8	8
<b>H/TOT</b>	<b>11</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>13</b>	<b>13</b>	<b>5</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>6</b>	<b>6</b>	<b>21</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>23</b>	<b>23</b>
08:00	4	1	0	0	0	5	5	5	2	0	0	0	7	7	6	1	0	0	0	7	7
08:15	1	0	0	0	0	1	1	3	1	0	0	0	4	4	7	1	0	0	0	8	8
08:30	0	1	0	1	0	2	3	4	1	0	0	0	5	5	10	1	0	0	0	11	11
08:45	2	0	0	0	0	2	2	5	3	0	0	0	8	8	13	1	0	0	0	14	14
<b>H/TOT</b>	<b>7</b>	<b>2</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>10</b>	<b>11</b>	<b>17</b>	<b>7</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>24</b>	<b>24</b>	<b>36</b>	<b>4</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>40</b>	<b>40</b>
09:00	0	1	0	0	0	1	1	7	1	0	0	0	8	8	9	0	0	0	0	9	9
09:15	1	0	0	0	0	1	1	8	0	0	0	0	8	8	3	1	0	0	0	4	4
09:30	2	1	0	0	0	3	3	3	2	0	0	0	5	5	10	0	0	0	0	10	10
09:45	0	0	0	0	0	0	0	4	0	0	0	0	4	4	4	1	0	0	0	5	5
<b>H/TOT</b>	<b>3</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>5</b>	<b>5</b>	<b>22</b>	<b>3</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>25</b>	<b>25</b>	<b>26</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>28</b>	<b>28</b>
10:00	0	0	0	0	0	0	0	3	1	0	0	0	4	4	2	0	0	0	0	2	2
10:15	0	0	0	0	0	0	0	4	0	0	0	0	4	4	6	1	0	0	0	7	7
10:30	0	0	0	0	0	0	0	3	0	0	0	0	3	3	5	0	0	0	0	5	5
10:45	0	0	0	0	0	0	0	4	1	0	0	0	5	5	2	2	0	0	0	4	4
<b>H/TOT</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>14</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>16</b>	<b>16</b>	<b>15</b>	<b>3</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>18</b>	<b>18</b>
11:00	1	0	0	0	0	1	1	2	0	0	0	0	2	2	4	0	0	0	0	4	4
11:15	1	0	0	0	0	1	1	1	1	0	0	0	2	2	3	2	0	0	0	5	5
11:30	0	0	0	0	0	0	0	4	0	0	0	0	4	4	1	1	0	0	0	2	2
11:45	0	0	0	0	0	0	0	7	0	0	0	0	7	7	7	1	0	0	0	8	8
<b>H/TOT</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>2</b>	<b>2</b>	<b>14</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>15</b>	<b>15</b>	<b>15</b>	<b>4</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>19</b>	<b>19</b>
12:00	0	0	0	0	0	0	0	6	0	0	0	0	6	6	9	2	0	0	0	11	11
12:15	0	0	0	0	0	0	0	5	0	0	0	0	5	5	2	1	0	0	0	3	3
12:30	0	0	0	0	0	0	0	2	1	0	0	0	3	3	3	0	0	0	0	3	3
12:45	1	0	0	0	0	1	1	7	0	0	0	0	7	7	3	2	0	0	0	5	5
<b>H/TOT</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>1</b>	<b>20</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>21</b>	<b>21</b>	<b>17</b>	<b>5</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>22</b>	<b>22</b>

## ABACUS TRANSPORTATION SURVEYS

**GREYSTONES TRAFFIC COUNTS  
MANUAL CLASSIFIED JUNCTION TURNING COUNTS**

**APRIL 2016  
ATH/16/036**

SITE: 06

DATE: 28th April 2016

LOCATION: Eden Gate/Priory Avenue Estates

DAY: Thursday

TIME	MOVEMENT 7					TOT	PCU	MOVEMENT 8					TOT	PCU	MOVEMENT 9					TOT	PCU
	CAR	LGV	OGV1	OGV2	BUS			CAR	LGV	OGV1	OGV2	BUS			CAR	LGV	OGV1	OGV2	BUS		
13:00	1	0	0	0	0	1	1	8	1	0	0	0	9	9	6	1	0	0	0	7	7
13:15	1	0	0	0	0	1	1	6	0	0	0	0	6	6	4	1	0	0	0	5	5
13:30	0	1	0	0	0	1	1	9	0	0	0	0	9	9	1	0	0	0	0	1	1
13:45	1	0	0	0	0	1	1	4	0	0	0	0	4	4	8	1	0	0	0	9	9
<b>H/TOT</b>	<b>3</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>4</b>	<b>4</b>	<b>27</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>28</b>	<b>28</b>	<b>19</b>	<b>3</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>22</b>	<b>22</b>
14:00	0	0	0	0	0	0	0	7	2	0	0	0	9	9	4	0	0	0	0	4	4
14:15	4	0	0	0	0	4	4	4	0	0	0	0	4	4	4	1	0	0	0	5	5
14:30	0	0	0	0	0	0	0	9	1	0	0	0	10	10	2	0	0	0	0	2	2
14:45	0	0	0	0	0	0	0	15	0	0	0	0	15	15	2	0	0	0	0	2	2
<b>H/TOT</b>	<b>4</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>4</b>	<b>4</b>	<b>35</b>	<b>3</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>38</b>	<b>38</b>	<b>12</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>13</b>	<b>13</b>
15:00	0	0	0	0	0	0	0	3	0	0	0	0	3	3	6	1	0	0	0	7	7
15:15	1	0	0	0	0	1	1	10	1	0	0	0	11	11	3	0	0	0	0	3	3
15:30	0	0	0	0	0	0	0	14	0	0	0	0	14	14	2	0	0	0	0	2	2
15:45	0	0	0	0	0	0	0	10	0	0	0	0	10	10	3	1	1	0	0	5	6
<b>H/TOT</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>1</b>	<b>37</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>38</b>	<b>38</b>	<b>14</b>	<b>2</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>17</b>	<b>18</b>
16:00	2	0	1	0	0	3	4	11	1	0	0	0	12	12	1	1	0	0	0	2	2
16:15	1	0	0	0	0	1	1	14	0	0	0	0	14	14	8	1	0	0	1	10	11
16:30	1	0	0	0	0	1	1	8	0	0	0	0	8	8	7	0	0	0	0	7	7
16:45	3	0	1	0	0	4	5	13	0	0	0	0	13	13	7	0	0	0	0	7	7
<b>H/TOT</b>	<b>7</b>	<b>0</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>9</b>	<b>10</b>	<b>46</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>47</b>	<b>47</b>	<b>23</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>26</b>	<b>27</b>
17:00	1	0	0	0	0	1	1	18	0	0	0	0	18	18	11	0	0	0	0	11	11
17:15	0	0	0	0	0	0	0	14	1	1	0	0	16	17	12	1	0	0	0	13	13
17:30	2	0	0	0	0	2	2	21	1	0	0	0	22	22	4	1	0	0	0	5	5
17:45	1	0	0	0	0	1	1	21	2	0	0	0	23	23	14	0	0	0	0	14	14
<b>H/TOT</b>	<b>4</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>4</b>	<b>4</b>	<b>74</b>	<b>4</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>79</b>	<b>80</b>	<b>41</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>43</b>	<b>43</b>
18:00	2	0	0	0	0	2	2	21	2	0	0	0	23	23	15	0	0	0	0	15	15
18:15	0	0	0	0	0	0	0	17	0	0	0	0	17	17	5	1	0	0	0	6	6
18:30	1	0	0	0	0	1	1	27	2	0	0	0	29	29	9	0	0	0	0	9	9
18:45	0	0	0	0	0	0	0	11	0	0	0	0	11	11	4	0	0	0	0	4	4
<b>H/TOT</b>	<b>3</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>3</b>	<b>3</b>	<b>76</b>	<b>4</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>80</b>	<b>80</b>	<b>33</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>34</b>	<b>34</b>
<b>P/TOT</b>	<b>46</b>	<b>7</b>	<b>2</b>	<b>1</b>	<b>0</b>	<b>56</b>	<b>58</b>	<b>387</b>	<b>29</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>417</b>	<b>418</b>	<b>272</b>	<b>31</b>	<b>1</b>	<b>0</b>	<b>1</b>	<b>305</b>	<b>307</b>

## ABACUS TRANSPORTATION SURVEYS

**GREYSTONES TRAFFIC COUNTS  
MANUAL CLASSIFIED JUNCTION TURNING COUNTS**

**APRIL 2016  
ATH/16/036**

SITE: 06

DATE: 28th April 2016

LOCATION: Eden Gate/Priory Avenue Estates

DAY: Thursday

TIME	MOVEMENT 10						MOVEMENT 11						MOVEMENT 12								
	CAR	LGV	OGV1	OGV2	BUS	TOT	PCU	CAR	LGV	OGV1	OGV2	BUS	TOT	PCU	CAR	LGV	OGV1	OGV2	BUS	TOT	PCU
07:00	4	0	1	0	0	5	6	4	0	0	0	0	4	4	0	0	0	0	0	0	0
07:15	3	0	1	0	0	4	5	4	0	0	0	0	4	4	0	0	0	0	0	0	0
07:30	6	0	0	0	0	6	6	2	0	0	0	0	2	2	0	0	0	0	0	0	0
07:45	8	0	0	0	1	9	10	2	0	0	0	0	2	2	2	0	0	0	0	2	2
<b>H/TOT</b>	<b>21</b>	<b>0</b>	<b>2</b>	<b>0</b>	<b>1</b>	<b>24</b>	<b>26</b>	<b>12</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>12</b>	<b>12</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>2</b>	<b>2</b>
08:00	2	1	0	0	0	3	3	6	1	0	0	0	7	7	0	0	0	0	0	0	0
08:15	6	2	0	0	0	8	8	4	1	0	0	0	5	5	1	0	0	0	0	1	1
08:30	7	0	0	0	0	7	7	5	0	0	0	0	5	5	1	0	0	0	0	1	1
08:45	7	0	0	0	0	7	7	2	0	0	0	0	2	2	2	0	0	0	0	2	2
<b>H/TOT</b>	<b>22</b>	<b>3</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>25</b>	<b>25</b>	<b>17</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>19</b>	<b>19</b>	<b>4</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>4</b>	<b>4</b>
09:00	11	2	1	0	0	14	15	6	0	0	0	0	6	6	1	0	0	0	0	1	1
09:15	1	1	0	0	0	2	2	2	0	0	0	0	2	2	1	0	0	0	0	1	1
09:30	5	1	0	0	0	6	6	0	0	0	0	0	0	0	2	0	0	0	0	2	2
09:45	2	0	0	0	0	2	2	1	0	0	0	0	1	1	0	0	0	0	0	0	0
<b>H/TOT</b>	<b>19</b>	<b>4</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>24</b>	<b>25</b>	<b>9</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>9</b>	<b>9</b>	<b>4</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>4</b>	<b>4</b>
10:00	5	1	0	0	0	6	6	0	0	0	0	0	0	0	2	0	0	0	0	2	2
10:15	2	1	1	0	0	4	5	0	0	0	0	0	0	0	1	0	0	0	0	1	1
10:30	5	1	0	0	0	6	6	1	0	0	0	0	1	1	0	0	0	0	0	0	0
10:45	6	0	0	0	0	6	6	1	0	0	0	0	1	1	1	0	0	0	0	1	1
<b>H/TOT</b>	<b>18</b>	<b>3</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>22</b>	<b>23</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>2</b>	<b>2</b>	<b>4</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>4</b>	<b>4</b>
11:00	6	2	0	0	0	8	8	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:15	8	0	0	0	0	8	8	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:30	2	2	0	0	0	4	4	1	1	0	0	0	2	2	1	0	0	0	0	1	1
11:45	2	0	0	0	0	2	2	0	1	0	0	0	1	1	1	0	0	0	0	1	1
<b>H/TOT</b>	<b>18</b>	<b>4</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>22</b>	<b>22</b>	<b>1</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>3</b>	<b>3</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>2</b>	<b>2</b>
12:00	13	2	0	0	0	15	15	0	0	0	0	0	0	0	4	0	0	0	0	4	4
12:15	5	1	0	0	0	6	6	1	0	0	0	0	1	1	1	0	0	0	0	1	1
12:30	4	1	0	0	0	5	5	1	0	0	0	0	1	1	0	1	0	0	0	1	1
12:45	7	0	0	0	0	7	7	1	0	0	0	0	1	1	1	0	0	0	0	1	1
<b>H/TOT</b>	<b>29</b>	<b>4</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>33</b>	<b>33</b>	<b>3</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>3</b>	<b>3</b>	<b>6</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>7</b>	<b>7</b>

**ABACUS TRANSPORTATION SURVEYS**

**GREYSTONES TRAFFIC COUNTS  
MANUAL CLASSIFIED JUNCTION TURNING COUNTS**

**APRIL 2016  
ATH/16/036**

SITE: 06

DATE: 28th April 2016

LOCATION: Eden Gate/Priory Avenue Estates

DAY: Thursday

TIME	MOVEMENT 10					TOT	PCU	MOVEMENT 11					TOT	PCU	MOVEMENT 12					TOT	PCU
	CAR	LGV	OGV1	OGV2	BUS			CAR	LGV	OGV1	OGV2	BUS			CAR	LGV	OGV1	OGV2	BUS		
13:00	6	2	0	0	0	8	8	2	1	0	0	0	3	3	0	1	0	0	0	1	1
13:15	5	1	0	0	0	6	6	2	0	0	0	0	2	2	0	0	0	0	0	0	0
13:30	3	2	0	0	0	5	5	2	0	0	0	0	2	2	0	0	0	0	0	0	0
13:45	3	2	0	0	0	5	5	1	0	0	0	0	1	1	2	0	0	0	0	2	2
<b>H/TOT</b>	<b>17</b>	<b>7</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>24</b>	<b>24</b>	<b>7</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>8</b>	<b>8</b>	<b>2</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>3</b>	<b>3</b>
14:00	10	0	0	0	0	10	10	6	0	0	0	0	6	6	1	0	0	0	0	1	1
14:15	5	1	0	0	0	6	6	3	1	0	0	0	4	4	1	0	0	0	0	1	1
14:30	6	1	0	0	0	7	7	0	0	0	0	0	0	0	1	0	0	0	0	1	1
14:45	2	1	0	0	0	3	3	0	0	0	0	0	0	0	7	0	0	0	0	7	7
<b>H/TOT</b>	<b>23</b>	<b>3</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>26</b>	<b>26</b>	<b>9</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>10</b>	<b>10</b>	<b>10</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>10</b>	<b>10</b>
15:00	3	0	0	0	0	3	3	0	0	0	0	0	0	0	2	0	0	0	0	2	2
15:15	3	2	0	0	0	5	5	0	0	0	0	0	0	0	1	0	0	0	0	1	1
15:30	4	1	0	0	0	5	5	0	0	0	0	0	0	0	3	0	0	0	0	3	3
15:45	4	1	1	0	0	6	7	1	0	0	0	0	1	1	2	0	0	0	0	2	2
<b>H/TOT</b>	<b>14</b>	<b>4</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>19</b>	<b>20</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>1</b>	<b>8</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>8</b>	<b>8</b>
16:00	1	0	0	0	0	1	1	0	0	0	0	0	0	0	2	1	0	0	0	3	3
16:15	6	1	0	0	1	8	9	1	0	0	0	0	1	1	1	0	0	0	0	1	1
16:30	11	1	0	0	0	12	12	0	0	0	0	0	0	0	2	1	0	0	0	3	3
16:45	7	0	0	0	0	7	7	0	0	0	0	0	0	0	3	0	0	0	0	3	3
<b>H/TOT</b>	<b>25</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>28</b>	<b>29</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>1</b>	<b>8</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>10</b>	<b>10</b>
17:00	10	0	0	0	0	10	10	2	0	0	0	0	2	2	4	0	0	0	0	4	4
17:15	15	0	0	0	0	15	15	2	0	0	0	0	2	2	6	0	0	0	0	6	6
17:30	20	1	0	0	0	21	21	4	0	0	0	0	4	4	1	0	0	0	0	1	1
17:45	10	1	0	0	0	11	11	3	0	0	0	0	3	3	3	0	0	0	0	3	3
<b>H/TOT</b>	<b>55</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>57</b>	<b>57</b>	<b>11</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>11</b>	<b>11</b>	<b>14</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>14</b>	<b>14</b>
18:00	15	0	0	0	0	15	15	3	0	0	0	0	3	3	5	0	0	0	0	5	5
18:15	13	2	0	0	0	15	15	1	0	0	0	0	1	1	4	0	0	0	0	4	4
18:30	14	0	0	0	0	14	14	2	0	0	0	0	2	2	2	0	0	0	0	2	2
18:45	7	0	0	0	0	7	7	0	0	0	0	0	0	0	4	0	0	0	0	4	4
<b>H/TOT</b>	<b>49</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>51</b>	<b>51</b>	<b>6</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>6</b>	<b>6</b>	<b>15</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>15</b>	<b>15</b>
<b>P/TOT</b>	<b>310</b>	<b>38</b>	<b>5</b>	<b>0</b>	<b>2</b>	<b>355</b>	<b>360</b>	<b>79</b>	<b>6</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>85</b>	<b>85</b>	<b>79</b>	<b>4</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>83</b>	<b>83</b>

## ABACUS TRANSPORTATION SURVEYS

### GREYSTONES TRAFFIC COUNTS MANUAL CLASSIFIED JUNCTION TURNING COUNTS

SITE: 07

DATE:

LOCATION: Eden Gate

DAY:

TIME	MOVEMENT 1					TOT	PCU	MOVEMENT 2					TOT	PCU
	CAR	LGV	OGV1	OGV2	BUS			CAR	LGV	OGV1	OGV2	BUS		
07:00	21	0	1	0	0	22	23	4	1	0	0	0	5	5
07:15	21	2	1	0	0	24	25	5	2	0	0	0	7	7
07:30	25	0	0	0	0	25	25	14	0	0	0	0	14	14
07:45	33	1	0	0	1	35	36	14	2	0	0	0	16	16
<b>H/TOT</b>	<b>100</b>	<b>3</b>	<b>2</b>	<b>0</b>	<b>1</b>	<b>106</b>	<b>108</b>	<b>37</b>	<b>5</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>42</b>	<b>42</b>
08:00	25	5	0	0	0	30	30	15	4	0	0	0	19	19
08:15	32	3	0	0	0	35	35	11	2	0	0	0	13	13
08:30	40	1	1	0	0	42	43	14	3	0	1	0	18	19
08:45	36	2	0	0	0	38	38	20	4	0	0	0	24	24
<b>H/TOT</b>	<b>133</b>	<b>11</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>145</b>	<b>146</b>	<b>60</b>	<b>13</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>74</b>	<b>75</b>
09:00	32	2	1	0	0	35	36	16	2	0	0	0	18	18
09:15	14	1	0	0	0	15	15	12	1	0	0	0	13	13
09:30	12	1	0	0	0	13	13	15	3	0	0	0	18	18
09:45	18	2	0	0	0	20	20	8	1	0	0	0	9	9
<b>H/TOT</b>	<b>76</b>	<b>6</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>83</b>	<b>84</b>	<b>51</b>	<b>7</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>58</b>	<b>58</b>
10:00	12	1	0	0	0	13	13	5	1	0	0	0	6	6
10:15	13	3	1	0	0	17	18	10	1	0	0	0	11	11
10:30	15	4	0	0	0	19	19	8	0	0	0	0	8	8
10:45	11	0	1	0	0	12	13	6	3	0	0	0	9	9
<b>H/TOT</b>	<b>51</b>	<b>8</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>61</b>	<b>62</b>	<b>29</b>	<b>5</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>34</b>	<b>34</b>
11:00	14	4	0	0	0	18	18	7	0	0	0	0	7	7
11:15	16	0	0	0	0	16	16	5	3	0	0	0	8	8
11:30	14	3	0	0	0	17	17	5	1	0	0	0	6	6
11:45	12	0	0	0	0	12	12	14	1	0	0	0	15	15
<b>H/TOT</b>	<b>56</b>	<b>7</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>63</b>	<b>63</b>	<b>31</b>	<b>5</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>36</b>	<b>36</b>
12:00	25	3	0	0	0	28	28	15	2	0	0	0	17	17
12:15	12	2	0	0	0	14	14	7	1	0	0	0	8	8
12:30	11	1	0	0	0	12	12	5	1	0	0	0	6	6
12:45	20	2	0	0	0	22	22	11	2	0	0	0	13	13
<b>H/TOT</b>	<b>68</b>	<b>8</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>76</b>	<b>76</b>	<b>38</b>	<b>6</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>44</b>	<b>44</b>

## ABACUS TRANSPORTATION SURVEYS

### GREYSTONES TRAFFIC COUNTS MANUAL CLASSIFIED JUNCTION TURNING COUNTS

SITE: 07

DATE:

LOCATION: Eden Gate

DAY:

TIME	MOVEMENT 1					TOT	PCU	MOVEMENT 2					TOT	PCU
	CAR	LGV	OGV1	OGV2	BUS			CAR	LGV	OGV1	OGV2	BUS		
13:00	19	3	0	0	0	22	22	15	2	0	0	0	17	17
13:15	16	2	0	0	0	18	18	11	1	0	0	0	12	12
13:30	15	4	0	0	0	19	19	10	1	0	0	0	11	11
13:45	21	4	0	0	0	25	25	13	1	0	0	0	14	14
<b>H/TOT</b>	<b>71</b>	<b>13</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>84</b>	<b>84</b>	<b>49</b>	<b>5</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>54</b>	<b>54</b>
14:00	22	1	0	1	0	24	25	11	2	0	0	0	13	13
14:15	26	1	0	0	0	27	27	12	1	0	0	0	13	13
14:30	20	1	0	0	0	21	21	11	1	0	0	0	12	12
14:45	28	1	0	0	0	29	29	17	0	0	0	0	17	17
<b>H/TOT</b>	<b>96</b>	<b>4</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>101</b>	<b>102</b>	<b>51</b>	<b>4</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>55</b>	<b>55</b>
15:00	13	0	0	0	0	13	13	9	1	0	0	0	10	10
15:15	17	4	0	0	0	21	21	14	1	0	0	0	15	15
15:30	27	3	0	0	0	30	30	16	0	0	0	0	16	16
15:45	19	3	1	0	0	23	24	13	1	1	0	0	15	16
<b>H/TOT</b>	<b>76</b>	<b>10</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>87</b>	<b>88</b>	<b>52</b>	<b>3</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>56</b>	<b>57</b>
16:00	16	1	0	0	0	17	17	14	2	1	0	0	17	18
16:15	24	1	0	0	1	26	27	23	1	0	0	1	25	26
16:30	27	3	0	0	0	30	30	16	0	0	0	0	16	16
16:45	21	0	0	0	0	21	21	23	0	1	0	0	24	25
<b>H/TOT</b>	<b>88</b>	<b>5</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>94</b>	<b>95</b>	<b>76</b>	<b>3</b>	<b>2</b>	<b>0</b>	<b>1</b>	<b>82</b>	<b>84</b>
17:00	28	1	0	0	0	29	29	30	0	0	0	0	30	30
17:15	33	0	0	0	0	33	33	26	2	1	0	0	29	30
17:30	34	1	0	0	0	35	35	27	2	0	0	0	29	29
17:45	35	2	0	0	0	37	37	36	2	0	0	0	38	38
<b>H/TOT</b>	<b>130</b>	<b>4</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>134</b>	<b>134</b>	<b>119</b>	<b>6</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>126</b>	<b>127</b>
18:00	33	0	0	0	0	33	33	38	2	0	0	0	40	40
18:15	33	3	0	0	0	36	36	22	1	0	0	0	23	23
18:30	28	1	0	0	0	29	29	37	2	0	0	0	39	39
18:45	24	0	0	0	0	24	24	15	0	0	0	0	15	15
<b>H/TOT</b>	<b>118</b>	<b>4</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>122</b>	<b>122</b>	<b>112</b>	<b>5</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>117</b>	<b>117</b>
<b>P/TOT</b>	<b>1063</b>	<b>83</b>	<b>7</b>	<b>1</b>	<b>2</b>	<b>1156</b>	<b>1163</b>	<b>705</b>	<b>67</b>	<b>4</b>	<b>1</b>	<b>1</b>	<b>778</b>	<b>782</b>



## ABACUS TRANSPORTATION SURVEYS

### APRIL 2016 GREYSTONES TRAFFIC COUNTS ATH/16/036 MANUAL CLASSIFIED JUNCTION TURNING COUNTS

28th April 2016 SITE: 07

DATE:

Thursday LOCATION: Eden Gate

DAY:

TIME	MOVEMENT 3					TOT	PCU	MOVEMENT 4					TOT	PCU
	CAR	LGV	OGV1	OGV2	BUS			CAR	LGV	OGV1	OGV2	BUS		
07:00	49	9	0	0	1	59	60	144	24	3	0	1	172	175
07:15	52	11	4	0	3	70	75	136	18	2	0	0	156	157
07:30	104	15	4	0	3	126	131	117	14	6	0	2	139	144
07:45	66	25	8	1	3	103	111	128	17	2	1	3	151	156
<b>H/TOT</b>	<b>271</b>	<b>60</b>	<b>16</b>	<b>1</b>	<b>10</b>	<b>358</b>	<b>377</b>	<b>525</b>	<b>73</b>	<b>13</b>	<b>1</b>	<b>6</b>	<b>618</b>	<b>632</b>
08:00	79	12	4	1	1	97	101	139	15	6	0	1	161	165
08:15	102	18	6	1	1	128	133	126	16	5	0	3	150	156
08:30	145	12	1	0	0	158	159	131	15	3	1	1	151	155
08:45	109	15	3	0	4	131	137	135	18	2	0	1	156	158
<b>H/TOT</b>	<b>435</b>	<b>57</b>	<b>14</b>	<b>2</b>	<b>6</b>	<b>514</b>	<b>530</b>	<b>531</b>	<b>64</b>	<b>16</b>	<b>1</b>	<b>6</b>	<b>618</b>	<b>633</b>
09:00	90	9	3	0	1	103	106	116	17	3	1	0	137	140
09:15	73	8	7	0	0	88	92	121	15	1	0	1	138	140
09:30	60	13	4	0	4	81	87	100	17	3	0	0	120	122
09:45	81	9	6	1	3	100	107	105	11	6	0	1	123	127
<b>H/TOT</b>	<b>304</b>	<b>39</b>	<b>20</b>	<b>1</b>	<b>8</b>	<b>372</b>	<b>391</b>	<b>442</b>	<b>60</b>	<b>13</b>	<b>1</b>	<b>2</b>	<b>518</b>	<b>528</b>
10:00	57	12	9	0	2	80	87	70	16	6	0	0	92	95
10:15	61	9	5	0	1	76	80	67	16	4	1	0	88	91
10:30	58	7	6	1	0	72	76	64	15	4	0	0	83	85
10:45	64	13	2	2	0	81	85	62	14	4	0	1	81	84
<b>H/TOT</b>	<b>240</b>	<b>41</b>	<b>22</b>	<b>3</b>	<b>3</b>	<b>309</b>	<b>327</b>	<b>263</b>	<b>61</b>	<b>18</b>	<b>1</b>	<b>1</b>	<b>344</b>	<b>355</b>
11:00	57	16	2	1	0	76	78	73	13	4	1	1	92	96
11:15	58	14	2	1	0	75	77	68	12	5	2	1	88	94
11:30	65	13	6	0	1	85	89	81	22	8	1	0	112	117
11:45	67	12	3	0	2	84	88	77	14	1	0	0	92	93
<b>H/TOT</b>	<b>247</b>	<b>55</b>	<b>13</b>	<b>2</b>	<b>3</b>	<b>320</b>	<b>332</b>	<b>299</b>	<b>61</b>	<b>18</b>	<b>4</b>	<b>2</b>	<b>384</b>	<b>400</b>
12:00	85	15	4	2	0	106	111	71	12	4	0	4	91	97
12:15	63	9	4	0	0	76	78	82	16	4	3	0	105	111
12:30	73	18	8	1	1	101	107	86	20	7	1	2	116	123
12:45	77	11	4	1	0	93	96	89	14	2	1	0	106	108
<b>H/TOT</b>	<b>298</b>	<b>53</b>	<b>20</b>	<b>4</b>	<b>1</b>	<b>376</b>	<b>392</b>	<b>328</b>	<b>62</b>	<b>17</b>	<b>5</b>	<b>6</b>	<b>418</b>	<b>439</b>

## ABACUS TRANSPORTATION SURVEYS

### APRIL 2016 GREYSTONES TRAFFIC COUNTS ATH/16/036 MANUAL CLASSIFIED JUNCTION TURNING COUNTS

28th April 2016 SITE: 07

DATE:

Thursday LOCATION: Eden Gate

DAY:

TIME	MOVEMENT 3					TOT	PCU	MOVEMENT 4					TOT	PCU
	CAR	LGV	OGV1	OGV2	BUS			CAR	LGV	OGV1	OGV2	BUS		
13:00	75	9	10	0	0	94	99	73	15	5	2	0	95	100
13:15	67	7	5	1	0	80	84	61	13	7	1	2	84	91
13:30	98	14	6	0	1	119	123	103	11	1	0	0	115	116
13:45	79	15	3	0	1	98	101	64	21	4	1	0	90	93
<b>H/TOT</b>	<b>319</b>	<b>45</b>	<b>24</b>	<b>1</b>	<b>2</b>	<b>391</b>	<b>406</b>	<b>301</b>	<b>60</b>	<b>17</b>	<b>4</b>	<b>2</b>	<b>384</b>	<b>400</b>
14:00	81	13	1	0	1	96	98	77	15	4	1	1	98	102
14:15	86	16	1	0	0	103	104	98	9	3	0	2	112	116
14:30	95	12	1	0	0	108	109	86	19	6	1	0	112	116
14:45	95	12	4	1	2	114	119	94	10	5	2	1	112	118
<b>H/TOT</b>	<b>357</b>	<b>53</b>	<b>7</b>	<b>1</b>	<b>3</b>	<b>421</b>	<b>429</b>	<b>355</b>	<b>53</b>	<b>18</b>	<b>4</b>	<b>4</b>	<b>434</b>	<b>452</b>
15:00	76	8	3	1	0	88	91	92	14	9	0	2	117	124
15:15	92	11	4	0	1	108	111	85	25	7	0	1	118	123
15:30	114	14	7	3	1	139	147	91	12	3	1	0	107	110
15:45	88	17	3	1	1	110	114	94	20	8	0	4	126	134
<b>H/TOT</b>	<b>370</b>	<b>50</b>	<b>17</b>	<b>5</b>	<b>3</b>	<b>445</b>	<b>463</b>	<b>362</b>	<b>71</b>	<b>27</b>	<b>1</b>	<b>7</b>	<b>468</b>	<b>490</b>
16:00	99	10	1	0	1	111	113	86	28	8	1	2	125	132
16:15	99	10	6	0	4	119	126	86	28	2	1	1	118	121
16:30	101	23	2	0	2	128	131	100	27	4	2	3	136	144
16:45	117	10	2	0	1	130	132	113	25	2	0	1	141	143
<b>H/TOT</b>	<b>416</b>	<b>53</b>	<b>11</b>	<b>0</b>	<b>8</b>	<b>488</b>	<b>502</b>	<b>385</b>	<b>108</b>	<b>16</b>	<b>4</b>	<b>7</b>	<b>520</b>	<b>540</b>
17:00	83	14	2	0	0	99	100	138	32	2	1	2	175	179
17:15	118	10	0	0	0	128	128	141	22	2	1	1	167	170
17:30	149	13	2	0	1	165	167	127	21	2	0	3	153	157
17:45	262	34	9	1	4	310	320	122	16	0	0	0	138	138
<b>H/TOT</b>	<b>612</b>	<b>71</b>	<b>13</b>	<b>1</b>	<b>5</b>	<b>702</b>	<b>715</b>	<b>528</b>	<b>91</b>	<b>6</b>	<b>2</b>	<b>6</b>	<b>633</b>	<b>645</b>
18:00	142	15	5	1	0	163	167	113	19	0	0	1	133	134
18:15	146	19	1	2	0	168	171	119	24	2	0	0	145	146
18:30	135	19	2	0	0	156	157	106	19	3	0	3	131	136
18:45	116	13	2	0	1	132	134	77	15	0	1	0	93	94
<b>H/TOT</b>	<b>539</b>	<b>66</b>	<b>10</b>	<b>3</b>	<b>1</b>	<b>619</b>	<b>629</b>	<b>415</b>	<b>77</b>	<b>5</b>	<b>1</b>	<b>4</b>	<b>502</b>	<b>510</b>
<b>P/TOT</b>	<b>4408</b>	<b>643</b>	<b>187</b>	<b>24</b>	<b>53</b>	<b>5315</b>	<b>5493</b>	<b>4734</b>	<b>841</b>	<b>184</b>	<b>29</b>	<b>53</b>	<b>5841</b>	<b>6024</b>

**ABACUS TRANSPORTATION SURVEYS**

**GREYSTONES TRAFFIC COUNTS  
MANUAL CLASSIFIED JUNCTION TURNING COUNTS**

**APRIL 2016  
ATH/16/036**

SITE: 08

DATE: 28th April 2016

LOCATION: R774/Tony Doyle Coaches

DAY: Thursday

TIME	MOVEMENT 1					TOT	PCU	MOVEMENT 2					TOT	PCU	MOVEMENT 3					TOT	PCU			
	CAR	LGV	OGV1	OGV2	BUS			CAR	LGV	OGV1	OGV2	BUS			CAR	LGV	OGV1	OGV2	BUS					
07:00	1	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	2	2	0	0
07:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	2	2	0	0
07:45	1	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>H/TOT</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>2</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>4</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>4</b>	<b>4</b>	<b>0</b>	<b>0</b>
08:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>H/TOT</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
09:00	1	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
09:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	1	0	0
09:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	1	0	0	
09:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>H/TOT</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>2</b>	<b>2</b>	<b>0</b>	<b>0</b>	
10:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	1	0	0	0
10:15	1	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	1	0	0	0
<b>H/TOT</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>2</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>0</b>	
11:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	1	0	0	0
11:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	2	0	0	0
11:45	1	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>H/TOT</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>2</b>	<b>3</b>	<b>0</b>	<b>0</b>	<b>0</b>	
12:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	1	0	0	0
12:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>H/TOT</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	

## ABACUS TRANSPORTATION SURVEYS

**GREYSTONES TRAFFIC COUNTS  
MANUAL CLASSIFIED JUNCTION TURNING COUNTS**

**APRIL 2016  
ATH/16/036**

SITE: 08

DATE: 28th April 2016

LOCATION: R774/Tony Doyle Coaches

DAY: Thursday

TIME	MOVEMENT 1						MOVEMENT 2						MOVEMENT 3								
	CAR	LGV	OGV1	OGV2	BUS	TOT	PCU	CAR	LGV	OGV1	OGV2	BUS	TOT	PCU	CAR	LGV	OGV1	OGV2	BUS	TOT	PCU
13:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13:45	1	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>H/TOT</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
14:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>H/TOT</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
15:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	1
15:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>H/TOT</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>1</b>
16:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16:45	1	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>H/TOT</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
17:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>H/TOT</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
18:00	1	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>H/TOT</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
<b>P/TOT</b>	<b>8</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>8</b>	<b>8</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>10</b>	<b>1</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>12</b>	<b>13</b>

**ABACUS TRANSPORTATION SURVEYS**

**GREYSTONES TRAFFIC COUNTS  
MANUAL CLASSIFIED JUNCTION TURNING COUNTS**

**APRIL 2016  
ATH/16/036**

SITE: 08

DATE: 28th April 2016

LOCATION: R774/Tony Doyle Coaches

DAY: Thursday

TIME	MOVEMENT 4						MOVEMENT 5						MOVEMENT 6						MOVEMENT 6a										
	CAR	LGV	OGV1	OGV2	BUS	TOT	PCU	CAR	LGV	OGV1	OGV2	BUS	TOT	PCU	CAR	LGV	OGV1	OGV2	BUS	TOT	PCU	CAR	LGV	OGV1	OGV2	BUS	TOT	PCU	
07:00	2	0	0	0	0	2	2	50	10	0	0	1	61	62	3	1	1	0	0	0	5	6	0	1	0	1	0	2	3
07:15	0	0	0	0	0	0	0	57	13	4	0	3	77	82	2	2	1	0	0	0	5	6	2	1	0	0	0	3	3
07:30	1	0	0	0	0	1	1	111	15	4	0	2	132	136	4	0	0	0	0	4	4	6	2	1	0	0	9	10	
07:45	0	0	0	0	0	0	0	75	27	8	1	1	112	118	0	0	0	0	0	0	0	0	7	3	1	0	0	11	12
<b>H/TOT</b>	<b>3</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>3</b>	<b>3</b>	<b>293</b>	<b>65</b>	<b>16</b>	<b>1</b>	<b>7</b>	<b>382</b>	<b>398</b>	<b>9</b>	<b>3</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>14</b>	<b>15</b>	<b>15</b>	<b>7</b>	<b>2</b>	<b>1</b>	<b>0</b>	<b>25</b>	<b>27</b>	
08:00	0	0	0	0	0	0	0	85	15	4	1	1	106	110	0	1	0	0	0	1	1	3	0	0	0	0	3	3	
08:15	0	0	0	0	0	0	0	109	19	6	1	1	136	141	0	0	0	0	0	0	0	0	13	0	0	0	0	13	13
08:30	0	0	0	0	0	0	0	150	15	1	1	0	167	169	0	0	1	0	1	2	4	8	3	0	0	0	11	11	
08:45	0	0	0	0	0	0	0	124	17	3	0	4	148	154	1	0	0	0	1	2	3	16	3	0	0	0	19	19	
<b>H/TOT</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>468</b>	<b>66</b>	<b>14</b>	<b>3</b>	<b>6</b>	<b>557</b>	<b>574</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>0</b>	<b>2</b>	<b>5</b>	<b>8</b>	<b>40</b>	<b>6</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>46</b>	<b>46</b>	
09:00	0	0	0	0	0	0	0	100	9	3	0	1	113	116	2	0	0	0	0	2	2	8	1	1	0	1	11	13	
09:15	1	0	0	0	0	1	1	83	9	7	0	0	99	103	0	0	0	0	0	0	0	12	3	1	0	0	16	17	
09:30	0	0	0	0	0	0	0	71	14	4	0	4	93	99	0	1	0	0	3	4	7	9	3	3	1	0	16	19	
09:45	0	0	0	0	0	0	0	84	10	6	1	3	104	111	1	1	0	1	1	4	6	8	0	1	0	0	9	10	
<b>H/TOT</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>1</b>	<b>338</b>	<b>42</b>	<b>20</b>	<b>1</b>	<b>8</b>	<b>409</b>	<b>428</b>	<b>3</b>	<b>2</b>	<b>0</b>	<b>1</b>	<b>4</b>	<b>10</b>	<b>15</b>	<b>37</b>	<b>7</b>	<b>6</b>	<b>1</b>	<b>1</b>	<b>52</b>	<b>57</b>	
10:00	2	0	0	0	0	2	2	58	13	9	0	2	82	89	1	0	0	0	1	2	3	13	1	0	0	0	14	14	
10:15	0	0	0	0	0	0	0	65	10	5	0	1	81	85	2	0	0	1	0	3	4	7	3	3	1	0	14	17	
10:30	0	0	0	0	0	0	0	62	7	6	1	0	76	80	2	1	0	0	1	4	5	8	2	1	0	0	11	12	
10:45	0	0	0	0	0	0	0	70	15	2	2	0	89	93	1	0	0	1	0	2	3	7	3	1	0	0	11	12	
<b>H/TOT</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>2</b>	<b>2</b>	<b>255</b>	<b>45</b>	<b>22</b>	<b>3</b>	<b>3</b>	<b>328</b>	<b>346</b>	<b>6</b>	<b>1</b>	<b>0</b>	<b>2</b>	<b>2</b>	<b>11</b>	<b>16</b>	<b>35</b>	<b>9</b>	<b>5</b>	<b>1</b>	<b>0</b>	<b>50</b>	<b>54</b>	
11:00	0	0	0	0	0	0	0	60	16	2	1	0	79	81	1	0	0	0	0	1	1	6	4	0	0	0	10	10	
11:15	1	0	0	0	0	1	1	59	15	1	1	0	76	78	1	0	0	0	0	1	1	5	3	0	0	0	8	8	
11:30	0	0	0	0	0	0	0	67	14	6	0	0	87	90	1	0	0	0	0	1	1	12	1	0	0	0	13	13	
11:45	0	0	0	0	0	0	0	74	13	3	0	2	92	96	0	0	2	0	0	2	3	4	4	2	0	0	10	11	
<b>H/TOT</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>1</b>	<b>260</b>	<b>58</b>	<b>12</b>	<b>2</b>	<b>2</b>	<b>334</b>	<b>345</b>	<b>3</b>	<b>0</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>5</b>	<b>6</b>	<b>27</b>	<b>12</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>41</b>	<b>42</b>	
12:00	0	0	0	0	0	0	0	91	17	4	2	0	114	119	2	1	0	1	0	4	5	8	3	1	0	0	12	13	
12:15	1	0	0	0	0	1	1	67	9	4	0	0	80	82	0	1	0	1	0	2	3	10	0	3	0	0	13	15	
12:30	0	0	0	0	0	0	0	76	17	8	1	1	103	109	0	0	0	0	0	0	0	9	3	0	0	0	12	12	
12:45	0	0	0	0	0	0	0	81	12	4	1	0	98	101	0	0	0	1	0	1	2	11	0	1	0	0	12	13	
<b>H/TOT</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>1</b>	<b>315</b>	<b>55</b>	<b>20</b>	<b>4</b>	<b>1</b>	<b>395</b>	<b>411</b>	<b>2</b>	<b>2</b>	<b>0</b>	<b>3</b>	<b>0</b>	<b>7</b>	<b>11</b>	<b>38</b>	<b>6</b>	<b>5</b>	<b>0</b>	<b>0</b>	<b>49</b>	<b>52</b>	

**ABACUS TRANSPORTATION SURVEYS**

**GREYSTONES TRAFFIC COUNTS  
MANUAL CLASSIFIED JUNCTION TURNING COUNTS**

**APRIL 2016  
ATH/16/036**

SITE: 08

DATE: 28th April 2016

LOCATION: R774/Tony Doyle Coaches

DAY: Thursday

TIME	MOVEMENT 4						MOVEMENT 5						MOVEMENT 6						MOVEMENT 6a										
	CAR	LGV	OGV1	OGV2	BUS	TOT	PCU	CAR	LGV	OGV1	OGV2	BUS	TOT	PCU	CAR	LGV	OGV1	OGV2	BUS	TOT	PCU	CAR	LGV	OGV1	OGV2	BUS	TOT	PCU	
13:00	0	0	0	0	0	0	0	84	9	10	0	0	103	108	1	0	0	0	0	1	1	9	4	0	0	0	13	13	
13:15	0	0	0	0	0	0	0	77	7	5	1	0	90	94	0	0	0	0	0	0	0	0	15	1	1	0	0	17	18
13:30	0	0	0	0	0	0	0	101	15	6	0	0	122	125	0	0	1	0	0	1	2	13	2	0	0	0	15	15	
13:45	0	0	0	0	0	0	0	81	16	3	0	1	101	104	3	0	0	0	0	3	3	13	2	0	0	0	15	15	
<b>H/TOT</b>	0	0	0	0	0	0	0	343	47	24	1	1	416	430	4	0	1	0	0	5	6	50	9	1	0	0	60	61	
14:00	0	0	0	0	0	0	0	86	13	1	0	1	101	103	0	1	0	0	0	1	1	23	2	0	0	0	25	25	
14:15	0	0	0	0	0	0	0	96	17	1	0	0	114	115	2	0	1	1	0	4	6	4	2	1	0	0	7	8	
14:30	0	0	0	0	0	0	0	100	13	1	0	0	114	115	2	0	0	0	0	2	2	11	4	2	0	0	17	18	
14:45	0	0	0	0	0	0	0	108	10	4	1	2	125	130	0	0	0	0	0	0	0	9	2	0	0	0	11	11	
<b>H/TOT</b>	0	0	0	0	0	0	0	390	53	7	1	3	454	462	4	1	1	1	0	7	9	47	10	3	0	0	60	62	
15:00	0	0	0	0	0	0	0	81	9	3	1	0	94	97	0	0	0	0	0	0	0	7	3	1	0	0	11	12	
15:15	0	0	0	0	0	0	0	100	12	4	0	1	117	120	1	1	0	0	1	3	4	16	2	0	1	2	21	24	
15:30	0	0	0	0	0	0	0	126	14	7	3	1	151	159	0	0	0	0	1	1	2	11	3	0	0	0	14	14	
15:45	0	0	0	0	0	0	0	94	18	4	0	1	117	120	2	0	0	1	0	3	4	10	3	3	0	0	16	18	
<b>H/TOT</b>	0	0	0	0	0	0	0	401	53	18	4	3	479	496	3	1	0	1	2	7	10	44	11	4	1	2	62	67	
16:00	0	0	0	0	0	0	0	109	12	2	0	1	124	126	1	0	0	0	1	2	3	18	4	2	0	1	25	27	
16:15	0	0	0	0	0	0	0	115	11	6	0	5	137	145	1	0	0	0	0	1	1	6	2	1	1	0	10	12	
16:30	0	0	0	0	0	0	0	111	23	2	0	2	138	141	0	1	0	0	0	1	1	15	4	1	0	0	20	21	
16:45	0	0	0	0	0	0	0	129	10	3	0	1	143	146	0	1	0	1	1	3	5	8	3	2	0	0	13	14	
<b>H/TOT</b>	0	0	0	0	0	0	0	464	56	13	0	9	542	558	2	2	0	1	2	7	10	47	13	6	1	1	68	73	
17:00	1	0	0	0	0	1	1	101	13	2	0	0	116	117	1	4	0	1	2	8	11	11	4	3	0	0	18	20	
17:15	0	0	0	0	0	0	0	136	12	1	0	0	149	150	1	0	0	0	2	3	5	18	1	1	0	0	20	21	
17:30	0	0	0	0	0	0	0	167	14	2	0	0	183	184	2	0	0	0	1	3	4	12	4	1	0	0	17	18	
17:45	0	0	0	0	0	0	0	291	35	9	1	4	340	350	1	0	0	0	1	2	3	18	1	1	0	0	20	21	
<b>H/TOT</b>	1	0	0	0	0	1	1	695	74	14	1	4	788	800	5	4	0	1	6	16	23	59	10	6	0	0	75	78	
18:00	0	0	0	0	0	0	0	172	17	5	1	0	195	199	0	1	0	1	0	2	3	16	1	1	0	0	18	19	
18:15	0	0	0	0	0	0	0	161	19	1	2	0	183	186	0	1	0	0	0	1	1	17	0	1	0	0	18	19	
18:30	0	0	0	0	0	0	0	156	20	2	0	0	178	179	1	0	0	0	0	1	1	9	0	0	0	0	9	9	
18:45	0	0	0	0	0	0	0	126	13	2	0	1	142	144	5	0	0	0	1	6	7	10	2	1	0	0	13	14	
<b>H/TOT</b>	0	0	0	0	0	0	0	615	69	10	3	1	698	708	6	2	0	1	1	10	12	52	3	3	0	0	58	60	
<b>P/TOT</b>	9	0	0	0	0	9	9	4837	683	190	24	48	5782	5956	48	19	7	11	19	104	141	491	103	43	5	4	646	678	

## ABACUS TRANSPORTATION SURVEYS

**GREYSTONES TRAFFIC COUNTS  
MANUAL CLASSIFIED JUNCTION TURNING COUNTS**

**APRIL 2016  
ATH/16/036**

SITE: 08

DATE: 28th April 2016

LOCATION: R774/Tony Doyle Coaches

DAY: Thursday

TIME	MOVEMENT 7						MOVEMENT 8						MOVEMENT 9								
	CAR	LGV	OGV1	OGV2	BUS	TOT	PCU	CAR	LGV	OGV1	OGV2	BUS	TOT	PCU	CAR	LGV	OGV1	OGV2	BUS	TOT	PCU
07:00	0	0	3	0	6	9	17	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:15	0	0	0	0	3	3	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:30	3	0	0	0	4	7	11	0	0	0	0	0	0	0	1	0	0	0	1	2	3
07:45	0	1	0	0	1	2	3	0	0	0	0	0	0	0	0	0	0	0	1	1	2
<b>H/TOT</b>	<b>3</b>	<b>1</b>	<b>3</b>	<b>0</b>	<b>14</b>	<b>21</b>	<b>37</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>2</b>	<b>3</b>	<b>5</b>
08:00	1	1	0	0	0	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:15	0	0	0	0	1	1	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:45	0	2	0	0	0	2	2	0	0	0	0	0	0	0	0	2	0	0	0	2	2
<b>H/TOT</b>	<b>1</b>	<b>3</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>5</b>	<b>6</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>2</b>	<b>2</b>
09:00	2	0	0	0	0	2	2	0	0	0	0	0	0	0	1	0	0	0	0	1	1
09:15	0	3	0	0	0	3	3	1	0	0	0	0	1	1	0	0	0	0	0	0	0
09:30	2	1	0	0	0	3	3	0	0	0	0	0	0	0	0	1	0	0	0	1	1
09:45	1	1	0	0	0	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>H/TOT</b>	<b>5</b>	<b>5</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>10</b>	<b>10</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>2</b>	<b>2</b>
10:00	1	0	0	0	0	1	1	0	0	0	0	0	0	0	1	0	0	0	0	1	1
10:15	0	0	1	0	1	2	4	0	0	0	0	0	0	0	1	0	0	0	0	1	1
10:30	1	1	0	0	0	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:45	1	0	0	1	0	2	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>H/TOT</b>	<b>3</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>7</b>	<b>10</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>2</b>	<b>2</b>
11:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	1
11:30	3	0	0	1	3	7	11	0	0	0	0	0	0	0	0	0	0	0	1	1	2
11:45	0	0	1	0	0	1	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>H/TOT</b>	<b>3</b>	<b>0</b>	<b>1</b>	<b>1</b>	<b>3</b>	<b>8</b>	<b>13</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>2</b>	<b>3</b>
12:00	1	1	1	0	0	3	4	0	0	0	0	0	0	0	1	0	0	0	0	1	1
12:15	0	2	0	1	0	3	4	0	0	0	0	0	0	0	0	1	0	0	0	1	1
12:30	1	0	1	0	0	2	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:45	0	1	0	0	0	1	1	0	0	0	0	0	0	0	0	1	0	0	0	1	1
<b>H/TOT</b>	<b>2</b>	<b>4</b>	<b>2</b>	<b>1</b>	<b>0</b>	<b>9</b>	<b>11</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>3</b>	<b>3</b>

## ABACUS TRANSPORTATION SURVEYS

**GREYSTONES TRAFFIC COUNTS**  
**MANUAL CLASSIFIED JUNCTION TURNING COUNTS**

**APRIL 2016**  
**ATH/16/036**

SITE: 08

DATE: 28th April 2016

LOCATION: R774/Tony Doyle Coaches

DAY: Thursday

TIME	MOVEMENT 7						MOVEMENT 8						MOVEMENT 9								
	CAR	LGV	OGV1	OGV2	BUS	TOT	PCU	CAR	LGV	OGV1	OGV2	BUS	TOT	PCU	CAR	LGV	OGV1	OGV2	BUS	TOT	PCU
13:00	0	0	0	1	0	1	2	0	0	0	0	0	0	0	1	1	0	0	0	2	2
13:15	1	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	2
13:45	1	0	0	0	1	2	3	0	0	0	0	0	0	0	3	0	0	0	0	3	3
<b>H/TOT</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>1</b>	<b>4</b>	<b>6</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>4</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>6</b>	<b>7</b>
14:00	1	1	1	0	1	4	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14:15	2	0	0	0	1	3	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14:30	1	0	1	0	0	2	3	0	0	0	0	0	0	0	1	0	0	0	0	1	1
14:45	2	0	0	0	0	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>H/TOT</b>	<b>6</b>	<b>1</b>	<b>2</b>	<b>0</b>	<b>2</b>	<b>11</b>	<b>14</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>1</b>
15:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15:15	1	0	0	1	0	2	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15:30	1	1	0	0	0	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15:45	2	0	0	0	0	2	2	0	0	0	0	0	0	0	1	0	0	1	0	2	3
<b>H/TOT</b>	<b>4</b>	<b>1</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>6</b>	<b>7</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>2</b>	<b>3</b>
16:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	1
16:15	1	0	1	0	0	2	3	0	0	0	0	0	0	0	1	0	0	0	0	1	1
16:30	3	1	0	0	0	4	4	0	0	0	0	0	0	0	1	0	0	0	0	1	1
16:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	1
<b>H/TOT</b>	<b>4</b>	<b>1</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>6</b>	<b>7</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>4</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>4</b>	<b>4</b>
17:00	2	0	1	0	0	3	4	0	0	0	0	0	0	0	1	1	0	0	0	2	2
17:15	2	1	0	0	1	4	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17:30	2	2	0	0	0	4	4	0	0	0	0	0	0	0	1	1	0	0	0	2	2
17:45	4	0	0	1	0	5	6	0	0	0	0	0	0	0	1	1	0	0	0	2	2
<b>H/TOT</b>	<b>10</b>	<b>3</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>16</b>	<b>19</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>3</b>	<b>3</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>6</b>	<b>6</b>
18:00	2	0	0	0	0	2	2	0	0	0	0	0	0	0	1	0	0	0	0	1	1
18:15	1	0	0	0	0	1	1	0	0	0	0	0	0	0	1	0	0	0	0	1	1
18:30	4	0	0	0	1	5	6	0	0	0	0	0	0	0	0	1	0	0	0	1	1
18:45	5	1	0	1	0	7	8	0	0	0	0	0	0	0	1	0	0	0	0	1	1
<b>H/TOT</b>	<b>12</b>	<b>1</b>	<b>0</b>	<b>1</b>	<b>1</b>	<b>15</b>	<b>17</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>3</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>4</b>	<b>4</b>
<b>P/TOT</b>	<b>55</b>	<b>21</b>	<b>11</b>	<b>7</b>	<b>24</b>	<b>118</b>	<b>157</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>1</b>	<b>21</b>	<b>11</b>	<b>0</b>	<b>1</b>	<b>4</b>	<b>37</b>	<b>42</b>



**ABACUS TRANSPORTATION SURVEYS**

**GREYSTONES TRAFFIC COUNTS  
MANUAL CLASSIFIED JUNCTION TURNING COUNTS**

**APRIL 2016  
ATH/16/036**

SITE: 08

DATE: 28th April 2016

LOCATION: R774/Tony Doyle Coaches

DAY: Thursday

TIME	MOVEMENT 10						MOVEMENT 11						MOVEMENT 12						MOVEMENT 12a										
	CAR	LGV	OGV1	OGV2	BUS	TOT	PCU	CAR	LGV	OGV1	OGV2	BUS	TOT	PCU	CAR	LGV	OGV1	OGV2	BUS	TOT	PCU	CAR	LGV	OGV1	OGV2	BUS	TOT	PCU	
07:00	1	1	1	0	0	3	4	140	23	2	0	1	166	168	1	0	0	0	0	1	1	2	0	0	0	0	2	2	
07:15	0	0	0	0	0	0	0	135	18	2	0	0	155	156	1	0	0	0	0	0	1	1	0	0	0	0	0	0	
07:30	1	0	0	0	1	2	3	110	14	6	0	1	131	135	0	0	0	0	0	0	0	0	6	0	0	0	0	6	6
07:45	1	0	0	0	0	1	1	123	17	2	1	2	145	149	0	0	0	0	0	0	0	0	4	0	0	0	1	5	6
<b>H/TOT</b>	<b>3</b>	<b>1</b>	<b>1</b>	<b>0</b>	<b>1</b>	<b>6</b>	<b>8</b>	<b>508</b>	<b>72</b>	<b>12</b>	<b>1</b>	<b>4</b>	<b>597</b>	<b>608</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>2</b>	<b>2</b>	<b>12</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>13</b>	<b>14</b>	
08:00	0	0	0	0	0	0	0	130	14	6	0	1	151	155	0	0	0	0	0	0	0	0	9	1	0	0	0	10	10
08:15	0	0	0	0	0	0	0	122	15	5	0	3	145	151	0	0	0	0	0	0	0	0	4	1	0	0	0	5	5
08:30	0	0	0	0	0	0	0	121	15	3	1	1	141	145	1	0	0	0	0	0	1	1	9	0	0	0	0	9	9
08:45	0	1	0	0	0	1	1	130	17	2	0	1	150	152	0	0	0	0	0	0	0	0	5	0	0	0	0	5	5
<b>H/TOT</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>1</b>	<b>503</b>	<b>61</b>	<b>16</b>	<b>1</b>	<b>6</b>	<b>587</b>	<b>602</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>1</b>	<b>27</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>29</b>	<b>29</b>	
09:00	2	0	0	0	0	2	2	110	15	3	1	0	129	132	0	0	0	0	0	0	0	0	4	2	0	0	0	6	6
09:15	0	0	0	0	1	1	2	119	15	1	0	0	135	136	0	0	0	0	0	0	0	0	2	0	0	0	0	2	2
09:30	0	0	0	0	0	0	0	96	16	3	0	0	115	117	0	0	0	0	0	0	0	0	4	1	0	0	0	5	5
09:45	0	0	0	0	0	0	0	100	11	6	0	1	118	122	0	0	0	0	0	0	0	0	5	0	0	0	0	5	5
<b>H/TOT</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>3</b>	<b>4</b>	<b>425</b>	<b>57</b>	<b>13</b>	<b>1</b>	<b>1</b>	<b>497</b>	<b>506</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>15</b>	<b>3</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>18</b>	<b>18</b>	
10:00	1	0	0	0	0	1	1	66	16	6	0	0	88	91	0	0	0	0	0	0	0	0	3	0	0	0	0	3	3
10:15	0	0	0	0	0	0	0	63	16	4	1	0	84	87	0	0	0	0	0	0	0	0	4	0	0	0	0	4	4
10:30	0	0	0	0	0	0	0	60	15	4	0	0	79	81	0	0	0	0	0	0	0	0	4	0	0	0	0	4	4
10:45	0	0	0	0	0	0	0	62	12	3	0	1	78	81	0	1	1	0	0	0	2	3	0	1	0	0	0	1	1
<b>H/TOT</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>1</b>	<b>251</b>	<b>59</b>	<b>17</b>	<b>1</b>	<b>1</b>	<b>329</b>	<b>340</b>	<b>0</b>	<b>1</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>2</b>	<b>3</b>	<b>11</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>12</b>	<b>12</b>	
11:00	0	0	0	0	0	0	0	69	13	4	1	1	88	92	0	0	0	0	0	0	0	0	4	0	0	0	0	4	4
11:15	0	0	0	0	0	0	0	64	11	4	2	1	82	88	0	0	0	0	0	0	0	0	4	1	1	0	0	6	7
11:30	0	1	0	1	0	2	3	78	21	8	0	0	107	111	0	0	0	0	0	0	0	0	3	0	0	0	0	3	3
11:45	0	0	0	0	0	0	0	71	14	1	0	0	86	87	0	0	0	0	0	0	0	0	6	0	0	0	0	6	6
<b>H/TOT</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>2</b>	<b>3</b>	<b>282</b>	<b>59</b>	<b>17</b>	<b>3</b>	<b>2</b>	<b>363</b>	<b>377</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>17</b>	<b>1</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>19</b>	<b>20</b>	
12:00	2	0	0	0	0	2	2	61	12	4	0	4	81	87	0	0	0	0	0	0	0	0	8	0	0	0	0	8	8
12:15	0	1	0	0	0	1	1	79	15	4	3	0	101	107	0	0	0	0	0	0	0	0	3	0	0	0	0	3	3
12:30	0	0	0	0	0	0	0	84	18	7	1	2	112	119	0	0	0	0	0	0	0	0	2	2	0	0	0	4	4
12:45	0	0	0	0	0	0	0	82	14	2	1	0	99	101	0	0	0	0	0	0	0	0	7	0	0	0	0	7	7
<b>H/TOT</b>	<b>2</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>3</b>	<b>3</b>	<b>306</b>	<b>59</b>	<b>17</b>	<b>5</b>	<b>6</b>	<b>393</b>	<b>414</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>20</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>22</b>	<b>22</b>	

**ABACUS TRANSPORTATION SURVEYS**

**GREYSTONES TRAFFIC COUNTS  
MANUAL CLASSIFIED JUNCTION TURNING COUNTS**

**APRIL 2016  
ATH/16/036**

SITE: 08

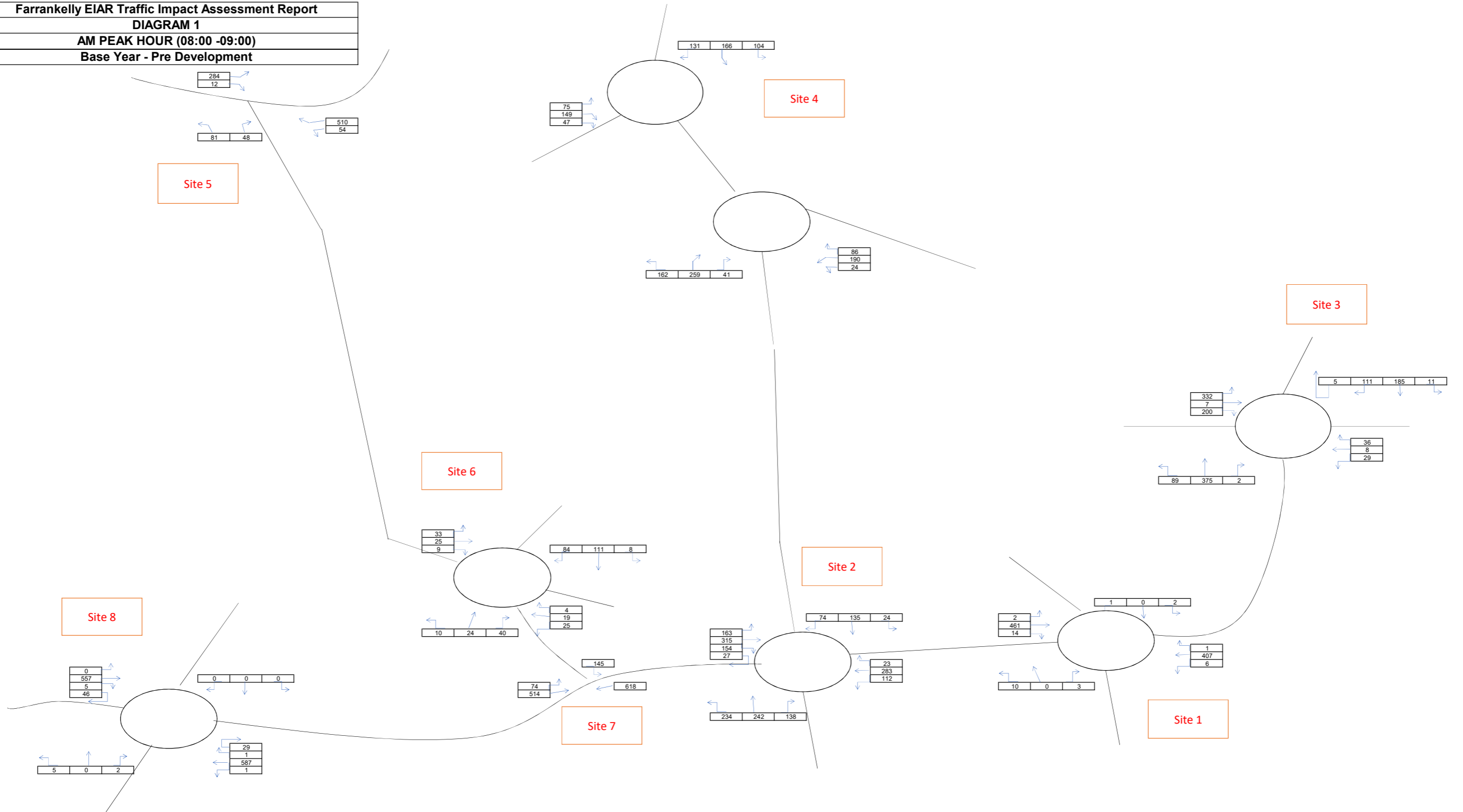
DATE: 28th April 2016

LOCATION: R774/Tony Doyle Coaches

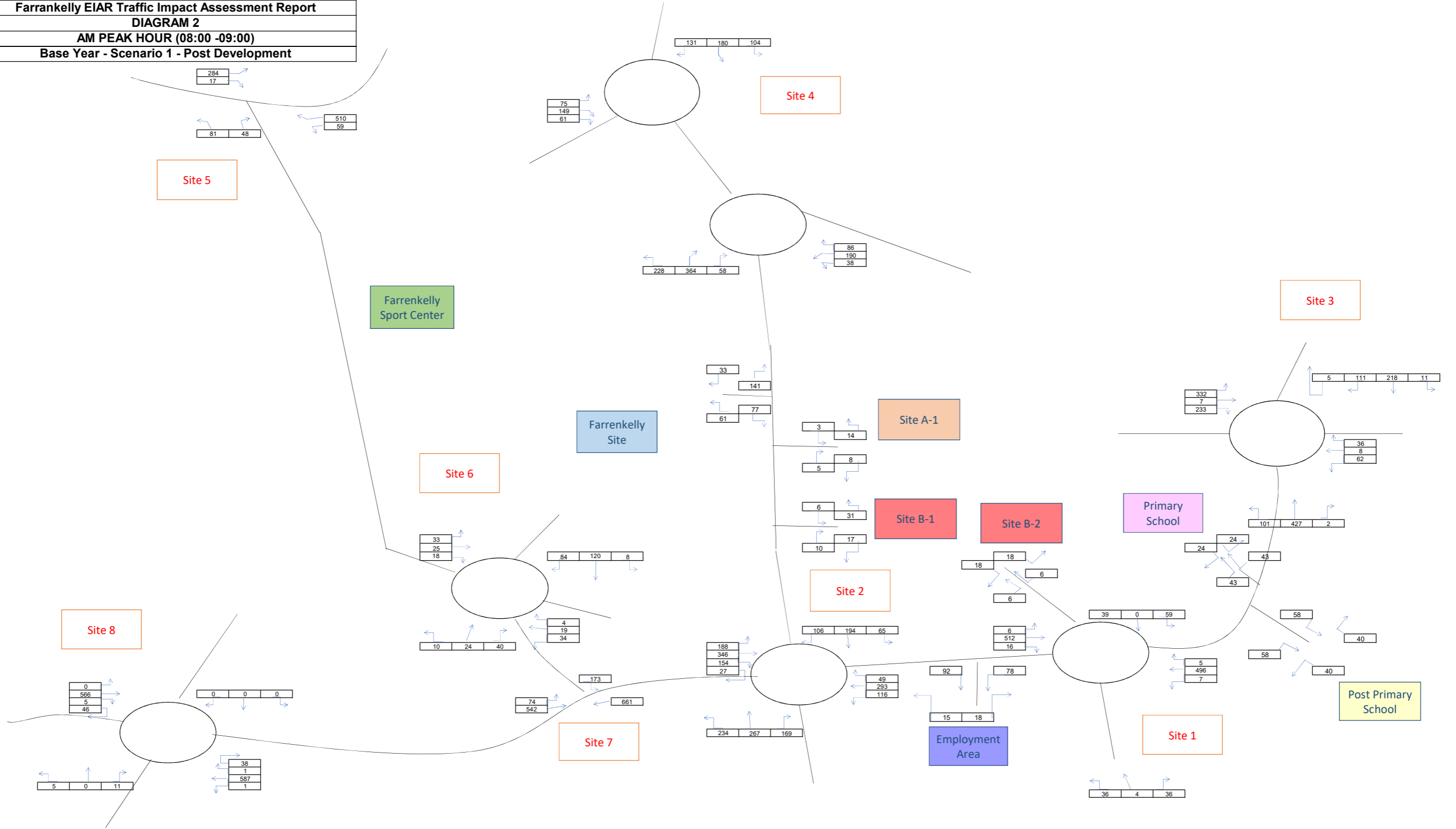
DAY: Thursday

TIME	MOVEMENT 10						MOVEMENT 11						MOVEMENT 12						MOVEMENT 12a									
	CAR	LGV	OGV1	OGV2	BUS	TOT	PCU	CAR	LGV	OGV1	OGV2	BUS	TOT	PCU	CAR	LGV	OGV1	OGV2	BUS	TOT	PCU	CAR	LGV	OGV1	OGV2	BUS	TOT	PCU
13:00	2	1	0	0	0	3	3	66	13	5	2	0	86	91	0	0	0	0	0	0	0	5	1	0	0	0	6	6
13:15	2	0	0	0	0	2	2	58	12	7	1	2	80	87	0	0	0	0	0	0	0	1	1	0	0	0	2	2
13:30	1	0	0	0	0	1	1	95	11	1	0	0	107	108	0	0	0	0	0	0	0	7	0	0	0	0	7	7
13:45	0	1	0	0	0	1	1	57	20	4	1	0	82	85	0	0	0	0	0	0	0	7	0	0	0	0	7	7
<b>H/TOT</b>	<b>5</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>7</b>	<b>7</b>	<b>276</b>	<b>56</b>	<b>17</b>	<b>4</b>	<b>2</b>	<b>355</b>	<b>371</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>20</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>22</b>	<b>22</b>
14:00	0	0	0	0	0	0	0	71	13	4	1	1	90	94	0	0	0	0	0	0	0	6	2	0	0	0	8	8
14:15	0	0	0	0	0	0	0	96	9	3	0	2	110	114	0	0	0	0	0	0	0	2	0	0	0	0	2	2
14:30	0	0	0	0	0	0	0	81	19	6	1	0	107	111	0	0	0	0	0	0	0	5	0	0	0	0	5	5
14:45	2	0	0	0	0	2	2	88	8	5	2	1	104	110	0	0	0	0	0	0	0	4	2	0	0	0	6	6
<b>H/TOT</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>2</b>	<b>2</b>	<b>336</b>	<b>49</b>	<b>18</b>	<b>4</b>	<b>4</b>	<b>411</b>	<b>429</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>17</b>	<b>4</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>21</b>	<b>21</b>
15:00	0	0	0	0	0	0	0	88	14	9	0	2	113	120	0	0	0	0	0	0	0	4	0	0	0	0	4	4
15:15	1	0	0	0	0	1	1	78	25	7	0	1	111	116	0	0	0	0	0	0	0	6	0	0	0	0	6	6
15:30	1	1	0	1	0	3	4	86	11	3	0	0	100	102	0	0	0	0	0	0	0	4	0	0	0	0	4	4
15:45	0	0	0	0	0	0	0	88	20	8	0	4	120	128	0	0	0	0	0	0	0	6	0	0	0	0	6	6
<b>H/TOT</b>	<b>2</b>	<b>1</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>4</b>	<b>5</b>	<b>340</b>	<b>70</b>	<b>27</b>	<b>0</b>	<b>7</b>	<b>444</b>	<b>465</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>20</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>20</b>	<b>20</b>
16:00	0	0	0	0	0	0	0	83	28	8	1	2	122	129	0	0	0	0	0	0	0	3	0	0	0	0	3	3
16:15	1	0	0	0	0	1	1	79	28	2	1	1	111	114	0	0	0	0	0	0	0	6	0	0	0	0	6	6
16:30	0	0	0	0	1	1	2	95	27	4	2	2	130	137	0	0	0	0	0	0	0	5	0	0	0	0	5	5
16:45	1	1	0	0	0	2	2	102	24	2	0	1	129	131	1	0	0	0	0	0	1	9	0	0	0	0	9	9
<b>H/TOT</b>	<b>2</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>4</b>	<b>5</b>	<b>359</b>	<b>107</b>	<b>16</b>	<b>4</b>	<b>6</b>	<b>492</b>	<b>511</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>1</b>	<b>23</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>23</b>	<b>23</b>
17:00	0	0	0	0	0	0	0	127	32	2	1	2	164	168	0	0	0	0	0	0	0	11	0	0	0	0	11	11
17:15	0	1	0	0	0	1	1	133	21	2	1	1	158	161	0	0	0	0	0	0	0	8	0	0	0	0	8	8
17:30	1	0	0	0	2	3	5	118	21	2	0	0	141	142	0	0	0	0	0	0	0	8	0	0	0	1	9	10
17:45	0	0	0	0	0	0	0	116	16	0	0	0	132	132	0	0	0	0	0	0	0	6	0	0	0	0	6	6
<b>H/TOT</b>	<b>1</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>2</b>	<b>4</b>	<b>6</b>	<b>494</b>	<b>90</b>	<b>6</b>	<b>2</b>	<b>3</b>	<b>595</b>	<b>604</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>33</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>34</b>	<b>35</b>
18:00	2	0	0	0	0	2	2	105	19	0	0	1	125	126	0	0	0	0	0	0	0	6	0	0	0	0	6	6
18:15	0	0	0	0	0	0	0	113	23	2	0	0	138	139	0	0	0	0	0	0	0	6	1	0	0	0	7	7
18:30	0	0	0	0	0	0	0	90	19	3	0	3	115	120	0	0	0	0	0	0	0	16	0	0	0	0	16	16
18:45	2	0	0	0	0	2	2	71	15	0	1	0	87	88	0	0	0	0	0	0	0	4	0	0	0	0	4	4
<b>H/TOT</b>	<b>4</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>4</b>	<b>4</b>	<b>379</b>	<b>76</b>	<b>5</b>	<b>1</b>	<b>4</b>	<b>465</b>	<b>473</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>32</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>33</b>	<b>33</b>
<b>P/TOT</b>	<b>24</b>	<b>9</b>	<b>1</b>	<b>2</b>	<b>5</b>	<b>41</b>	<b>49</b>	<b>4459</b>	<b>815</b>	<b>181</b>	<b>27</b>	<b>46</b>	<b>5528</b>	<b>5700</b>	<b>4</b>	<b>1</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>6</b>	<b>7</b>	<b>247</b>	<b>16</b>	<b>1</b>	<b>0</b>	<b>2</b>	<b>266</b>	<b>269</b>

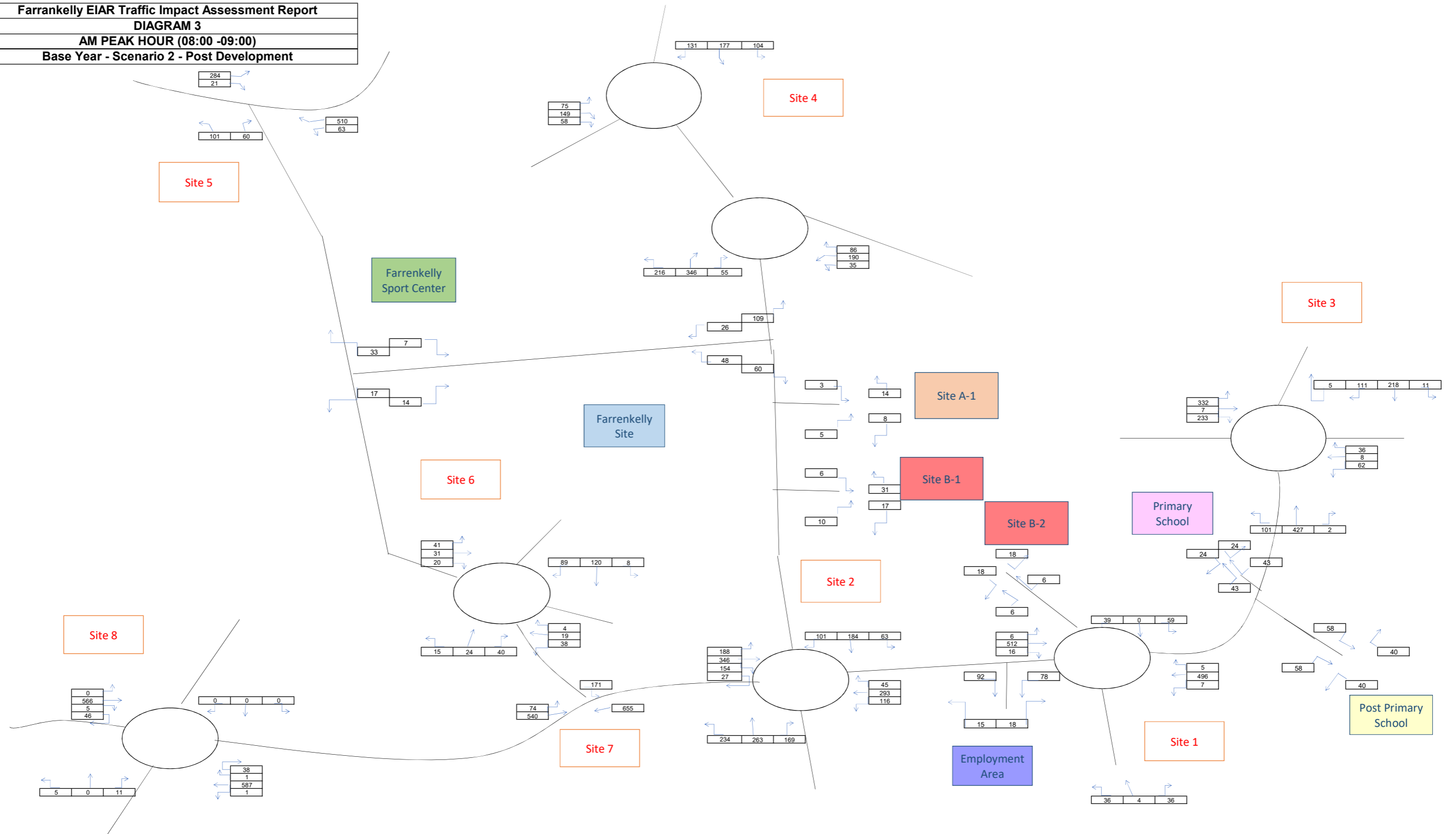
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**DIAGRAM 1**  
**AM PEAK HOUR (08:00 -09:00)**  
**Base Year - Pre Development**



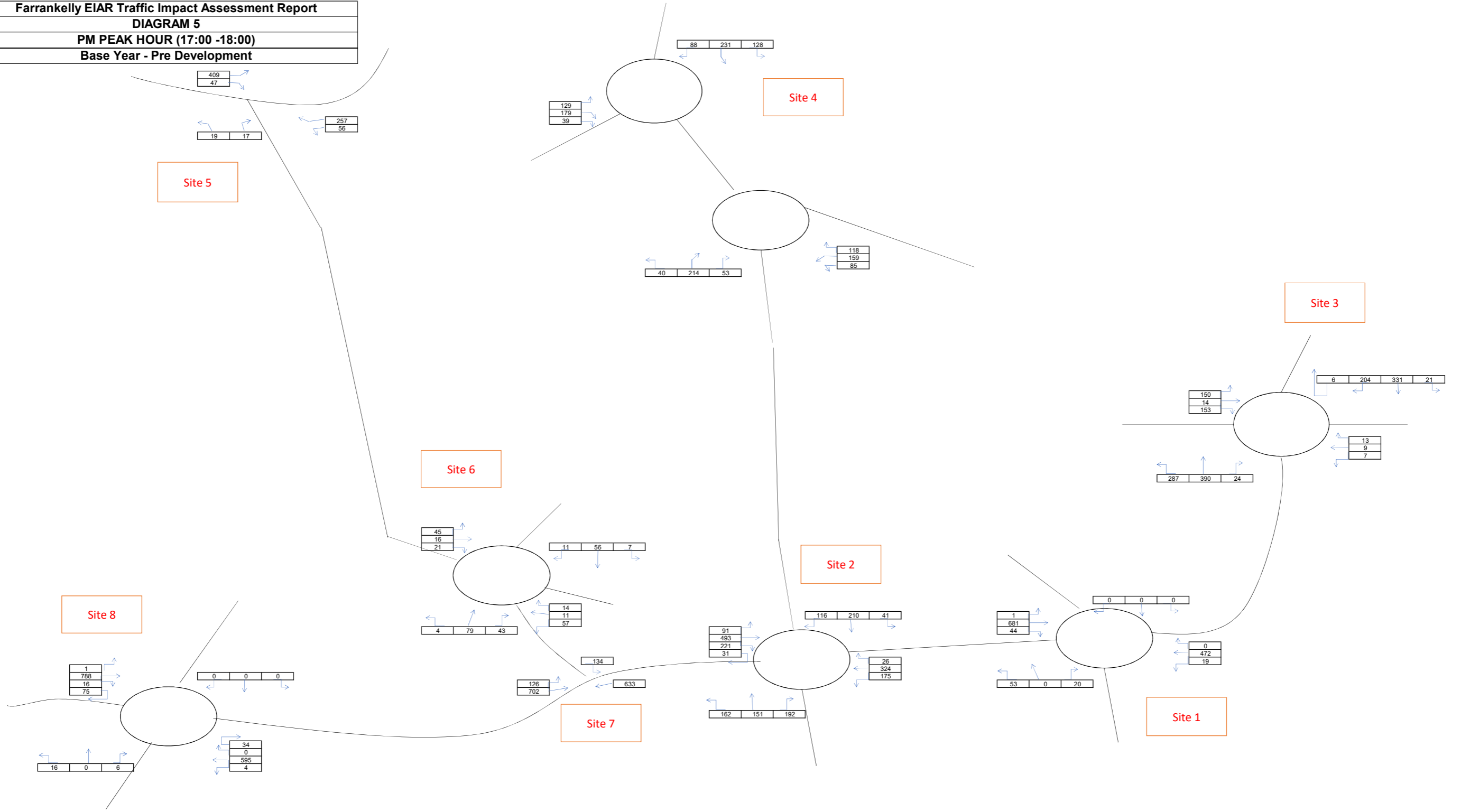
**Farrankelly EIAR Traffic Impact Assessment Report**  
**DIAGRAM 2**  
**AM PEAK HOUR (08:00 -09:00)**  
**Base Year - Scenario 1 - Post Development**



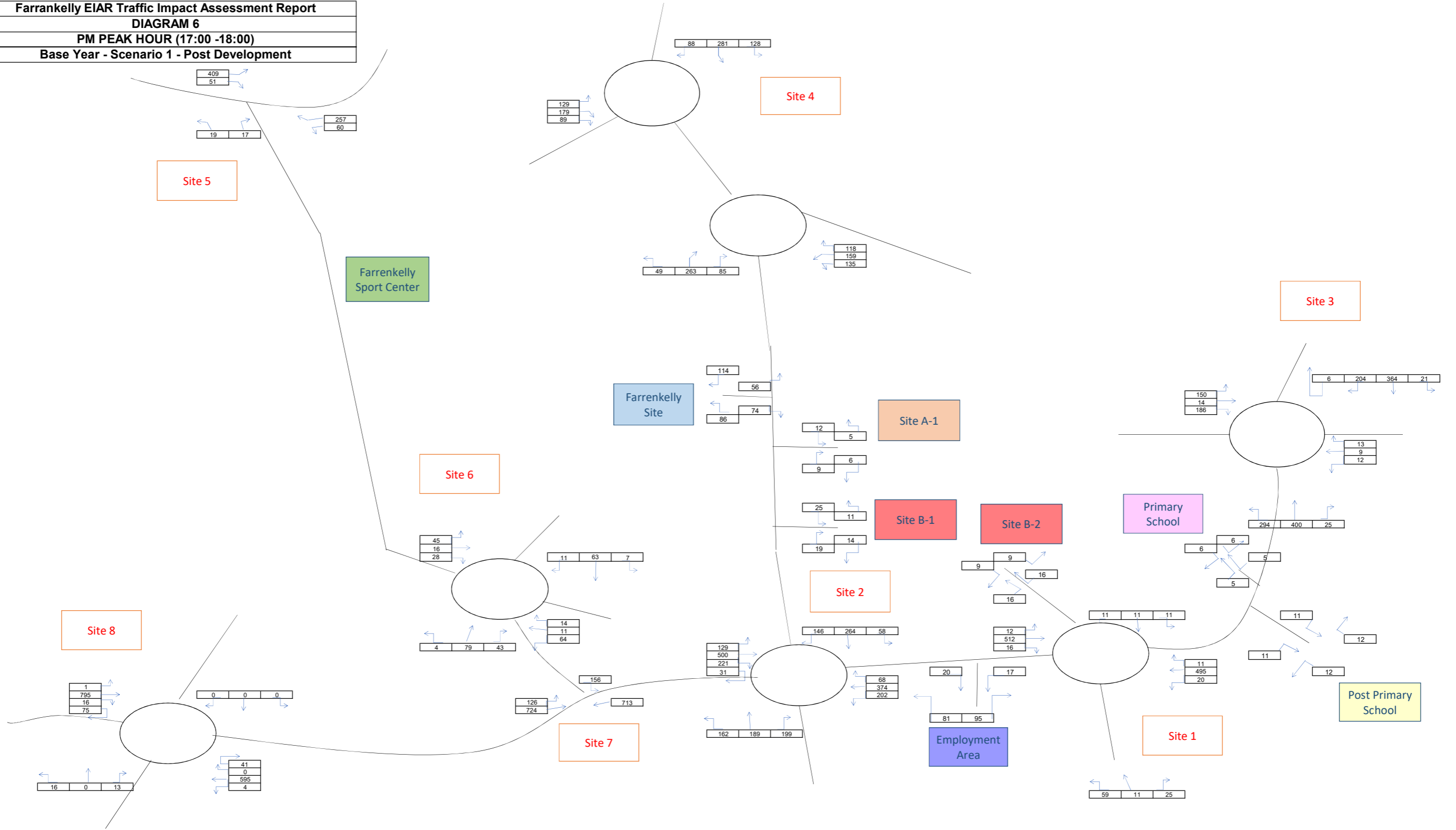
**Farrankelly EIAR Traffic Impact Assessment Report**  
**DIAGRAM 3**  
**AM PEAK HOUR (08:00 -09:00)**  
**Base Year - Scenario 2 - Post Development**



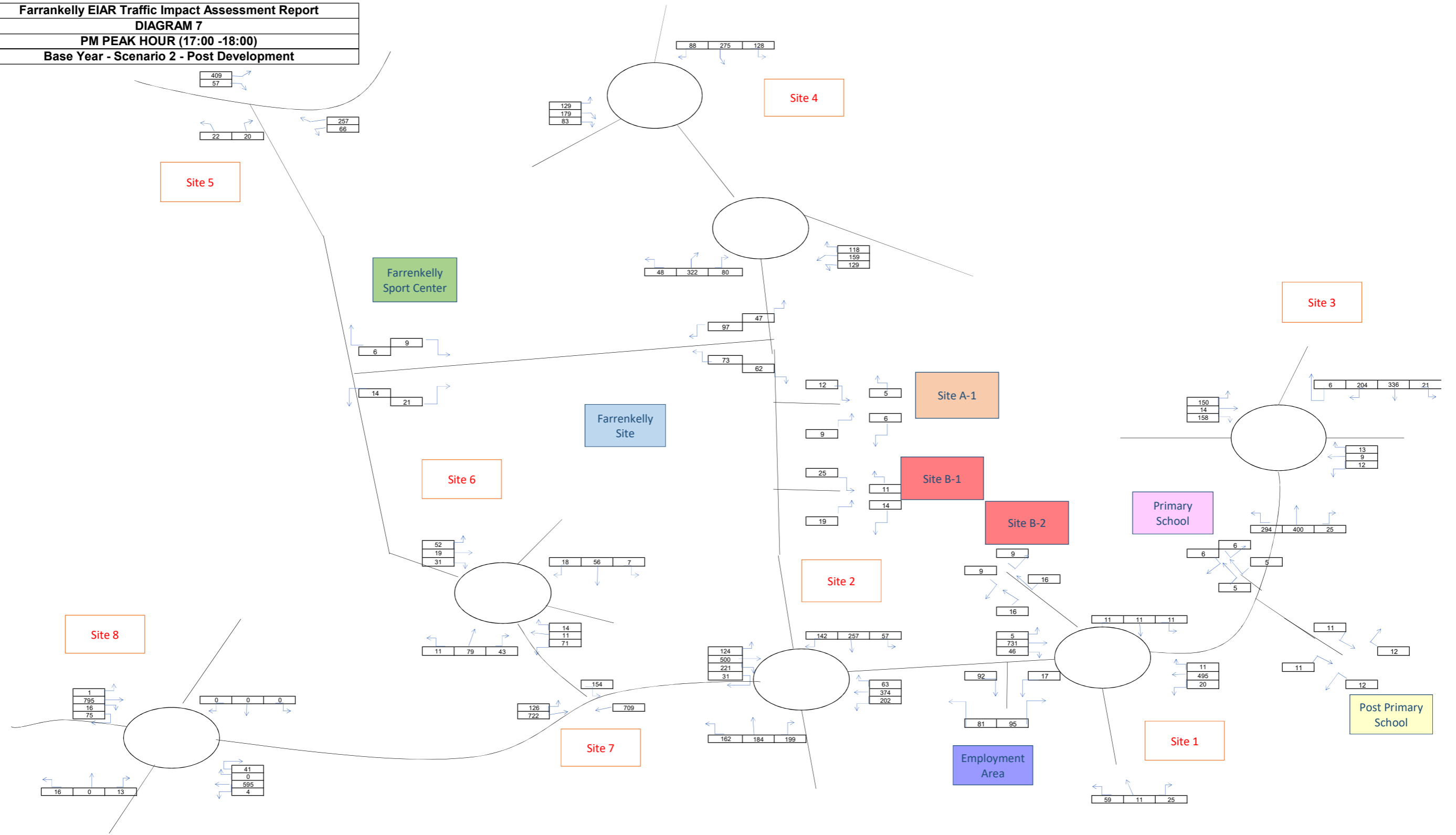
**Farrankelly EIA Traffic Impact Assessment Report**  
**DIAGRAM 5**  
**PM PEAK HOUR (17:00 -18:00)**  
**Base Year - Pre Development**



**Farrankelly EIAR Traffic Impact Assessment Report**  
**DIAGRAM 6**  
**PM PEAK HOUR (17:00 -18:00)**  
**Base Year - Scenario 1 - Post Development**

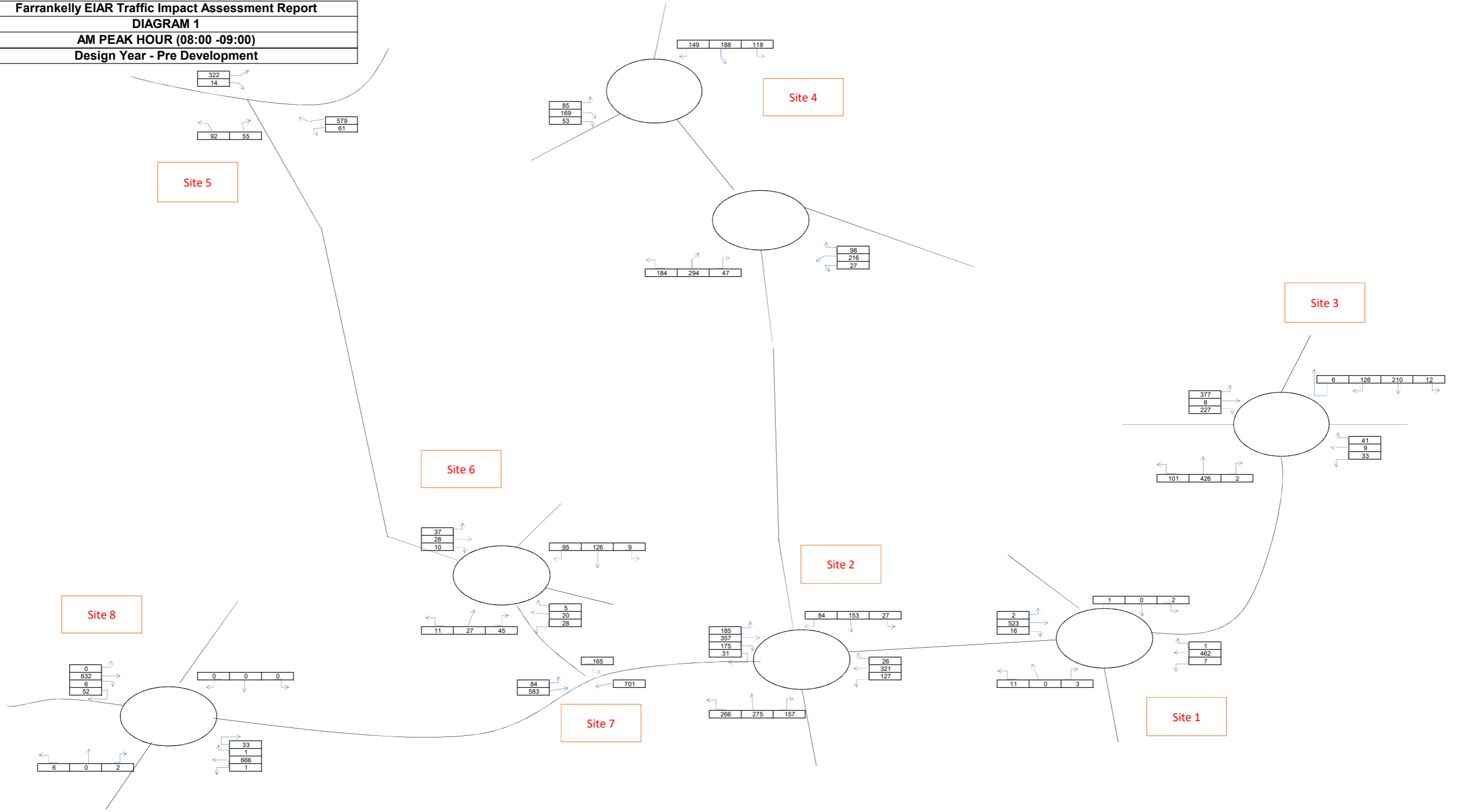


**Farrankelly EIAR Traffic Impact Assessment Report**  
**DIAGRAM 7**  
**PM PEAK HOUR (17:00 -18:00)**  
**Base Year - Scenario 2 - Post Development**

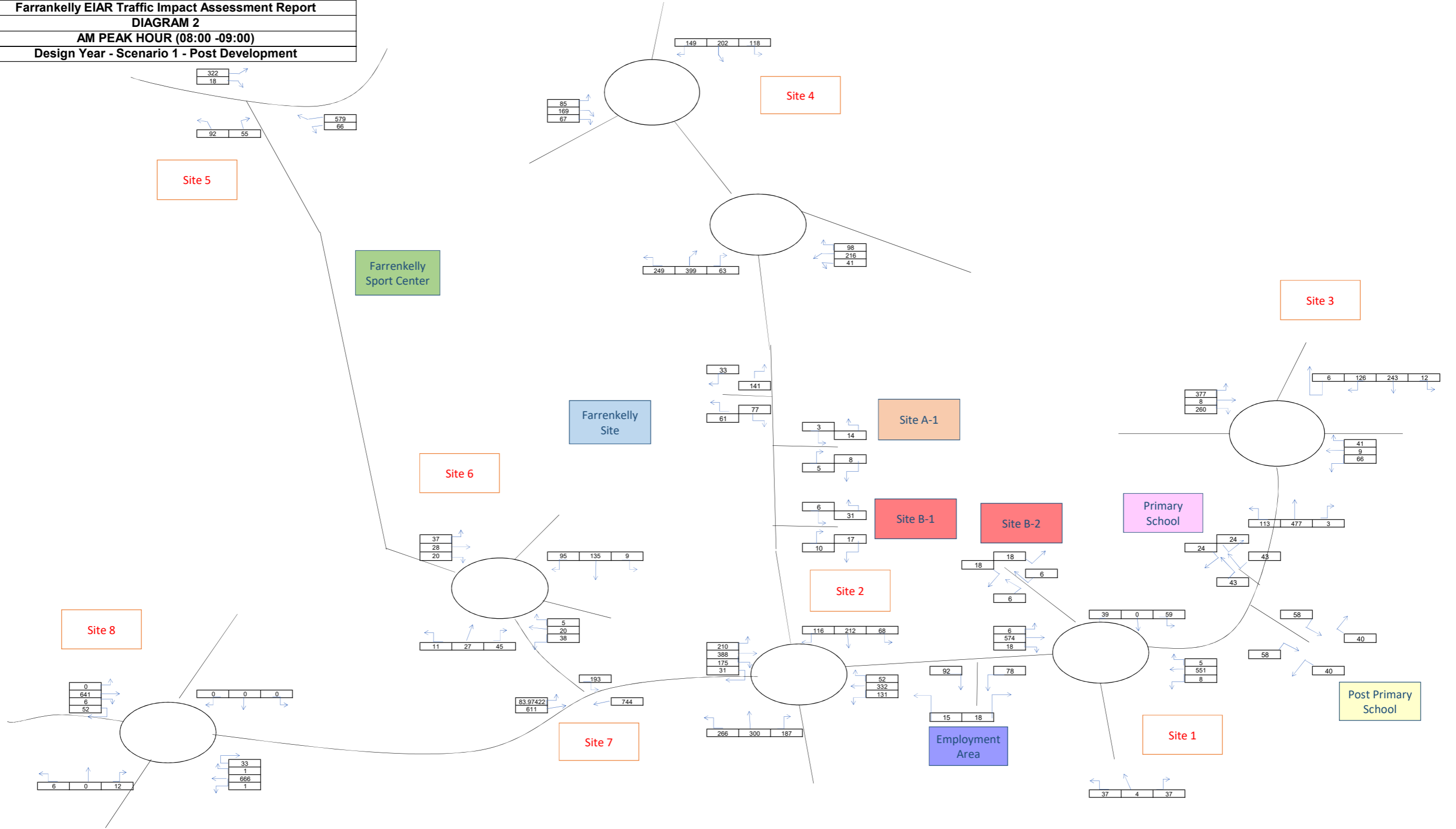




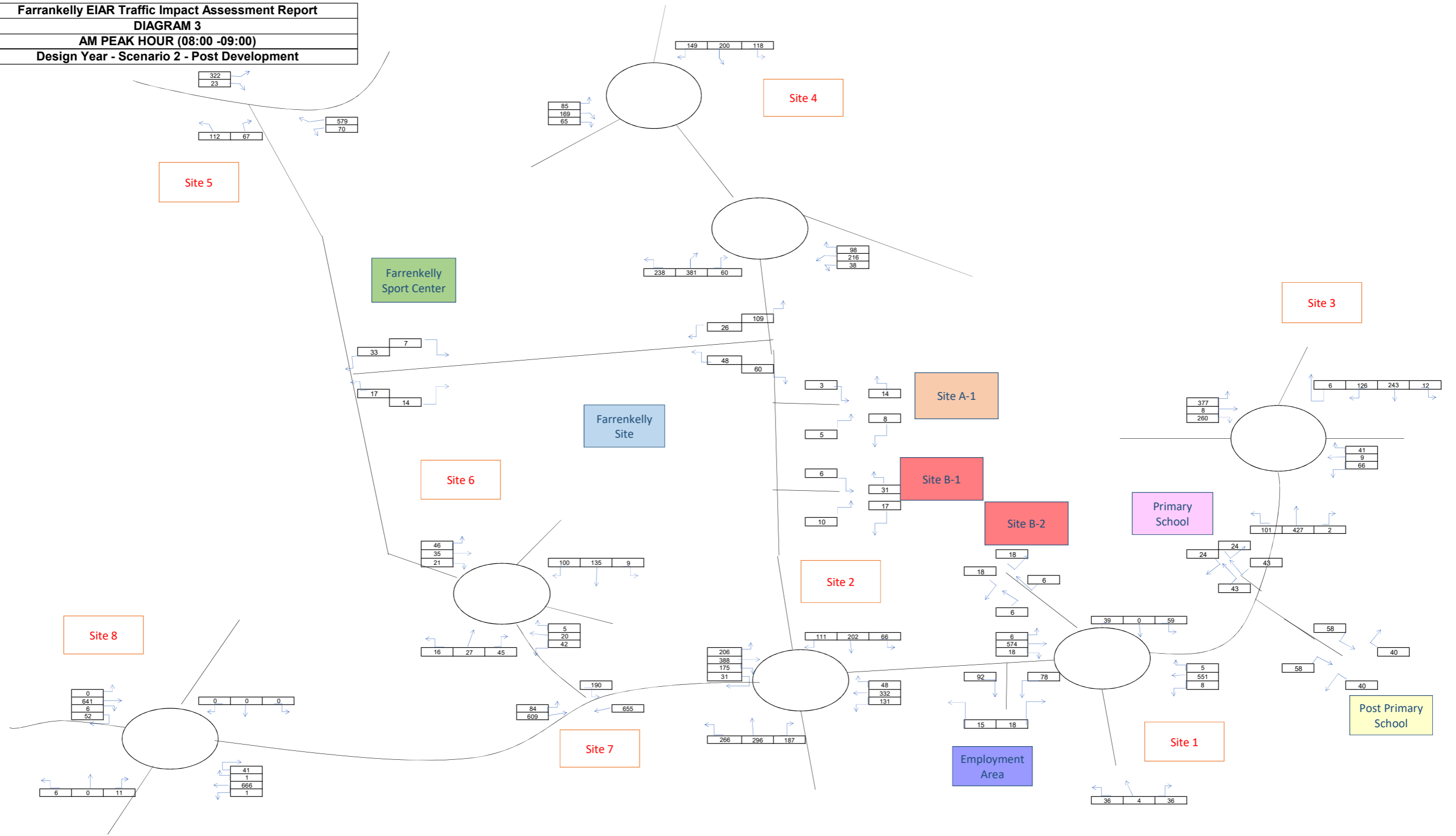
**Farrankelly EIAR Traffic Impact Assessment Report**  
**DIAGRAM 1**  
**AM PEAK HOUR (08:00 -09:00)**  
**Design Year - Pre Development**



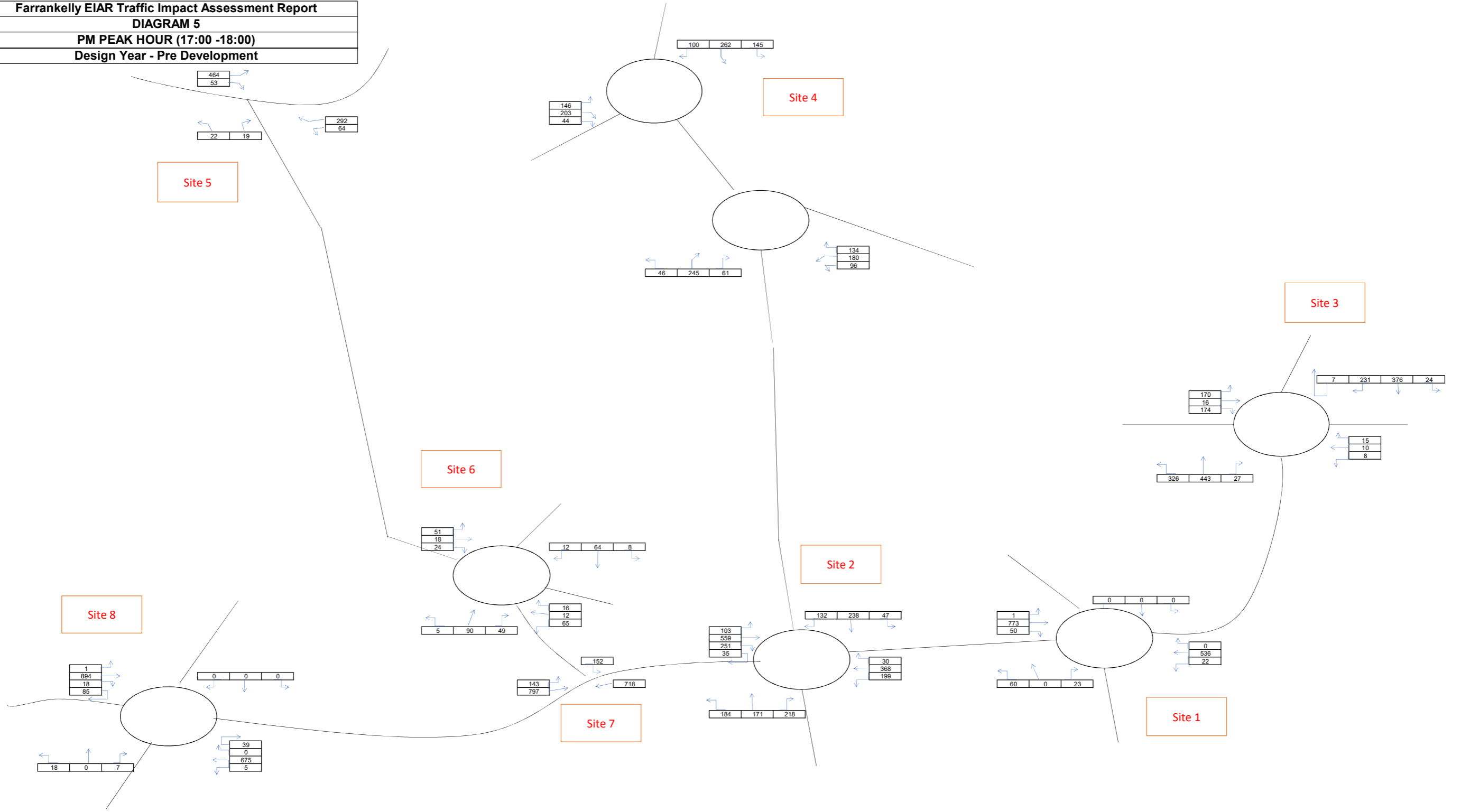
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**DIAGRAM 2**  
**AM PEAK HOUR (08:00 -09:00)**  
**Design Year - Scenario 1 - Post Development**



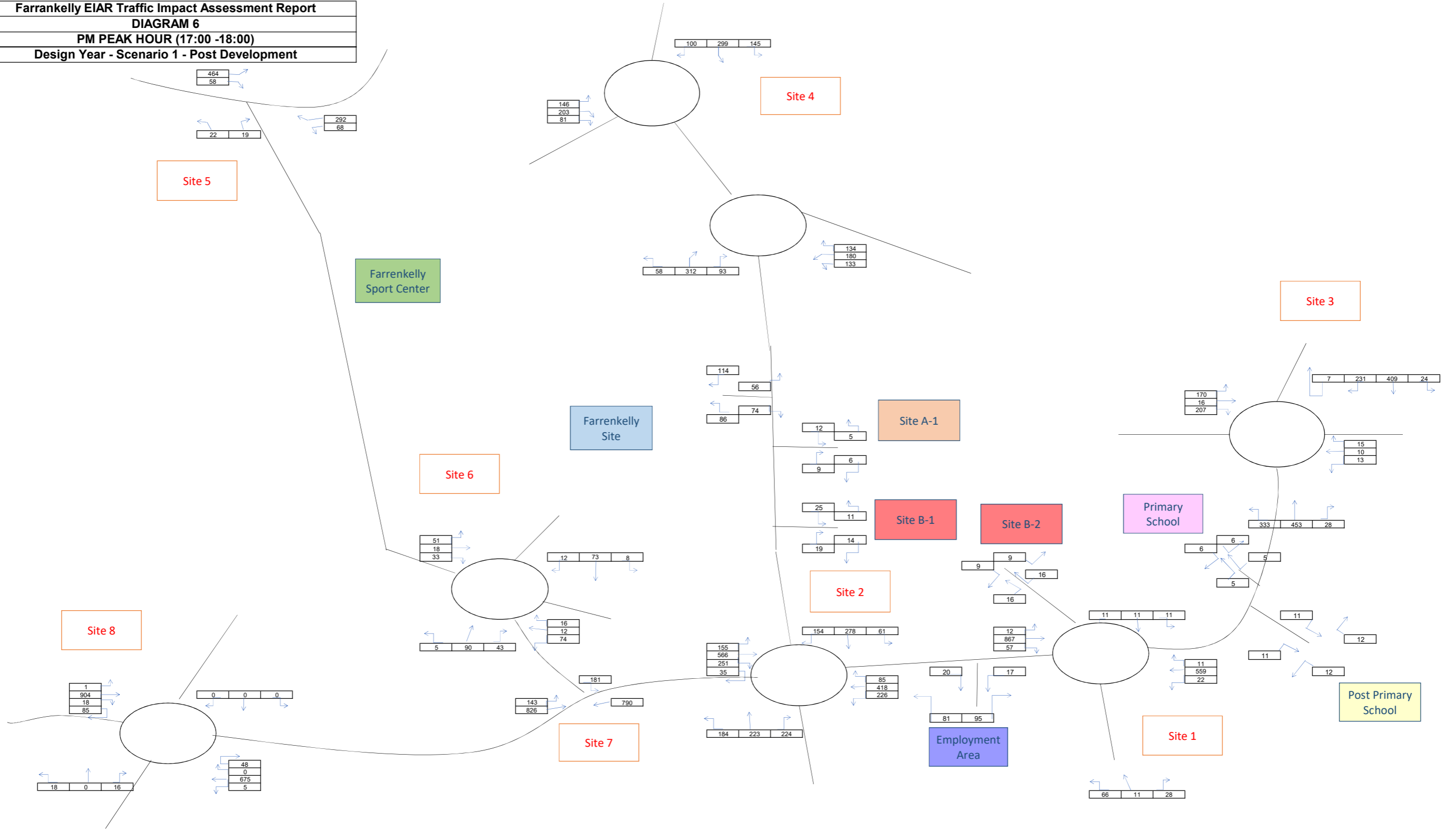
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**DIAGRAM 3**  
**AM PEAK HOUR (08:00 -09:00)**  
**Design Year - Scenario 2 - Post Development**



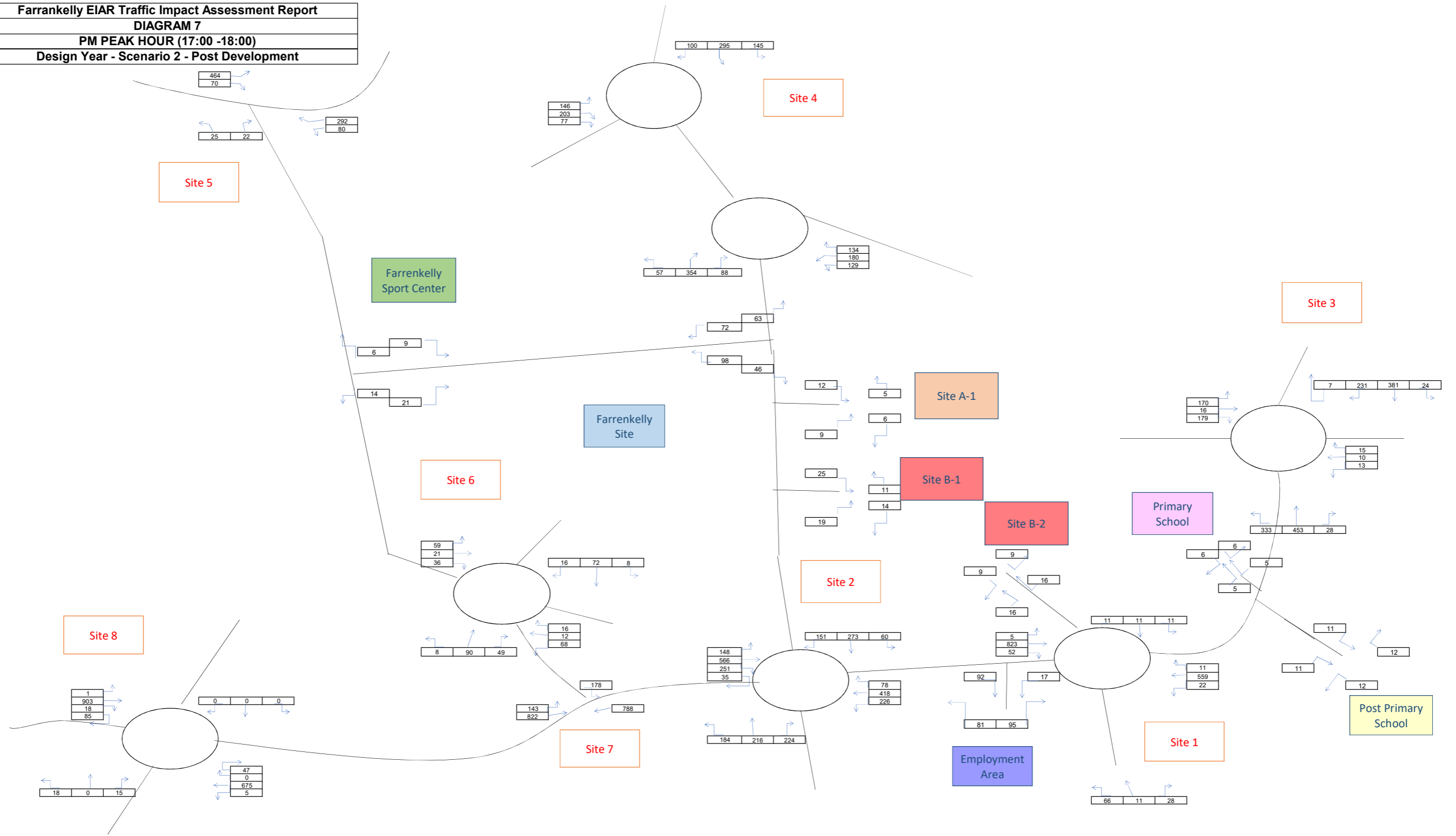
**Farrankelly EIAR Traffic Impact Assessment Report**  
**DIAGRAM 5**  
**PM PEAK HOUR (17:00 -18:00)**  
**Design Year - Pre Development**



**Farrankelly EIAR Traffic Impact Assessment Report**  
**DIAGRAM 6**  
**PM PEAK HOUR (17:00 -18:00)**  
**Design Year - Scenario 1 - Post Development**



**Farrankelly EIAR Traffic Impact Assessment Report**  
**DIAGRAM 7**  
**PM PEAK HOUR (17:00 -18:00)**  
**Design Year - Scenario 2 - Post Development**



<b>Junctions 8</b>
<b>PICADY 8 - Priority Intersection Module</b>
Version: 8.0.3.332 [14595,13/11/2013] © Copyright TRL Limited, 2019
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<b>The users of this computer program for the solution of an engineering problem are in no way relieved of their responsibility for the correctness of the solution</b>

**Filename:** Kilcoole Rd Access - Sc1- post dev - base year.arc8

**Path:** P:\Proj\2016\16146\16146-14-CALCS\Traffic\Farrankelly Additional Site\Junctions 8 Calculations\All developments considered\Picady & Arcady analysis\Post Development Sc1

**Report generation date:** 19/02/2019 13:32:54

« **Scenario 1 - Post Dev - Base Year - Scenario 1, AM**

- » **Junction Network**
- » **Arms**
- » **Traffic Flows**
- » **Entry Flows**
- » **Turning Proportions**
- » **Vehicle Mix**
- » **Results**

**Summary of junction performance**

	AM					PM					
	Queue (PCU)	Delay (s)	RFC	LOS	Junction LOS	Queue (PCU)	Delay (s)	RFC	LOS	Junction LOS	
<b>Scenario 1 - Post Dev - Base Year - Scenario 1</b>											
Stream B-AC	1.36	20.94	0.58	C	C	0.69	17.64	0.41	C	B	
Stream C-A	-	-	-	-		-	-	-	-		-
Stream C-B	0.09	8.53	0.08	A		0.35	10.09	0.26	B		
Stream A-B	-	-	-	-		-	-	-	-		-
Stream A-C	-	-	-	-		-	-	-	-		-

Values shown are the maximum values over all time segments. Delay is the maximum value of average delay per arriving vehicle. Junction LOS and Junction Delay are demand-weighted averages.

"D1 - Scenario 1, AM " model duration: 08:00 - 09:30

"D2 - Scenario 1, PM" model duration: 17:00 - 18:30

Run using Junctions 8.0.3.332 at 19/02/2019 13:32:54

## File summary

### File Description

<b>Title</b>	Farrankelly
<b>Location</b>	Kilcoole Road/Development Access
<b>Site Number</b>	N/A
<b>Date</b>	13/02/2019
<b>Version</b>	
<b>Status</b>	(new file)
<b>Identifier</b>	
<b>Client</b>	Cairn
<b>Jobnumber</b>	16.146
<b>Enumerator</b>	EL
<b>Description</b>	Kilcoole Road Access will serve the Eastern side of the proposed Farrankelly development.

## Analysis Options

Vehicle Length (m)	Do Queue Variations	Calculate Residual Capacity	Residual Capacity Criteria Type	RFC Threshold	Average Delay Threshold (s)	Queue Threshold (PCU)
5.75			N/A	0.85	36.00	20.00

## Units

Distance Units	Speed Units	Traffic Units Input	Traffic Units Results	Flow Units	Average Delay Units	Total Delay Units	Rate Of Delay Units
m	kph	PCU	PCU	perHour	s	-Min	perMin

# Scenario 1 - Post Dev - Base Year - Scenario 1, AM

## Data Errors and Warnings

*No errors or warnings*

## Analysis Set Details

Name	Description	Locked	Network Flow Scaling Factor (%)	Reason For Scaling Factors
Scenario 1 - Post Dev - Base Year	In Scenario 1 only the Kilcoole Road access is open. The year considered is the base year post development.		100.000	

## Demand Set Details

Name	Scenario Name	Time Period Name	Description	Traffic Profile Type	Model Start Time (HH:mm)	Model Finish Time (HH:mm)	Model Time Period Length (min)	Time Segment Length (min)	Single Time Segment Only	Locked
Scenario 1, AM	Scenario 1	AM		ONE HOUR	08:00	09:30	90	15		

# Junction Network

## Junctions

Name	Junction Type	Major Road Direction	Arm Order	Junction Delay (s)	Junction LOS
Kilcoole Road access	T-Junction	Two-way	A,B,C	19.31	C

## Junction Network Options

Driving Side	Lighting
Left	Normal/unknown



# Arms

## Arms

Arm	Name	Description	Arm Type
A	Kilcoole Road		Major
B	Kilcoole Road access		Minor
C	Kilcoole Road		Major

## Major Arm Geometry

Arm	Width of carriageway (m)	Has kerbed central reserve	Width of kerbed central reserve (m)	Has right turn bay	Width For Right Turn (m)	Visibility For Right Turn (m)	Blocks?	Blocking Queue (PCU)
C	6.20		0.00		2.20	49.00		

*Geometries for Arm C are measured opposite Arm B. Geometries for Arm A (if relevant) are measured opposite Arm D.*

## Minor Arm Geometry

Arm	Minor Arm Type	Lane Width (m)	Lane Width (Left) (m)	Lane Width (Right) (m)	Width at give-way (m)	Width at 5m (m)	Width at 10m (m)	Width at 15m (m)	Width at 20m (m)	Estimate Flare Length	Flare Length (PCU)	Visibility To Left (m)	Visibility To Right (m)
B	One lane	2.75										49	49

## Pedestrian Crossings

Arm	Crossing Type
A	None
B	None
C	None

## Slope / Intercept / Capacity

### Priority Intersection Slopes and Intercepts

Junction	Stream	Intercept (PCU/hr)	Slope for A-B	Slope for A-C	Slope for C-A	Slope for C-B
1	B-A	504.721	0.091	0.230	0.145	0.329
1	B-C	638.395	0.097	0.245	-	-
1	C-B	602.340	0.231	0.231	-	-

*The slopes and intercepts shown above do NOT include any corrections or adjustments.*

*Streams may be combined, in which case capacity will be adjusted.*

*Values are shown for the first time segment only; they may differ for subsequent time segments.*

# Traffic Flows

## Demand Set Data Options

Default Vehicle Mix	Vehicle Mix Varies Over Time	Vehicle Mix Varies Over Turn	Vehicle Mix Varies Over Entry	Vehicle Mix Source	PCU Factor for a HV (PCU)	Default Turning Proportions	Estimate from entry/exit counts	Turning Proportions Vary Over Time	Turning Proportions Vary Over Turn	Turning Proportions Vary Over Entry
		✓	✓	HV Percentages	2.00				✓	✓

# Entry Flows

## General Flows Data

Arm	Profile Type	Use Turning Counts	Average Demand Flow (PCU/hr)	Flow Scaling Factor (%)
A	ONE HOUR	✓	566.00	100.000
B	ONE HOUR	✓	218.00	100.000
C	ONE HOUR	✓	312.00	100.000

# Turning Proportions

## Turning Counts or Proportions (PCU/hr) - Junction 1 (for whole period)

		To		
		A	B	C
From	A	0.000	61.000	505.000
	B	77.000	0.000	141.000
	C	279.000	33.000	0.000

## Turning Proportions (PCU) - Junction 1 (for whole period)

		To		
		A	B	C
From	A	0.00	0.11	0.89
	B	0.35	0.00	0.65
	C	0.89	0.11	0.00

# Vehicle Mix

## Average PCU Per Vehicle - Junction 1 (for whole period)

		To		
		A	B	C
From	A	1.000	1.000	1.000
	B	1.000	1.000	1.000
	C	1.000	1.000	1.000

## Heavy Vehicle Percentages - Junction 1 (for whole period)

		To		
		A	B	C
From	A	0.000	0.000	0.000
	B	0.000	0.000	0.000
	C	0.000	0.000	0.000

# Results

## Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS
B-AC	0.58	20.94	1.36	C
C-A	-	-	-	-
C-B	0.08	8.53	0.09	A
A-B	-	-	-	-
A-C	-	-	-	-

## Main Results for each time segment

### Main results: (08:00-08:15)

Stream	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
B-AC	164.12	162.00	0.00	467.36	0.351	0.53	11.711	B
C-A	210.05	210.05	0.00	-	-	-	-	-
C-B	24.84	24.64	0.00	503.76	0.049	0.05	7.510	A
A-B	45.92	45.92	0.00	-	-	-	-	-
A-C	380.19	380.19	0.00	-	-	-	-	-

### Main results: (08:15-08:30)

Stream	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
B-AC	195.98	195.02	0.00	444.10	0.441	0.77	14.394	B
C-A	250.82	250.82	0.00	-	-	-	-	-
C-B	29.67	29.61	0.00	484.62	0.061	0.06	7.910	A
A-B	54.84	54.84	0.00	-	-	-	-	-
A-C	453.98	453.98	0.00	-	-	-	-	-

### Main results: (08:30-08:45)

Stream	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
B-AC	240.02	237.77	0.00	411.49	0.583	1.33	20.452	C
C-A	307.18	307.18	0.00	-	-	-	-	-
C-B	36.33	36.25	0.00	458.17	0.079	0.09	8.529	A
A-B	67.16	67.16	0.00	-	-	-	-	-
A-C	556.02	556.02	0.00	-	-	-	-	-

### Main results: (08:45-09:00)

Stream	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
B-AC	240.02	239.89	0.00	411.48	0.583	1.36	20.936	C
C-A	307.18	307.18	0.00	-	-	-	-	-
C-B	36.33	36.33	0.00	458.17	0.079	0.09	8.533	A
A-B	67.16	67.16	0.00	-	-	-	-	-
A-C	556.02	556.02	0.00	-	-	-	-	-

**Main results: (09:00-09:15)**

Stream	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
B-AC	195.98	198.18	0.00	444.07	0.441	0.81	14.770	B
C-A	250.82	250.82	0.00	-	-	-	-	-
C-B	29.67	29.75	0.00	484.62	0.061	0.07	7.916	A
A-B	54.84	54.84	0.00	-	-	-	-	-
A-C	453.98	453.98	0.00	-	-	-	-	-

**Main results: (09:15-09:30)**

Stream	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
B-AC	164.12	165.16	0.00	467.31	0.351	0.55	11.955	B
C-A	210.05	210.05	0.00	-	-	-	-	-
C-B	24.84	24.90	0.00	503.76	0.049	0.05	7.520	A
A-B	45.92	45.92	0.00	-	-	-	-	-
A-C	380.19	380.19	0.00	-	-	-	-	-

<b>Junctions 8</b>
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**Filename:** Kilcoole Rd Access - Sc1- post dev - design year.arc8

**Path:** P:\Proj\2016\16146\16146-14-CALCS\Traffic\Farrankelly Additional Site\Junctions 8 Calculations\All developments considered\Picady & Arcady analysis\Post Development Sc1

**Report generation date:** 19/02/2019 13:36:25

« **Scenario 1 - Post Dev - Des Year - Scenario 1, AM**

- » **Junction Network**
- » **Arms**
- » **Traffic Flows**
- » **Entry Flows**
- » **Turning Proportions**
- » **Vehicle Mix**
- » **Results**

**Summary of junction performance**

	AM					PM					
	Queue (PCU)	Delay (s)	RFC	LOS	Junction LOS	Queue (PCU)	Delay (s)	RFC	LOS	Junction LOS	
<b>Scenario 1 - Post Dev - Des Year - Scenario 1</b>											
Stream B-AC	1.53	23.52	0.61	C	C	0.77	19.83	0.44	C	C	
Stream C-A	-	-	-	-		-	-	-	-		-
Stream C-B	0.09	8.84	0.08	A		0.37	10.67	0.27	B		
Stream A-B	-	-	-	-		-	-	-	-		-
Stream A-C	-	-	-	-		-	-	-	-		-

Values shown are the maximum values over all time segments. Delay is the maximum value of average delay per arriving vehicle. Junction LOS and Junction Delay are demand-weighted averages.

"D1 - Scenario 1, AM" model duration: 08:00 - 09:30

"D2 - Scenario 1, PM" model duration: 17:00 - 18:30

Run using Junctions 8.0.3.332 at 19/02/2019 13:36:24

## File summary

### File Description

<b>Title</b>	Farrankelly
<b>Location</b>	Kilcoole Road/Development Access
<b>Site Number</b>	N/A
<b>Date</b>	13/02/2019
<b>Version</b>	
<b>Status</b>	
<b>Identifier</b>	
<b>Client</b>	Caim
<b>Jobnumber</b>	16.146
<b>Enumerator</b>	EL
<b>Description</b>	Kilcoole Road Access will serve the Eastern side of the proposed Farrankelly development.

## Analysis Options

Vehicle Length (m)	Do Queue Variations	Calculate Residual Capacity	Residual Capacity Criteria Type	RFC Threshold	Average Delay Threshold (s)	Queue Threshold (PCU)
5.75			N/A	0.85	36.00	20.00

## Units

Distance Units	Speed Units	Traffic Units Input	Traffic Units Results	Flow Units	Average Delay Units	Total Delay Units	Rate Of Delay Units
m	kph	PCU	PCU	perHour	s	-Min	perMin

# Scenario 1 - Post Dev - Des Year - Scenario 1, AM

## Data Errors and Warnings

*No errors or warnings*

## Analysis Set Details

Name	Description	Locked	Network Flow Scaling Factor (%)	Reason For Scaling Factors
Scenario 1 - Post Dev - Des Year	In Scenario 1 only the Kilcoole Road access is open. The year considered is the design year post development.		100.000	

## Demand Set Details

Name	Scenario Name	Time Period Name	Description	Traffic Profile Type	Model Start Time (HH:mm)	Model Finish Time (HH:mm)	Model Time Period Length (min)	Time Segment Length (min)	Single Time Segment Only	Locked
Scenario 1, AM	Scenario 1	AM		ONE HOUR	08:00	09:30	90	15		

# Junction Network

## Junctions

Name	Junction Type	Major Road Direction	Arm Order	Junction Delay (s)	Junction LOS
Kilcoole Road access	T-Junction	Two-way	A,B,C	21.59	C

## Junction Network Options

Driving Side	Lighting
Left	Normal/unknown

# Arms

## Arms

Arm	Name	Description	Arm Type
A	Kilcoole Road		Major
B	Kilcoole Road access		Minor
C	Kilcoole Road		Major

## Major Arm Geometry

Arm	Width of carriageway (m)	Has kerbed central reserve	Width of kerbed central reserve (m)	Has right turn bay	Width For Right Turn (m)	Visibility For Right Turn (m)	Blocks?	Blocking Queue (PCU)
C	6.20		0.00		2.20	49.00		

*Geometries for Arm C are measured opposite Arm B. Geometries for Arm A (if relevant) are measured opposite Arm D.*

## Minor Arm Geometry

Arm	Minor Arm Type	Lane Width (m)	Lane Width (Left) (m)	Lane Width (Right) (m)	Width at give-way (m)	Width at 5m (m)	Width at 10m (m)	Width at 15m (m)	Width at 20m (m)	Estimate Flare Length	Flare Length (PCU)	Visibility To Left (m)	Visibility To Right (m)
B	One lane	2.75										49	49

## Pedestrian Crossings

Arm	Crossing Type
A	None
B	None
C	None

## Slope / Intercept / Capacity

### Priority Intersection Slopes and Intercepts

Junction	Stream	Intercept (PCU/hr)	Slope for A-B	Slope for A-C	Slope for C-A	Slope for C-B
1	B-A	504.721	0.091	0.230	0.145	0.329
1	B-C	638.395	0.097	0.245	-	-
1	C-B	602.340	0.231	0.231	-	-

*The slopes and intercepts shown above do NOT include any corrections or adjustments.*

*Streams may be combined, in which case capacity will be adjusted.*

*Values are shown for the first time segment only; they may differ for subsequent time segments.*

# Traffic Flows

## Demand Set Data Options

Default Vehicle Mix	Vehicle Mix Varies Over Time	Vehicle Mix Varies Over Turn	Vehicle Mix Varies Over Entry	Vehicle Mix Source	PCU Factor for a HV (PCU)	Default Turning Proportions	Estimate from entry/exit counts	Turning Proportions Vary Over Time	Turning Proportions Vary Over Turn	Turning Proportions Vary Over Entry
		✓	✓	HV Percentages	2.00				✓	✓

# Entry Flows

## General Flows Data

Arm	Profile Type	Use Turning Counts	Average Demand Flow (PCU/hr)	Flow Scaling Factor (%)
A	ONE HOUR	✓	624.00	100.000
B	ONE HOUR	✓	218.00	100.000
C	ONE HOUR	✓	343.00	100.000

# Turning Proportions

## Turning Counts or Proportions (PCU/hr) - Junction 1 (for whole period)

		To		
		A	B	C
From	A	0.000	61.000	563.000
	B	77.000	0.000	141.000
	C	310.000	33.000	0.000

## Turning Proportions (PCU) - Junction 1 (for whole period)

		To		
		A	B	C
From	A	0.00	0.10	0.90
	B	0.35	0.00	0.65
	C	0.90	0.10	0.00

# Vehicle Mix

## Average PCU Per Vehicle - Junction 1 (for whole period)

		To		
		A	B	C
From	A	1.000	1.000	1.000
	B	1.000	1.000	1.000
	C	1.000	1.000	1.000

## Heavy Vehicle Percentages - Junction 1 (for whole period)

		To		
		A	B	C
From	A	0.000	0.000	0.000
	B	0.000	0.000	0.000
	C	0.000	0.000	0.000



# Results

## Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS
B-AC	0.61	23.52	1.53	C
C-A	-	-	-	-
C-B	0.08	8.84	0.09	A
A-B	-	-	-	-
A-C	-	-	-	-

## Main Results for each time segment

### Main results: (08:00-08:15)

Stream	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
B-AC	164.12	161.91	0.00	454.75	0.361	0.55	12.204	B
C-A	233.38	233.38	0.00	-	-	-	-	-
C-B	24.84	24.63	0.00	493.66	0.050	0.05	7.671	A
A-B	45.92	45.92	0.00	-	-	-	-	-
A-C	423.86	423.86	0.00	-	-	-	-	-

### Main results: (08:15-08:30)

Stream	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
B-AC	195.98	194.92	0.00	428.87	0.457	0.82	15.315	C
C-A	278.68	278.68	0.00	-	-	-	-	-
C-B	29.67	29.61	0.00	472.56	0.063	0.07	8.126	A
A-B	54.84	54.84	0.00	-	-	-	-	-
A-C	506.13	506.13	0.00	-	-	-	-	-

### Main results: (08:30-08:45)

Stream	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
B-AC	240.02	237.36	0.00	392.48	0.612	1.48	22.811	C
C-A	341.32	341.32	0.00	-	-	-	-	-
C-B	36.33	36.25	0.00	443.40	0.082	0.09	8.840	A
A-B	67.16	67.16	0.00	-	-	-	-	-
A-C	619.87	619.87	0.00	-	-	-	-	-

### Main results: (08:45-09:00)

Stream	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
B-AC	240.02	239.85	0.00	392.46	0.612	1.53	23.515	C
C-A	341.32	341.32	0.00	-	-	-	-	-
C-B	36.33	36.33	0.00	443.40	0.082	0.09	8.843	A
A-B	67.16	67.16	0.00	-	-	-	-	-
A-C	619.87	619.87	0.00	-	-	-	-	-

**Main results: (09:00-09:15)**

Stream	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
B-AC	195.98	198.61	0.00	428.85	0.457	0.87	15.809	C
C-A	278.68	278.68	0.00	-	-	-	-	-
C-B	29.67	29.75	0.00	472.56	0.063	0.07	8.131	A
A-B	54.84	54.84	0.00	-	-	-	-	-
A-C	506.13	506.13	0.00	-	-	-	-	-

**Main results: (09:15-09:30)**

Stream	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
B-AC	164.12	165.28	0.00	454.70	0.361	0.58	12.490	B
C-A	233.38	233.38	0.00	-	-	-	-	-
C-B	24.84	24.90	0.00	493.66	0.050	0.05	7.680	A
A-B	45.92	45.92	0.00	-	-	-	-	-
A-C	423.86	423.86	0.00	-	-	-	-	-

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**Filename:** Priory Rd Access - Sc2- post dev - base year.arc8  
**Path:** P:\Proj\2016\16146\16146-14-CALCS\Traffic\Farrankelly Additional Site\Junctions 8 Calculations\All developments considered\Picady & Arcady analysis\Post Development Sc2  
**Report generation date:** 19/02/2019 13:39:49

- « Scenario 2 - Post Dev - Base Year - Scenario 2, AM
- » Junction Network
- » Arms
- » Traffic Flows
- » Entry Flows
- » Turning Proportions
- » Vehicle Mix
- » Results

### Summary of junction performance

	AM					PM					
	Queue (PCU)	Delay (s)	RFC	LOS	Junction LOS	Queue (PCU)	Delay (s)	RFC	LOS	Junction LOS	
<b>Scenario 2 - Post Dev - Base Year - Scenario 2</b>											
Stream B-AC	0.12	8.07	0.11	A	A	0.04	6.80	0.04	A	A	
Stream C-A	-	-	-	-		-	-	-	-		-
Stream C-B	0.03	6.39	0.03	A		0.04	6.60	0.04	A		
Stream A-B	-	-	-	-		-	-	-	-		-
Stream A-C	-	-	-	-		-	-	-	-		-

Values shown are the maximum values over all time segments. Delay is the maximum value of average delay per arriving vehicle. Junction LOS and Junction Delay are demand-weighted averages.

"D1 - Scenario 2, AM " model duration: 08:00 - 09:30  
 "D2 - Scenario 2, PM" model duration: 17:00 - 18:30

Run using Junctions 8.0.3.332 at 19/02/2019 13:39:48

## File summary

### File Description

Title	Farrankelly
Location	Priory Road/Development Access
Site Number	N/A
Date	13/02/2019
Version	
Status	
Identifier	
Client	Cairn
Jobnumber	16.146
Enumerator	
Description	Priory Road Access will serve the South-western side of the proposed Farrankelly development.

## Analysis Options

Vehicle Length (m)	Do Queue Variations	Calculate Residual Capacity	Residual Capacity Criteria Type	RFC Threshold	Average Delay Threshold (s)	Queue Threshold (PCU)
5.75			N/A	0.85	36.00	20.00

## Units

Distance Units	Speed Units	Traffic Units Input	Traffic Units Results	Flow Units	Average Delay Units	Total Delay Units	Rate Of Delay Units
m	kph	PCU	PCU	perHour	s	-Min	perMin

# Scenario 2 - Post Dev - Base Year - Scenario 2, AM

## Data Errors and Warnings

*No errors or warnings*

## Analysis Set Details

Name	Description	Locked	Network Flow Scaling Factor (%)	Reason For Scaling Factors
Scenario 2 - Post Dev - Base Year	In Scenario 2 both the site accesses are open to the traffic. The year considered is the base year post development.		100.000	

## Demand Set Details

Name	Scenario Name	Time Period Name	Description	Traffic Profile Type	Model Start Time (HH:mm)	Model Finish Time (HH:mm)	Model Time Period Length (min)	Time Segment Length (min)	Single Time Segment Only	Locked
Scenario 2, AM	Scenario 2	AM		ONE HOUR	08:00	09:30	90	15		

# Junction Network

## Junctions

Name	Junction Type	Major Road Direction	Arm Order	Junction Delay (s)	Junction LOS
Priory Road Junction	T-Junction	Two-way	A,B,C	7.70	A

## Junction Network Options

Driving Side	Lighting
Left	Normal/unknown

# Arms

## Arms

Arm	Name	Description	Arm Type
A	Priory Road		Major
B	Priory Road access		Minor
C	Priory Road		Major

## Major Arm Geometry

Arm	Width of carriageway (m)	Has kerbed central reserve	Width of kerbed central reserve (m)	Has right turn bay	Width For Right Turn (m)	Visibility For Right Turn (m)	Blocks?	Blocking Queue (PCU)
C	6.00		0.00		2.20	49.00		

*Geometries for Arm C are measured opposite Arm B. Geometries for Arm A (if relevant) are measured opposite Arm D.*

## Minor Arm Geometry

Arm	Minor Arm Type	Lane Width (m)	Lane Width (Left) (m)	Lane Width (Right) (m)	Width at give-way (m)	Width at 5m (m)	Width at 10m (m)	Width at 15m (m)	Width at 20m (m)	Estimate Flare Length	Flare Length (PCU)	Visibility To Left (m)	Visibility To Right (m)
B	One lane	2.75										49	49

## Pedestrian Crossings

Arm	Crossing Type
A	None
B	None
C	None

## Slope / Intercept / Capacity

### Priority Intersection Slopes and Intercepts

Junction	Stream	Intercept (PCU/hr)	Slope for A-B	Slope for A-C	Slope for C-A	Slope for C-B
1	B-A	504.721	0.092	0.232	0.146	0.332
1	B-C	638.395	0.098	0.247	-	-
1	C-B	602.340	0.233	0.233	-	-

*The slopes and intercepts shown above do NOT include any corrections or adjustments.*

*Streams may be combined, in which case capacity will be adjusted.*

*Values are shown for the first time segment only; they may differ for subsequent time segments.*

# Traffic Flows

## Demand Set Data Options

Default Vehicle Mix	Vehicle Mix Varies Over Time	Vehicle Mix Varies Over Turn	Vehicle Mix Varies Over Entry	Vehicle Mix Source	PCU Factor for a HV (PCU)	Default Turning Proportions	Estimate from entry/exit counts	Turning Proportions Vary Over Time	Turning Proportions Vary Over Turn	Turning Proportions Vary Over Entry
		✓	✓	HV Percentages	2.00				✓	✓

# Entry Flows

## General Flows Data

Arm	Profile Type	Use Turning Counts	Average Demand Flow (PCU/hr)	Flow Scaling Factor (%)
A	ONE HOUR	✓	91.00	100.000
B	ONE HOUR	✓	50.00	100.000
C	ONE HOUR	✓	136.00	100.000

# Turning Proportions

## Turning Counts or Proportions (PCU/hr) - Junction 1 (for whole period)

		To		
		A	B	C
From	A	0.000	7.000	84.000
	B	33.000	0.000	17.000
	C	122.000	14.000	0.000

## Turning Proportions (PCU) - Junction 1 (for whole period)

		To		
		A	B	C
From	A	0.00	0.08	0.92
	B	0.66	0.00	0.34
	C	0.90	0.10	0.00

# Vehicle Mix

## Average PCU Per Vehicle - Junction 1 (for whole period)

		To		
		A	B	C
From	A	1.000	1.000	1.000
	B	1.000	1.000	1.000
	C	1.000	1.000	1.000

## Heavy Vehicle Percentages - Junction 1 (for whole period)

		To		
		A	B	C
From	A	0.000	0.000	0.000
	B	0.000	0.000	0.000
	C	0.000	0.000	0.000

# Results

## Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS
B-AC	0.11	8.07	0.12	A
C-A	-	-	-	-
C-B	0.03	6.39	0.03	A
A-B	-	-	-	-
A-C	-	-	-	-

## Main Results for each time segment

### Main results: (08:00-08:15)

Stream	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
B-AC	37.64	37.33	0.00	514.70	0.073	0.08	7.536	A
C-A	91.85	91.85	0.00	-	-	-	-	-
C-B	10.54	10.47	0.00	586.35	0.018	0.02	6.251	A
A-B	5.27	5.27	0.00	-	-	-	-	-
A-C	63.24	63.24	0.00	-	-	-	-	-

### Main results: (08:15-08:30)

Stream	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
B-AC	44.95	44.88	0.00	509.06	0.088	0.10	7.754	A
C-A	109.68	109.68	0.00	-	-	-	-	-
C-B	12.59	12.57	0.00	583.25	0.022	0.02	6.307	A
A-B	6.29	6.29	0.00	-	-	-	-	-
A-C	75.51	75.51	0.00	-	-	-	-	-

### Main results: (08:30-08:45)

Stream	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
B-AC	55.05	54.95	0.00	501.27	0.110	0.12	8.064	A
C-A	134.32	134.32	0.00	-	-	-	-	-
C-B	15.41	15.39	0.00	578.96	0.027	0.03	6.387	A
A-B	7.71	7.71	0.00	-	-	-	-	-
A-C	92.49	92.49	0.00	-	-	-	-	-

### Main results: (08:45-09:00)

Stream	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
B-AC	55.05	55.05	0.00	501.27	0.110	0.12	8.067	A
C-A	134.32	134.32	0.00	-	-	-	-	-
C-B	15.41	15.41	0.00	578.96	0.027	0.03	6.387	A
A-B	7.71	7.71	0.00	-	-	-	-	-
A-C	92.49	92.49	0.00	-	-	-	-	-

**Main results: (09:00-09:15)**

Stream	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
B-AC	44.95	45.05	0.00	509.05	0.088	0.10	7.760	A
C-A	109.68	109.68	0.00	-	-	-	-	-
C-B	12.59	12.61	0.00	583.25	0.022	0.02	6.310	A
A-B	6.29	6.29	0.00	-	-	-	-	-
A-C	75.51	75.51	0.00	-	-	-	-	-

**Main results: (09:15-09:30)**

Stream	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
B-AC	37.64	37.72	0.00	514.67	0.073	0.08	7.551	A
C-A	91.85	91.85	0.00	-	-	-	-	-
C-B	10.54	10.56	0.00	586.35	0.018	0.02	6.254	A
A-B	5.27	5.27	0.00	-	-	-	-	-
A-C	63.24	63.24	0.00	-	-	-	-	-



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**Filename:** Priory Rd Access - Sc2- post dev - design year.arc8

**Path:** P:\Proj\2016\16146\16146-14-CALCS\Traffic\Farrankelly Additional Site\Junctions 8 Calculations\All developments considered\Picady & Arcady analysis\Post Development Sc2

**Report generation date:** 19/02/2019 13:42:40

« **Scenario 2 - Post Dev - Des Year - Scenario 2, AM**

- » **Junction Network**
- » **Arms**
- » **Traffic Flows**
- » **Entry Flows**
- » **Turning Proportions**
- » **Vehicle Mix**
- » **Results**

**Summary of junction performance**

	AM					PM					
	Queue (PCU)	Delay (s)	RFC	LOS	Junction LOS	Queue (PCU)	Delay (s)	RFC	LOS	Junction LOS	
<b>Scenario 2 - Post Dev - Des Year - Scenario 2</b>											
Stream B-AC	0.12	8.11	0.11	A	A	0.04	6.86	0.04	A	A	
Stream C-A	-	-	-	-		-	-	-	-		-
Stream C-B	0.01	6.33	0.01	A		0.04	6.65	0.04	A		
Stream A-B	-	-	-	-		-	-	-	-		-
Stream A-C	-	-	-	-		-	-	-	-		-

Values shown are the maximum values over all time segments. Delay is the maximum value of average delay per arriving vehicle. Junction LOS and Junction Delay are demand-weighted averages.

"D1 - Scenario 2, AM " model duration: 08:00 - 09:30

"D2 - Scenario 2, PM" model duration: 17:00 - 18:30

Run using Junctions 8.0.3.332 at 19/02/2019 13:42:39

## File summary

### File Description

<b>Title</b>	Farrankelly
<b>Location</b>	Priory Road/Development Access
<b>Site Number</b>	N/A
<b>Date</b>	13/02/2019
<b>Version</b>	
<b>Status</b>	(new file)
<b>Identifier</b>	
<b>Client</b>	Cairn
<b>Jobnumber</b>	16.146
<b>Enumerator</b>	
<b>Description</b>	Priory Road Access will serve the South-western side of the proposed Farrankelly development.

## Analysis Options

Vehicle Length (m)	Do Queue Variations	Calculate Residual Capacity	Residual Capacity Criteria Type	RFC Threshold	Average Delay Threshold (s)	Queue Threshold (PCU)
5.75			N/A	0.85	36.00	20.00

## Units

Distance Units	Speed Units	Traffic Units Input	Traffic Units Results	Flow Units	Average Delay Units	Total Delay Units	Rate Of Delay Units
m	kph	PCU	PCU	perHour	s	-Min	perMin

# Scenario 2 - Post Dev - Des Year - Scenario 2, AM

## Data Errors and Warnings

*No errors or warnings*

## Analysis Set Details

Name	Description	Locked	Network Flow Scaling Factor (%)	Reason For Scaling Factors
Scenario 2 - Post Dev - Des Year	In Scenario 2 both the site accesses are open to the traffic. The year considered is the base year post development.		100.000	

## Demand Set Details

Name	Scenario Name	Time Period Name	Description	Traffic Profile Type	Model Start Time (HH:mm)	Model Finish Time (HH:mm)	Model Time Period Length (min)	Time Segment Length (min)	Single Time Segment Only	Locked
Scenario 2, AM	Scenario 2	AM		ONE HOUR	08:00	09:30	90	15		

# Junction Network

## Junctions

Name	Junction Type	Major Road Direction	Arm Order	Junction Delay (s)	Junction LOS
Priory Road Junction	T-Junction	Two-way	A,B,C	7.89	A

## Junction Network Options

Driving Side	Lighting
Left	Normal/unknown

# Arms

## Arms

Arm	Name	Description	Arm Type
A	Priory Road		Major
B	Priory Road		Minor
C	Priory Road		Major

## Major Arm Geometry

Arm	Width of carriageway (m)	Has kerbed central reserve	Width of kerbed central reserve (m)	Has right turn bay	Width For Right Turn (m)	Visibility For Right Turn (m)	Blocks?	Blocking Queue (PCU)
C	6.00		0.00		2.20	49.00		

*Geometries for Arm C are measured opposite Arm B. Geometries for Arm A (if relevant) are measured opposite Arm D.*

## Minor Arm Geometry

Arm	Minor Arm Type	Lane Width (m)	Lane Width (Left) (m)	Lane Width (Right) (m)	Width at give-way (m)	Width at 5m (m)	Width at 10m (m)	Width at 15m (m)	Width at 20m (m)	Estimate Flare Length	Flare Length (PCU)	Visibility To Left (m)	Visibility To Right (m)
B	One lane	2.75										49	49

## Pedestrian Crossings

Arm	Crossing Type
A	None
B	None
C	None

## Slope / Intercept / Capacity

### Priority Intersection Slopes and Intercepts

Junction	Stream	Intercept (PCU/hr)	Slope for A-B	Slope for A-C	Slope for C-A	Slope for C-B
1	B-A	504.721	0.092	0.232	0.146	0.332
1	B-C	638.395	0.098	0.247	-	-
1	C-B	602.340	0.233	0.233	-	-

*The slopes and intercepts shown above do NOT include any corrections or adjustments.*

*Streams may be combined, in which case capacity will be adjusted.*

*Values are shown for the first time segment only; they may differ for subsequent time segments.*

# Traffic Flows

## Demand Set Data Options

Default Vehicle Mix	Vehicle Mix Varies Over Time	Vehicle Mix Varies Over Turn	Vehicle Mix Varies Over Entry	Vehicle Mix Source	PCU Factor for a HV (PCU)	Default Turning Proportions	Estimate from entry/exit counts	Turning Proportions Vary Over Time	Turning Proportions Vary Over Turn	Turning Proportions Vary Over Entry
		✓	✓	HV Percentages	2.00				✓	✓

# Entry Flows

## General Flows Data

Arm	Profile Type	Use Turning Counts	Average Demand Flow (PCU/hr)	Flow Scaling Factor (%)
A	ONE HOUR	✓	100.00	100.000
B	ONE HOUR	✓	50.00	100.000
C	ONE HOUR	✓	143.00	100.000

# Turning Proportions

## Turning Counts or Proportions (PCU/hr) - Junction 1 (for whole period)

		To		
		A	B	C
From	A	0.000	7.000	93.000
	B	33.000	0.000	17.000
	C	136.000	7.000	0.000

## Turning Proportions (PCU) - Junction 1 (for whole period)

		To		
		A	B	C
From	A	0.00	0.07	0.93
	B	0.66	0.00	0.34
	C	0.95	0.05	0.00

# Vehicle Mix

## Average PCU Per Vehicle - Junction 1 (for whole period)

		To		
		A	B	C
From	A	1.000	1.000	1.000
	B	1.000	1.000	1.000
	C	1.000	1.000	1.000

## Heavy Vehicle Percentages - Junction 1 (for whole period)

		To		
		A	B	C
From	A	0.000	0.000	0.000
	B	0.000	0.000	0.000
	C	0.000	0.000	0.000

# Results

## Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS
B-AC	0.11	8.11	0.12	A
C-A	-	-	-	-
C-B	0.01	6.33	0.01	A
A-B	-	-	-	-
A-C	-	-	-	-

## Main Results for each time segment

### Main results: (08:00-08:15)

Stream	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
B-AC	37.64	37.33	0.00	513.24	0.073	0.08	7.559	A
C-A	102.39	102.39	0.00	-	-	-	-	-
C-B	5.27	5.23	0.00	584.77	0.009	0.01	6.211	A
A-B	5.27	5.27	0.00	-	-	-	-	-
A-C	70.02	70.02	0.00	-	-	-	-	-

### Main results: (08:15-08:30)

Stream	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
B-AC	44.95	44.88	0.00	507.33	0.089	0.10	7.784	A
C-A	122.26	122.26	0.00	-	-	-	-	-
C-B	6.29	6.29	0.00	581.36	0.011	0.01	6.259	A
A-B	6.29	6.29	0.00	-	-	-	-	-
A-C	83.61	83.61	0.00	-	-	-	-	-

### Main results: (08:30-08:45)

Stream	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
B-AC	55.05	54.95	0.00	499.15	0.110	0.12	8.102	A
C-A	149.74	149.74	0.00	-	-	-	-	-
C-B	7.71	7.70	0.00	576.64	0.013	0.01	6.326	A
A-B	7.71	7.71	0.00	-	-	-	-	-
A-C	102.39	102.39	0.00	-	-	-	-	-

### Main results: (08:45-09:00)

Stream	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
B-AC	55.05	55.05	0.00	499.15	0.110	0.12	8.106	A
C-A	149.74	149.74	0.00	-	-	-	-	-
C-B	7.71	7.71	0.00	576.64	0.013	0.01	6.326	A
A-B	7.71	7.71	0.00	-	-	-	-	-
A-C	102.39	102.39	0.00	-	-	-	-	-

**Main results: (09:00-09:15)**

Stream	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
B-AC	44.95	45.05	0.00	507.33	0.089	0.10	7.790	A
C-A	122.26	122.26	0.00	-	-	-	-	-
C-B	6.29	6.30	0.00	581.36	0.011	0.01	6.262	A
A-B	6.29	6.29	0.00	-	-	-	-	-
A-C	83.61	83.61	0.00	-	-	-	-	-

**Main results: (09:15-09:30)**

Stream	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
B-AC	37.64	37.72	0.00	513.23	0.073	0.08	7.571	A
C-A	102.39	102.39	0.00	-	-	-	-	-
C-B	5.27	5.28	0.00	584.77	0.009	0.01	6.211	A
A-B	5.27	5.27	0.00	-	-	-	-	-
A-C	70.02	70.02	0.00	-	-	-	-	-

Junctions 8
ARCADY 8 - Roundabout Module
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**Filename:** Site 2 - Sc1- post dev- base year.arc8

**Path:** P:\Proj\2016\16146\16146-14-CALCS\Traffic\Farrankelly Additional Site\Junctions 8 Calculations\All developments considered\Picady & Arcady analysis\Post Development Sc1

**Report generation date:** 19/02/2019 13:49:02

« Scenario 1 - Post Dev - Base Year - Scenario 1, AM

- » Junction Network
- » Arms
- » Traffic Flows
- » Entry Flows
- » Turning Proportions
- » Vehicle Mix
- » Results

**Summary of junction performance**

	AM					PM				
	Queue (PCU)	Delay (s)	RFC	LOS	Junction LOS	Queue (PCU)	Delay (s)	RFC	LOS	Junction LOS
Scenario 1 - Post Dev - Base Year - Scenario 1										
Arm 1	0.32	2.31	0.24	A	A	0.57	2.91	0.36	A	A
Arm 2	0.83	4.09	0.46	A		0.65	3.90	0.40	A	
Arm 3	0.64	2.86	0.39	A		0.86	3.22	0.46	A	
Arm 4	0.44	3.93	0.31	A		0.77	5.41	0.44	A	

Values shown are the maximum values over all time segments. Delay is the maximum value of average delay per arriving vehicle. Junction LOS and Junction Delay are demand-weighted averages.

"D1 - Scenario 1, AM " model duration: 08:00 - 09:30

"D2 - Scenario 1, PM" model duration: 17:00 - 18:30

Run using Junctions 8.0.3.332 at 19/02/2019 13:49:01

## File summary

### File Description

<b>Title</b>	Farrankelly
<b>Location</b>	Kilcoole Roundabout
<b>Site Number</b>	2
<b>Date</b>	13/02/2019
<b>Version</b>	
<b>Status</b>	
<b>Identifier</b>	
<b>Client</b>	Cairn
<b>Jobnumber</b>	16.146
<b>Enumerator</b>	EL
<b>Description</b>	Kilcoole Roundabout is accessed from the north by Kilcoole Road, directly connected to Kilcoole Road access.

## Analysis Options

Vehicle Length (m)	Do Queue Variations	Calculate Residual Capacity	Residual Capacity Criteria Type	RFC Threshold	Average Delay Threshold (s)	Queue Threshold (PCU)
5.75			N/A	0.85	36.00	20.00

## Units

Distance Units	Speed Units	Traffic Units Input	Traffic Units Results	Flow Units	Average Delay Units	Total Delay Units	Rate Of Delay Units
m	kph	PCU	PCU	perHour	s	-Min	perMin

# Scenario 1 - Post Dev - Base Year - Scenario 1, AM

## Data Errors and Warnings

*No errors or warnings*

## Analysis Set Details

Name	Description	Locked	Network Flow Scaling Factor (%)	Reason For Scaling Factors
Scenario 1 - Post Dev - Base Year	In Scenario 1 only the Kilcoole Road access is open. The year considered is the base year post development.		100.000	

## Demand Set Details

Name	Scenario Name	Time Period Name	Description	Traffic Profile Type	Model Start Time (HH:mm)	Model Finish Time (HH:mm)	Model Time Period Length (min)	Time Segment Length (min)	Single Time Segment Only	Locked
Scenario 1, AM	Scenario 1	AM		ONE HOUR	08:00	09:30	90	15		

# Junction Network

## Junctions

Name	Junction Type	Arm Order	Grade Separated	Large Roundabout	Junction Delay (s)	Junction LOS
Site 2 - Kilcoole roundabout	Roundabout	1,2,3,4			3.29	A

## Junction Network Options

Driving Side	Lighting
Left	Normal/unknown



# Arms

## Arms

Arm	Name	Description
1	R774	
2	R761	
3	R774 - Farrankelly Road	
4	R761 - Kilcoole road	

## Roundabout Geometry

Arm	V - Approach road half-width (m)	E - Entry width (m)	I' - Effective flare length (m)	R - Entry radius (m)	D - Inscribed circle diameter (m)	PHI - Conflict (entry) angle (deg)	Exit Only
1	6.30	8.40	12.10	35.70	66.00	23.00	
2	3.30	8.60	19.70	227.00	66.00	35.00	
3	6.80	8.20	10.90	101.90	66.00	35.00	
4	3.40	8.30	14.70	22.50	66.00	34.00	

## Pedestrian Crossings

Arm	Crossing Type
1	None
2	None
3	None
4	None

## Slope / Intercept / Capacity

### Roundabout Slope and Intercept used in model

Arm	Enter slope and intercept directly	Entered slope	Entered intercept (PCU/hr)	Final Slope	Final Intercept (PCU/hr)
1		(calculated)	(calculated)	0.654	2424.151
2		(calculated)	(calculated)	0.566	1913.611
3		(calculated)	(calculated)	0.646	2412.866
4		(calculated)	(calculated)	0.528	1733.833

*The slope and intercept shown above include any corrections and adjustments.*

# Traffic Flows

## Demand Set Data Options

Default Vehicle Mix	Vehicle Mix Varies Over Time	Vehicle Mix Varies Over Turn	Vehicle Mix Varies Over Entry	Vehicle Mix Source	PCU Factor for a HV (PCU)	Default Turning Proportions	Estimate from entry/exit counts	Turning Proportions Vary Over Time	Turning Proportions Vary Over Turn	Turning Proportions Vary Over Entry
		✓	✓	HV Percentages	2.00				✓	✓

# Entry Flows

## General Flows Data

Arm	Profile Type	Use Turning Counts	Average Demand Flow (PCU/hr)	Flow Scaling Factor (%)
1	ONE HOUR	✓	458.00	100.000
2	ONE HOUR	✓	670.00	100.000
3	ONE HOUR	✓	736.00	100.000
4	ONE HOUR	✓	365.00	100.000

# Turning Proportions

## Turning Counts or Proportions (PCU/hr) - Junction 1 (for whole period)

		To			
		1	2	3	4
From	1	0.000	116.000	293.000	49.000
	2	169.000	0.000	234.000	267.000
	3	346.000	175.000	27.000	188.000
	4	65.000	194.000	106.000	0.000

## Turning Proportions (PCU) - Junction 1 (for whole period)

		To			
		1	2	3	4
From	1	0.00	0.25	0.64	0.11
	2	0.25	0.00	0.35	0.40
	3	0.47	0.24	0.04	0.26
	4	0.18	0.53	0.29	0.00

# Vehicle Mix

## Average PCU Per Vehicle - Junction 1 (for whole period)

		To			
		1	2	3	4
From	1	1.000	1.000	1.000	1.000
	2	1.000	1.000	1.000	1.000
	3	1.000	1.000	1.000	1.000
	4	1.000	1.000	1.000	1.000

## Heavy Vehicle Percentages - Junction 1 (for whole period)

		To			
		1	2	3	4
From	1	0.000	0.000	0.000	0.000
	2	0.000	0.000	0.000	0.000
	3	0.000	0.000	0.000	0.000
	4	0.000	0.000	0.000	0.000

# Results

## Results Summary for whole modelled period

Arm	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS
1	0.24	2.31	0.32	A
2	0.46	4.09	0.83	A
3	0.39	2.86	0.64	A
4	0.31	3.93	0.44	A

## Main Results for each time segment

### Main results: (08:00-08:15)

Arm	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Circulating Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
1	344.81	344.06	376.79	0.00	2177.70	0.158	0.19	1.962	A
2	504.41	502.75	356.72	0.00	1711.64	0.295	0.42	2.974	A
3	554.10	552.74	363.97	0.00	2177.61	0.254	0.34	2.213	A
4	274.79	273.86	538.36	0.00	1449.56	0.190	0.23	3.057	A

### Main results: (08:15-08:30)

Arm	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Circulating Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
1	411.73	411.53	450.93	0.00	2129.21	0.193	0.24	2.095	A
2	602.32	601.74	426.76	0.00	1671.98	0.360	0.56	3.362	A
3	661.65	661.22	435.61	0.00	2131.31	0.310	0.45	2.449	A
4	328.13	327.83	644.10	0.00	1393.73	0.235	0.31	3.377	A

### Main results: (08:30-08:45)

Arm	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Circulating Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
1	504.27	503.93	552.07	0.00	2063.05	0.244	0.32	2.309	A
2	737.68	736.60	522.56	0.00	1617.74	0.456	0.83	4.080	A
3	810.35	809.58	533.25	0.00	2068.20	0.392	0.64	2.859	A
4	401.87	401.35	788.58	0.00	1317.44	0.305	0.44	3.928	A

### Main results: (08:45-09:00)

Arm	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Circulating Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
1	504.27	504.26	552.71	0.00	2062.64	0.244	0.32	2.309	A
2	737.68	737.67	522.98	0.00	1617.50	0.456	0.83	4.091	A
3	810.35	810.34	533.99	0.00	2067.72	0.392	0.64	2.862	A
4	401.87	401.87	789.42	0.00	1316.99	0.305	0.44	3.933	A

**Main results: (09:00-09:15)**

Arm	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Circulating Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
1	411.73	412.06	451.92	0.00	2128.56	0.193	0.24	2.099	A
2	602.32	603.39	427.44	0.00	1671.60	0.360	0.57	3.375	A
3	661.65	662.41	436.74	0.00	2130.58	0.311	0.45	2.452	A
4	328.13	328.64	645.41	0.00	1393.04	0.236	0.31	3.385	A

**Main results: (09:15-09:30)**

Arm	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Circulating Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
1	344.81	345.01	378.30	0.00	2176.71	0.158	0.19	1.966	A
2	504.41	505.00	357.86	0.00	1710.99	0.295	0.42	2.985	A
3	554.10	554.54	365.54	0.00	2176.60	0.255	0.34	2.219	A
4	274.79	275.09	540.27	0.00	1448.55	0.190	0.24	3.070	A

<b>Junctions 8</b>
<b>ARCADY 8 - Roundabout Module</b>
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**Filename:** Site 2 - Sc1- post dev-design year.arc8

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**Report generation date:** 19/02/2019 13:53:58

« **Scenario 1 - Post Dev - Base Year - Scenario 1, AM**

- » **Junction Network**
- » **Arms**
- » **Traffic Flows**
- » **Entry Flows**
- » **Turning Proportions**
- » **Vehicle Mix**
- » **Results**

**Summary of junction performance**

	AM					PM				
	Queue (PCU)	Delay (s)	RFC	LOS	Junction LOS	Queue (PCU)	Delay (s)	RFC	LOS	Junction LOS
<b>Scenario 1 - Post Dev - Base Year - Scenario 1</b>										
<b>Arm 1</b>	0.38	2.44	0.28	A	A	0.72	3.26	0.42	A	A
<b>Arm 2</b>	1.09	4.78	0.52	A		0.88	4.57	0.47	A	
<b>Arm 3</b>	0.77	3.15	0.44	A		1.19	3.89	0.55	A	
<b>Arm 4</b>	0.51	4.27	0.34	A		0.95	6.36	0.49	A	

Values shown are the maximum values over all time segments. Delay is the maximum value of average delay per arriving vehicle. Junction LOS and Junction Delay are demand-weighted averages.

"D1 - Scenario 1, AM " model duration: 08:00 - 09:30

"D2 - Scenario 1, PM" model duration: 17:00 - 18:30

Run using Junctions 8.0.3.332 at 19/02/2019 13:53:57

## File summary

### File Description

<b>Title</b>	Farrankelly
<b>Location</b>	Kilcoole Roundabout
<b>Site Number</b>	2
<b>Date</b>	13/02/2019
<b>Version</b>	
<b>Status</b>	
<b>Identifier</b>	
<b>Client</b>	Cairn
<b>Jobnumber</b>	16.146
<b>Enumerator</b>	EL
<b>Description</b>	Kilcoole Roundabout is accessed from the north by Kilcoole Road, directly connected to Kilcoole Road access.

## Analysis Options

Vehicle Length (m)	Do Queue Variations	Calculate Residual Capacity	Residual Capacity Criteria Type	RFC Threshold	Average Delay Threshold (s)	Queue Threshold (PCU)
5.75			N/A	0.85	36.00	20.00

## Units

Distance Units	Speed Units	Traffic Units Input	Traffic Units Results	Flow Units	Average Delay Units	Total Delay Units	Rate Of Delay Units
m	kph	PCU	PCU	perHour	s	-Min	perMin

# Scenario 1 - Post Dev - Base Year - Scenario 1, AM

## Data Errors and Warnings

*No errors or warnings*

## Analysis Set Details

Name	Description	Locked	Network Flow Scaling Factor (%)	Reason For Scaling Factors
Scenario 1 - Post Dev - Base Year			100.000	

## Demand Set Details

Name	Scenario Name	Time Period Name	Description	Traffic Profile Type	Model Start Time (HH:mm)	Model Finish Time (HH:mm)	Model Time Period Length (min)	Time Segment Length (min)	Single Time Segment Only	Locked
Scenario 1, AM	Scenario 1	AM		ONE HOUR	08:00	09:30	90	15		

# Junction Network

## Junctions

Name	Junction Type	Arm Order	Grade Separated	Large Roundabout	Junction Delay (s)	Junction LOS
Site 2 - Kilcoole roundabout	Roundabout	1,2,3,4			3.68	A

## Junction Network Options

Driving Side	Lighting
Left	Normal/unknown

# Arms

## Arms

Arm	Name	Description
1	R774	
2	R761	
3	R774 - Farrankelly Road	
4	R761 - Kilcoole road	

## Roundabout Geometry

Arm	V - Approach road half-width (m)	E - Entry width (m)	I' - Effective flare length (m)	R - Entry radius (m)	D - Inscribed circle diameter (m)	PHI - Conflict (entry) angle (deg)	Exit Only
1	6.30	8.40	12.10	35.70	66.00	23.00	
2	3.30	8.60	19.70	227.00	66.00	35.00	
3	6.80	8.20	10.90	101.90	66.00	35.00	
4	3.40	8.30	14.70	22.50	66.00	34.00	

## Pedestrian Crossings

Arm	Crossing Type
1	None
2	None
3	None
4	None

## Slope / Intercept / Capacity

### Roundabout Slope and Intercept used in model

Arm	Enter slope and intercept directly	Entered slope	Entered intercept (PCU/hr)	Final Slope	Final Intercept (PCU/hr)
1		(calculated)	(calculated)	0.654	2424.151
2		(calculated)	(calculated)	0.566	1913.611
3		(calculated)	(calculated)	0.646	2412.866
4		(calculated)	(calculated)	0.528	1733.833

*The slope and intercept shown above include any corrections and adjustments.*

# Traffic Flows

## Demand Set Data Options

Default Vehicle Mix	Vehicle Mix Varies Over Time	Vehicle Mix Varies Over Turn	Vehicle Mix Varies Over Entry	Vehicle Mix Source	PCU Factor for a HV (PCU)	Default Turning Proportions	Estimate from entry/exit counts	Turning Proportions Vary Over Time	Turning Proportions Vary Over Turn	Turning Proportions Vary Over Entry
		✓	✓	HV Percentages	2.00				✓	✓

# Entry Flows

## General Flows Data

Arm	Profile Type	Use Turning Counts	Average Demand Flow (PCU/hr)	Flow Scaling Factor (%)
1	ONE HOUR	✓	515.00	100.000
2	ONE HOUR	✓	753.00	100.000
3	ONE HOUR	✓	804.00	100.000
4	ONE HOUR	✓	396.00	100.000

# Turning Proportions

## Turning Counts or Proportions (PCU/hr) - Junction 1 (for whole period)

		To			
		1	2	3	4
From	1	0.000	131.000	332.000	52.000
	2	187.000	0.000	266.000	300.000
	3	388.000	175.000	31.000	210.000
	4	68.000	212.000	116.000	0.000

## Turning Proportions (PCU) - Junction 1 (for whole period)

		To			
		1	2	3	4
From	1	0.00	0.25	0.64	0.10
	2	0.25	0.00	0.35	0.40
	3	0.48	0.22	0.04	0.26
	4	0.17	0.54	0.29	0.00

# Vehicle Mix

## Average PCU Per Vehicle - Junction 1 (for whole period)

		To			
		1	2	3	4
From	1	1.000	1.000	1.000	1.000
	2	1.000	1.000	1.000	1.000
	3	1.000	1.000	1.000	1.000
	4	1.000	1.000	1.000	1.000

## Heavy Vehicle Percentages - Junction 1 (for whole period)

		To			
		1	2	3	4
From	1	0.000	0.000	0.000	0.000
	2	0.000	0.000	0.000	0.000
	3	0.000	0.000	0.000	0.000
	4	0.000	0.000	0.000	0.000



# Results

## Results Summary for whole modelled period

Arm	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS
1	0.28	2.44	0.38	A
2	0.52	4.78	1.09	A
3	0.44	3.15	0.77	A
4	0.34	4.27	0.51	A

## Main Results for each time segment

### Main results: (08:00-08:15)

Arm	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Circulating Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
1	387.72	386.85	400.75	0.00	2162.03	0.179	0.22	2.027	A
2	566.90	564.89	398.75	0.00	1687.84	0.336	0.50	3.200	A
3	605.29	603.73	404.40	0.00	2151.48	0.281	0.39	2.324	A
4	298.13	297.08	586.33	0.00	1424.24	0.209	0.26	3.191	A

### Main results: (08:15-08:30)

Arm	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Circulating Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
1	462.97	462.73	479.63	0.00	2110.44	0.219	0.28	2.184	A
2	676.93	676.16	477.05	0.00	1643.51	0.412	0.70	3.717	A
3	722.78	722.25	484.03	0.00	2100.02	0.344	0.52	2.613	A
4	356.00	355.64	701.52	0.00	1363.41	0.261	0.35	3.572	A

### Main results: (08:30-08:45)

Arm	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Circulating Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
1	567.03	566.61	587.16	0.00	2040.10	0.278	0.38	2.443	A
2	829.07	827.50	584.11	0.00	1582.90	0.524	1.09	4.756	A
3	885.22	884.24	592.39	0.00	2029.97	0.436	0.77	3.139	A
4	436.00	435.36	858.78	0.00	1280.37	0.341	0.51	4.258	A

### Main results: (08:45-09:00)

Arm	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Circulating Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
1	567.03	567.02	587.94	0.00	2039.59	0.278	0.38	2.444	A
2	829.07	829.04	584.64	0.00	1582.60	0.524	1.09	4.777	A
3	885.22	885.21	593.43	0.00	2029.30	0.436	0.77	3.145	A
4	436.00	436.00	859.88	0.00	1279.79	0.341	0.51	4.266	A

**Main results: (09:00-09:15)**

Arm	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Circulating Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
1	462.97	463.38	480.83	0.00	2109.65	0.219	0.28	2.188	A
2	676.93	678.49	477.89	0.00	1643.04	0.412	0.71	3.737	A
3	722.78	723.75	485.60	0.00	2099.00	0.344	0.53	2.621	A
4	356.00	356.63	703.21	0.00	1362.52	0.261	0.36	3.583	A

**Main results: (09:15-09:30)**

Arm	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Circulating Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
1	387.72	387.97	402.46	0.00	2160.91	0.179	0.22	2.030	A
2	566.90	567.69	400.08	0.00	1687.09	0.336	0.51	3.220	A
3	605.29	605.83	406.32	0.00	2150.24	0.282	0.39	2.333	A
4	298.13	298.49	588.57	0.00	1423.05	0.210	0.27	3.204	A

<b>Junctions 8</b>
<b>ARCADY 8 - Roundabout Module</b>
Version: 8.0.3.332 [14595,13/11/2013] © Copyright TRL Limited, 2019
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**Filename:** Site 4 - Sc1- post dev- base year.arc8

**Path:** P:\Proj\2016\16146\16146-14-CALCS\Traffic\Farrankelly Additional Site\Junctions 8 Calculations\All developments considered\Picady & Arcady analysis\Post Development Sc1

**Report generation date:** 19/02/2019 14:02:10

« **Scenario 1 - Post Dev - Base Year - Scenario 1, AM**

- » **Junction Network**
- » **Arms**
- » **Traffic Flows**
- » **Entry Flows**
- » **Turning Proportions**
- » **Vehicle Mix**
- » **Results**

**Summary of junction performance**

	AM					PM				
	Queue (PCU)	Delay (s)	RFC	LOS	Junction LOS	Queue (PCU)	Delay (s)	RFC	LOS	Junction LOS
<b>Scenario 1 - Post Dev - Base Year - Scenario 1</b>										
Junction 1 - Arm 1	0.79	9.22	0.45	A	C	1.00	8.32	0.50	A	A
Junction 1 - Arm 2	1.03	8.20	0.51	A		1.69	11.32	0.63	B	
Junction 1 - Arm 3	7.11	28.52	0.89	D		0.25	4.10	0.20	A	
Junction 2 - Arm 1	0.75	5.00	0.43	A	B	0.21	3.51	0.18	A	A
Junction 2 - Arm 2	0.98	10.28	0.50	B		1.47	11.85	0.60	B	
Junction 2 - Arm 3	3.47	18.07	0.78	C		0.92	7.59	0.48	A	

Values shown are the maximum values over all time segments. Delay is the maximum value of average delay per arriving vehicle. Junction LOS and Junction Delay are demand-weighted averages.

"D1 - Scenario 1, AM " model duration: 08:00 - 09:30

"D2 - Scenario 1, PM" model duration: 17:00 - 18:30

Run using Junctions 8.0.3.332 at 19/02/2019 14:02:07

## File summary

### File Description

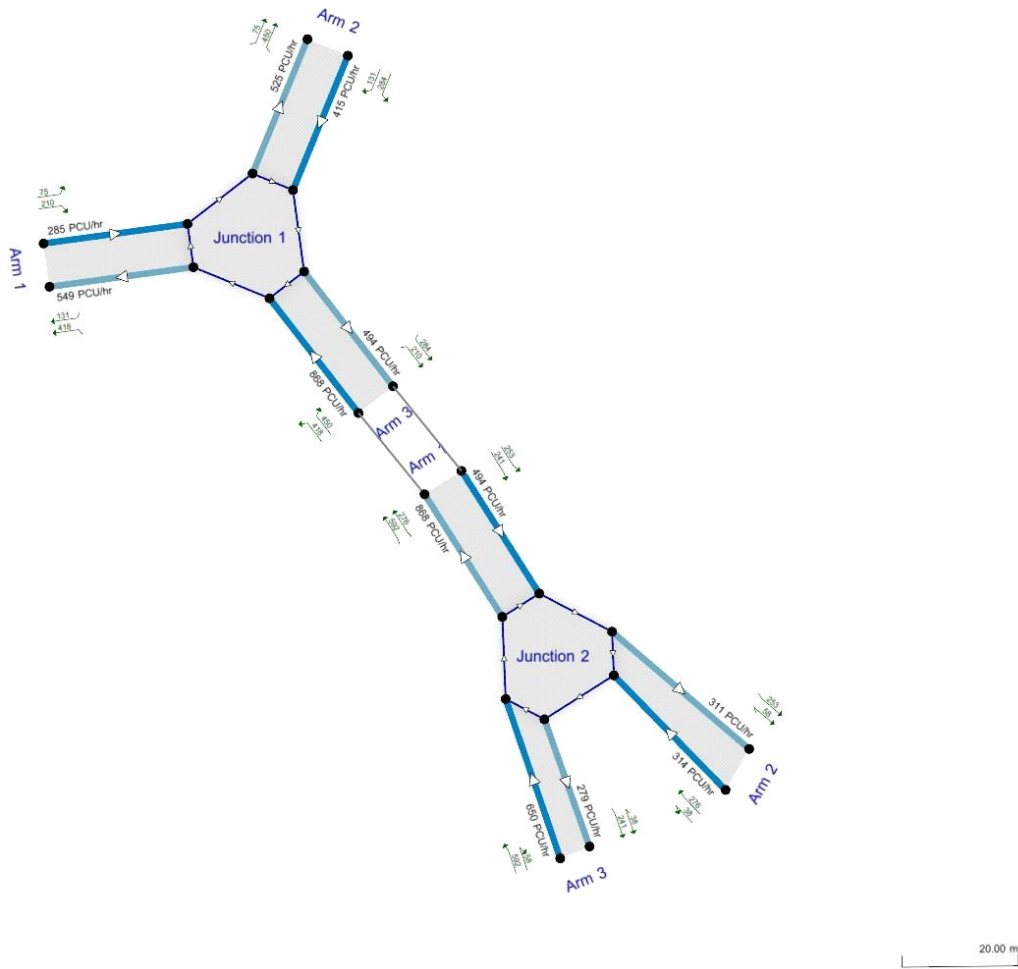
<b>Title</b>	Farrankelly
<b>Location</b>	Killincarrig Cross Roads
<b>Site Number</b>	4
<b>Date</b>	13/02/2019
<b>Version</b>	
<b>Status</b>	
<b>Identifier</b>	
<b>Client</b>	Cairn
<b>Jobnumber</b>	16.146
<b>Enumerator</b>	EL
<b>Description</b>	Killincarrig Cross Roadst is the greater affected roundabout by the proposed development. It will be accessed from the south by Kilcoole Road, directly connected to Kilcoole Road access.

## Analysis Options

Vehicle Length (m)	Do Queue Variations	Calculate Residual Capacity	Residual Capacity Criteria Type	RFC Threshold	Average Delay Threshold (s)	Queue Threshold (PCU)
5.75			N/A	0.85	36.00	20.00

## Units

Distance Units	Speed Units	Traffic Units Input	Traffic Units Results	Flow Units	Average Delay Units	Total Delay Units	Rate Of Delay Units
m	kph	PCU	PCU	perHour	s	-Min	perMin



Text overlays show original input turning counts (PCU/hr). They do NOT indicate junction performance.  
 Time Segment: (08:00-08:15)  
 Showing Analysis Set "A1 - Scenario 1 - Post Dev - Base Year "; Demand Set "D1 - Scenario 1, AM"

The junction diagram reflects the last run of ARCADY.

## Scenario 1 - Post Dev - Base Year - Scenario 1, AM

### Data Errors and Warnings

Severity	Area	Item	Description
Warning	Linked Roundabout	Junction 1 - Arm 3	If the distance between linked junctions is small, results should be treated with caution. The linked junctions will be modelled as separate junctions, but the real behaviour may be that of a complex system with interactions that cannot be modelled.
Warning	Linked Roundabout	Junction 2 - Arm 1	If the distance between linked junctions is small, results should be treated with caution. The linked junctions will be modelled as separate junctions, but the real behaviour may be that of a complex system with interactions that cannot be modelled.

### Analysis Set Details

Name	Description	Locked	Network Flow Scaling Factor (%)	Reason For Scaling Factors
Scenario 1 - Post Dev - Base Year	In Scenario 1 only the Kilcoole Road access is open. The year considered is the base year post development.		100.000	

## Demand Set Details

Name	Scenario Name	Time Period Name	Description	Traffic Profile Type	Model Start Time (HH:mm)	Model Finish Time (HH:mm)	Model Time Period Length (min)	Time Segment Length (min)	Single Time Segment Only	Locked
Scenario 1, AM	Scenario 1	AM		Varies by Arm	08:00	09:30	90	15		

## Junction Network

### Junctions

Junction	Name	Junction Type	Arm Order	Grade Separated	Large Roundabout	Junction Delay (s)	Junction LOS
1	Northern Roundabout	Roundabout	1,2,3			19.63	C
2	Southern Roundabout	Roundabout	1,2,3			11.96	B

### Junction Network Options

Driving Side	Lighting
Left	Normal/unknown

## Arms

### Arms

Junction	Arm	Name	Description
1	1	R762	
1	2	R761 -North arm	
1	3	R761 -South arm	
2	1	R761	
2	2	R762 - Mil Road	
2	3	R761 - Kilcoole Road	

### Roundabout Geometry

Junction	Arm	V - Approach road half-width (m)	E - Entry width (m)	I' - Effective flare length (m)	R - Entry radius (m)	D - Inscribed circle diameter (m)	PHI - Conflict (entry) angle (deg)	Exit Only
1	1	3.20	3.50	19.90	26.20	20.00	66.00	
1	2	3.10	4.20	5.50	39.84	20.00	71.00	
1	3	3.40	3.70	4.30	38.00	20.00	24.00	
2	1	3.30	4.20	7.90	63.95	18.00	15.00	
2	2	2.70	3.50	6.80	11.68	18.00	74.00	
2	3	3.10	3.60	5.06	42.60	18.00	31.00	

### Pedestrian Crossings

Junction	Arm	Crossing Type
1	1	None
1	2	None
1	3	None
2	1	None
2	2	None
2	3	None

## Slope / Intercept / Capacity

### Roundabout Slope and Intercept used in model

Junction	Arm	Enter slope and intercept directly	Entered slope	Entered intercept (PCU/hr)	Final Slope	Final Intercept (PCU/hr)
1	1		(calculated)	(calculated)	0.471	936.585
1	2		(calculated)	(calculated)	0.484	1007.806
1	3		(calculated)	(calculated)	0.565	1153.090
2	1		(calculated)	(calculated)	0.610	1302.511
2	2		(calculated)	(calculated)	0.422	807.777
2	3		(calculated)	(calculated)	0.544	1078.098

The slope and intercept shown above include any corrections and adjustments.

## Traffic Flows

### Demand Set Data Options

Default Vehicle Mix	Vehicle Mix Varies Over Time	Vehicle Mix Varies Over Turn	Vehicle Mix Varies Over Entry	Vehicle Mix Source	PCU Factor for a HV (PCU)	Default Turning Proportions	Estimate from entry/exit counts	Turning Proportions Vary Over Time	Turning Proportions Vary Over Turn	Turning Proportions Vary Over Entry
		✓	✓	HV Percentages	2.00				✓	✓

## Entry Flows

### General Flows Data

Junction	Arm	Profile Type	Use Turning Counts	Average Demand Flow (PCU/hr)	Flow Scaling Factor (%)
1	1	ONE HOUR	✓	285.00	100.000
1	2	ONE HOUR	✓	415.00	100.000
1	3	Linked Arm		N/A	
2	1	Linked Arm		N/A	
2	2	ONE HOUR	✓	314.00	100.000
2	3	ONE HOUR	✓	650.00	100.000

### Linked Arm Data

Junction	Arm	From Junction ID	From Arm ID	Link Type	Flow Source	Uniform Flow (PCU/hr)	Flow Multiplier (%)	Internal Storage Space (PCU)
1	3	2	1	Simple (vertical queueing)	Normal	0.00	100.00	
2	1	1	3	Simple (vertical queueing)	Normal	0.00	100.00	

## Turning Proportions

### Turning Counts or Proportions (PCU/hr) - Junction 1 (for whole period)

		To		
		1	2	3
From	1	0.000	75.000	210.000
	2	131.000	0.000	284.000
	3	418.000	450.000	0.000

**Turning Proportions (PCU) - Junction 1 (for whole period)**

		To		
		1	2	3
From	1	0.00	0.26	0.74
	2	0.32	0.00	0.68
	3	0.48	0.52	0.00

**Turning Counts or Proportions (PCU/hr) - Junction 2 (for whole period)**

		To		
		1	2	3
From	1	0.000	253.000	241.000
	2	276.000	0.000	38.000
	3	592.000	58.000	0.000

**Turning Proportions (PCU) - Junction 2 (for whole period)**

		To		
		1	2	3
From	1	0.00	0.51	0.49
	2	0.88	0.00	0.12
	3	0.91	0.09	0.00

## Vehicle Mix

**Average PCU Per Vehicle - Junction 1 (for whole period)**

		To		
		1	2	3
From	1	1.000	1.000	1.000
	2	1.000	1.000	1.000
	3	1.000	1.000	1.000

**Heavy Vehicle Percentages - Junction 1 (for whole period)**

		To		
		1	2	3
From	1	0.000	0.000	0.000
	2	0.000	0.000	0.000
	3	0.000	0.000	0.000

**Average PCU Per Vehicle - Junction 2 (for whole period)**

		To		
		1	2	3
From	1	1.000	1.000	1.000
	2	1.000	1.000	1.000
	3	1.000	1.000	1.000



### Heavy Vehicle Percentages - Junction 2 (for whole period)

		To		
		1	2	3
From	1	0.000	0.000	0.000
	2	0.000	0.000	0.000
	3	0.000	0.000	0.000

## Results

### Results Summary for whole modelled period

Junction	Arm	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS
1	1	0.45	9.22	0.79	A
1	2	0.51	8.20	1.03	A
1	3	0.89	28.52	7.11	D
2	1	0.43	5.00	0.75	A
2	2	0.50	10.28	0.98	B
2	3	0.78	18.07	3.47	C

### Main Results for each time segment

#### Main results: (08:00-08:15)

Junction	Arm	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Circulating Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
1	1	214.56	213.06	333.09	0.00	779.64	0.275	0.38	6.337	A
1	2	312.43	310.44	156.99	0.00	931.75	0.335	0.50	5.775	A
1	3	648.14	642.50	97.99	0.00	1097.70	0.590	1.41	7.816	A
2	1	369.43	367.81	43.31	0.00	1276.10	0.290	0.40	3.956	A
2	2	236.40	234.51	179.44	0.00	732.09	0.323	0.47	7.207	A
2	3	489.35	485.32	206.13	0.00	966.06	0.507	1.01	7.431	A

#### Main results: (08:15-08:30)

Junction	Arm	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Circulating Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
1	1	256.21	255.65	401.07	0.00	747.60	0.343	0.52	7.310	A
1	2	373.08	372.36	188.38	0.00	916.54	0.407	0.68	6.607	A
1	3	777.63	773.62	117.54	0.00	1086.66	0.716	2.41	11.350	B
2	1	443.20	442.69	51.94	0.00	1270.84	0.349	0.53	4.344	A
2	2	282.28	281.60	215.97	0.00	716.68	0.394	0.64	8.261	A
2	3	584.34	582.04	247.52	0.00	943.56	0.619	1.58	9.894	A

**Main results: (08:30-08:45)**

Junction	Arm	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Circulating Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
1	1	313.79	312.73	483.57	0.00	708.73	0.443	0.78	9.066	A
1	2	456.92	455.55	230.43	0.00	896.17	0.510	1.02	8.144	A
1	3	948.16	932.75	143.80	0.00	1071.81	0.885	6.27	23.599	C
2	1	542.18	541.33	63.23	0.00	1263.95	0.429	0.74	4.975	A
2	2	345.72	344.42	264.09	0.00	696.38	0.496	0.97	10.189	B
2	3	715.66	708.65	302.74	0.00	913.54	0.783	3.34	17.001	C

**Main results: (08:45-09:00)**

Junction	Arm	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Circulating Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
1	1	313.79	313.73	493.44	0.00	704.08	0.446	0.79	9.219	A
1	2	456.92	456.89	231.17	0.00	895.81	0.510	1.03	8.200	A
1	3	955.15	951.79	144.22	0.00	1071.58	0.891	7.11	28.522	D
2	1	543.84	543.81	63.81	0.00	1263.60	0.430	0.75	5.001	A
2	2	345.72	345.68	265.30	0.00	695.87	0.497	0.98	10.276	B
2	3	715.66	715.12	303.84	0.00	912.94	0.784	3.47	18.067	C

**Main results: (09:00-09:15)**

Junction	Arm	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Circulating Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
1	1	256.21	257.24	417.51	0.00	739.86	0.346	0.54	7.477	A
1	2	373.08	374.42	189.55	0.00	915.97	0.407	0.70	6.663	A
1	3	787.96	805.33	118.19	0.00	1086.29	0.725	2.77	13.529	B
2	1	445.78	446.60	52.78	0.00	1270.33	0.351	0.54	4.374	A
2	2	282.28	283.54	217.88	0.00	715.88	0.394	0.66	8.352	A
2	3	584.34	591.51	249.23	0.00	942.63	0.620	1.68	10.453	B

**Main results: (09:15-09:30)**

Junction	Arm	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Circulating Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
1	1	214.56	215.16	342.88	0.00	775.02	0.277	0.39	6.438	A
1	2	312.43	313.18	158.54	0.00	931.00	0.336	0.51	5.833	A
1	3	656.40	661.37	98.86	0.00	1097.22	0.598	1.52	8.352	A
2	1	372.86	373.37	43.89	0.00	1275.75	0.292	0.42	3.991	A
2	2	236.40	237.10	182.15	0.00	730.94	0.323	0.48	7.299	A
2	3	489.35	491.88	208.41	0.00	964.82	0.507	1.05	7.651	A

<b>Junctions 8</b>
<b>ARCADY 8 - Roundabout Module</b>
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**Filename:** Site 4 - Sc1- post dev- design year.arc8

**Path:** P:\Proj\2016\16146\16146-14-CALCS\Traffic\Farrankelly Additional Site\Junctions 8 Calculations\All developments considered\Picady & Arcady analysis\Post Development Sc1

**Report generation date:** 19/02/2019 14:09:44

« **Scenario 1 - Post Dev Design Year - Scenario 1, AM**

- » **Junction Network**
- » **Arms**
- » **Traffic Flows**
- » **Entry Flows**
- » **Turning Proportions**
- » **Vehicle Mix**
- » **Results**

**Summary of junction performance**

	AM					PM				
	Queue (PCU)	Delay (s)	RFC	LOS	Junction LOS	Queue (PCU)	Delay (s)	RFC	LOS	Junction LOS
<b>Scenario 1 - Post Dev Design Year - Scenario 1</b>										
Junction 1 - Arm 1	1.05	10.81	0.52	B	E	1.19	9.12	0.55	A	B
Junction 1 - Arm 2	1.39	9.84	0.59	A		2.27	13.97	0.70	B	
Junction 1 - Arm 3	20.64	70.79	1.00	F		0.25	4.13	0.20	A	
Junction 2 - Arm 1	0.94	5.55	0.49	A	C	0.22	3.53	0.18	A	A
Junction 2 - Arm 2	1.31	12.27	0.57	B		1.80	13.45	0.65	B	
Junction 2 - Arm 3	6.38	31.21	0.88	D		1.32	9.46	0.57	A	

Values shown are the maximum values over all time segments. Delay is the maximum value of average delay per arriving vehicle. Junction LOS and Junction Delay are demand-weighted averages.

"D1 - Scenario 1, AM " model duration: 08:00 - 09:30

"D2 - Scenario 1, PM" model duration: 17:00 - 18:30

Run using Junctions 8.0.3.332 at 19/02/2019 14:09:42

## File summary

### File Description

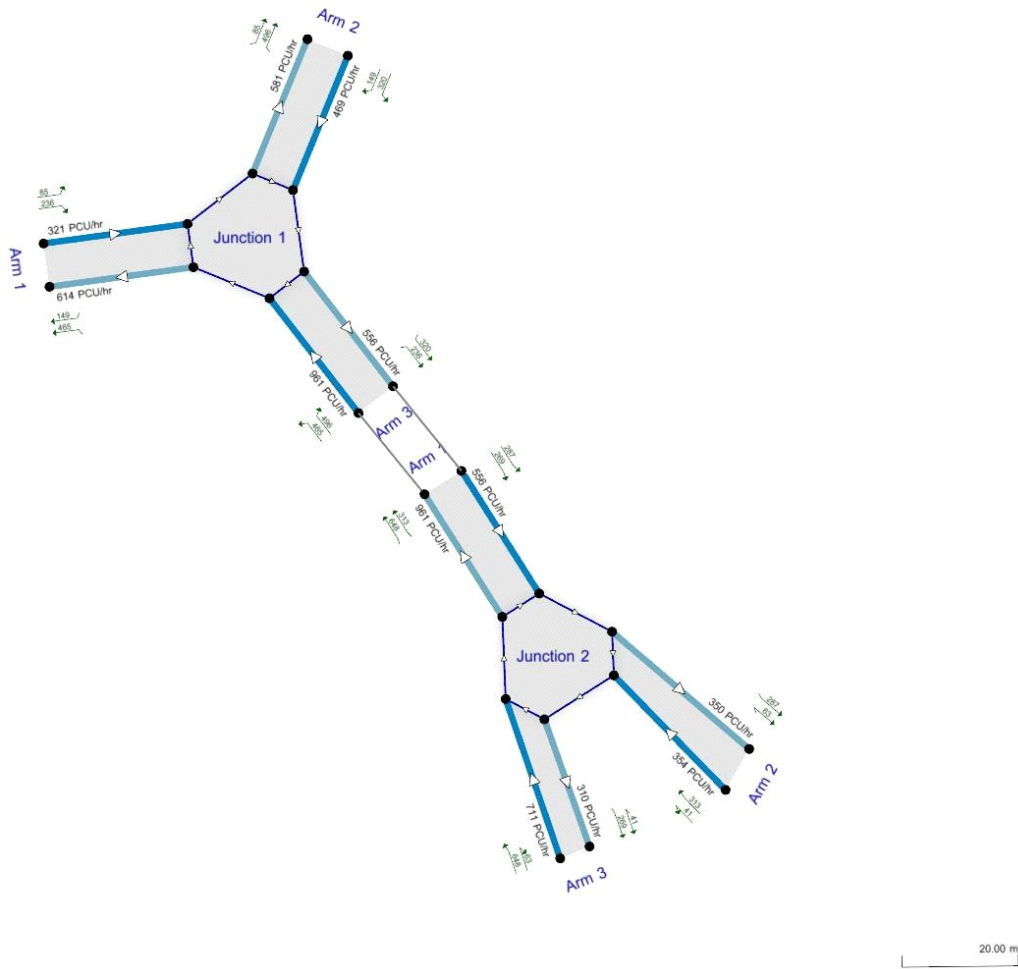
<b>Title</b>	Farrankelly
<b>Location</b>	Killincarrig Cross Roads
<b>Site Number</b>	4
<b>Date</b>	13/02/2019
<b>Version</b>	
<b>Status</b>	
<b>Identifier</b>	
<b>Client</b>	Cairn
<b>Jobnumber</b>	16.146
<b>Enumerator</b>	EL
<b>Description</b>	Killincarrig Cross Roads is the greater affected roundabout by the proposed development. It will be accessed from the south by Kilcoole Road, directly connected to Kilcoole Road access.

## Analysis Options

Vehicle Length (m)	Do Queue Variations	Calculate Residual Capacity	Residual Capacity Criteria Type	RFC Threshold	Average Delay Threshold (s)	Queue Threshold (PCU)
5.75			N/A	0.85	36.00	20.00

## Units

Distance Units	Speed Units	Traffic Units Input	Traffic Units Results	Flow Units	Average Delay Units	Total Delay Units	Rate Of Delay Units
m	kph	PCU	PCU	perHour	s	-Min	perMin



Text overlays show original input turning counts (PCU/hr). They do NOT indicate junction performance.  
 Time Segment: (08:00-08:15)  
 Showing Analysis Set "A1 - Scenario 1 - Post Dev Design Year"; Demand Set "D1 - Scenario 1, AM"

The junction diagram reflects the last run of ARCADY.

## Scenario 1 - Post Dev Design Year - Scenario 1, AM

### Data Errors and Warnings

Severity	Area	Item	Description
Warning	Linked Roundabout	Junction 1 - Arm 3	If the distance between linked junctions is small, results should be treated with caution. The linked junctions will be modelled as separate junctions, but the real behaviour may be that of a complex system with interactions that cannot be modelled.
Warning	Linked Roundabout	Junction 2 - Arm 1	If the distance between linked junctions is small, results should be treated with caution. The linked junctions will be modelled as separate junctions, but the real behaviour may be that of a complex system with interactions that cannot be modelled.

### Analysis Set Details

Name	Description	Locked	Network Flow Scaling Factor (%)	Reason For Scaling Factors
Scenario 1 - Post Dev Design Year	In Scenario 1 only the Kilcoole Road access is open. The year considered is the base year post development.		100.000	

## Demand Set Details

Name	Scenario Name	Time Period Name	Description	Traffic Profile Type	Model Start Time (HH:mm)	Model Finish Time (HH:mm)	Model Time Period Length (min)	Time Segment Length (min)	Single Time Segment Only	Locked
Scenario 1, AM	Scenario 1	AM		Varies by Arm	08:00	09:30	90	15		

## Junction Network

### Junctions

Junction	Name	Junction Type	Arm Order	Grade Separated	Large Roundabout	Junction Delay (s)	Junction LOS
1	North Roundabout	Roundabout	1,2,3			43.45	E
2	South Roundabout	Roundabout	1,2,3			18.28	C

### Junction Network Options

Driving Side	Lighting
Left	Normal/unknown

## Arms

### Arms

Junction	Arm	Name	Description
1	1	R762	
1	2	R761 -North arm	
1	3	R761 -South arm	
2	1	R761	
2	2	R762 - Mil Road	
2	3	R761 - Kilcoole Road	

### Roundabout Geometry

Junction	Arm	V - Approach road half-width (m)	E - Entry width (m)	I' - Effective flare length (m)	R - Entry radius (m)	D - Inscribed circle diameter (m)	PHI - Conflict (entry) angle (deg)	Exit Only
1	1	3.20	3.50	19.90	26.20	20.00	66.00	
1	2	3.10	4.20	5.50	39.84	20.00	71.00	
1	3	3.40	3.70	4.30	38.00	20.00	24.00	
2	1	3.30	4.20	7.90	63.95	18.00	15.00	
2	2	2.70	3.50	6.80	11.68	18.00	74.00	
2	3	3.10	3.60	5.06	42.60	18.00	31.00	

### Pedestrian Crossings

Junction	Arm	Crossing Type
1	1	None
1	2	None
1	3	None
2	1	None
2	2	None
2	3	None

## Slope / Intercept / Capacity

### Roundabout Slope and Intercept used in model

Junction	Arm	Enter slope and intercept directly	Entered slope	Entered intercept (PCU/hr)	Final Slope	Final Intercept (PCU/hr)
1	1		(calculated)	(calculated)	0.471	936.585
1	2		(calculated)	(calculated)	0.484	1007.806
1	3		(calculated)	(calculated)	0.565	1153.090
2	1		(calculated)	(calculated)	0.610	1302.511
2	2		(calculated)	(calculated)	0.422	807.777
2	3		(calculated)	(calculated)	0.544	1078.098

The slope and intercept shown above include any corrections and adjustments.

## Traffic Flows

### Demand Set Data Options

Default Vehicle Mix	Vehicle Mix Varies Over Time	Vehicle Mix Varies Over Turn	Vehicle Mix Varies Over Entry	Vehicle Mix Source	PCU Factor for a HV (PCU)	Default Turning Proportions	Estimate from entry/exit counts	Turning Proportions Vary Over Time	Turning Proportions Vary Over Turn	Turning Proportions Vary Over Entry
		✓	✓	HV Percentages	2.00				✓	✓

## Entry Flows

### General Flows Data

Junction	Arm	Profile Type	Use Turning Counts	Average Demand Flow (PCU/hr)	Flow Scaling Factor (%)
1	1	ONE HOUR	✓	321.00	100.000
1	2	ONE HOUR	✓	469.00	100.000
1	3	Linked Arm		N/A	
2	1	Linked Arm		N/A	
2	2	ONE HOUR	✓	354.00	100.000
2	3	ONE HOUR	✓	711.00	100.000

### Linked Arm Data

Junction	Arm	From Junction ID	From Arm ID	Link Type	Flow Source	Uniform Flow (PCU/hr)	Flow Multiplier (%)	Internal Storage Space (PCU)
1	3	2	1	Simple (vertical queueing)	Normal	0.00	100.00	
2	1	1	3	Simple (vertical queueing)	Normal	0.00	100.00	

## Turning Proportions

### Turning Counts or Proportions (PCU/hr) - Junction 1 (for whole period)

		To		
		1	2	3
From	1	0.000	85.000	236.000
	2	149.000	0.000	320.000
	3	465.000	496.000	0.000

**Turning Proportions (PCU) - Junction 1 (for whole period)**

		To		
		1	2	3
From	1	0.00	0.26	0.74
	2	0.32	0.00	0.68
	3	0.48	0.52	0.00

**Turning Counts or Proportions (PCU/hr) - Junction 2 (for whole period)**

		To		
		1	2	3
From	1	0.000	287.000	269.000
	2	313.000	0.000	41.000
	3	648.000	63.000	0.000

**Turning Proportions (PCU) - Junction 2 (for whole period)**

		To		
		1	2	3
From	1	0.00	0.52	0.48
	2	0.88	0.00	0.12
	3	0.91	0.09	0.00

## Vehicle Mix

**Average PCU Per Vehicle - Junction 1 (for whole period)**

		To		
		1	2	3
From	1	1.000	1.000	1.000
	2	1.000	1.000	1.000
	3	1.000	1.000	1.000

**Heavy Vehicle Percentages - Junction 1 (for whole period)**

		To		
		1	2	3
From	1	0.000	0.000	0.000
	2	0.000	0.000	0.000
	3	0.000	0.000	0.000

**Average PCU Per Vehicle - Junction 2 (for whole period)**

		To		
		1	2	3
From	1	1.000	1.000	1.000
	2	1.000	1.000	1.000
	3	1.000	1.000	1.000



### Heavy Vehicle Percentages - Junction 2 (for whole period)

		To		
		1	2	3
From	1	0.000	0.000	0.000
	2	0.000	0.000	0.000
	3	0.000	0.000	0.000

## Results

### Results Summary for whole modelled period

Junction	Arm	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS
1	1	0.52	10.81	1.05	B
1	2	0.59	9.84	1.39	A
1	3	1.00	70.79	20.64	F
2	1	0.49	5.55	0.94	A
2	2	0.57	12.27	1.31	B
2	3	0.88	31.21	6.38	D

### Main Results for each time segment

#### Main results: (08:00-08:15)

Junction	Arm	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Circulating Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
1	1	241.67	239.84	366.15	0.00	764.06	0.316	0.46	6.844	A
1	2	353.09	350.63	176.33	0.00	922.38	0.383	0.61	6.271	A
1	3	716.86	709.41	111.40	0.00	1090.13	0.658	1.86	9.284	A
2	1	415.57	413.64	46.98	0.00	1273.86	0.326	0.48	4.176	A
2	2	266.51	264.21	200.13	0.00	723.36	0.368	0.58	7.802	A
2	3	535.28	530.24	233.61	0.00	951.12	0.563	1.26	8.457	A

#### Main results: (08:15-08:30)

Junction	Arm	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Circulating Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
1	1	288.57	287.82	440.12	0.00	729.20	0.396	0.65	8.142	A
1	2	421.62	420.64	211.61	0.00	905.29	0.466	0.86	7.413	A
1	3	859.89	852.73	133.64	0.00	1077.56	0.798	3.65	15.522	C
2	1	498.61	497.96	56.32	0.00	1268.17	0.393	0.64	4.670	A
2	2	318.24	317.32	240.92	0.00	706.16	0.451	0.81	9.236	A
2	3	639.17	635.65	280.57	0.00	925.60	0.691	2.14	12.263	B

**Main results: (08:30-08:45)**

Junction	Arm	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Circulating Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
1	1	353.43	351.94	516.81	0.00	693.07	0.510	1.02	10.505	B
1	2	516.38	514.31	258.75	0.00	882.45	0.585	1.38	9.721	A
1	3	1043.02	1001.33	163.39	0.00	1060.74	0.983	14.07	43.434	E
2	1	609.66	608.53	68.07	0.00	1261.01	0.483	0.93	5.509	A
2	2	389.76	387.83	294.42	0.00	683.59	0.570	1.29	12.090	B
2	3	782.83	768.17	342.92	0.00	891.71	0.878	5.81	26.442	D

**Main results: (08:45-09:00)**

Junction	Arm	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Circulating Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
1	1	353.43	353.31	531.42	0.00	686.18	0.515	1.05	10.807	B
1	2	516.38	516.31	259.76	0.00	881.96	0.585	1.39	9.841	A
1	3	1055.91	1029.63	164.03	0.00	1060.38	0.996	20.64	70.793	F
2	1	612.03	611.99	69.16	0.00	1260.34	0.486	0.94	5.552	A
2	2	389.76	389.68	296.09	0.00	682.89	0.571	1.31	12.268	B
2	3	782.83	780.52	344.55	0.00	890.82	0.879	6.38	31.213	D

**Main results: (09:00-09:15)**

Junction	Arm	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Circulating Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
1	1	288.57	289.96	486.56	0.00	707.32	0.408	0.70	8.655	A
1	2	421.62	423.65	213.18	0.00	904.53	0.466	0.89	7.519	A
1	3	880.32	942.70	134.59	0.00	1077.02	0.817	5.05	34.174	D
2	1	502.23	503.33	58.07	0.00	1267.10	0.396	0.66	4.719	A
2	2	318.24	320.12	243.52	0.00	705.06	0.451	0.84	9.399	A
2	3	639.17	655.34	283.05	0.00	924.25	0.692	2.34	14.116	B

**Main results: (09:15-09:30)**

Junction	Arm	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Circulating Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
1	1	241.67	242.57	381.91	0.00	756.63	0.319	0.47	7.017	A
1	2	353.09	354.12	178.34	0.00	921.41	0.383	0.63	6.356	A
1	3	728.08	739.95	112.50	0.00	1089.50	0.668	2.08	10.627	B
2	1	419.95	420.62	47.79	0.00	1273.37	0.330	0.50	4.224	A
2	2	266.51	267.49	203.50	0.00	721.94	0.369	0.59	7.940	A
2	3	535.28	539.36	236.51	0.00	949.54	0.564	1.32	8.861	A

<b>Junctions 8</b>
<b>ARCADY 8 - Roundabout Module</b>
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**Filename:** Site 6 - Sc2- post dev - base year.arc8

**Path:** P:\Proj\2016\16146\16146-14-CALCS\Traffic\Farrankelly Additional Site\Junctions 8 Calculations\All developments considered\Picady & Arcady analysis\Post Development Sc2

**Report generation date:** 19/02/2019 14:40:28

« **Scenario 2 - Post Dev - Base Year - Scenario 2, AM**

- » **Junction Network**
- » **Arms**
- » **Traffic Flows**
- » **Entry Flows**
- » **Turning Proportions**
- » **Vehicle Mix**
- » **Results**

**Summary of junction performance**

	AM					PM				
	Queue (PCU)	Delay (s)	RFC	LOS	Junction LOS	Queue (PCU)	Delay (s)	RFC	LOS	Junction LOS
<b>Scenario 2 - Post Dev - Base Year - Scenario 2</b>										
<b>Arm 1</b>	0.07	3.99	0.07	A	A	0.11	3.84	0.10	A	A
<b>Arm 2</b>	0.10	4.46	0.09	A		0.19	4.60	0.16	A	
<b>Arm 3</b>	0.13	4.58	0.11	A		0.15	4.87	0.13	A	
<b>Arm 4</b>	0.25	3.72	0.20	A		0.08	3.22	0.07	A	

Values shown are the maximum values over all time segments. Delay is the maximum value of average delay per arriving vehicle. Junction LOS and Junction Delay are demand-weighted averages.

"D1 - Scenario 2, AM " model duration: 08:00 - 09:30

"D2 - Scenario 2, PM" model duration: 17:00 - 18:30

Run using Junctions 8.0.3.332 at 19/02/2019 14:40:28

## File summary

### File Description

Title	Farrankelly
Location	Eden Gate roundabout
Site Number	
Date	14/02/2019
Version	
Status	
Identifier	
Client	Cairn
Jobnumber	16.146
Enumerator	EL
Description	Eden gate roundabout is going to be affected in Scenario 2 by the opening of Priory Road access. It will be accessed from the north and the year considered for the analysis is the base year post development.

## Analysis Options

Vehicle Length (m)	Do Queue Variations	Calculate Residual Capacity	Residual Capacity Criteria Type	RFC Threshold	Average Delay Threshold (s)	Queue Threshold (PCU)
5.75			N/A	0.85	36.00	20.00

## Units

Distance Units	Speed Units	Traffic Units Input	Traffic Units Results	Flow Units	Average Delay Units	Total Delay Units	Rate Of Delay Units
m	kph	PCU	PCU	perHour	s	-Min	perMin

# Scenario 2 - Post Dev - Base Year - Scenario 2, AM

## Data Errors and Warnings

*No errors or warnings*

## Analysis Set Details

Name	Description	Locked	Network Flow Scaling Factor (%)	Reason For Scaling Factors
Scenario 2 - Post Dev - Base Year	In Scenario 2 both the site accesses are open to the traffic. The year considered is the design year post development.		100.000	

## Demand Set Details

Name	Scenario Name	Time Period Name	Description	Traffic Profile Type	Model Start Time (HH:mm)	Model Finish Time (HH:mm)	Model Time Period Length (min)	Time Segment Length (min)	Single Time Segment Only	Locked
Scenario 2, AM	Scenario 2	AM		ONE HOUR	08:00	09:30	90	15		

# Junction Network

## Junctions

Name	Junction Type	Arm Order	Grade Separated	Large Roundabout	Junction Delay (s)	Junction LOS
Eden Gate roundabout	Roundabout	1,2,3,4			4.06	A

## Junction Network Options

Driving Side	Lighting
Left	Normal/unknown

## Arms

### Arms

Arm	Name	Description
1	Eden Centre access	
2	Eden Gate south	
3	L52027 - Priory Road	
4	Eden Gate north	

### Roundabout Geometry

Arm	V - Approach road half-width (m)	E - Entry width (m)	I' - Effective flare length (m)	R - Entry radius (m)	D - Inscribed circle diameter (m)	PHI - Conflict (entry) angle (deg)	Exit Only
1	3.20	4.20	4.20	15.90	14.00	36.00	
2	3.00	3.50	2.10	33.00	14.00	48.00	
3	2.40	5.20	5.35	18.90	14.00	63.00	
4	3.70	4.20	3.10	29.80	14.00	24.00	

### Pedestrian Crossings

Arm	Crossing Type
1	None
2	None
3	None
4	None

### Slope / Intercept / Capacity

#### Roundabout Slope and Intercept used in model

Arm	Enter slope and intercept directly	Entered slope	Entered intercept (PCU/hr)	Final Slope	Final Intercept (PCU/hr)
1		(calculated)	(calculated)	0.532	1103.411
2		(calculated)	(calculated)	0.498	952.007
3		(calculated)	(calculated)	0.468	921.822
4		(calculated)	(calculated)	0.588	1266.083

*The slope and intercept shown above include any corrections and adjustments.*

## Traffic Flows

### Demand Set Data Options

Default Vehicle Mix	Vehicle Mix Varies Over Time	Vehicle Mix Varies Over Turn	Vehicle Mix Varies Over Entry	Vehicle Mix Source	PCU Factor for a HV (PCU)	Default Turning Proportions	Estimate from entry/exit counts	Turning Proportions Vary Over Time	Turning Proportions Vary Over Turn	Turning Proportions Vary Over Entry
		✓	✓	HV Percentages	2.00				✓	✓

# Entry Flows

## General Flows Data

Arm	Profile Type	Use Turning Counts	Average Demand Flow (PCU/hr)	Flow Scaling Factor (%)
1	ONE HOUR	✓	61.00	100.000
2	ONE HOUR	✓	76.00	100.000
3	ONE HOUR	✓	92.00	100.000
4	ONE HOUR	✓	217.00	100.000

# Turning Proportions

## Turning Counts or Proportions (PCU/hr) - Junction 1 (for whole period)

		To			
		1	2	3	4
From	1	0.000	38.000	19.000	4.000
	2	40.000	0.000	12.000	24.000
	3	31.000	20.000	0.000	41.000
	4	8.000	120.000	89.000	0.000

## Turning Proportions (PCU) - Junction 1 (for whole period)

		To			
		1	2	3	4
From	1	0.00	0.62	0.31	0.07
	2	0.53	0.00	0.16	0.32
	3	0.34	0.22	0.00	0.45
	4	0.04	0.55	0.41	0.00

# Vehicle Mix

## Average PCU Per Vehicle - Junction 1 (for whole period)

		To			
		1	2	3	4
From	1	1.000	1.000	1.000	1.000
	2	1.000	1.000	1.000	1.000
	3	1.000	1.000	1.000	1.000
	4	1.000	1.000	1.000	1.000

## Heavy Vehicle Percentages - Junction 1 (for whole period)

		To			
		1	2	3	4
From	1	0.000	0.000	0.000	0.000
	2	0.000	0.000	0.000	0.000
	3	0.000	0.000	0.000	0.000
	4	0.000	0.000	0.000	0.000

# Results

## Results Summary for whole modelled period

Arm	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS
1	0.07	3.99	0.07	A
2	0.09	4.46	0.10	A
3	0.11	4.58	0.13	A
4	0.20	3.72	0.25	A

## Main Results for each time segment

### Main results: (08:00-08:15)

Arm	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Circulating Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
1	45.92	45.73	171.74	0.00	1012.02	0.045	0.05	3.725	A
2	57.22	56.95	84.00	0.00	910.20	0.063	0.07	4.218	A
3	69.26	68.93	50.96	0.00	897.97	0.077	0.08	4.339	A
4	163.37	162.76	68.18	0.00	1226.00	0.133	0.15	3.384	A

### Main results: (08:15-08:30)

Arm	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Circulating Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
1	54.84	54.79	205.71	0.00	993.95	0.055	0.06	3.832	A
2	68.32	68.26	100.61	0.00	901.94	0.076	0.08	4.318	A
3	82.71	82.63	61.08	0.00	893.23	0.093	0.10	4.441	A
4	195.08	194.93	81.74	0.00	1218.03	0.160	0.19	3.518	A

### Main results: (08:30-08:45)

Arm	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Circulating Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
1	67.16	67.10	251.90	0.00	969.37	0.069	0.07	3.989	A
2	83.68	83.59	123.20	0.00	890.69	0.094	0.10	4.460	A
3	101.29	101.19	74.79	0.00	886.81	0.114	0.13	4.582	A
4	238.92	238.70	100.09	0.00	1207.24	0.198	0.25	3.716	A

### Main results: (08:45-09:00)

Arm	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Circulating Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
1	67.16	67.16	252.13	0.00	969.25	0.069	0.07	3.990	A
2	83.68	83.68	123.31	0.00	890.64	0.094	0.10	4.460	A
3	101.29	101.29	74.87	0.00	886.77	0.114	0.13	4.582	A
4	238.92	238.92	100.19	0.00	1207.18	0.198	0.25	3.717	A

**Main results: (09:00-09:15)**

Arm	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Circulating Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
1	54.84	54.90	206.10	0.00	993.74	0.055	0.06	3.836	A
2	68.32	68.41	100.80	0.00	901.84	0.076	0.08	4.319	A
3	82.71	82.81	61.21	0.00	893.17	0.093	0.10	4.444	A
4	195.08	195.30	81.91	0.00	1217.93	0.160	0.19	3.522	A

**Main results: (09:15-09:30)**

Arm	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Circulating Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
1	45.92	45.97	172.56	0.00	1011.59	0.045	0.05	3.727	A
2	57.22	57.28	84.40	0.00	910.00	0.063	0.07	4.221	A
3	69.26	69.34	51.25	0.00	897.83	0.077	0.08	4.345	A
4	163.37	163.52	68.58	0.00	1225.76	0.133	0.15	3.391	A



<b>Junctions 8</b>
<b>ARCADY 8 - Roundabout Module</b>
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**Filename:** Site 6 - Sc2- post dev - design year.arc8

**Path:** P:\Proj\2016\16146\16146-14-CALCS\Traffic\Farrankelly Additional Site\Junctions 8 Calculations\All developments considered\Picady & Arcady analysis\Post Development Sc2

**Report generation date:** 19/02/2019 14:43:06

« **Scenario 2 - Post Dev - Base Year - Scenario 2, AM**

- » **Junction Network**
- » **Arms**
- » **Traffic Flows**
- » **Entry Flows**
- » **Turning Proportions**
- » **Vehicle Mix**
- » **Results**

**Summary of junction performance**

	AM					PM				
	Queue (PCU)	Delay (s)	RFC	LOS	Junction LOS	Queue (PCU)	Delay (s)	RFC	LOS	Junction LOS
<b>Scenario 2 - Post Dev - Base Year - Scenario 2</b>										
<b>Arm 1</b>	0.08	4.09	0.08	A	A	0.12	3.92	0.11	A	A
<b>Arm 2</b>	0.12	4.58	0.11	A		0.22	4.74	0.18	A	
<b>Arm 3</b>	0.15	4.68	0.13	A		0.18	5.04	0.15	A	
<b>Arm 4</b>	0.29	3.86	0.22	A		0.10	3.31	0.09	A	

Values shown are the maximum values over all time segments. Delay is the maximum value of average delay per arriving vehicle. Junction LOS and Junction Delay are demand-weighted averages.

"D1 - Scenario 2, AM " model duration: 08:00 - 09:30

"D2 - Scenario 2, PM" model duration: 17:00 - 18:30

Run using Junctions 8.0.3.332 at 19/02/2019 14:43:06

## File summary

### File Description

<b>Title</b>	Farrankelly
<b>Location</b>	Eden Gate roundabout
<b>Site Number</b>	
<b>Date</b>	14/02/2019
<b>Version</b>	
<b>Status</b>	
<b>Identifier</b>	
<b>Client</b>	Cairn
<b>Jobnumber</b>	16.146
<b>Enumerator</b>	EL
<b>Description</b>	Eden gate roundabout is going to be affected in Scenario 2 by the opening of Priory Road access. It will be accessed from the north and the year considered for the analysis is the base year post development.

## Analysis Options

Vehicle Length (m)	Do Queue Variations	Calculate Residual Capacity	Residual Capacity Criteria Type	RFC Threshold	Average Delay Threshold (s)	Queue Threshold (PCU)
5.75			N/A	0.85	36.00	20.00

## Units

Distance Units	Speed Units	Traffic Units Input	Traffic Units Results	Flow Units	Average Delay Units	Total Delay Units	Rate Of Delay Units
m	kph	PCU	PCU	perHour	s	-Min	perMin

# Scenario 2 - Post Dev - Base Year - Scenario 2, AM

## Data Errors and Warnings

*No errors or warnings*

## Analysis Set Details

Name	Description	Locked	Network Flow Scaling Factor (%)	Reason For Scaling Factors
Scenario 2 - Post Dev - Base Year	In Scenario 2 both the site accesses are open to the traffic. The year considered is the design year post development.		100.000	

## Demand Set Details

Name	Scenario Name	Time Period Name	Description	Traffic Profile Type	Model Start Time (HH:mm)	Model Finish Time (HH:mm)	Model Time Period Length (min)	Time Segment Length (min)	Single Time Segment Only	Locked
Scenario 2, AM	Scenario 2	AM		ONE HOUR	08:00	09:30	90	15		

# Junction Network

## Junctions

Name	Junction Type	Arm Order	Grade Separated	Large Roundabout	Junction Delay (s)	Junction LOS
Eden Gate roundabout	Roundabout	1,2,3,4			4.18	A

## Junction Network Options

Driving Side	Lighting
Left	Normal/unknown

## Arms

### Arms

Arm	Name	Description
1	Eden Centre access	
2	Eden Gate south	
3	L52027 - Priory Road	
4	Eden Gate north	

### Roundabout Geometry

Arm	V - Approach road half-width (m)	E - Entry width (m)	I' - Effective flare length (m)	R - Entry radius (m)	D - Inscribed circle diameter (m)	PHI - Conflict (entry) angle (deg)	Exit Only
1	3.20	4.20	4.20	15.90	14.00	36.00	
2	3.00	3.50	2.10	33.00	14.00	48.00	
3	2.40	5.20	5.35	18.90	14.00	63.00	
4	3.70	4.20	3.10	29.80	14.00	24.00	

### Pedestrian Crossings

Arm	Crossing Type
1	None
2	None
3	None
4	None

### Slope / Intercept / Capacity

#### Roundabout Slope and Intercept used in model

Arm	Enter slope and intercept directly	Entered slope	Entered intercept (PCU/hr)	Final Slope	Final Intercept (PCU/hr)
1		(calculated)	(calculated)	0.532	1103.411
2		(calculated)	(calculated)	0.498	952.007
3		(calculated)	(calculated)	0.468	921.822
4		(calculated)	(calculated)	0.588	1266.083

*The slope and intercept shown above include any corrections and adjustments.*

## Traffic Flows

### Demand Set Data Options

Default Vehicle Mix	Vehicle Mix Varies Over Time	Vehicle Mix Varies Over Turn	Vehicle Mix Varies Over Entry	Vehicle Mix Source	PCU Factor for a HV (PCU)	Default Turning Proportions	Estimate from entry/exit counts	Turning Proportions Vary Over Time	Turning Proportions Vary Over Turn	Turning Proportions Vary Over Entry
		✓	✓	HV Percentages	2.00				✓	✓

# Entry Flows

## General Flows Data

Arm	Profile Type	Use Turning Counts	Average Demand Flow (PCU/hr)	Flow Scaling Factor (%)
1	ONE HOUR	✓	67.00	100.000
2	ONE HOUR	✓	88.00	100.000
3	ONE HOUR	✓	102.00	100.000
4	ONE HOUR	✓	244.00	100.000

# Turning Proportions

## Turning Counts or Proportions (PCU/hr) - Junction 1 (for whole period)

		To			
		1	2	3	4
From	1	0.000	42.000	20.000	5.000
	2	45.000	0.000	16.000	27.000
	3	35.000	21.000	0.000	46.000
	4	9.000	135.000	100.000	0.000

## Turning Proportions (PCU) - Junction 1 (for whole period)

		To			
		1	2	3	4
From	1	0.00	0.63	0.30	0.07
	2	0.51	0.00	0.18	0.31
	3	0.34	0.21	0.00	0.45
	4	0.04	0.55	0.41	0.00

# Vehicle Mix

## Average PCU Per Vehicle - Junction 1 (for whole period)

		To			
		1	2	3	4
From	1	1.000	1.000	1.000	1.000
	2	1.000	1.000	1.000	1.000
	3	1.000	1.000	1.000	1.000
	4	1.000	1.000	1.000	1.000

## Heavy Vehicle Percentages - Junction 1 (for whole period)

		To			
		1	2	3	4
From	1	0.000	0.000	0.000	0.000
	2	0.000	0.000	0.000	0.000
	3	0.000	0.000	0.000	0.000
	4	0.000	0.000	0.000	0.000

# Results

## Results Summary for whole modelled period

Arm	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS
1	0.08	4.09	0.08	A
2	0.11	4.58	0.12	A
3	0.13	4.68	0.15	A
4	0.22	3.86	0.29	A

## Main Results for each time segment

### Main results: (08:00-08:15)

Arm	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Circulating Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
1	50.44	50.23	191.97	0.00	1001.26	0.050	0.05	3.785	A
2	66.25	65.94	93.74	0.00	905.35	0.073	0.08	4.288	A
3	76.79	76.42	57.70	0.00	894.81	0.086	0.09	4.397	A
4	183.70	182.99	75.67	0.00	1221.59	0.150	0.18	3.464	A

### Main results: (08:15-08:30)

Arm	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Circulating Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
1	60.23	60.18	229.95	0.00	981.05	0.061	0.07	3.909	A
2	79.11	79.04	112.28	0.00	896.13	0.088	0.10	4.405	A
3	91.70	91.61	69.16	0.00	889.45	0.103	0.11	4.512	A
4	219.35	219.18	90.71	0.00	1212.75	0.181	0.22	3.623	A

### Main results: (08:30-08:45)

Arm	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Circulating Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
1	73.77	73.70	281.58	0.00	953.58	0.077	0.08	4.091	A
2	96.89	96.79	137.49	0.00	883.58	0.110	0.12	4.575	A
3	112.30	112.18	84.69	0.00	882.18	0.127	0.15	4.675	A
4	268.65	268.38	111.08	0.00	1200.78	0.224	0.29	3.860	A

### Main results: (08:45-09:00)

Arm	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Circulating Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
1	73.77	73.77	281.86	0.00	953.43	0.077	0.08	4.092	A
2	96.89	96.89	137.63	0.00	883.51	0.110	0.12	4.576	A
3	112.30	112.30	84.78	0.00	882.13	0.127	0.15	4.675	A
4	268.65	268.65	111.20	0.00	1200.71	0.224	0.29	3.862	A

**Main results: (09:00-09:15)**

Arm	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Circulating Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
1	60.23	60.30	230.42	0.00	980.80	0.061	0.07	3.910	A
2	79.11	79.21	112.51	0.00	896.01	0.088	0.10	4.407	A
3	91.70	91.82	69.31	0.00	889.37	0.103	0.12	4.515	A
4	219.35	219.61	90.91	0.00	1212.63	0.181	0.22	3.628	A

**Main results: (09:15-09:30)**

Arm	Total Demand (PCU/hr)	Entry Flow (PCU/hr)	Circulating Flow (PCU/hr)	Pedestrian Demand (Ped/hr)	Capacity (PCU/hr)	RFC	End Queue (PCU)	Delay (s)	LOS
1	50.44	50.49	192.92	0.00	1000.76	0.050	0.05	3.787	A
2	66.25	66.32	94.20	0.00	905.13	0.073	0.08	4.291	A
3	76.79	76.88	58.03	0.00	894.65	0.086	0.09	4.402	A
4	183.70	183.87	76.12	0.00	1221.33	0.150	0.18	3.469	A

# Proposed Residential Development at Farrankelly, Greystones

## Development Access & Street DMURS Design Report



August 2019



## Proposed Residential Development at Farrankelly, Greystones

### Development Access and Street DMURS Design Report

Document No:.....16.146 DMURS

Author: .....EL

Checker: .....JB

Approver: .....SMG

Document No	Description	Made	Checked	Approved	Date
16.146 DMURS	Draft v1	EL	JB	SMG	19-07-2019
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# Proposed Residential Development at Farrankelly, Greystones

## Development Access and Street DMURS Design Report

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## 1.0 INTRODUCTION

The report described the designs of the access junctions and internal streets for the proposed Farrankelly residential development, and how it complies with the Design Manual for Urban Roads and Streets 2013 (DMURS), published by the DTTAS.

A secondary supplementary reference document adopted in the design is the *Recommendations for Site Development Works for Housing Areas* (1998), published by the Department of Environment and Local Government.

The design proposals are the outcome of an integrated design approach that seeks to provide a sustainable community connected by well-designed streets which deliver safe, convenient and attractive networks within and through the subject lands.

## 2.0 DMURS JUNCTION VISIBILITY SPLAYS

All visibility splays are designed in accordance with the Design Manual for Urban Roads and Street (DMURS). Relevant extracts from DMURS are included below.

SSD STANDARDS			
<b>Design Speed (km/h)</b>	<b>SSD Standard (metres)</b>	<b>Design Speed (km/h)</b>	<b>SSD Standard (metres)</b>
10	7	10	8
20	14	20	15
30	23	30	24
40	33	40	36
50	45	50	49
60	59	60	65
<b>Forward Visibility</b>		<b>Forward Visibility on Bus Routes</b>	

Table 4.2: Reduced SSD standards for application within cities towns and villages. Reduced forward visibility increases driver caution and reduces vehicle speeds.

Figure 1 Extract from DMURS – SSD Standards

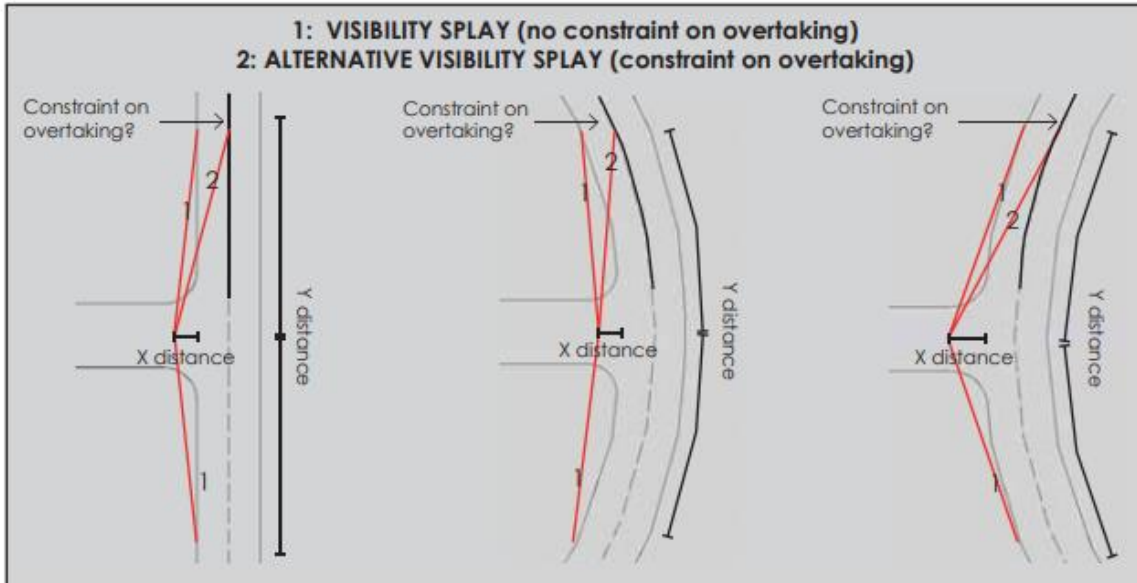


Figure 4.63: Forward visibility splays refer to an X and Y value. The X value allows drivers to observe traffic on the intersected arm. The Y value allows the driver of a vehicle to stop safely should an object enter its path, and is based on the SSD value.

### Figure 2 Extract from DMURS – Visibility Splays

The R761 Kilcoole Road entrance junction is located at the start on the inside of a curve and there is a crest curve to the south of the proposed entrance. The proposed entrance location as identified so that suitable visibility splays are achieved. The junction also includes the setting back of the site boundary to include the provision of a footpath and a widened verge to accommodate the future Kilcoole Road upgrade.

The proposed main access on Priory Road is on a relative straight section of the road and will provided with suitable visibility splays and the provision of a footpath.

The proposed access junction layouts including the visibility splays are shown on the drawings FK-ROD-ZO-XX-DR-C--0094, FK-ROD-ZO-XX-DR-C-0095 and FK-ROD-ZO-XX-DR-C-0096 included with the application.

## 3.0 STREETS DESIGN STANDARDS

The purpose of this section is to summarise the proposed design standards adopted for streets within the proposed development. It is based on the DMURS of which relevant extracts are provided below.

### 3.1 DESIGN PARAMETERS

The first consideration is the Function and Context for the internal streets within the proposed development in accordance with Table 3.1 and Table 4.1 of DMURS:

DMURS Description	Roads Act/NRA DMRB	Traffic Management Guidelines	National Cycle Manual
Arterial	National	Primary Distributor Roads	Distributor
Link	Regional (see note 1)	District Distributor Local Collector (see Notes 1 and 2)	Local Collector
Local	Local	Access	Access

**Notes**

Note 1: Larger Regional/District Distributors may fall into the category of Arterial where they are the main links between major centres (i.e. towns) or have an orbital function.

Note 2: Local Distributors may fall into the category of Local street where they are relatively short in length and simply link a neighbourhood to the broader street network.

Table 3.1: Terminology used within this Manual compared with other key publications.

		PEDESTRIAN PRIORITY	VEHICLE PRIORITY			
FUNCTION	ARTERIAL	30-40 KM/H	40-50 KM/H	40-50 KM/H	50-60 KM/H	60-80 KM/H
	LINK	30 KM/H	30-50 KM/H	30-50 KM/H	50-60 KM/H	60-80 KM/H
	LOCAL	10-30 KM/H	10-30 KM/H	10-30 KM/H	30-50 KM/H	60 KM/H
		CENTRE	N'HOOD	SUBURBAN	BUSINESS/ INDUSTRIAL	RURAL FRINGE
		CONTEXT				

Figure 3 Extracted from DMURS Table 4.1 - Design Speed selection matrix indicating the links between place, movement and speed that need to be taken into account in order to achieve effective and balanced design solutions

All streets within the development have the following function, context as associated design speed range.

- Function: Local
- Context: Neighbourhood
- Speed: 10 - 30 km/h.

All streets within the development are classified as Local Streets with a range of hierarchy within the development including the local link street that connects through the development between Kilcoole Road,

the other side streets and a number of homezones. These design parameters then lead to the selection of the various elements of the street cross-section and alignment as described below.

### 3.2 FOOTPATHS & PEDESTRIAN CONNECTIVITY

In Section 4.3.1 (page 86), DMURS defines the footway as the minimum width needed for the wheelchairs to pass each other and it proposes a minimum of 1.8m width. A slightly wider footpath width of 2.0m has been adopted as standard throughout the proposed development. On certain streets a footpath is provided on one side only, where there is no specific pedestrian desire line, with a verge on the other side to cater for street landscaping.

The proposed development includes a greenway along the northern boundary for pedestrians and cyclists that will connect with the existing Mill Lane, providing an attractive and direct route leading towards Greystones Town Centre and the Train Station. A series of shared walk and cycle paths are provided through the green open spaces within the development that will connect the greenway to the Eden Gate development to the south.

The footpaths connect with the existing footpath and pedestrian routes in the surrounds via proposed signalised pedestrian crossings on the Kilcoole Road, with one crossing located immediately south of the proposed vehicular access and a second crossing located at the proposed greenway connecting to Mill Lane.

### 3.3 VERGES

As regards the verges, DMURS in Section 4.3.1 (pages 87-88) clarifies that there is no minimum requirement for verges on Local Streets, therefore the provision of a verge is optional, and it may be provided on certain streets to suit the overall architectural and landscape design including the provision of street trees. Where a verge is provided it has a minimum width of 1.5m to be effective and to suit maintenance of grass or other planting.

### 3.4 CYCLING

Section 4.3.5 of DMURS encourages the design of lightly-trafficked/low-speed streets to create Shared Streets where cyclists and motor vehicles share the carriageway. The proposed development is designed with a low speed environment and low traffic volumes, and it is not necessary or appropriate to provide segregated cycling facilities along the streets.

### 3.5 STREET HIERARCHY, CARRIAGEWAY WIDTH & CROSS SECTION

The DMURS section related to the carriageway width is Section 4.4.1 (pages 101 and 102). The standard carriageway widths on Local Streets should be between 5-5.5m (i.e. with lane widths of 2.5-2.75m).

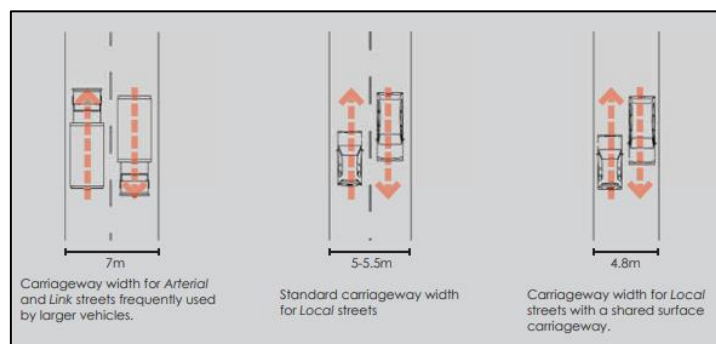


Figure 4 Extracted figure from DMURS (Figure 4.55 originally) - Carriageway widths

From the DMURS provisions outlined above there are a number of combinations of the various cross-section components that are proposed for the various streets within the proposed development as follows.

Local Street Type 1: The main street into the development from Kilcoole Road and Priory Road, including road objective R08, which is designed as follows:

- 5.5m carriageway
- 2.0m footpaths as required
- Verges as required including green open space

Local Street Type 2: Typical side-street with double footpath and no verges.

- 5.0m carriageway
- 2.0m footpath x 2

Local Street Type 3: Home Zone cul-de-sac serving up to 20 houses.

- 4.8m shared surface
- 1.5m verge x 2
- 7.8m total width

The homezones are designed to promote place and provide maximum pedestrian priority on streets where vehicular movements are low.

### 3.6 DESIGN SPEED, ALIGNMENT AND CURVATURE

Section 4.4.6 provides information regarding horizontal and vertical alignment and curvatures. Within the proposed development the standards that apply for the alignment design speed are as follows:

- Main Local Streets, Type 1: 30 km/h;
- Typical Side Streets, Type 2: 20 km/h;
- Shared Surface Streets, Type 3: no design speed.

HORIZONTAL CURVATURE						
Design Speed (km/h)	10	20	30	40	50	60
Minimum Radius with adverse camber of 2.5%	-	11	26	56	104	178
Minimum Radius with superelevation of 2.5 %	-	-	-	46	82	136
VERTICAL CURVATURE						
Design Speed (km/h)	10	20	30	40	50	60
Crest Curve K Value	N/A	N/A	N/A	2.6	4.7	8.2
Sag Curve K Value	N/A	N/A	2.3	4.1	6.4	9.2

**Figure 5 Extracted table from DMURS (Table 4.3 originally) - Carriageway geometry parameters for horizontal and vertical curvature**

In relation to the horizontal alignment, a crossfall of 2.5% is generally provided throughout in accordance with Section 4.4.6 of DMURS. Superelevation is not provided on horizontal curves as this would encourage higher traffic speeds.

As regards the vertical alignment, the site is quite hilly, where it falls from the south-west to the north-east of the site, from 58mOD to 30mOD adjacent to Kilcoole Road. The vertical alignment of the circulation roads required careful design to meet the provisions of DMURS, as specified in Figure 5 and 6.

*Maximum and Minimum Gradients*

In urban areas, it is likely that the comfort of vulnerable road users will be the determining factor for desirable maximum longitudinal gradients on streets. Part M of the building regulations advises that access routes with a gradient of 1:20 or less are preferred. Therefore a maximum gradient of 5% is desirable on streets where pedestrians are active.

In hilly terrain, steeper gradients may be required but regard must be had to the maximum gradient that most wheelchair users can negotiate of 8.3%, although this should be limited to shorter distances. A designer may need to consider mitigation measures, such as intermediate landings, to ensure that pedestrian routes are accessible. This also needs to be considered at the network level and as a response to place making.

The inclusion of streets that exceed these gradients may not be significant within a network where there are alternative routes that can be taken between destinations and where steeper gradients may in fact have placemaking benefits.

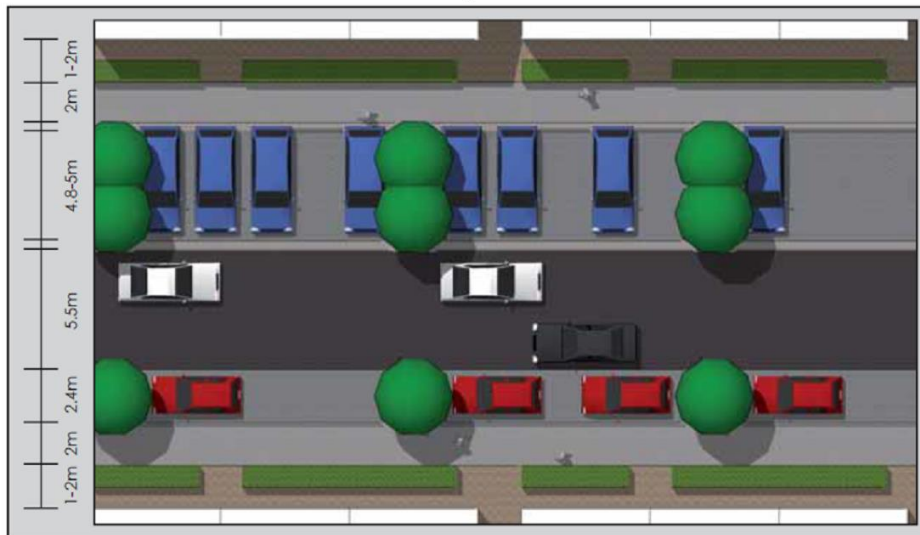
**Figure 6 Extracted text from DMURS (page 113)**

**3.7 CAR PARKING**

The proposed street widths and the provision of numerous driveways will generally preclude on-street parking on most of the roads within the development. However, some provision is to be made for visitor parking informally at street sections that do not have frontage access, such as on gable ends of houses at the end of a row, or on certain streets adjoining green spaces.

The proposed on-street car parking for the duplex units is provided in accordance with DMURS (pages 120-121), which include the recommended dimensions for a parking space as follows:

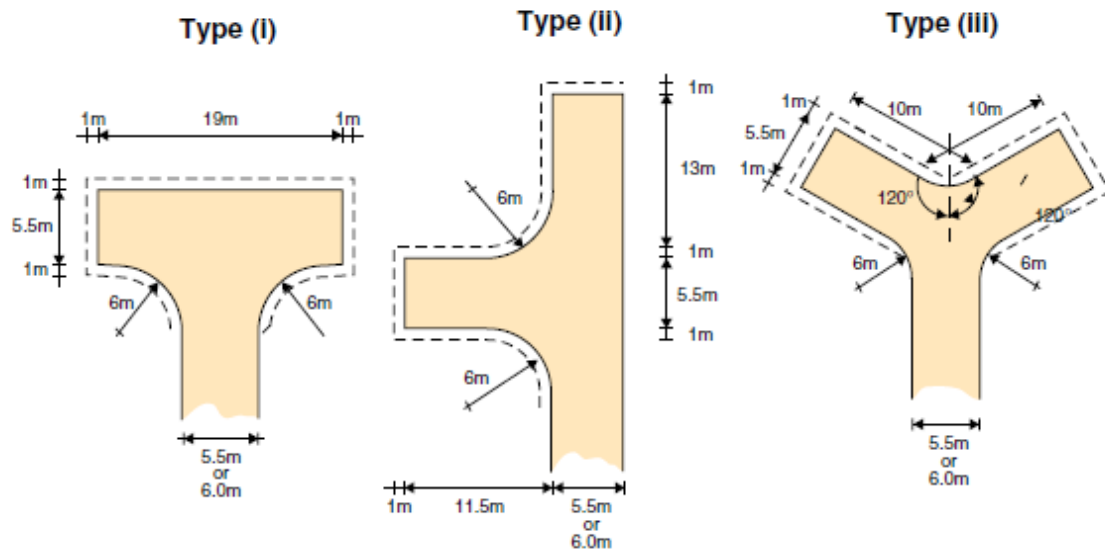
- 2.4m wide;
- 6.0m long for parallel parking;
- 4.8m long for perpendicular parking with 0.3m overhang space at the inner end and 0.5m separator strip at the outer end = 5.6m total.



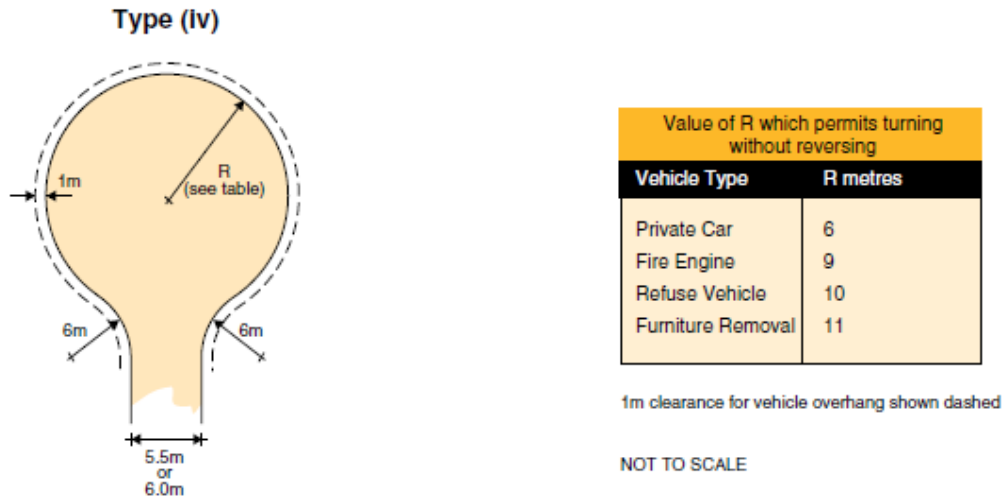
**Figure 7 Extract illustrating the layout of a Local Street with a uniform mix of parallel and perpendicular parking**

### 3.8 CUL-DE-SACS

Where cul-de-sacs are longer than 50m turning bays are provided in accordance with the *Recommendations for Site Development Works for Housing Area Type I & IV* as reproduced below, to suit specific site constraints which have occurred. All internal road network and turning bays are assessed using the Autodesk vehicle tracking add on to ensure adequate design for vehicle movements.







**Figure 8 Residential Turning Bays**

#### 4.0 SUMMARY

The accesses and streets within the proposed development have been designed to be safe, attractive and comfortable for all users and have been designed in accordance with the Design Manual for Urban Roads and Streets.

## **APPENDIX D – LAND AND SOILS**

Ground Investigations Report Farrankelly 29-11-18



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# Ground Investigations Ireland

## Farrankelly

### Ground Investigation Report

#### **DOCUMENT CONTROL SHEET**

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## APPENDICES

Appendix 1	Site Location Plan
Appendix 2	Trial Pit Records
Appendix 3	Soakaway Results
Appendix 4	Cable Percussion Borehole Records
Appendix 5	Laboratory Testing

## **1.0 Preamble**

On the instructions of Roughan & O'Donovan Consulting Engineers, a site investigation was carried out by Ground Investigations Ireland Ltd., between September and October 2018 at the site of the proposed housing development in Farankelly Co. Wicklow.

## **2.0 Overview**

### **2.1. Background**

It is proposed to construct a housing development with associated services, access roads and car parking at the proposed site. The site is currently greenfield and is situated south of Delgany off the N11 Co. Wicklow. The proposed construction is envisaged to consist of conventional foundations and pavement make up with some local excavations for services and plant.

### **2.2. Purpose and Scope**

The purpose of the site investigation was to investigate subsurface conditions utilising a variety of investigative methods in accordance with the project specification. The scope of the work undertaken for this project included the following:

- Visit project site to observe existing conditions
- Carry out 3 No. Soakaways to determine a soil infiltration value to BRE digest 365
- Carry out 18 No. Cable Percussion boreholes to a maximum depth of 8.00m BGL
- Installation of 5 No. Groundwater monitoring wells
- Geotechnical & Environmental Laboratory testing
- Report with recommendations

## **3.0 Subsurface Exploration**

### **3.1. General**

During the ground investigation a programme of intrusive investigation specified by the Consulting Engineer was undertaken to determine the sub surface conditions at the proposed site. Regular sampling and in-situ testing was undertaken in the exploratory holes to facilitate the geotechnical descriptions and to enable laboratory testing to be carried out on the soil samples recovered during excavation and drilling.

The procedures used in this site investigation are in accordance with Eurocode 7 Part 2: Ground Investigation and testing (ISEN 1997 – 2:2007) and B.S. 5930:2015.

### **3.2. Trial Pits**

The trial pits were excavated using a 3.5T tracked excavator at the locations shown in the exploratory hole location plan in Appendix 1. The locations were checked using a CAT scan to minimise the potential for encountering services during the excavation. The trial pits were sampled, logged and photographed by a Geotechnical Engineer/Engineering Geologist prior to backfilling with arisings. Notes were made of any services, inclusions, pit stability, groundwater encountered and the characteristics of the strata encountered and are presented on the trial pit logs which are provided in Appendix 2 of this Report.

### **3.3. Soakaway Testing**

The soakaway testing was carried out in selected trial pits at the locations shown in the exploratory hole location plan in Appendix 1. These pits were carefully excavated and filled with water to assess the infiltration characteristics of the proposed site. The pits were allowed to drain and the drop in water level was recorded over time as required by BRE Digest 365. The pits were logged prior to completing the soakaway test and were backfilled with arising's upon completion. The soakaway test results are provided in Appendix 3 of this Report.

### **3.4. Cable Percussion Boreholes**

The Cable Percussion Boreholes were drilled using a Dando 2000 drilling rig with regular in-situ testing and sampling undertaken to facilitate the production of geotechnical logs and laboratory testing.

The standard method of boring in soil for site investigation is known as the Cable Percussion method. It consists of using a Shell in non cohesive soils and a clay cutter in cohesive soils, both operated on a wire cable. Very hard soils, boulders and other hard obstructions are broken up by chiselling and the fragments removed with the Shell. Where ground conditions made it necessary, the borehole was lined with 200mm diameter steel casing. While the use of the Cable Percussion method of boring gives the maximum data on soil conditions, some mixing of laminated soil is inevitable. For this reason, thin lenses of granular material may not be noticed. Disturbed samples were taken from the boring tools at suitable depths, so that there is a representative sample at the top of each change in stratum and thereafter at regular intervals down the borehole until the next stratum was encountered. The disturbed samples were then sealed and sent to the laboratory where they were visually examined to confirm the description of the relevant strata.

Standard Penetration Tests were carried out in the boreholes. The results of these tests, together with the depths at which the tests were taken are shown on the accompanying borehole records. The test consists of a thick wall sampler tube, 50mm external diameter, being driven into the soil by a monkey weighing 63.5kg and with a free drop of 760mm. For gravels and glacial till the driving shoe was replaced by a solid 60° cone. The Standard Penetration Test number referred to as the 'N' value is the number of blows required to drive the tube 300mm, after an initial penetration of 150mm. The number gives a guide to the consistency of the soil and can also be used to estimate the relative strength/density at the depth of the test and also to estimate the bearing capacity and compressibility of the soil. The cable percussion borehole logs are provided in Appendix 4 of this Report.

### **3.5. Surveying**

The exploratory hole locations have been recorded using a Trimble R10 GNSS System which records the coordinates and elevation of the locations to ITM or Irish National Grid as required by the project specification. The coordinates and elevations are provided on the exploratory hole logs in the appendices of this Report.

### **3.6. Groundwater Monitoring Installations**

Groundwater Monitoring Installation were installed upon the completion of the boreholes to enable sampling and the determination of the equilibrium groundwater level. The typical groundwater monitoring installation consists of a 50mm HDPE slotted pipe with a pea gravel response zone and bentonite seal installed to the Engineers specification. Where required the standpipe is sealed with a gas tap and finished with a durable steel cover fixed in place with a concrete surround. The installation details are provided on the exploratory hole logs in the appendices of this Report.

### **3.7. Laboratory Testing**

Samples were selected from the exploratory holes for a range of geotechnical and environmental testing to assist in the classification of soils and to provide information for the proposed design. Geotechnical testing consisting of moisture content, Atterberg limits, Particle Size Distribution (PSD), tests were carried out in NMTL's Geotechnical Laboratory in Carlow

Environmental testing, including Waste Acceptance Criteria (Suite I), pH and sulphate testing was carried out by Jones Environmental Laboratory in the UK.

The results of the laboratory testing are included in Appendix 5 of this Report.

## 4.0 Ground Conditions

### 4.1. General

The ground conditions encountered during the investigation are summarised below with reference to insitu and laboratory test results. The full details of the strata encountered during the ground investigation are provided in the exploratory hole logs included in the appendices of this report.

The sequence of strata encountered were consistent across the site and are generally comprised;

- Topsoil
- Granular Deposits
- Cohesive Deposits

**TOPSOIL:** Topsoil was encountered in all the exploratory holes and was present to a maximum depth of 0.3m BGL.

**COHESIVE DEPOSITS:** Cohesive deposits were encountered beneath the TOPSOIL and were described typically as *brown sandy gravelly CLAY with occasional cobbles and boulders*. The secondary sand and gravel constituents varied across the site and with depth, with granular lenses occasionally present in the glacial till matrix. The strength of the cohesive deposits typically increased with depth and was firm to stiff or stiff below 1.5m BGL in the majority of the exploratory holes. These deposits had some, occasional or frequent cobble and boulder content where noted on the exploratory hole logs.

**GRANULAR DEPOSITS:** The granular deposits were encountered within the cohesive deposits and were typically described as *brown clayey sandy subrounded to subangular fine to coarse GRAVEL with occasional cobbles and rare boulders* or *Grey brown clayey gravelly SAND*. The secondary sand/gravel and silt/clay constituents varied across the site and with depth while occasional or frequent cobble and boulder content also present where noted on the exploratory hole logs.

Based on the SPT N values the deposits are typically medium dense and become dense with depth.

### 4.2. Groundwater

No groundwater was noted during the investigation however we would point out that these exploratory holes did not remain open for sufficiently long periods of time to establish the hydrogeological regime and groundwater levels would be expected to vary with the time of year, rainfall, nearby construction and other factors. For this reason, standpipes were installed in BH01, BH04, BH10, BH12 and BH16 to allow the equilibrium groundwater level to be determined.

### 4.3. Laboratory Testing

The geotechnical testing carried out on soil samples recovered generally confirm the descriptions on the logs with the primary constituent of the cohesive deposits found to be a CLAY of low to intermediate



plasticity. The Particle Size Distribution tests confirm that generally the cohesive deposits are well-graded with percentages of sands and gravels ranging between 19% and 55.1% generally with fines contents of 9.70 to 57.5%. Three samples, BH10 at 1.50m, BH12 at 0.50m and BH18 at 1.50m graded as clayey sandy Gravel with Clay/Silt content ranging between 9.7% to 17.20%, Sand of 19% to 27% and Gravel of 55% to 62.7%.

The pH and sulphate testing carried out indicate that pH results are near neutral and that the water soluble sulphate results is low when compared to the guideline values from BRE Special Digest 1:2005. The samples tested classify the soil as a Design Sulphate Level DS-1.

The results of the Waste Acceptance Criterial Test Suite are presented with the individual parameter limits for "Inert" "Non Hazardous" and "Hazardous" as outlined within European Council Directive 1999 131/EC Article 16 Annex II, "Criteria and procedures for the acceptance of waste at landfills". The intended disposal site should be consulted to ensure compliance with their specific requirements.

The results indicate that the samples tested are below the inert landfill waste acceptance criteria, all spoil disposed of off-site should be sent to a suitably licenced facility. The possibility for contamination, not revealed by the testing undertaken should be borne in mind particularly where Made Ground deposits are present or the previous site use or location indicate a risk of environmental variation.

A waste classification report is recommended to be completed in accordance with the EPA guidelines on the classification of waste (2015) if material is to be disposed of off site to identify the appropriate type of facility.

The results from the completed laboratory testing is included in Appendix 5 of this report.

## **5.0 Recommendations & Conclusions**

### **5.1. General**

The recommendations given and opinions expressed in this report are based on the findings as detailed in the exploratory hole records. Where an opinion is expressed on the material between exploratory hole locations, this is for guidance only and no liability can be accepted for its accuracy. No responsibility can be accepted for conditions which have not been revealed by the exploratory holes. Limited information has been provided at the ground investigation stage and any designs based on the recommendations or conclusions should be completed in accordance with the current design codes, taking into account the variation and the specific details contained within the exploratory hole logs.

### **5.2. Foundations**

An allowable bearing capacity of 100 kN/m<sup>2</sup> is recommended for conventional strip or pad foundations on the firm to stiff cohesive deposits or medium dense granular deposits at a depth of 1.0m BGL. Where the cohesive deposits are deeper, such as at the locations BH13 and BH17, lean mix trench fill to a depth of 2.0m BGL is recommended to achieve the recommended allowable bearing capacity.

Further investigations consisting of trial pits and dynamic probing is recommended to optimise the allowable bearing capacity recommendations for the residential development.

A ground bearing floor slab is recommended to be based on the firm to stiff cohesive deposits with an appropriate depth of compacted hardcore specified by the consulting engineer and in accordance with the limits and guidelines in SR21:214 -A1:2016 and/or NRA SRW CL808 Type E granular stone fill.

The possibility for variation in the depth of the suitable foundry stratum should be considered and foundation inspections should be carried out. Any soft spots encountered at the proposed foundation depths should be excavated and replaced with lean mix concrete.

In any part of the site, should part of the foundation be on cohesive and granular deposits we would recommend that all the foundations of the unit in question be lowered to the competent stratum to avoid differential settlement.

The pH and sulphate testing completed on samples recovered from the trial holes indicates the pH results are near neutral and the sulphate results are low, when compared to the guideline values from BRE Special Digest 1:2005. No special precautions are required for concrete foundations to prevent sulphate attack.

### **5.3. Excavations**

Short term temporary excavations in the cohesive deposits will remain stable for a limited time only and will require to be appropriately battered or the sides supported if the excavation is below 1.25m BGL or is required to permit man entry.

Excavations in the or soft Cohesive Deposits will require to be appropriately battered or the sides supported due to the low strength of these deposits.

Any excavations which penetrate the granular deposits will require to be appropriately battered or the sides supported and are may require dewatering due to the groundwater seepages noted in the exploratory hole logs in the Appendices of this Report.

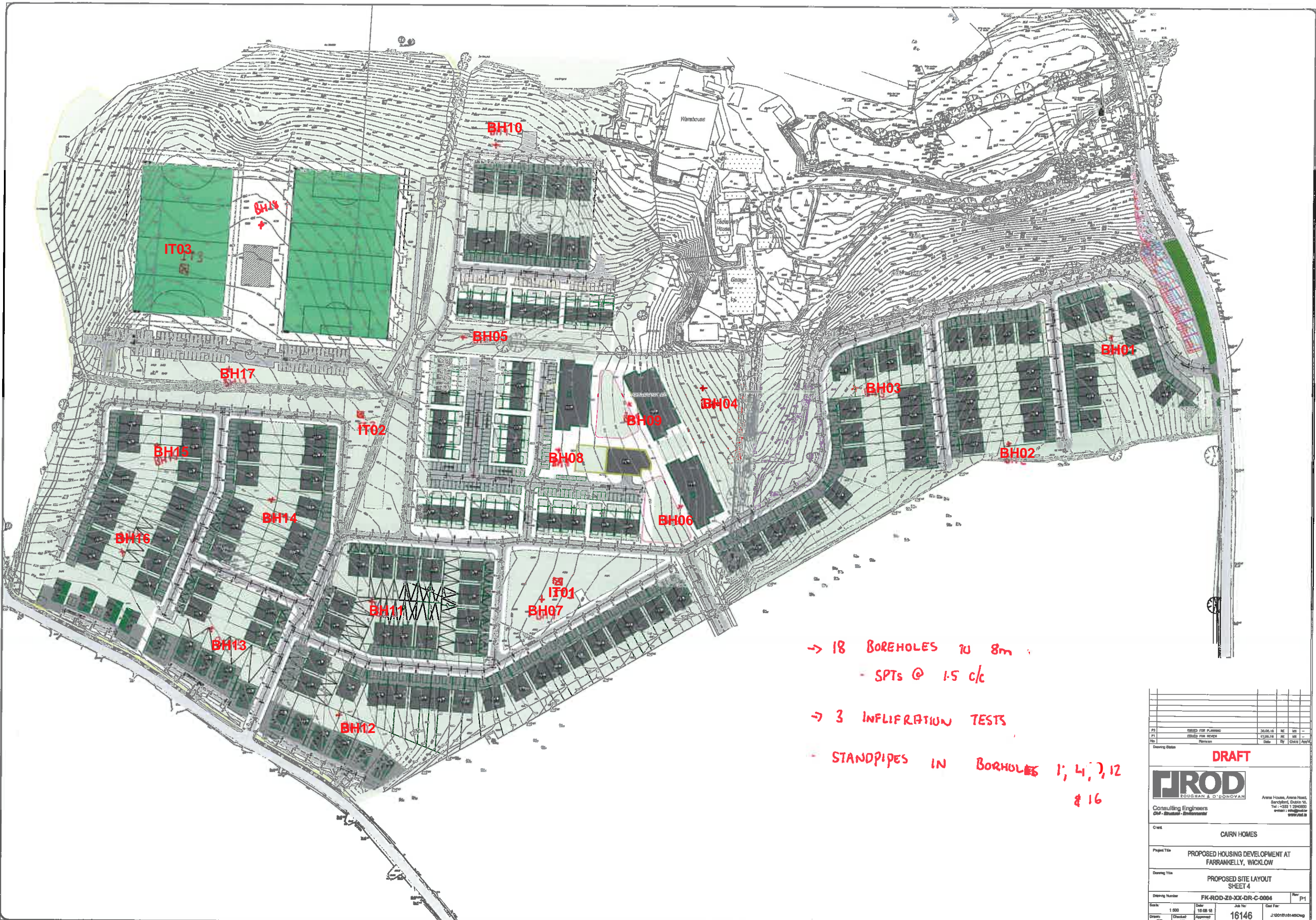
The groundwater and stability noted on the trial pit logs should be consulted when determining the most appropriate construction methods for excavations. Generally, where significant excavations are required in water bearing granular deposits a cut-off wall may be more cost effective than extensive dewatering. An assessment by a specialist dewatering contractor is recommended to determine the most cost effective approach to the proposed excavation.

#### **5.4. Soakaway Design**

Infiltration rates of  $7.686 \times 10^{-6}$ ,  $3.649 \times 10^{-5}$  and  $3.767 \times 10^{-5}$  m/s respectively were calculated for the soakaway locations IT01, IT02 and IT03.

The recommendations provided in this report should be verified in the design of the proposed buildings, using the full details of the loading conditions and taking into consideration the allowable tolerable settlements/movements that the building can accommodate. The founding strata should be inspected and verified by a suitably qualified engineer prior to construction of the building foundations.

## **APPENDIX 1 - Site Location Plan**



→ 18 BOREHOLES TO 8m  
 - SPTS @ 1.5 c/c

→ 3 INFILTRATION TESTS

- STANDPIPES IN BOREHOLES 1, 4, 7, 12 & 16

Revisions			
No	Revision	Date	By
P2	ISSUED FOR PURCHASE	26.08.18	ME/MS
P1	ISSUED FOR REVIEW	07.08.18	ME/MS

Drawing Status: **DRAFT**

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Client: CAIRN HOMES

Project Title: PROPOSED HOUSING DEVELOPMENT AT FARRANKELLY, WICKLOW

Drawing Title: PROPOSED SITE LAYOUT SHEET 4

Drawing Number: FK-ROD-20-XX-DR-C-0004 Rev: P1

Scale: 1:200 Date: 10.08.18 Job No: 16146 Cont No: J:\2018\16146\DWG

Drawn: ME/MS Checked: MS/MS Approved: AMV

## **APPENDIX 2 – Trial Pit Records**



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**Site**  
Farankelly

**Trial Pit Number**  
**IT01**

<b>Machine</b> : 3.5 Tonne Excavator	<b>Dimensions</b> 0.50 x 1.70m	<b>Ground Level (mOD)</b> 46.16	<b>Client</b> Roghan & O'Donovan	<b>Job Number</b> 8065-09-18
<b>Method</b> : Trial Pit	<b>Location</b> 728511 E 710171.5 N	<b>Dates</b> 21/09/2018	<b>Project Contractor</b> Ground Investigation Ireland	<b>Sheet</b> 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
						MADE GROUND: Dark brown slightly sandy slightly gravelly TOPSOIL with grass rootlets and plastic fragments		
				45.86	0.30	Firm to stiff light brown slightly sandy slightly gravelly CLAY with rare subangular to subrounded cobbles		
				45.36	0.80	Stiff light reddish brown slightly sandy slightly gravelly CLAY		
				44.56	1.60	Complete at 1.60m		

<p><b>Plan</b></p> <p style="text-align: center;">. . . . .</p> <p style="text-align: center;">. . . . .</p> <p style="text-align: center;">. . . . .</p> <p style="text-align: center;">. . . . .</p> <p style="text-align: center;">. . . . .</p> <p style="text-align: center;">. . . . .</p>	<p><b>Remarks</b></p> <p>Trail pit stable No groundwater encountered Trial pit backfilled on completion</p>	
<b>Scale (approx)</b> 1:25	<b>Logged By</b> DML	<b>Figure No.</b> 8065-09-18.IT01



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**Site**  
Farankelly

**Trial Pit Number**  
**IT02**

<b>Machine</b> : 3.5 Tonne Excavator	<b>Dimensions</b> 0.50 x 1.60m	<b>Ground Level (mOD)</b> 48.09	<b>Client</b> Roghan & O'Donovan	<b>Job Number</b> 8065-09-18
<b>Method</b> : Trial Pit	<b>Location</b> 728399.8 E 710271.2 N	<b>Dates</b> 21/09/2018	<b>Project Contractor</b> Ground Investigation Ireland	<b>Sheet</b> 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
				47.79	(0.30)	Brown slightly sandy slightly gravelly TOPSOIL with grass rootlets		
				47.09	(0.70)	Firm light brown slightly sandy slightly gravelly CLAY with some subangular to subrounded cobbles and boulders		
				47.09	(0.50)	Loose light brown slightly slightly gravelly slightly clayey fine to medium SAND with silty lenses		
				46.59	1.50	Complete at 1.50m		

<p><b>Plan</b></p> <p style="text-align: center;">. . . . .</p> <p style="text-align: center;">. . . . .</p> <p style="text-align: center;">. . . . .</p> <p style="text-align: center;">. . . . .</p> <p style="text-align: center;">. . . . .</p> <p style="text-align: center;">. . . . .</p>	<p><b>Remarks</b></p> <p>Trail pit stable No groundwater encountered Trial pit backfilled on completion</p>	
<b>Scale (approx)</b> 1:25	<b>Logged By</b> DML	<b>Figure No.</b> 8065-09-18.IT02





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**Site**  
Farankelly

**Trial Pit Number**  
**IT03**

<b>Machine</b> : 3.5 Tonne Excavator	<b>Dimensions</b> 0.50 x 1.50m	<b>Ground Level (mOD)</b> 47.38	<b>Client</b> Roghan & O'Donovan	<b>Job Number</b> 8065-09-18
<b>Method</b> : Trial Pit	<b>Location</b> 728308.8 E 710366.3 N	<b>Dates</b> 21/09/2018	<b>Project Contractor</b> Ground Investigation Ireland	<b>Sheet</b> 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
				47.08	(0.30)	Brown slightly sandy slightly gravelly TOPSOIL with grass rootlets		
				46.38	(0.70)	Firm reddish brown slightly sandy gravelly CLAY with some subangular to subrounded cobbles and boulders		
				45.88	(0.50)	Medium dense light brown slightly slightly gravelly slightly clayey fine to medium SAND		
					1.50	Complete at 1.50m		

<p><b>Plan</b></p> <p style="text-align: center;">. . . . .</p> <p style="text-align: center;">. . . . .</p> <p style="text-align: center;">. . . . .</p> <p style="text-align: center;">. . . . .</p> <p style="text-align: center;">. . . . .</p> <p style="text-align: center;">. . . . .</p>	<p><b>Remarks</b></p> <p>Trail pit unstable side wall collapse No groundwater encountered Trial pit backfilled on completion</p>	
<b>Scale (approx)</b> 1:25	<b>Logged By</b> DML	<b>Figure No.</b> 8065-09-18.IT03

**Farrankelly Wicklow – Soakaway Photographs**

**IT01**



**IT01**



**IT01**



**IT02**



**IT02**



IT02



IT03



IT03



IT03



## **APPENDIX 3 – Soakaway Testing Records**



**SA01**

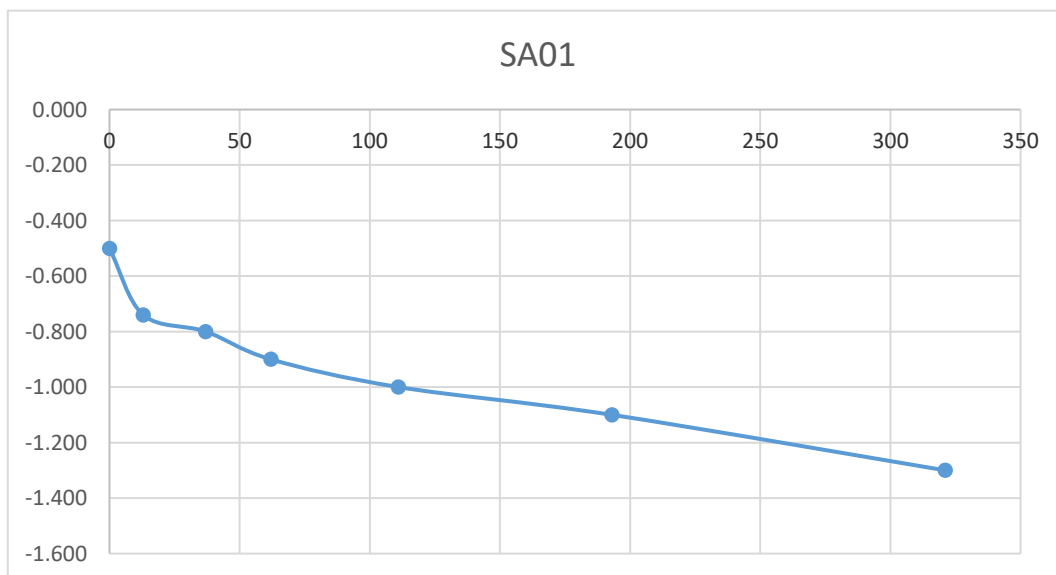
REV 01 Final

**Soakaway Test to BRE Digest 365**

**Trial Pit Dimensions: 1.70m x 0.5m 1.60m (L x W x D)**

Date	Time	Water level (m bgl)
24/09/2018	0	-0.500
24/09/2018	13	-0.740
24/09/2018	37	-0.800
24/09/2018	62	-0.900
24/09/2018	111	-1.000
24/09/2018	193	-1.100
24/09/2018	321	-1.300

<b>Start depth</b> <b>0.50</b>	<b>Depth of Pit</b> <b>1.600</b>	<b>Diff</b> <b>1.100</b>	<b>75% full</b> <b>0.775</b>	<b>25%full</b> <b>1.325</b>
Length of pit (m)	Width of pit (m)		75-25Ht (m)	Vp75-25 (m3)
1.700	0.500		0.550	0.47
Tp75-25 (from graph) (s)		<b>18600</b>	50% Eff Depth	ap50 (m2)
<b>f =</b>		<b>7.686E-06</b>	0.550	3.27
		<b>m/s</b>		



**SA02**

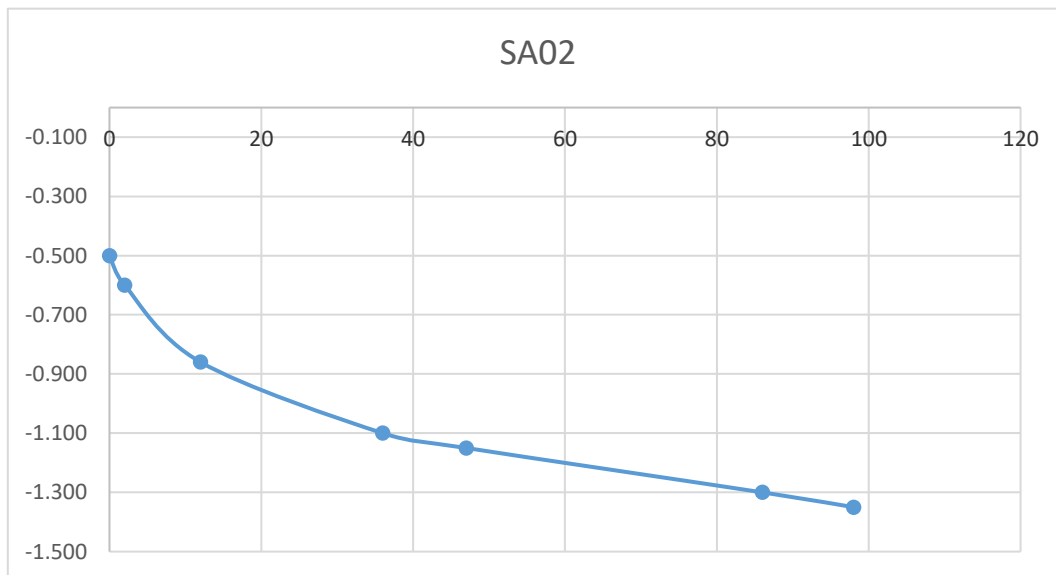
REV 01 Final

**Soakaway Test to BRE Digest 365**

**Trial Pit Dimensions: 1.60m x 0.5m 1.50m (L x W x D)**

Date	Time	Water level (m bgl)
24/09/2018	0	-0.500
24/09/2018	2	-0.600
24/09/2018	12	-0.860
24/09/2018	36	-1.100
24/09/2018	47	-1.150
24/09/2018	86	-1.300
24/09/2018	98	-1.350

<b>Start depth</b> <b>0.50</b>	<b>Depth of Pit</b> <b>1.500</b>	<b>Diff</b> <b>1.000</b>	<b>75% full</b> <b>0.75</b>	<b>25%full</b> <b>1.25</b>
Length of pit (m)	Width of pit (m)		75-25Ht (m)	Vp75-25 (m3)
1.600	0.500		0.500	0.40
Tp75-25 (from graph) (s)		<b>3780</b>	50% Eff Depth	ap50 (m2)
<b>f =</b>		<b>3.649E-05</b>	0.500	2.9
		<b>m/s</b>		



**SA03**

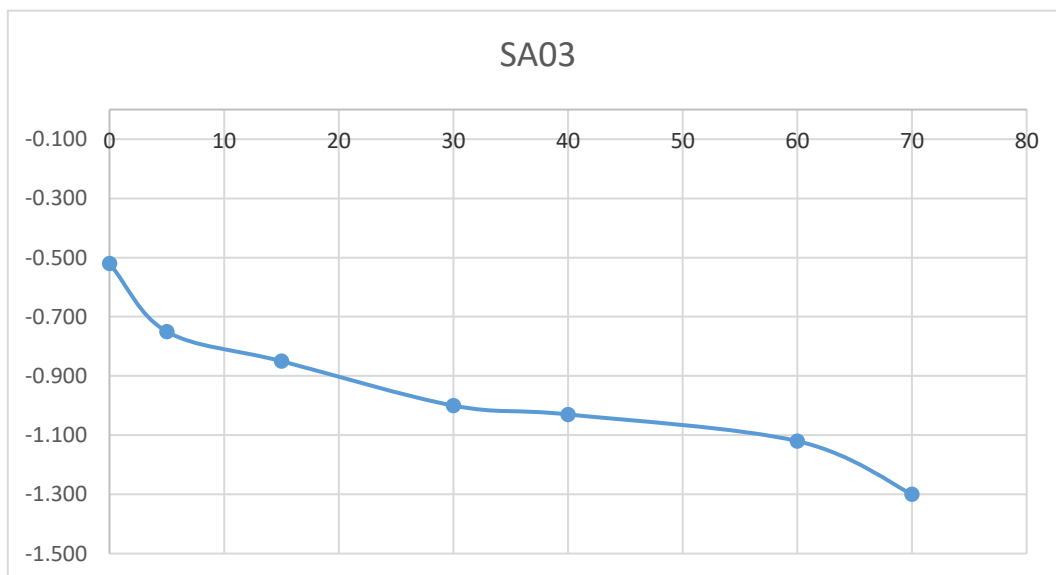
REV 01 Final

**Soakaway Test to BRE Digest 365**

**Trial Pit Dimensions: 1.50m x 0.5m 1.50m (L x W x D)**

Date	Time	Water level (m bgl)
24/09/2018	0	-0.520
24/09/2018	5	-0.750
24/09/2018	15	-0.850
24/09/2018	30	-1.000
24/09/2018	40	-1.030
24/09/2018	60	-1.120
24/09/2018	70	-1.300

<b>Start depth</b> <b>0.52</b>	<b>Depth of Pit</b> <b>1.500</b>	<b>Diff</b> <b>0.980</b>	<b>75% full</b> <b>0.765</b>	<b>25%full</b> <b>1.255</b>
Length of pit (m) 1.500	Width of pit (m) 0.500		75-25Ht (m) 0.490	Vp75-25 (m3) 0.37
Tp75-25 (from graph) (s) <b>f =</b>	<b>3600</b>	<b>m/s</b>	50% Eff Depth 0.490	ap50 (m2) 2.71



## **APPENDIX 4 – Cable Percussion Borehole Records**



# Ground Investigations Ireland Ltd

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**Site**  
Farankelly

**Borehole Number**  
**BH01**

<b>Machine</b> : DANDO 2000	<b>Casing Diameter</b> 200mm cased to 3.70m	<b>Ground Level (mOD)</b> 41.49	<b>Client</b> Roghan & O'Donovan	<b>Job Number</b> 8065-09-18
<b>Method</b> : Cable Percussion	<b>Location (dGPS)</b> 728909.9 E 710320.9 N	<b>Dates</b> 28/09/2018	<b>Project Contractor</b> Ground Investigation Ireland	<b>Sheet</b> 1/1

Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.50	B				41.29	(0.20) 0.20	Brown slightly sandy slightly gravelly TOPSOIL with rootlets		
1.00-1.45 1.00	SPT(C) N=12 B			2,2/2,3,3,4		(1.30)	Firm to stiff brown sandy CLAY with some cobbles and boulders		
1.50	B				39.99	1.50	Stiff brown sandy gravelly CLAY with some cobbles and boulders		
2.00-2.45 2.00	SPT(C) N=15 B			1,2/1,3,5,6		(1.50)			
3.00-3.38 3.00	SPT(C) 50/225 B			9,12/15,17,18	38.49	3.00	Dense greyish brown slightly clayey fine to coarse SAND		
					37.79	3.70	Obstruction due to presumed boulder or Rock		
							Complete at 3.70m		

<b>Remarks</b> Borehole backfilled on completion No groundwater encountered Chiselling from 3.40m to 3.70m for 1.5 hours.	<b>Scale (approx)</b> 1:50	<b>Logged By</b> DML
<b>Figure No.</b> 8065-09-18.BH01		



# Ground Investigations Ireland Ltd

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**Site**  
Farankelly

**Borehole Number**  
**BH01A**

<b>Machine</b> : DANDO 2000	<b>Casing Diameter</b> 200mm cased to 5.40m	<b>Ground Level (mOD)</b>	<b>Client</b> Roghan & O'Donovan	<b>Job Number</b> 8065-09-18
<b>Method</b> : Cable Percussion	<b>Location (dGPS)</b> Adjacent to BH01	<b>Dates</b> 28/09/2018	<b>Project Contractor</b> Ground Investigation Ireland	<b>Sheet</b> 1/1

Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
0.50	B					(0.30) 0.30	Brown slightly sandy slightly gravelly TOPSOIL with rootlets			
1.00-1.45 1.00	SPT(C) N=12 B			2,2/2,3,3,4		(1.20)	Firm brown very sandy gravelly CLAY with cobbles and boulders			
1.50	B					1.50	Stiff brown sandy gravelly CLAY with some cobbles and boulders			
2.00-2.45 2.00	SPT(C) N=15 B			1,2/1,3,5,6		(1.70)				
3.00-3.45 3.00	SPT(C) N=22 B			2,4/4,6,6,6		3.20	Dense greyish brown slightly clayey gravelly fine to coarse SAND			
4.00-4.15 4.00	SPT(C) 50/0 B			25/50		(2.20)				
5.00-5.38 5.00	SPT(C) 50/230 B			3,7/11,18,21		5.40	Obstruction due to presumed boulder or Rock			
							Complete at 5.40m			

<b>Remarks</b> 50mm slotted standpipe installed from 5.40m to 2.00m with pea gravel surround, plain pipe installed from 2.00m to ground level with bentonite seal and raised cover. No groundwater encountered Chiselling from 3.90m to 5.40m for 0.75 hours. Chiselling from 5.40m to 5.40m for 1 hour.	<b>Scale (approx)</b> 1:50	<b>Logged By</b> DML
<b>Figure No.</b> 8065-09-18.BH01A		



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**Site**  
Farankelly

**Borehole Number**  
**BH02**

<b>Machine</b> : DANDO 2000	<b>Casing Diameter</b> 200mm cased to 7.00m	<b>Ground Level (mOD)</b> 48.41	<b>Client</b> Roghan & O'Donovan	<b>Job Number</b> 8065-09-18
<b>Method</b> : Cable Percussion	<b>Location (dGPS)</b> 728811.6 E 710264.7 N	<b>Dates</b> 02/10/2018	<b>Project Contractor</b> Ground Investigation Ireland	<b>Sheet</b> 1/1

Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.50	B				48.11	(0.30) 0.30	Brown slightly sandy slightly gravelly TOPSOIL with rootlets		
1.00-1.45 1.00	SPT(C) N=16 B			1,2/2,4,5,5			Stiff brown slightly sandy slightly gravelly CLAY with angular cobbles		
1.50	B					(2.70)			
2.00-2.45 2.00	SPT(C) N=25 B			1,1/4,6,6,9					
3.00-3.45 3.00	SPT(C) N=35 B			3,5/5,8,9,13	45.41	3.00	Stiff brown slightly sandy gravelly CLAY with angular cobbles		
4.00-4.45 4.00	SPT(C) N=39 B			2,4/6,8,8,17	44.41	4.00	Stiff brown slightly sandy slightly gravelly CLAY with angular cobbles		
5.00-5.38 5.00	SPT(C) 50/225 B			5,9/13,21,16		(3.00)			
6.00-6.30 6.00	SPT(C) 50/150 B			7,11/15,35					
7.00-7.00 7.00	SPT(C) 25*/0 50/0 B			25/50	41.41	7.00	Obstruction due to presumed boulder or Rock Complete at 7.00m		

<b>Remarks</b> Borehole backfilled on completion No groundwater encountered Chiselling from 6.50m to 7.00m for 1.0 hour.	<b>Scale (approx)</b> 1:50	<b>Logged By</b> DML
<b>Figure No.</b> 8065-09-18.BH02		



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**Site**  
Farankelly

**Borehole Number**  
**BH03**

<b>Machine</b> : DANDO 2000	<b>Casing Diameter</b> 200mm cased to 8.00m	<b>Ground Level (mOD)</b> 40.81	<b>Client</b> Roghan & O'Donovan	<b>Job Number</b> 8065-09-18
<b>Method</b> : Cable Percussion	<b>Location (dGPS)</b> 728714.6 E 710301.2 N	<b>Dates</b> 03/10/2018	<b>Project Contractor</b> Ground Investigation Ireland	<b>Sheet</b> 1/1

Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.50	B				40.51	(0.30) 0.30	Brown slightly sandy slightly gravelly TOPSOIL with rootlets		
1.00-1.45 1.00	SPT(C) N=17 B			2,3/3,4,5,5		(1.20)	Stiff brown slightly gravelly sandy CLAY		
1.50	B				39.31	1.50	Firm brown slightly sandy slightly gravelly CLAY with some cobbles		
2.00-2.45 2.00	SPT(C) N=10 B			1,2/2,2,3,3		(0.80)	Stiff brown slightly gravelly sandy CLAY		
3.00-3.45 3.00	SPT(C) N=10 B			1,1/2,2,2,4		(1.70)	Stiff Brown sandy gravelly CLAY		
4.00-4.45 4.00	SPT(C) N=19 B			2,3/3,5,6,5		36.81 4.00	Stiff brown sandy gravelly CLAY with angular cobbles and boulders		
5.00-5.45 5.00	SPT(C) N=36 B			1,4/7,9,10,10		35.71 5.10	Obstruction due to presumed boulder or Rock		
6.00-6.45 6.00	SPT(C) N=40 B			3,6/8,8,13,11		(2.90)	Complete at 8.00m		
7.00-7.45 7.00	SPT(C) N=50 B			1,5/7,16,27		32.81 8.00			

<b>Remarks</b> Borehole backfilled on completion No groundwater encountered	<b>Scale (approx)</b> 1:50	<b>Logged By</b> DML
<b>Figure No.</b> 8065-09-18.BH03		





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Site  
Farankelly

Borehole  
Number  
**BH04**

Machine : DANDO 2000	Casing Diameter 200mm cased to 8.30m	Ground Level (mOD) 37.97	Client Roghan & O'Donovan	Job Number 8065-09-18
Method : Cable Percussion	Location (dGPS) 728612.3 E 710289.1 N	Dates 25/09/2018- 26/09/2018	Project Contractor Ground Investigation Ireland	Sheet 1/1

Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
0.50	B				37.67	(0.30) 0.30	Brown slightly sandy slightly gravelly TOPSOIL with rootlets			
1.00-1.45 1.00	SPT(C) N=12 B			2,2/2,3,3,4		(1.20)	Firm to stiff brown slightly gravelly sandy CLAY			
1.50	B				36.47	1.50	Firm brown sandy gravelly CLAY with some cobbles			
2.00-2.45 2.00	SPT(C) N=15 B			1,3/2,3,4,6		(0.80)				
					35.67	2.30	Stiff brown gravelly very sandy CLAY			
3.00-3.45 3.00	SPT(C) N=16 B			2,1/3,5,5,3		(0.70)				
					34.97	3.00	Stiff brown slightly gravelly sandy CLAY			
4.00-4.45 4.00	SPT(C) N=17 B			1,3/5,4,4,4		(1.00)				
					33.97	4.00	Stiff brown slightly sandy gravelly CLAY			
5.00-5.45 5.00	SPT(C) N=42 B			3,7/8,8,11,15		(1.10)				
					32.87	5.10	Stiff brown sandy gravelly CLAY with angular cobbles and boulders			
6.00-6.38 6.00	SPT(C) 50/225 B			1,10/17,12,21		(0.90)				
					31.97	6.00	Stiff brown sandy gravelly CLAY with angular cobbles and boulders			
7.00-7.15 7.00	SPT(C) 50/0 B			25/50		(1.00)				
					30.97	7.00	Stiff brown slightly sandy slightly gravelly CLAY with angular cobbles and boulders			
8.00-8.15 8.00	SPT(C) 50/0 B			25/50		(1.30)				
					29.67	8.30	Obstruction due to presumed boulder or Rock			
							Complete at 8.30m			

<b>Remarks</b> No groundwater encountered 50mm slotted standpipe installed from 8.300m to 2.00m with pea gravel surround, plain pipe installed from 2.00m to ground level with bentonite seal and raised cover. Chiselling from 7.10m to 7.40m for 1 hour. Chiselling from 7.90m to 8.30m for 0.75 hours.	<b>Scale (approx)</b>  1:50	<b>Logged By</b>  DML
<b>Figure No.</b> 8065-09-18.BH04		



# Ground Investigations Ireland Ltd

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**Site**  
Farankelly

**Borehole Number**  
**BH05**

<b>Machine</b> : DANDO 2000	<b>Casing Diameter</b> 200mm cased to 6.80m	<b>Ground Level (mOD)</b> 45.08	<b>Client</b> Roghan & O'Donovan	<b>Job Number</b> 8065-09-18
<b>Method</b> : Cable Percussion	<b>Location (dGPS)</b> 728543.5 E 710238.6 N	<b>Dates</b> 04/09/2018- 05/09/2018	<b>Project Contractor</b> Ground Investigation Ireland	<b>Sheet</b> 1/1

Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.50	B				44.78	(0.30)	Brown slightly sandy slightly gravelly TOPSOIL with rootlets		
						0.30	Firm brown sandy gravelly CLAY		
1.00-1.45 1.00	SPT(C) N=13 B			1,2/2,2,4,5		(1.20)			
1.50	B				43.58	1.50	Firm to stiff brown slightly sandy gravelly CLAY		
2.00-2.45 2.00	SPT(C) N=18 B			2,4/4,3,5,6	43.18	1.90	Stiff brown slightly sandy very clayey subrounded to rounded fine to coarse GRAVEL		
						(1.20)			
3.00-3.45 3.00	SPT(C) N=22 B			2,4/5,4,5,8	41.98	3.10	Stiff brown slightly gravelly sandy CLAY with angular cobbles and boulders		
						(0.90)			
4.00-4.45 4.00	SPT(C) N=29 B			1,3/6,6,6,11	41.08	4.00	Stiff brown slightly gravelly slightly sandy silty CLAY with angular cobbles and boulders		
						(1.00)			
5.00-5.30 5.00	SPT(C) 50/150 B			7,9/21,29	40.08	5.00	Stiff brown sandy gravelly CLAY with angular cobbles and boulders		
						(1.00)			
6.00-6.45 6.00	SPT(C) N=50 B			3,9/7,7,18,18	39.08	6.00	Stiff brown sandy gravelly CLAY with angular cobbles and boulders		
						(0.80)			
					38.28	6.80	Obstruction due to presumed boulder or Rock		
							Complete at 6.80m		

<b>Remarks</b> No groundwater encountered Borehole backfilled on completion Chiselling from 1.60m to 1.80m for 0.5 hours. Chiselling from 5.30m to 5.60m for 0.75 hours. Chiselling from 6.60m to 6.80m for 1.0 hour.	<b>Scale (approx)</b> 1:50	<b>Logged By</b> DML
<b>Figure No.</b> 8065-09-18.BH05		



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**Site**  
Farankelly

**Borehole Number**  
**BH06**

<b>Machine</b> : DANDO 2000	<b>Casing Diameter</b> 200mm cased to 8.00m	<b>Ground Level (mOD)</b> 42.40	<b>Client</b> Roghan & O'Donovan	<b>Job Number</b> 8065-09-18
<b>Method</b> : Cable Percussion	<b>Location (dGPS)</b> 728604.9 E 710192.9 N	<b>Dates</b> 04/09/2018-05/09/2018	<b>Project Contractor</b> Ground Investigation Ireland	<b>Sheet</b> 1/1

Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.50	B				42.10	(0.30)	Brown slightly sandy slightly gravelly TOPSOIL with rootlets		
						0.30	Firm brown sandy gravelly CLAY		
1.00-1.45 1.00	SPT(C) N=10 B			1,2/2,2,2,4		(1.20)			
1.50	B				40.90	1.50	Stiff brown sandy gravelly CLAY		
2.00-2.45 2.00	SPT(C) N=20 B			1,2/2,5,5,8		(1.70)			
3.00-3.45 3.00	SPT(C) N=19 B			3,3/2,3,7,7	39.20	3.20	Stiff brown slightly gravelly very sandy CLAY		
4.00-4.45 4.00	SPT(C) N=21 B			2,5/5,5,5,6	38.40	4.00	Medium dense brown slightly gravelly clayey fine to coarse SAND		
5.00-5.30 5.00	SPT(C) 50/150 B			6,9/17,33	37.40	5.00	Stiff brown slightly sandy gravelly CLAY with angular cobbles		
6.00-6.22 6.00	SPT(C) 50/70 B			12,23/50		(1.80)			
7.00-7.15 7.00	SPT(C) 50/0 B			25/50	35.60	6.80	Stiff light brown slightly sandy gravelly CLAY with angular cobbles		
					34.40	8.00	Obstruction due to presumed boulder or Rock		
							Complete at 8.00m		

<b>Remarks</b> No groundwater encountered Borehole backfilled on completion Chiselling from 7.10m to 8.00m for 1.5 hours.	<b>Scale (approx)</b> 1:50	<b>Logged By</b> DML
<b>Figure No.</b> 8065-09-18.BH06		



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**Site**  
Farankelly

**Borehole Number**  
**BH07**

<b>Machine</b> : DANDO 2000	<b>Casing Diameter</b> 200mm cased to 3.60m	<b>Ground Level (mOD)</b> 47.82	<b>Client</b> Roghan & O'Donovan	<b>Job Number</b> 8065-09-18
<b>Method</b> : Cable Percussion	<b>Location (dGPS)</b> 728475.5 E 710134.2 N	<b>Dates</b> 24/09/2018	<b>Project Contractor</b> Ground Investigation Ireland	<b>Sheet</b> 1/1

Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.50	B				47.52	(0.30)	Brown slightly sandy slightly gravelly TOPSOIL with rootlets		
						0.30	Stiff brown slightly sandy very gravelly CLAY		
1.00-1.45 1.00	SPT(C) N=22 B			1,2/4,6,6,6		(1.20)			
1.50	B				46.32	1.50	Dense brown clayey very sandy subangular to subrounded fine to coarse GRAVEL with cobbles and boulders		
2.00-2.45 2.00	SPT(C) N=38 B			1,7/12,10,8,8		(2.10)			
3.00-3.38 3.00	SPT(C) 50/225 B			5,9/11,18,21		3.60	Obstruction due to presumed boulder or Rock		
					44.22		Complete at 3.60m		

<b>Remarks</b> No groundwater encountered Borehole backfilled on completion Chiselling from 3.60m to 3.60m for 1.0 hour.	<b>Scale (approx)</b>	<b>Logged By</b>
	1:50	DML
	<b>Figure No.</b> 8065-09-18.BH07	



# Ground Investigations Ireland Ltd

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**Site**  
Farankelly

**Borehole Number**  
**BH08**

<b>Machine</b> : DANDO 2000	<b>Casing Diameter</b> 200mm cased to 8.00m	<b>Ground Level (mOD)</b> 45.08	<b>Client</b> Roghan & O'Donovan	<b>Job Number</b> 8065-09-18
<b>Method</b> : Cable Percussion	<b>Location (dGPS)</b> 728543.5 E 710238.6 N	<b>Dates</b> 24/09/2018	<b>Project Contractor</b> Ground Investigation Ireland	<b>Sheet</b> 1/1

Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.50	B					(0.30)	Brown slightly sandy slightly gravelly TOPSOIL with rootlets		
						0.30	Stiff brown slightly gravelly sandy CLAY		
1.00-1.45 1.00	SPT(C) N=31 B			3,5/7,7,11,6	44.08	(0.70)			
1.50	B					(1.00)	Stiff brown slightly sandy slightly clayey subangular to subrounded fine to coarse GRAVEL		
2.00-2.15 2.00	SPT(C) 50/0 B			25/50	43.08	2.00	Brown slightly sandy slightly gravelly CLAY		
						(1.00)			
3.00-3.45 3.00	SPT(C) N=28 B			4,6/5,5,9,9	42.08	3.00	Brown slightly sandy slightly gravelly silty CLAY		
						(1.00)			
4.00-4.45 4.00	SPT(C) N=40 B			2,7/7,8,11,14	41.08	4.00	Stiff brown sandy gravelly CLAY with cobbles and boulders		
5.00-5.45 5.00	SPT(C) N=33 B			4,5/7,10,7,9		(2.30)			
6.00-6.45 6.00	SPT(C) N=50 B			1,5/6,13,17,14	38.78	6.30	Stiff dark brown sandy gravelly CLAY with cobbles and boulders		
7.00-7.45 7.00	SPT(C) N=50 B			16,19/50		(1.70)			
8.00-8.00	SPT(C) 25*/0 50/0			25/50	37.08	8.00	Obstruction due to presumed boulder or Rock		
							Complete at 8.00m		

<b>Remarks</b> No groundwater encountered Borehole backfilled on completion Chiselling from 1.90m to 2.40m for 1.5 hours.	<b>Scale (approx)</b> 1:50	<b>Logged By</b> DML
<b>Figure No.</b> 8065-09-18.BH08		



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**Site**  
Farankelly

**Borehole Number**  
**BH09**

<b>Machine</b> : DANDO 2000	<b>Casing Diameter</b> 200mm cased to 7.30m	<b>Ground Level (mOD)</b> 43.30	<b>Client</b> Roghan & O'Donovan	<b>Job Number</b> 8065-09-18
<b>Method</b> : Cable Percussion	<b>Location (dGPS)</b> 728562.6 E 710274.4 N	<b>Dates</b> 25/09/2018	<b>Project Contractor</b> Ground Investigation Ireland	<b>Sheet</b> 1/1

Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.50	B				43.00	(0.30) 0.30	Brown slightly sandy slightly gravelly TOPSOIL with rootlets		
1.00-1.45 1.00	SPT(C) N=19 B			1,3/3,4,6,6			Stiff brown sandy gravelly CLAY with cobbles and boulders		
1.50	B								
2.00-2.45 2.00	SPT(C) N=33 B			3,5/5,8,9,11					
3.00-3.45 3.00	SPT(C) N=49 B			6,6/6,10,14,19		(5.30)			
4.00-4.30 4.00	SPT(C) 50/150 B			1,5/11,39					
5.00-5.45 5.00	SPT(C) N=28 B			2,4/6,7,6,9					
6.00-6.30 6.00	SPT(C) 50/150 B			7,15/23,27	37.70	5.60	Stiff dark brown slightly sandy slightly gravelly CLAY with cobbles and boulders		
7.00-7.15	SPT(C) 50/0			25/50	36.00	7.30	Obstruction due to presumed boulder or Rock		
							Complete at 7.30m		

<b>Remarks</b> No groundwater encountered Borehole backfilled on completion Chiselling from 4.30m to 4.50m for 0.5 hours. Chiselling from 7.10m to 7.30m for 1.0 hour.	<b>Scale (approx)</b> 1:50	<b>Logged By</b> DML
<b>Figure No.</b> 8065-09-18.BH09		



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**Site**  
Farankelly

**Borehole Number**  
**BH10**

<b>Machine</b> : DANDO 2000	<b>Casing Diameter</b> 200mm cased to 3.20m	<b>Ground Level (mOD)</b> 41.22	<b>Client</b> Roghan & O'Donovan	<b>Job Number</b> 8065-09-18
<b>Method</b> : Cable Percussion	<b>Location (dGPS)</b> 728468.3 E 710415.9 N	<b>Dates</b> 04/10/2018	<b>Project Contractor</b> Ground Investigation Ireland	<b>Sheet</b> 1/1

Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
0.50	B				40.92	(0.30) 0.30	Brown slightly sandy slightly gravelly TOPSOIL with rootlets			
1.00-1.45 1.00	SPT(C) N=24 B			2,4/4,7,5,8		(1.20)	Stiff brown slightly sandy gravelly CLAY			
1.50	B				39.72	1.50	Stiff brown slightly sandy slightly clayey subangular to subrounded fine to coarse GRAVEL			
2.00-2.45 2.00	SPT(C) N=41 B			1,3/8,8,11,14	39.22	2.00	Stiff brown slightly sandy gravelly CLAY with cobbles and boulders			
3.00-3.23 3.00	SPT(C) 50/75 B			7,15/50	38.02	3.20	Obstruction due to presumed boulder or Rock Complete at 3.20m			

<b>Remarks</b> No groundwater encountered 50mm slotted standpipe installed from 3.20m to 1.00m with pea gravel surround, plain pipe installed from 1.00m to ground level with bentonite seal and raised cover. Chiselling from 3.10m to 3.20m for 1 hour.	<b>Scale (approx)</b> 1:50	<b>Logged By</b> DML
<b>Figure No.</b> 8065-09-18.BH10		



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**Site**  
Farankelly

**Borehole Number**  
**BH11**

<b>Machine</b> : DANDO 2000	<b>Casing Diameter</b> 200mm cased to 3.70m	<b>Ground Level (mOD)</b> 50.19	<b>Client</b> Roghan & O'Donovan	<b>Job Number</b> 8065-09-18
<b>Method</b> : Cable Percussion	<b>Location (dGPS)</b> 728422.6 E 710156 N	<b>Dates</b> 24/09/2018	<b>Project Contractor</b> Ground Investigation Ireland	<b>Sheet</b> 1/1

Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
1.00-1.45 1.00	SPT(C) N=28 B			4,6/7,6,8,7	49.89	(0.30)	Brown slightly sandy slightly gravelly TOPSOIL with rootlets		
						0.30	Stiff brown sandy gravelly CLAY with some cobbles		
2.00-2.45 2.00	SPT(C) N=41 B			8,24/14,10,5,12	49.19	(0.70)	Dense brown slightly clayey sandy subangular to subrounded fine to coarse GRAVEL with some cobbles		
						1.00			
3.00-3.45 3.00	SPT(C) N=48 B			8,10/12,12,11,13	46.49	(2.70)	Obstruction due to presumed boulder or Rock		
						3.70		Complete at 3.70m	

<b>Remarks</b> No groundwater encountered Borehole backfilled on completion Chiselling from 3.70m to 3.70m for 1 hour.	<b>Scale (approx)</b> 1:50	<b>Logged By</b> DML
<b>Figure No.</b> 8065-09-18.BH11		





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**Site**  
Farankelly

**Borehole Number**  
**BH12**

<b>Machine</b> : DANDO 2000	<b>Casing Diameter</b> 200mm cased to 3.00m	<b>Ground Level (mOD)</b> 54.85	<b>Client</b> Roghan & O'Donovan	<b>Job Number</b> 8065-09-18
<b>Method</b> : Cable Percussion	<b>Location (dGPS)</b> 728365 E 710088.4 N	<b>Dates</b> 21/09/2018	<b>Project Contractor</b> Ground Investigation Ireland	<b>Sheet</b> 1/1

Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
1.00-1.30 1.00	SPT(C) 50/150 B			2,7/18,32	54.55	(0.30) 0.30	Brown slightly sandy slightly gravelly TOPSOIL with rootlets			
1.50	B				53.85	(0.70) 1.00	Stiff brown sandy gravelly CLAY with some cobbles			
2.00-2.30 2.00	SPT(C) 50/150 B			10,15/24,26	53.35	(0.50) 1.50	Stiff brown sandy clayey subangular to subrounded fine to coarse GRAVEL with some cobbles			
3.00-3.00 3.00	SPT(C) 25*/0 50/0 B			25/50	51.85	3.00	Obstruction due to presumed boulder or Rock Complete at 3.00m			

<b>Remarks</b> No groundwater encountered 50mm slotted standpipe installed from 3.00m to 1.0m with pea gravel surround, plain pipe installed from 1.00m to ground level with bentonite seal and raised cover. Chiselling from 1.40m to 1.80m for 1 hour. Chiselling from 2.90m to 3.00m for 1 hour.	<b>Scale (approx)</b> 1:50	<b>Logged By</b> DML
<b>Figure No.</b> 8065-09-18.BH12		



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**Site**  
Farankelly

**Borehole Number**  
**BH13**

<b>Machine</b> : DANDO 2000	<b>Casing Diameter</b> 200mm cased to 4.60m	<b>Ground Level (mOD)</b> 56.01	<b>Client</b> Roghan & O'Donovan	<b>Job Number</b> 8065-09-18
<b>Method</b> : Cable Percussion	<b>Location (dGPS)</b> 728309.7 E 710136.2 N	<b>Dates</b> 19/09/2018	<b>Project Contractor</b> Ground Investigation Ireland	<b>Sheet</b> 1/1

Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.50	B				55.71	(0.30)	Brown slightly sandy slightly gravelly TOPSOIL with rootlets		
						0.30	Brown sandy gravelly CLAY with cobbles		
1.00-1.45 1.00	SPT(C) N=6 B			3,3/1,1,2,2		(1.60)			
1.50	B								
2.00-2.45 2.00	SPT(C) N=23 B			1,3/4,4,7,8	54.11	1.90	Stiff brown very sandy clayey subangular to subrounded fine to coarse GRAVEL with some cobbles and boulders		
						(1.10)			
3.00-3.45 3.00	SPT(C) N=34 B			3,5/5,9,10,10	53.01	3.00	Stiff light brown slightly sandy slightly gravelly silty CLAY with some cobbles		
						(1.60)			
4.00-4.30 4.00	SPT(C) 50/150 B			5,11/18,32	51.41	4.60	Obstruction due to presumed boulder or Rock		
							Complete at 4.60m		

<b>Remarks</b> No groundwater encountered Borehole backfilled on completion Chiselling from 4.30m to 4.60m for 1 hour.	<b>Scale (approx)</b> 1:50	<b>Logged By</b> DML
<b>Figure No.</b> 8065-09-18.BH13		



# Ground Investigations Ireland Ltd

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**Site**  
Farankelly

**Borehole Number**  
**BH14**

<b>Machine</b> : DANDO 2000	<b>Casing Diameter</b> 200mm cased to 4.20m	<b>Ground Level (mOD)</b> 50.66	<b>Client</b> Roghan & O'Donovan	<b>Job Number</b> 8065-09-18
<b>Method</b> : Cable Percussion	<b>Location (dGPS)</b> 728348.4 E 710226.9 N	<b>Dates</b> 19/09/2018	<b>Project Contractor</b> Ground Investigation Ireland	<b>Sheet</b> 1/1

Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.50	B				50.36	(0.30) 0.30	Brown slightly sandy slightly gravelly TOPSOIL with rootlets		
1.00-1.45 1.00	SPT(C) N=14 B			1,3/2,3,5,4		(1.20)	Firm to stiff brown sandy gravelly CLAY with cobbles		
1.50	B				49.16	1.50	Stiff brown slightly sandy very gravelly CLAY with cobbles		
2.00-2.45 2.00	SPT(C) N=50 B			4,9/9,14,10,17		(2.70)			
3.00-3.15 3.00	SPT(C) 50/0 B			25/50		4.20	Obstruction due to presumed boulder or Rock		
					46.46		Complete at 4.20m		

<b>Remarks</b> No groundwater encountered Borehole backfilled on completion Chiselling from 3.40m to 3.20m for 1 hour.	<b>Scale (approx)</b> 1:50	<b>Logged By</b> DML
<b>Figure No.</b> 8065-09-18.BH14		



# Ground Investigations Ireland Ltd

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**Site**  
Farankelly

**Borehole Number**  
**BH15**

<b>Machine</b> : DANDO 2000	<b>Casing Diameter</b> 200mm cased to 6.50m	<b>Ground Level (mOD)</b> 50.96	<b>Client</b> Roghan & O'Donovan	<b>Job Number</b> 8065-09-18
<b>Method</b> : Cable Percussion	<b>Location (dGPS)</b> 728271.6 E 710253.9 N	<b>Dates</b> 20/09/2018	<b>Project Contractor</b> Ground Investigation Ireland	<b>Sheet</b> 1/1

Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.50	B				50.66	(0.30)	Brown slightly sandy slightly gravelly TOPSOIL with rootlets		
						0.30	Stiff brown slightly sandy slightly gravelly CLAY with cobbles		
1.00-1.45 1.00	SPT(C) N=21 B			2,3/3,5,5,8	49.96	1.00	Stiff brown slightly sandy gravelly CLAY with cobbles		
1.50	B					(1.70)			
2.00-2.45 2.00	SPT(C) N=37 B			1,4/6,9,9,13					
3.00-3.38 3.00	SPT(C) 50/225 B			7,12/16,19,15	48.26	2.70	Stiff brown slightly sandy gravelly CLAY with cobbles and boulders		
4.00-4.15 4.00	SPT(C) 50/0 B			11,21/50		(3.80)			
5.00-5.15 5.00	SPT(C) 50/0 B			25/50					
6.00-6.15 6.00	SPT(C) 50/0 B			18,7/50	44.46	6.50	Obstruction due to presumed boulder or Rock		
							Complete at 6.50m		

<b>Remarks</b> No groundwater encountered Borehole backfilled on completion Chiselling from 3.30m to 3.70m for 0.75 hours. Chiselling from 6.40m to 6.50m for 1 hour.	<b>Scale (approx)</b> 1:50	<b>Logged By</b> DML
<b>Figure No.</b> 8065-09-18.BH15		



# Ground Investigations Ireland Ltd

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Site  
Farankelly

Borehole  
Number  
**BH16**

Machine : DANDO 2000	Casing Diameter 200mm cased to 5.40m	Ground Level (mOD) 56.78	Client Roghan & O'Donovan	Job Number 8065-09-18
Method : Cable Percussion	Location (dGPS) 728240.8 E 710182.6 N	Dates 19/09/2018- 20/09/2018	Project Contractor Ground Investigation Ireland	Sheet 1/1

Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
0.50	B				56.48	(0.30) 0.30	Brown slightly sandy slightly gravelly TOPSOIL with rootlets			
1.00-1.45 1.00	SPT(C) N=13 B			1,2/2,3,3,5		(1.70)	Stiff brown slightly sandy slightly gravelly CLAY with cobbles			
1.50	B									
2.00-2.45 2.00	SPT(C) N=15 B			2,2/4,3,4,4	54.78	2.00	Dense brown clayey gravelly fine to coarse SAND with cobbles			
3.00-3.45 3.00	SPT(C) N=31 B			3,6/6,7,8,10		(2.20)				
4.00-4.34 4.00	SPT(C) 50/185 B			5,8/13,14,22,1	52.58	4.20	Stiff brown very sandy gravelly CLAY with cobbles and boulders			
5.00-5.20 5.00	SPT(C) 50/50 B			6,18/50	51.38	5.40	Obstruction due to presumed boulder or Rock			
							Complete at 5.40m			

<b>Remarks</b> No groundwater encountered 50mm slotted standpipe installed from 5.40m to 1.00m with pea gravel surround, plain pipe installed from 1.00m to ground level with bentonite seal and raised cover. Chiselling from 5.20m to 5.40m for 1 hour.	<b>Scale (approx)</b>  1:50	<b>Logged By</b>  DML
<b>Figure No.</b> 8065-09-18.BH16		



# Ground Investigations Ireland Ltd

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**Site**  
Farankelly

**Borehole Number**  
**BH17**

<b>Machine</b> : DANDO 2000	<b>Casing Diameter</b> 200mm cased to 8.00m	<b>Ground Level (mOD)</b> 49.67	<b>Client</b> Roghan & O'Donovan	<b>Job Number</b> 8065-09-18
<b>Method</b> : Cable Percussion	<b>Location (dGPS)</b> 728328.2 E 710306.8 N	<b>Dates</b> 08/10/2018	<b>Project Contractor</b> Ground Investigation Ireland	<b>Sheet</b> 1/1

Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.50	B				49.37	(0.30) 0.30	Brown slightly sandy slightly gravelly TOPSOIL with rootlets		
1.00-1.45 1.00	SPT(C) N=9 B			1,1/2,2,2,3		(1.70)	Medium dense reddish brown very clayey gravelly fine to medium SAND with some cobbles		
1.50	B								
2.00-2.45 2.00	SPT(C) N=11 B			2,4/3,2,3,3	47.67	2.00	Loose reddish brown very clayey gravelly fine to medium SAND with some cobbles		
						(0.80)			
3.00-3.45 3.00	SPT(C) N=18 B			1,3/3,5,5,5	46.87	2.80	Stiff brown slightly sandy gravelly CLAY with some cobbles		
4.00-4.45 4.00	SPT(C) N=43 B			2,5/8,8,10,17					
5.00-5.30 5.00	SPT(C) 50/150 B			7,13/19,31		(5.20)			
6.00-6.15 6.00	SPT(C) 50/0 B			25/50					
7.00-7.00 7.00	SPT(C) 25*/0 50/0 B			25/50					
					41.67	8.00	Complete at 8.00m		

<b>Remarks</b> No groundwater encountered Borehole backfilled on completion	<b>Scale (approx)</b> 1:50	<b>Logged By</b> DML
<b>Figure No.</b> 8065-09-18.BH17		



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**Site**  
Farankelly

**Borehole Number**  
**BH18**

<b>Machine</b> : DANDO 2000	<b>Casing Diameter</b> 200mm cased to 2.70m	<b>Ground Level (mOD)</b> 47.02	<b>Client</b> Roghan & O'Donovan	<b>Job Number</b> 8065-09-18
<b>Method</b> : Cable Percussion	<b>Location (dGPS)</b> 728339.1 E 710381.1 N	<b>Dates</b> 05/10/2018	<b>Project Contractor</b> Ground Investigation Ireland	<b>Sheet</b> 1/1

Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.50	B			2,4/4,5,7,8	46.72	(0.30)	Brown slightly sandy slightly gravelly TOPSOIL with rootlets		
						0.30	Stiff brown sandy very gravelly CLAY with cobbles and boulders		
1.00-1.45 1.00	SPT(C) N=24 B			2,4/4,5,7,8	46.02	1.00	Medium dense brown sandy very clayey fine to coarse subangular to subrounded GRAVEL		
1.50	B				45.02	(1.00)			
2.00-2.23 2.00	SPT(C) 50/75 B			6,17/50	45.02	2.00	Dense brown sandy very clayey fine to coarse subangular to subrounded GRAVEL		
					44.32	(0.70)			
					44.32	2.70	Obstruction due to presumed boulder or Rock		
							Complete at 2.70m		

<b>Remarks</b> No groundwater encountered Borehole backfilled on completion Chiselling from 2.40m to 2.70m for 1.5 hours.	<b>Scale (approx)</b> 1:50	<b>Logged By</b> DML
<b>Figure No.</b> 8065-09-18.BH18		

## **APPENDIX 5 – Laboratory Testing**





# Exova Jones Environmental

Registered Office: Exova Environmental UK Limited, 10 Lower Grosvenor Place, London, SW1W 0EN. Reg No. 11371415

Unit 3 Deeside Point  
Zone 3  
Deeside Industrial Park  
Deeside  
CH5 2UA

Ground Investigations Ireland  
Catherinestown House  
Hazelhatch Road  
Newcastle  
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Ireland

Tel: +44 (0) 1244 833780

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**Attention :** Conor Finnerty  
**Date :** 16th November, 2018  
**Your reference :** 8065-09-18  
**Our reference :** Test Report 18/17808 Batch 1  
**Location :** Frankelly  
**Date samples received :** 5th November, 2018  
**Status :** Final report  
**Issue :** 1

Five samples were received for analysis on 5th November, 2018 of which five were scheduled for analysis. Please find attached our Test Report which should be read with notes at the end of the report and should include all sections if reproduced. Interpretations and opinions are outside the scope of any accreditation, and all results relate only to samples supplied.

All analysis is carried out on as received samples and reported on a dry weight basis unless stated otherwise. Results are not surrogate corrected.

Where Waste Acceptance Criteria Suite (EC Decision of 19 December 2002 (2003/33/EC)) has been requested, all analyses have been performed using the relevant EN methods where they exist.

## Compiled By:

**Lucas Halliwell**  
Project Co-ordinator

**Client Name:** Ground Investigations Ireland  
**Reference:** 8065-09-18  
**Location:** Farankelly  
**Contact:** Conor Finnerty  
**JE Job No.:** 18/17808

**Report : Solid**

**Solids:** V=60g VOC jar, J=250g glass jar, T=plastic tub

J E Sample No.	1-4	5-8	9-12	13-16	17-20															
Sample ID	BH01	BH03	BH09	BH10	BH16															
Depth	0.50	1.00	0.50	1.00	1.00															
COC No / misc																				
Containers	V J T	V J T	V J T	V J T	V J T															
Sample Date	28/09/2018	04/10/2018	25/09/2018	04/10/2018	04/10/2018															
Sample Type	Soil	Soil	Soil	Soil	Soil															
Batch Number	1	1	1	1	1															
Date of Receipt	05/11/2018	05/11/2018	05/11/2018	05/11/2018	05/11/2018															
						LOD/LOR	Units	Method No.	Please see attached notes for all abbreviations and acronyms											
Antimony	<1	1	1	<1	<1		mg/kg	TM30/PM15												
Arsenic #	8.1	9.9	12.6	8.7	9.9	<0.5	mg/kg	TM30/PM15												
Barium #	38	69	53	38	73	<1	mg/kg	TM30/PM15												
Cadmium #	0.6	2.2	0.9	0.8	0.8	<0.1	mg/kg	TM30/PM15												
Chromium #	36.5	50.2	33.7	23.7	39.4	<0.5	mg/kg	TM30/PM15												
Copper #	9	10	11	27	11	<1	mg/kg	TM30/PM15												
Lead #	10	23	24	14	17	<5	mg/kg	TM30/PM15												
Mercury #	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	mg/kg	TM30/PM15												
Molybdenum #	1.0	1.5	1.5	0.9	1.2	<0.1	mg/kg	TM30/PM15												
Nickel #	24.1	33.1	31.0	22.9	29.5	<0.7	mg/kg	TM30/PM15												
Selenium #	<1	1	2	1	1	<1	mg/kg	TM30/PM15												
Zinc #	52	74	89	55	87	<5	mg/kg	TM30/PM15												
PAH MS																				
Naphthalene #	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	mg/kg	TM4/PM8												
Acenaphthylene	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	mg/kg	TM4/PM8												
Acenaphthene #	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	mg/kg	TM4/PM8												
Fluorene #	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	mg/kg	TM4/PM8												
Phenanthrene #	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	mg/kg	TM4/PM8												
Anthracene #	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	mg/kg	TM4/PM8												
Fluoranthene #	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	mg/kg	TM4/PM8												
Pyrene #	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	mg/kg	TM4/PM8												
Benzo(a)anthracene #	<0.06	<0.06	<0.06	<0.06	<0.06	<0.06	mg/kg	TM4/PM8												
Chrysene #	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	mg/kg	TM4/PM8												
Benzo(bk)fluoranthene #	<0.07	<0.07	<0.07	<0.07	<0.07	<0.07	mg/kg	TM4/PM8												
Benzo(a)pyrene #	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	mg/kg	TM4/PM8												
Indeno(123cd)pyrene #	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	mg/kg	TM4/PM8												
Dibenzo(ah)anthracene #	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	mg/kg	TM4/PM8												
Benzo(ghi)perylene #	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	mg/kg	TM4/PM8												
Coronene	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	mg/kg	TM4/PM8												
PAH 6 Total #	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	mg/kg	TM4/PM8												
PAH 17 Total	<0.64	<0.64	<0.64	<0.64	<0.64	<0.64	mg/kg	TM4/PM8												
Benzo(b)fluoranthene	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	mg/kg	TM4/PM8												
Benzo(k)fluoranthene	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	mg/kg	TM4/PM8												
Benzo(j)fluoranthene	<1	<1	<1	<1	<1	<1	mg/kg	TM4/PM8												
PAH Surrogate % Recovery	113	115	116	117	110	<0	%	TM4/PM8												
Mineral Oil (C10-C40)	<30	<30	<30	<30	<30	<30	mg/kg	TM5/PM8/PM16												

**Client Name:** Ground Investigations Ireland  
**Reference:** 8065-09-18  
**Location:** Farankelly  
**Contact:** Conor Finnerty  
**JE Job No.:** 18/17808

**Report :** Solid

**Solids:** V=60g VOC jar, J=250g glass jar, T=plastic tub

J E Sample No.	1-4	5-8	9-12	13-16	17-20						LOD/LOR	Units	Method No.
	<b>Sample ID</b>	BH01	BH03	BH09	BH10	BH16							
<b>Depth</b>	0.50	1.00	0.50	1.00	1.00								
<b>COC No / misc</b>													
<b>Containers</b>	V J T	V J T	V J T	V J T	V J T								
<b>Sample Date</b>	28/09/2018	04/10/2018	25/09/2018	04/10/2018	04/10/2018								
<b>Sample Type</b>	Soil	Soil	Soil	Soil	Soil								
<b>Batch Number</b>	1	1	1	1	1								
<b>Date of Receipt</b>	05/11/2018	05/11/2018	05/11/2018	05/11/2018	05/11/2018								
Please see attached notes for all abbreviations and acronyms													
TPH CWG													
<b>Aliphatics</b>													
>C5-C6 #	<0.1	<0.1	<0.1	<0.1	<0.1						<0.1	mg/kg	TM36/PM12
>C6-C8 #	<0.1	<0.1	<0.1	<0.1	<0.1						<0.1	mg/kg	TM36/PM12
>C8-C10	<0.1	<0.1	<0.1	<0.1	<0.1						<0.1	mg/kg	TM36/PM12
>C10-C12 #	<0.2	<0.2	<0.2	<0.2	<0.2						<0.2	mg/kg	TMS/PM8/PM16
>C12-C16 #	<4	<4	<4	<4	<4						<4	mg/kg	TMS/PM8/PM16
>C16-C21 #	<7	<7	<7	<7	<7						<7	mg/kg	TMS/PM8/PM16
>C21-C35 #	<7	<7	<7	<7	<7						<7	mg/kg	TMS/PM8/PM16
>C35-C40	<7	<7	<7	<7	<7						<7	mg/kg	TMS/PM8/PM16
Total aliphatics C5-40	<26	<26	<26	<26	<26						<26	mg/kg	TMS/PM8/PM16/PM12/PM15
>C6-C10	<0.1	<0.1	<0.1	<0.1	<0.1						<0.1	mg/kg	TM36/PM12
>C10-C25	<10	<10	<10	<10	<10						<10	mg/kg	TMS/PM8/PM16
>C25-C35	<10	<10	<10	<10	<10						<10	mg/kg	TMS/PM8/PM16
<b>Aromatics</b>													
>C5-EC7 #	<0.1	<0.1	<0.1	<0.1	<0.1						<0.1	mg/kg	TM36/PM12
>EC7-EC8 #	<0.1	<0.1	<0.1	<0.1	<0.1						<0.1	mg/kg	TM36/PM12
>EC8-EC10 #	<0.1	<0.1	<0.1	<0.1	<0.1						<0.1	mg/kg	TM36/PM12
>EC10-EC12 #	<0.2	<0.2	<0.2	<0.2	<0.2						<0.2	mg/kg	TMS/PM8/PM16
>EC12-EC16 #	<4	<4	<4	<4	<4						<4	mg/kg	TMS/PM8/PM16
>EC16-EC21 #	<7	<7	<7	<7	<7						<7	mg/kg	TMS/PM8/PM16
>EC21-EC35 #	<7	<7	<7	<7	<7						<7	mg/kg	TMS/PM8/PM16
>EC35-EC40	<7	<7	<7	<7	<7						<7	mg/kg	TMS/PM8/PM16
Total aromatics C5-40	<26	<26	<26	<26	<26						<26	mg/kg	TMS/PM8/PM16/PM12/PM15
Total aliphatics and aromatics(C5-40)	<52	<52	<52	<52	<52						<52	mg/kg	TMS/PM8/PM16/PM12/PM15
>EC6-EC10 #	<0.1	<0.1	<0.1	<0.1	<0.1						<0.1	mg/kg	TM36/PM12
>EC10-EC25	<10	<10	<10	<10	<10						<10	mg/kg	TMS/PM8/PM16
>EC25-EC35	<10	<10	<10	<10	<10						<10	mg/kg	TMS/PM8/PM16
MTBE #	<5	<5	<5	<5	<5						<5	ug/kg	TM31/PM12
Benzene #	<5	<5	<5	<5	<5						<5	ug/kg	TM31/PM12
Toluene #	<5	<5	<5	<5	<5						<5	ug/kg	TM31/PM12
Ethylbenzene #	<5	<5	<5	<5	<5						<5	ug/kg	TM31/PM12
m/p-Xylene #	<5	<5	<5	<5	<5						<5	ug/kg	TM31/PM12
o-Xylene #	<5	<5	<5	<5	<5						<5	ug/kg	TM31/PM12
PCB 28 #	<5	<5	<5	<5	<5						<5	ug/kg	TM17/PM8
PCB 52 #	<5	<5	<5	<5	<5						<5	ug/kg	TM17/PM8
PCB 101 #	<5	<5	<5	<5	<5						<5	ug/kg	TM17/PM8
PCB 118 #	<5	<5	<5	<5	<5						<5	ug/kg	TM17/PM8
PCB 138 #	<5	<5	<5	<5	<5						<5	ug/kg	TM17/PM8
PCB 153 #	<5	<5	<5	<5	<5						<5	ug/kg	TM17/PM8
PCB 180 #	<5	<5	<5	<5	<5						<5	ug/kg	TM17/PM8
Total 7 PCBs #	<35	<35	<35	<35	<35						<35	ug/kg	TM17/PM8



Client Name: Ground Investigations Ireland  
 Reference: 8065-09-18  
 Location: Farankelly  
 Contact: Conor Finnerty  
 JE Job No.: 18/17808

Report : CEN 10:1 1 Batch

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

J E Sample No.	1-4	5-8	9-12	13-16	17-20															
Sample ID	BH01	BH03	BH09	BH10	BH16															
Depth	0.50	1.00	0.50	1.00	1.00															
COC No / misc																				
Containers	V J T	V J T	V J T	V J T	V J T															
Sample Date	28/09/2018	04/10/2018	25/09/2018	04/10/2018	04/10/2018															
Sample Type	Soil	Soil	Soil	Soil	Soil															
Batch Number	1	1	1	1	1															
Date of Receipt	05/11/2018	05/11/2018	05/11/2018	05/11/2018	05/11/2018															
																		LOD/LOR	Units	Method No.
Dissolved Antimony #	<0.002	<0.002	<0.002	<0.002	<0.002													<0.002	mg/l	TM30/PM17
Dissolved Antimony (A10) #	<0.02	<0.02	<0.02	<0.02	<0.02													<0.02	mg/kg	TM30/PM17
Dissolved Arsenic #	<0.0025	<0.0025	<0.0025	<0.0025	<0.0025													<0.0025	mg/l	TM30/PM17
Dissolved Arsenic (A10) #	<0.025	<0.025	<0.025	<0.025	<0.025													<0.025	mg/kg	TM30/PM17
Dissolved Barium #	<0.003	<0.003	<0.003	<0.003	<0.003													<0.003	mg/l	TM30/PM17
Dissolved Barium (A10) #	<0.03	<0.03	<0.03	<0.03	<0.03													<0.03	mg/kg	TM30/PM17
Dissolved Cadmium #	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005													<0.0005	mg/l	TM30/PM17
Dissolved Cadmium (A10) #	<0.005	<0.005	<0.005	<0.005	<0.005													<0.005	mg/kg	TM30/PM17
Dissolved Chromium #	<0.0015	<0.0015	<0.0015	<0.0015	<0.0015													<0.0015	mg/l	TM30/PM17
Dissolved Chromium (A10) #	<0.015	<0.015	<0.015	<0.015	<0.015													<0.015	mg/kg	TM30/PM17
Dissolved Copper #	<0.007	<0.007	<0.007	<0.007	<0.007													<0.007	mg/l	TM30/PM17
Dissolved Copper (A10) #	<0.07	<0.07	<0.07	<0.07	<0.07													<0.07	mg/kg	TM30/PM17
Dissolved Lead #	<0.005	<0.005	<0.005	<0.005	<0.005													<0.005	mg/l	TM30/PM17
Dissolved Lead (A10) #	<0.05	<0.05	<0.05	<0.05	<0.05													<0.05	mg/kg	TM30/PM17
Dissolved Molybdenum #	<0.002	<0.002	<0.002	<0.002	<0.002													<0.002	mg/l	TM30/PM17
Dissolved Molybdenum (A10) #	<0.02	<0.02	<0.02	<0.02	<0.02													<0.02	mg/kg	TM30/PM17
Dissolved Nickel #	<0.002	<0.002	<0.002	<0.002	<0.002													<0.002	mg/l	TM30/PM17
Dissolved Nickel (A10) #	<0.02	<0.02	<0.02	<0.02	<0.02													<0.02	mg/kg	TM30/PM17
Dissolved Selenium #	<0.003	<0.003	<0.003	<0.003	<0.003													<0.003	mg/l	TM30/PM17
Dissolved Selenium (A10) #	<0.03	<0.03	<0.03	<0.03	<0.03													<0.03	mg/kg	TM30/PM17
Dissolved Zinc #	<0.003	<0.003	<0.003	<0.003	<0.003													<0.003	mg/l	TM30/PM17
Dissolved Zinc (A10) #	<0.03	<0.03	<0.03	<0.03	<0.03													<0.03	mg/kg	TM30/PM17
Mercury Dissolved by CVA#	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001													<0.00001	mg/l	TM61/PM0
Mercury Dissolved by CVA#	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001													<0.0001	mg/kg	TM61/PM0
Phenol	<0.01	<0.01	<0.01	<0.01	<0.01													<0.01	mg/l	TM26/PM0
Phenol	<0.1	<0.1	<0.1	<0.1	<0.1													<0.1	mg/kg	TM26/PM0
Fluoride	0.4	0.5	0.5	<0.3	0.4													<0.3	mg/l	TM173/PM0
Fluoride	4	5	5	<3	4													<3	mg/kg	TM173/PM0
Sulphate as SO4 #	0.42	0.25	1.21	0.09	2.42													<0.05	mg/l	TM38/PM0
Sulphate as SO4 #	4.2	2.5	12.1	0.9	24.2													<0.5	mg/kg	TM38/PM0
Chloride #	<0.3	<0.3	<0.3	<0.3	0.6													<0.3	mg/l	TM38/PM0
Chloride #	<3	<3	<3	<3	6													<3	mg/kg	TM38/PM0
Dissolved Organic Carbon	2	3	2	5	2													<2	mg/l	TM60/PM0
Dissolved Organic Carbon	20	30	20	50	20													<20	mg/kg	TM60/PM0
pH	8.09	7.17	7.77	8.02	7.60													<0.01	pH units	TM73/PM0
Total Dissolved Solids #	59	37	68	104	71													<35	mg/l	TM20/PM0
Total Dissolved Solids #	590	370	680	1040	710													<350	mg/kg	TM20/PM0

Please see attached notes for all abbreviations and acronyms

Client Name: Ground Investigations Ireland  
 Reference: 8065-09-18  
 Location: Farankelly  
 Contact: Conor Finnerty  
 JE Job No.: 18/17808

Report : EN12457\_2  
 Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

J E Sample No.	1-4	5-8	9-12	13-16	17-20										
Sample ID	BH01	BH03	BH09	BH10	BH16										
Depth	0.50	1.00	0.50	1.00	1.00										
COC No / misc															
Containers	V J T	V J T	V J T	V J T	V J T										
Sample Date	28/09/2018	04/10/2018	25/09/2018	04/10/2018	04/10/2018										
Sample Type	Soil	Soil	Soil	Soil	Soil										
Batch Number	1	1	1	1	1										
Date of Receipt	05/11/2018	05/11/2018	05/11/2018	05/11/2018	05/11/2018										
						Inert	Stable Non-reactive	Hazardous	LOD LOR	Units	Method No.	Please see attached notes for all abbreviations and acronyms			
<b>Solid Waste Analysis</b>															
Total Organic Carbon #	0.35	0.51	0.48	0.65	0.41	3	5	6	<0.02	%	TM21/PM24				
Sum of BTEX	<0.025	<0.025	<0.025	<0.025	<0.025	6	-	-	<0.025	mg/kg	TM31/PM12				
Sum of 7 PCBs #	<0.035	<0.035	<0.035	<0.035	<0.035	1	-	-	<0.035	mg/kg	TM17/PM8				
Mineral Oil	<30	<30	<30	<30	<30	500	-	-	<30	mg/kg	TM5/PM8/PM16				
PAH Sum of 6 #	<0.22	<0.22	<0.22	<0.22	<0.22	-	-	-	<0.22	mg/kg	TM4/PM8				
PAH Sum of 17	<0.64	<0.64	<0.64	<0.64	<0.64	100	-	-	<0.64	mg/kg	TM4/PM8				
<b>CEN 10:1 Leachate</b>															
Arsenic #	<0.025	<0.025	<0.025	<0.025	<0.025	0.5	2	25	<0.025	mg/kg	TM30/PM17				
Barium #	<0.03	<0.03	<0.03	<0.03	<0.03	20	100	300	<0.03	mg/kg	TM30/PM17				
Cadmium #	<0.005	<0.005	<0.005	<0.005	<0.005	0.04	1	5	<0.005	mg/kg	TM30/PM17				
Chromium #	<0.015	<0.015	<0.015	<0.015	<0.015	0.5	10	70	<0.015	mg/kg	TM30/PM17				
Copper #	<0.07	<0.07	<0.07	<0.07	<0.07	2	50	100	<0.07	mg/kg	TM30/PM17				
Mercury #	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	0.01	0.2	2	<0.0001	mg/kg	TM61/PM0				
Molybdenum #	<0.02	<0.02	<0.02	<0.02	<0.02	0.5	10	30	<0.02	mg/kg	TM30/PM17				
Nickel #	<0.02	<0.02	<0.02	<0.02	<0.02	0.4	10	40	<0.02	mg/kg	TM30/PM17				
Lead #	<0.05	<0.05	<0.05	<0.05	<0.05	0.5	10	50	<0.05	mg/kg	TM30/PM17				
Antimony #	<0.02	<0.02	<0.02	<0.02	<0.02	0.06	0.7	5	<0.02	mg/kg	TM30/PM17				
Selenium #	<0.03	<0.03	<0.03	<0.03	<0.03	0.1	0.5	7	<0.03	mg/kg	TM30/PM17				
Zinc #	<0.03	<0.03	<0.03	<0.03	<0.03	4	50	200	<0.03	mg/kg	TM30/PM17				
Total Dissolved Solids #	590	370	680	1040	710	4000	60000	100000	<350	mg/kg	TM20/PM0				
Dissolved Organic Carbon	20	30	20	50	20	500	800	1000	<20	mg/kg	TM60/PM0				
Mass of raw test portion	0.1041	0.1032	0.1071	0.1039	0.1142	-	-	-		kg	NONE/PM17				
Dry Matter Content Ratio	86.3	87.0	84.1	86.7	78.7	-	-	-	<0.1	%	NONE/PM4				
Leachant Volume	0.886	0.887	0.883	0.886	0.876	-	-	-		l	NONE/PM17				
Elate Volume	0.85	0.85	0.83	0.82	0.85	-	-	-		l	NONE/PM17				
pH #	8.42	6.94	8.04	7.84	8.08	-	-	-	<0.01	pH units	TM73/PM11				
Phenol	<0.1	<0.1	<0.1	<0.1	<0.1	1	-	-	<0.1	mg/kg	TM26/PM0				
Fluoride	4	5	5	<3	4	-	-	-	<3	mg/kg	TM173/PM0				
Sulphate as SO4 #	4.2	2.5	12.1	0.9	24.2	1000	20000	50000	<0.5	mg/kg	TM38/PM0				
Chloride #	<3	<3	<3	<3	6	800	15000	25000	<3	mg/kg	TM38/PM0				

**Client Name:** Ground Investigations Ireland  
**Reference:** 8065-09-18  
**Location:** Farankelly  
**Contact:** Conor Finnerty

**Matrix : Solid**

J E Job No.	Batch	Sample ID	Depth	J E Sample No.	EPH Interpretation
18/17808	1	BH01	0.50	1-4	No interpretation possible
18/17808	1	BH03	1.00	5-8	No interpretation possible
18/17808	1	BH09	0.50	9-12	No interpretation possible
18/17808	1	BH10	1.00	13-16	No interpretation possible
18/17808	1	BH16	1.00	17-20	No interpretation possible

**Client Name:** Ground Investigations Ireland  
**Reference:** 18/09/8065  
**Location:** Farankelly  
**Contact:** Conor Finnerty

**Note:**

Asbestos Screen analysis is carried out in accordance with our documented in-house methods PM042 and TM065 and HSG 248 by Stereo and Polarised Light Microscopy using Dispersion Staining Techniques and is covered by our UKAS accreditation. Detailed Gravimetric Quantification and PCOM Fibre Analysis is carried out in accordance with our documented in-house methods PM042 and TM131 and HSG 248 using Stereo and Polarised Light Microscopy and Phase Contrast Optical Microscopy (PCOM). Samples are retained for not less than 6 months from the date of analysis unless specifically requested.

Opinions, including ACM type and Asbestos level less than 0.1%, lie outside the scope of our UKAS accreditation.

Where the sample is not taken by a Jones Environmental Laboratory consultant, Jones Environmental Laboratory cannot be responsible for inaccurate or unrepresentative sampling.

Signed on behalf of Jones Environmental Laboratory:



Ryan Butterworth  
 Asbestos Team Leader

J E Job No.	Batch	Sample ID	Depth	J E Sample No.	Date Of Analysis	Analysis	Result
18/17808	1	BH01	0.50	3	13/11/2018	General Description (Bulk Analysis)	soil.stones
					13/11/2018	Asbestos Fibres	NAD
					13/11/2018	Asbestos ACM	NAD
					13/11/2018	Asbestos Type	NAD
					13/11/2018	Asbestos Level Screen	NAD
18/17808	1	BH03	1.00	7	13/11/2018	General Description (Bulk Analysis)	soil.stones
					13/11/2018	Asbestos Fibres	NAD
					13/11/2018	Asbestos ACM	NAD
					13/11/2018	Asbestos Type	NAD
					13/11/2018	Asbestos Level Screen	NAD
18/17808	1	BH09	0.50	11	13/11/2018	General Description (Bulk Analysis)	soil.stones
					13/11/2018	Asbestos Fibres	NAD
					13/11/2018	Asbestos ACM	NAD
					13/11/2018	Asbestos Type	NAD
					13/11/2018	Asbestos Level Screen	NAD
18/17808	1	BH10	1.00	15	13/11/2018	General Description (Bulk Analysis)	soil.stones
					13/11/2018	Asbestos Fibres	NAD
					13/11/2018	Asbestos ACM	NAD
					13/11/2018	Asbestos Type	NAD
					13/11/2018	Asbestos Level Screen	NAD
18/17808	1	BH16	1.00	19	13/11/2018	General Description (Bulk Analysis)	soil.stones
					13/11/2018	Asbestos Fibres	NAD
					13/11/2018	Asbestos ACM	NAD
					13/11/2018	Asbestos Type	NAD
					13/11/2018	Asbestos Level Screen	NAD



**Client Name:** Ground Investigations Ireland  
**Reference:** 8065-09-18  
**Location:** Farankelly  
**Contact:** Conor Finnerty

**Matrix : Solid**

J E Job No.	Batch	Sample ID	Depth	J E Sample No.	Analysis	Reason
18/17808	1	BH01	0.50	1-4	EPH, GRO, PAH, PCB, pH, Sulphate, TOC	Sample holding time exceeded prior to receipt
18/17808	1	BH03	1.00	5-8	EPH, GRO, PAH, PCB, pH, Sulphate, TOC	Sample holding time exceeded prior to receipt
18/17808	1	BH09	0.50	9-12	EPH, GRO, PAH, PCB, pH, Sulphate, TOC	Sample holding time exceeded prior to receipt
18/17808	1	BH10	1.00	13-16	EPH, GRO, PAH, PCB, pH, Sulphate, TOC	Sample holding time exceeded prior to receipt
18/17808	1	BH16	1.00	17-20	EPH, GRO, PAH, PCB, pH, Sulphate, TOC	Sample holding time exceeded prior to receipt

Please note that only samples that are deviating are mentioned in this report. If no samples are listed it is because none were deviating. Only analyses which are accredited are recorded as deviating if set criteria are not met.

# NOTES TO ACCOMPANY ALL SCHEDULES AND REPORTS

JE Job No.: 18/17808

## SOILS

Please note we are only MCERTS accredited (UK soils only) for sand, loam and clay and any other matrix is outside our scope of accreditation.

Where an MCERTS report has been requested, you will be notified within 48 hours of any samples that have been identified as being outside our MCERTS scope. As validation has been performed on clay, sand and loam, only samples that are predominantly these matrices, or combinations of them will be within our MCERTS scope. If samples are not one of a combination of the above matrices they will not be marked as MCERTS accredited.

It is assumed that you have taken representative samples on site and require analysis on a representative subsample. Stones will generally be included unless we are requested to remove them.

All samples will be discarded one month after the date of reporting, unless we are instructed to the contrary.

If you have not already done so, please send us a purchase order if this is required by your company.

Where appropriate please make sure that our detection limits are suitable for your needs, if they are not, please notify us immediately.

All analysis is reported on a dry weight basis unless stated otherwise. Results are not surrogate corrected. Samples are dried at 35°C ±5°C unless otherwise stated. Moisture content for CEN Leachate tests are dried at 105°C ±5°C.

Where Mineral Oil or Fats, Oils and Grease is quoted, this refers to Total Aliphatics C10-C40.

Where a CEN 10:1 ZERO Headspace VOC test has been carried out, a 10:1 ratio of water to wet (as received) soil has been used.

% Asbestos in Asbestos Containing Materials (ACMs) is determined by reference to HSG 264 The Survey Guide - Appendix 2 : ACMs in buildings listed in order of ease of fibre release.

Negative Neutralization Potential (NP) values are obtained when the volume of NaOH (0.1N) titrated (pH 8.3) is greater than the volume of HCl (1N) to reduce the pH of the sample to 2.0 - 2.5. Any negative NP values are corrected to 0.

The calculation of Pyrite content assumes that all oxidisable sulphides present in the sample are pyrite. This may not be the case. The calculation may be an overestimate when other sulphides such as Barite (Barium Sulphate) are present.

## WATERS

Please note we are not a UK Drinking Water Inspectorate (DWI) Approved Laboratory .

ISO17025 accreditation applies to surface water and groundwater and usually one other matrix which is analysis specific, any other liquids are outside our scope of accreditation.

As surface waters require different sample preparation to groundwaters the laboratory must be informed of the water type when submitting samples.

Where Mineral Oil or Fats, Oils and Grease is quoted, this refers to Total Aliphatics C10-C40.

## DEVIATING SAMPLES

Samples must be received in a condition appropriate to the requested analyses. All samples should be submitted to the laboratory in suitable containers with sufficient ice packs to sustain an appropriate temperature for the requested analysis. If this is not the case you will be informed and any test results that may be compromised highlighted on your deviating samples report.

## SURROGATES

Surrogate compounds are added during the preparation process to monitor recovery of analytes. However low recovery in soils is often due to peat, clay or other organic rich matrices. For waters this can be due to oxidants, surfactants, organic rich sediments or remediation fluids. Acceptable limits for most organic methods are 70 - 130% and for VOCs are 50 - 150%. When surrogate recoveries are outside the performance criteria but the associated AQC passes this is assumed to be due to matrix effect. Results are not surrogate corrected.

## DILUTIONS

A dilution suffix indicates a dilution has been performed and the reported result takes this into account. No further calculation is required.

## BLANKS

Where analytes have been found in the blank, the sample will be treated in accordance with our laboratory procedure for dealing with contaminated blanks.

## NOTE

Data is only reported if the laboratory is confident that the data is a true reflection of the samples analysed. Data is only reported as accredited when all the requirements of our Quality System have been met. In certain circumstances where all the requirements of the Quality System have not been met, for instance if the associated AQC has failed, the reason is fully investigated and documented. The sample data is then evaluated alongside the other quality control checks performed during analysis to determine its suitability. Following this evaluation, provided the sample results have not been effected, the data is reported but accreditation is removed. It is a UKAS requirement for data not reported as accredited to be considered indicative only, but this does not mean the data is not valid.

Where possible, and if requested, samples will be re-extracted and a revised report issued with accredited results. Please do not hesitate to contact the laboratory if further details are required of the circumstances which have led to the removal of accreditation.

## REPORTS FROM THE SOUTH AFRICA LABORATORY

Any method number not prefixed with SA has been undertaken in our UK laboratory unless reported as subcontracted.

Please include all sections of this report if it is reproduced

All solid results are expressed on a dry weight basis unless stated otherwise.

**ABBREVIATIONS and ACRONYMS USED**

#	ISO17025 (UKAS Ref No. 4225) accredited - UK.
SA	ISO17025 (SANAS Ref No.T0729) accredited - South Africa.
B	Indicates analyte found in associated method blank.
DR	Dilution required.
M	MCERTS accredited.
NA	Not applicable
NAD	No Asbestos Detected.
ND	None Detected (usually refers to VOC and/SVOC TICs).
NDP	No Determination Possible
SS	Calibrated against a single substance
SV	Surrogate recovery outside performance criteria. This may be due to a matrix effect.
W	Results expressed on as received basis.
+	AQC failure, accreditation has been removed from this result, if appropriate, see 'Note' on previous page.
++	Result outside calibration range, results should be considered as indicative only and are not accredited.
*	Analysis subcontracted to an Exova Jones Environmental approved laboratory.
AD	Samples are dried at 35°C ±5°C
CO	Suspected carry over
LOD/LOR	Limit of Detection (Limit of Reporting) in line with ISO 17025 and MCERTS
ME	Matrix Effect
NFD	No Fibres Detected
BS	AQC Sample
LB	Blank Sample
N	Client Sample
TB	Trip Blank Sample
OC	Outside Calibration Range

## Appendix - Methods used for WAC (2003/33/EC)

JE Job No.: 18/17808

Leachate tests	
10l/kg; 4mm	I.S. EN 12457-2:2002 Specified particle size; water added to L/S ratio; capped; agitated for 24 ± 0.5 hours; eluate settled and filtered over 0.45 µm membrane filter.
Eluate analysis	
As	I.S. EN 12506 : EN ISO 11885 (ICP-OES)
Ba	I.S. EN 12506 : EN ISO 11885 (ICP-OES)
Cd	I.S. EN 12506 : EN ISO 11885 (ICP-OES)
Cr total	I.S. EN 12506 : EN ISO 11885 (ICP-OES)
Cu	I.S. EN 12506 : EN ISO 11885 (ICP-OES)
Hg	I.S. EN 13370 rec. EN 1483 (CVAAS)
Mo	I.S. EN 12506 : EN ISO 11885 (ICP-OES)
Ni	I.S. EN 12506 : EN ISO 11885 (ICP-OES)
Pb	I.S. EN 12506 : EN ISO 11885 (ICP-OES)
Sb	I.S. EN 12506 : EN ISO 11885 (ICP-OES)
Se	I.S. EN 12506 : EN ISO 11885 (ICP-OES)
Zn	I.S. EN 12506 : EN ISO 11885 (ICP-OES)
Chloride	I.S. EN 12506 rec. EN ISO 10304-part 1 (liquid chromatography of ions)
Fluoride	I.S. EN 12506 rec. EN ISO 10304-part 1 (liquid chromatography of ions)
Sulphate	I.S. EN 12506 rec. EN ISO 10304-part 1 (liquid chromatography of ions)
Phenol index	I.S. EN 13370 rec. ISO 6439 (4-Aminoantipyrine spectrometric methods after distillation)* ( BY HPLC - Jones Env)
DOC	I.S. EN 1484
TDS	I.S. EN 15216
Compositional analysis	
TOC	I.S. EN 13137 Method B: carbonates removed with acid; TOC by combustion.
BTEX	GC-FID
PCB7**	I.S. EN 15308 analysis by GC-ECD.
Mineral oil	I.S. EN 14039 C10 to C40 analysis by GC-FID.
PAH17***	I.S. EN 15527 PAH17 analysis by GC-MS
Metals	I.S. EN 13657 - Aqua regia digestion: EN ISO 11885 ( ICP-OES)
Other	
Dry matter	I.S. EN 14346 sample is dried to a constant mass in an oven at 105 ± 3 °C; Method B Water content by direct Karl-Fischer-titration and either volumetric or coulometric detection.
LOI	I.S. EN 15169 Difference in mass after heating in a furnace up to 550 ± 25 °C.
ANC	CEN/TS 15364 Determined by amounts of acid or base needed to cover the pH range
<p><b>Notes:</b></p> <p>*If not suitable due to LOD, precision, etc., any other suitable method can be used, e.g. AFS, ICP-MS</p> <p>**PCB-28, PCB-52, PCB-101, PCB-118, PCB-138, PCB-153 and PCB-180</p> <p>***Naphthalene, Acenaphthylene, Acenaphthene, Anthracene, Benzo(a)anthracene, Benzo(b)fluoranthene, Benzo(k)fluoranthene, Benzo(g,h,i)perylene, Benzo(a)pyrene, Chrysene, Coronene, Dibenzo(a,h)anthracene, Fluorene, Fluoranthene, Indeno(1,2,3-c,d)pyrene, Phenanthrene and Pyrene.</p>	

JE Job No: 18/17808

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/S ANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
PM4	Gravimetric measurement of Natural Moisture Content and % Moisture Content at either 35°C or 105°C. Calculation based on ISO 11465 and BS1377.	PM0	No preparation is required.			AR	
TM4	Modified USEPA 8270 method for the solvent extraction and determination of 16 PAHs by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.			AR	Yes
TM4	Modified USEPA 8270 method for the solvent extraction and determination of 16 PAHs by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.	Yes		AR	Yes
TM5	Modified USEPA 8015B method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) with carbon banding within the range C8-C40 GC-FID.	PM16	Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE.			AR	
TM5	Modified USEPA 8015B method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) with carbon banding within the range C8-C40 GC-FID.	PM8/PM16	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required/Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE.			AR	Yes
TM5	Modified USEPA 8015B method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) with carbon banding within the range C8-C40 GC-FID.	PM8/PM16	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required/Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE.	Yes		AR	Yes
TM5/TM36	please refer to TM5 and TM36 for method details	PM8/PM12/PM16	please refer to PM8/PM16 and PM12 for method details			AR	Yes
TM17	Modified US EPA method 8270. Determination of specific Polychlorinated Biphenyl congeners by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.	Yes		AR	Yes
TM20	Modified BS 1377-3: 1990/USEPA 160.3 Gravimetric determination of Total Dissolved Solids/Total Solids	PM0	No preparation is required.	Yes		AR	Yes
TM21	Modified BS 7755-3:1995, ISO10694:1995 Determination of Total Organic Carbon or Total Carbon by combustion in an Eltra TOC furnace/analyser in the presence of oxygen. The CO2 generated is quantified using infra-red detection. Organic Matter (SOM) calculated as per EA MCERTS Chemical Testing of Soil, March 2012 v4.	PM24	Dried and ground solid samples are washed with hydrochloric acid, then rinsed with deionised water to remove the mineral carbon before TOC analysis.	Yes		AD	Yes

JE Job No: 18/17808

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/S ANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM26	Determination of phenols by Reversed Phased High Performance Liquid Chromatography and Electro-Chemical Detection.	PM0	No preparation is required.			AR	Yes
TM30	Determination of Trace Metal elements by ICP-OES (Inductively Coupled Plasma - Optical Emission Spectrometry). Modified US EPA Method 200.7, 6010B and BS EN ISO 11885 2009	PM15	Acid digestion of dried and ground solid samples using Aqua Regia refluxed at 112.5 °C. Samples containing asbestos are not dried and ground.			AD	Yes
TM30	Determination of Trace Metal elements by ICP-OES (Inductively Coupled Plasma - Optical Emission Spectrometry). Modified US EPA Method 200.7, 6010B and BS EN ISO 11885 2009	PM15	Acid digestion of dried and ground solid samples using Aqua Regia refluxed at 112.5 °C. Samples containing asbestos are not dried and ground.	Yes		AD	Yes
TM30	Determination of Trace Metal elements by ICP-OES (Inductively Coupled Plasma - Optical Emission Spectrometry). Modified US EPA Method 200.7, 6010B and BS EN ISO 11885 2009	PM17	Modified method EN12457-2 As received solid samples are leached with water in a 10:1 water to soil ratio for 24 hours, the moisture content of the sample is included in the ratio.	Yes		AR	Yes
TM31	Modified USEPA 8015B. Determination of Methylterbutylether, Benzene, Toluene, Ethylbenzene and Xylene by headspace GC-FID.	PM12	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis.			AR	Yes
TM31	Modified USEPA 8015B. Determination of Methylterbutylether, Benzene, Toluene, Ethylbenzene and Xylene by headspace GC-FID.	PM12	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis.	Yes		AR	Yes
TM36	Modified US EPA method 8015B. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID. MTBE by GCFID co-elutes with 3-methylpentane if present and therefore can give a false positive. Positive MTBE results can be confirmed using GCMS.	PM12	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis.			AR	Yes
TM36	Modified US EPA method 8015B. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID. MTBE by GCFID co-elutes with 3-methylpentane if present and therefore can give a false positive. Positive MTBE results can be confirmed using GCMS.	PM12	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis.	Yes		AR	Yes
TM38	Soluble Ion analysis using Discrete Analyser. Modified US EPA methods 325.2 (Chloride), 375.4 (Sulphate), 365.2 (o-Phosphate), 353.1 (TON), 354.1 (Nitrite), 350.1 (NH4+) comparable to BS ISO 15923-1, 7196A (Hex Cr)	PM0	No preparation is required.	Yes		AR	Yes
TM38	Soluble Ion analysis using Discrete Analyser. Modified US EPA methods 325.2 (Chloride), 375.4 (Sulphate), 365.2 (o-Phosphate), 353.1 (TON), 354.1 (Nitrite), 350.1 (NH4+) comparable to BS ISO 15923-1, 7196A (Hex Cr)	PM20	Extraction of dried and ground or as received samples with deionised water in a 2:1 water to solid ratio using a reciprocal shaker for all analytes except hexavalent chromium. Extraction of as received sample using 10:1 ratio of 0.2M sodium hydroxide to soil for hexavalent chromium using a reciprocal shaker.	Yes		AD	Yes

JE Job No: 18/17808

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/S ANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM38	Soluble Ion analysis using Discrete Analyser. Modified US EPA methods 325.2 (Chloride), 375.4 (Sulphate), 365.2 (o-Phosphate), 353.1 (TON), 354.1 (Nitrite), 350.1 (NH4+) comparable to BS ISO 15923-1, 7196A (Hex Cr)	PM20	Extraction of dried and ground or as received samples with deionised water in a 2:1 water to solid ratio using a reciprocal shaker for all analytes except hexavalent chromium. Extraction of as received sample using 10:1 ratio of 0.2M sodium hydroxide to soil for hexavalent chromium using a reciprocal shaker.	Yes		AR	Yes
TM60	TC/TOC analysis of Waters by High Temperature Combustion followed by NDIR detection. Based on the following modified standard methods: USEPA 9060, APHA Standard Methods for Examination of Water and Wastewater 5310B, ASTM D 7573, and USEPA 415.1.	PM0	No preparation is required.			AR	Yes
TM61	Modified US EPA methods 245.7 and 200.7. Determination of Mercury by Cold Vapour Atomic Fluorescence.	PM0	No preparation is required.	Yes		AR	Yes
TM65	Asbestos Bulk Identification method based on HSG 248.	PM42	Solid samples undergo a thorough visual inspection for asbestos fibres prior to asbestos identification using TM065.	Yes		AR	
TM73	Modified US EPA methods 150.1 and 9045D and BS1377:1990. Determination of pH by Metrohm automated probe analyser.	PM0	No preparation is required.			AR	Yes
TM73	Modified US EPA methods 150.1 and 9045D and BS1377:1990. Determination of pH by Metrohm automated probe analyser.	PM11	Extraction of as received solid samples using one part solid to 2.5 parts deionised water.	Yes		AR	No
TM173	Analysis of fluoride by ISE (Ion Selective Electrode) using modified ISE method 340.2	PM0	No preparation is required.			AR	Yes
NONE	No Method Code	NONE	No Method Code			AR	Yes
NONE	No Method Code	PM17	Modified method EN12457-2 As received solid samples are leached with water in a 10:1 water to soil ratio for 24 hours, the moisture content of the sample is included in the ratio.				
NONE	No Method Code	PM17	Modified method EN12457-2 As received solid samples are leached with water in a 10:1 water to soil ratio for 24 hours, the moisture content of the sample is included in the ratio.			AR	

JE Job No: 18/17808

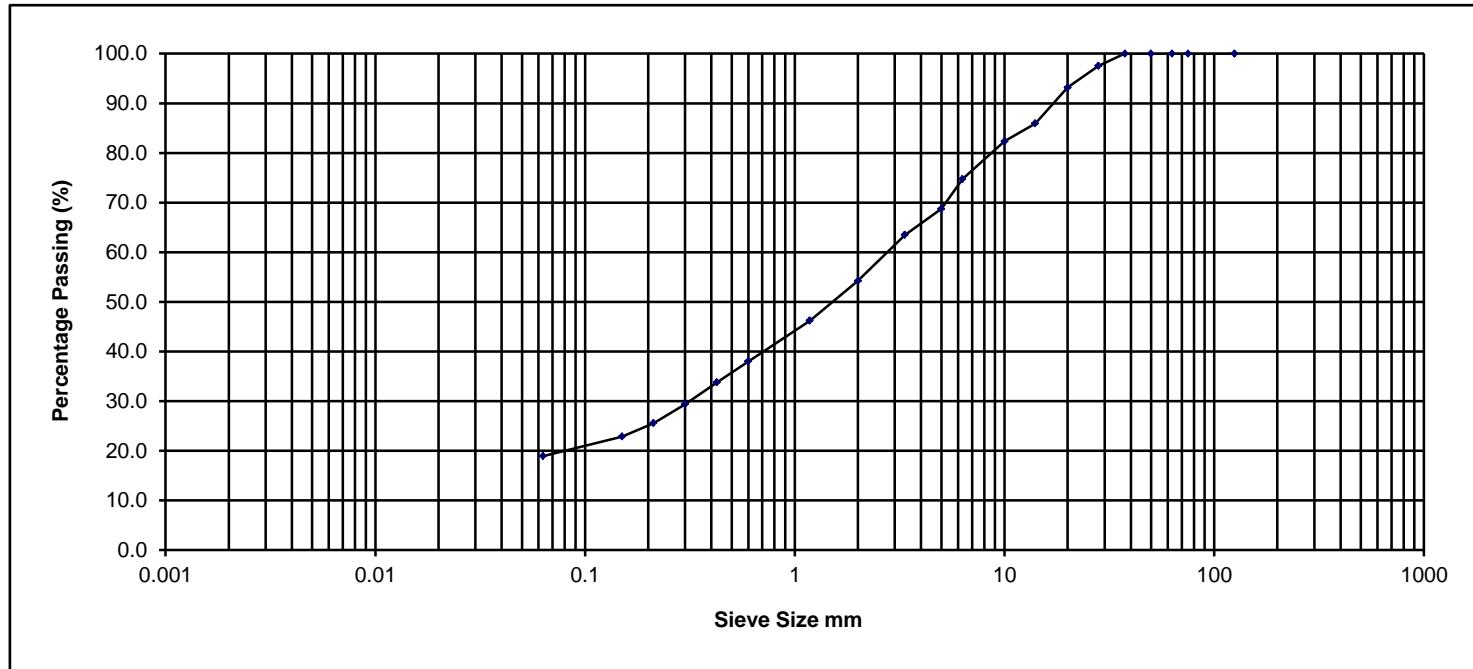
Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/S ANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
NONE	No Method Code	PM4	Gravimetric measurement of Natural Moisture Content and % Moisture Content at either 35°C or 105°C. Calculation based on ISO 11465 and BS1377.			AR	



**NMTL Ltd**

Sieve Size mm	% Passing
125.000	100.0
75.000	100.0
63.000	100.0
50.000	100.0
37.500	100.0
28.000	97.5
20.000	93.2
14.000	85.9
10.000	82.4
6.300	74.7
5.000	68.8
3.350	63.5
2.000	54.2
1.180	46.2
0.600	38.0
0.425	33.8
0.300	29.4
0.212	25.6
0.150	22.9
0.063	18.9

### Determination of Particle Size Distribution BS 1377 : 1990 : Part 2 : Clauses 9.2 & 9.5



Percentage Particle Size

Clay	Fine			Medium			Coarse			Cobbles	Boulder
	Fine	Medium	Coarse	Fine	Medium	Coarse	Fine	Medium	Coarse		
	Silt			Sand			Gravel				
	18.9			35.3			45.8			0.0	0.0

Sample Description Brown sandy gravelly silty CLAY.

Project No. NMTL 2738

BH/TP No. BH01

Project Farankelly

Sample No. B

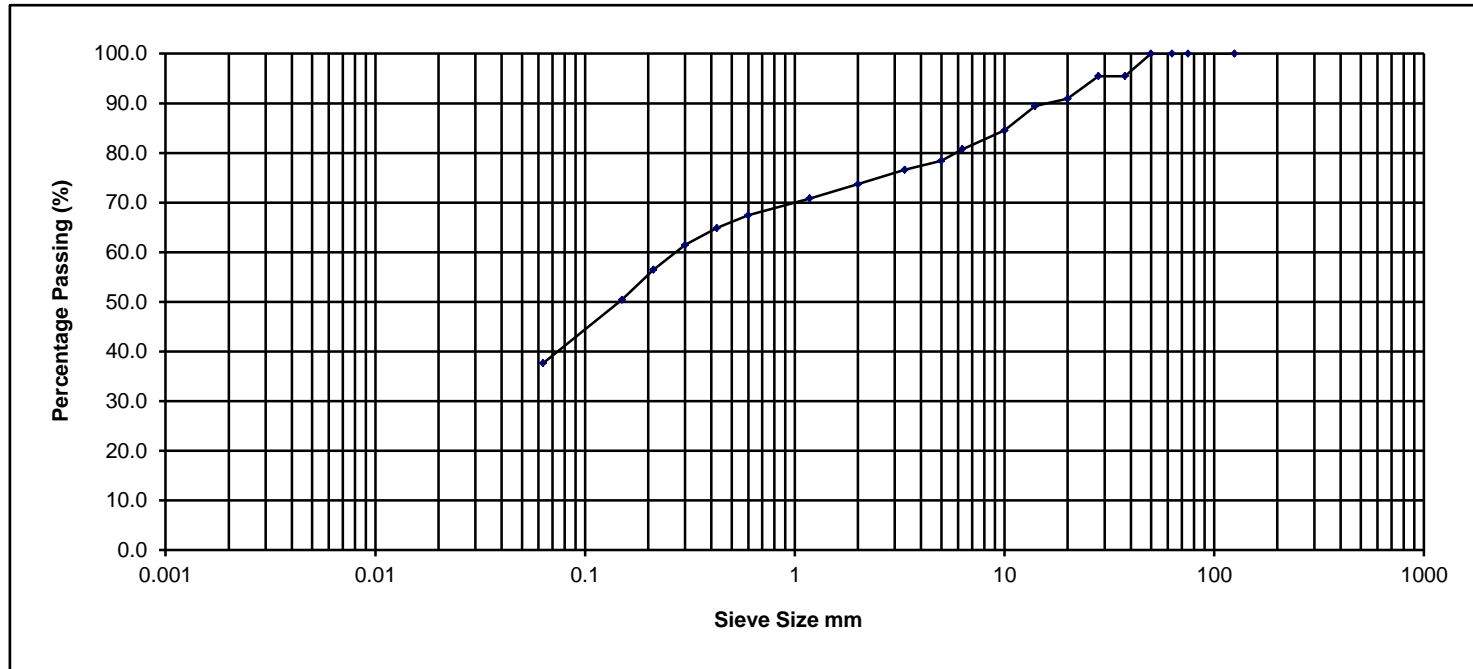
**NM**  
**TL**  
**Ltd**

Operator	Tzr	Checked	Nc	Approved	Bc	Date sample tested	13/11/2018	Depth	1.00m
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**NMTL Ltd**

Sieve Size mm	% Passing
125.000	100.0
75.000	100.0
63.000	100.0
50.000	100.0
37.500	95.5
28.000	95.5
20.000	90.9
14.000	89.4
10.000	84.5
6.300	80.8
5.000	78.4
3.350	76.6
2.000	73.7
1.180	70.9
0.600	67.4
0.425	64.9
0.300	61.4
0.212	56.5
0.150	50.4
0.063	37.6

### Determination of Particle Size Distribution BS 1377 : 1990 : Part 2 : Clauses 9.2 & 9.5



Percentage Particle Size

Clay	Fine			Medium			Coarse			Cobbles	Boulder
	Fine	Medium	Coarse	Fine	Medium	Coarse	Fine	Medium	Coarse		
	Silt			Sand			Gravel				
	37.6			36.1			26.3			0.0	0.0

Sample Description: Brown slightly gravelly sandy silty CLAY.

Project No. NMTL 2738

BH/TP No. BH02

Project Farankelly

Sample No. B

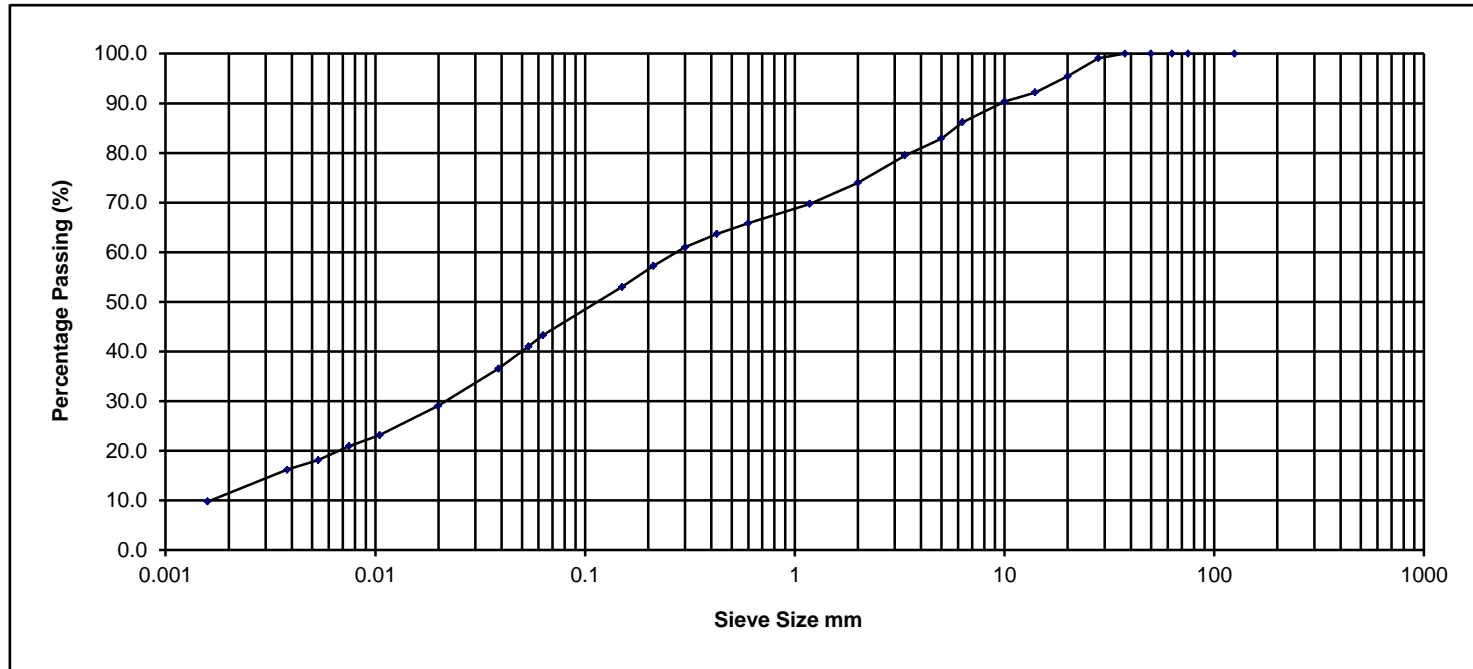
**NMTL Ltd**

Operator	Tzr	Checked	Nc	Approved	Bc	Date sample tested	13/11/2018	Depth	1.00m
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**NMTL Ltd**

Sieve Size mm	% Passing
125.000	100.0
75.000	100.0
63.000	100.0
50.000	100.0
37.500	100.0
28.000	99.1
20.000	95.4
14.000	92.2
10.000	90.3
6.300	86.2
5.000	82.9
3.350	79.5
2.000	74.0
1.180	69.8
0.600	65.8
0.425	63.7
0.300	61.0
0.212	57.3
0.150	53.0
0.063	43.3
0.054	41.0
0.039	36.6
0.020	29.0
0.010	23.2
0.007	20.9
0.005	18.1
0.004	16.2
0.002	9.8

### Determination of Particle Size Distribution BS 1377 : 1990 : Part 2 : Clauses 9.2 & 9.5



Clay	Percentage Particle Size						Cobbles	Boulder
	Fine	Medium	Coarse	Fine	Medium	Coarse		
	Silt		Sand		Gravel			
9.8	33.5		30.7		26.0		0.0	0.0

Sample Description: Brown slightly gravelly slightly sandy silty CLAY.

Project No. NMTL 2738

BH/TP No. BH03

Project Farankelly

Sample No. B

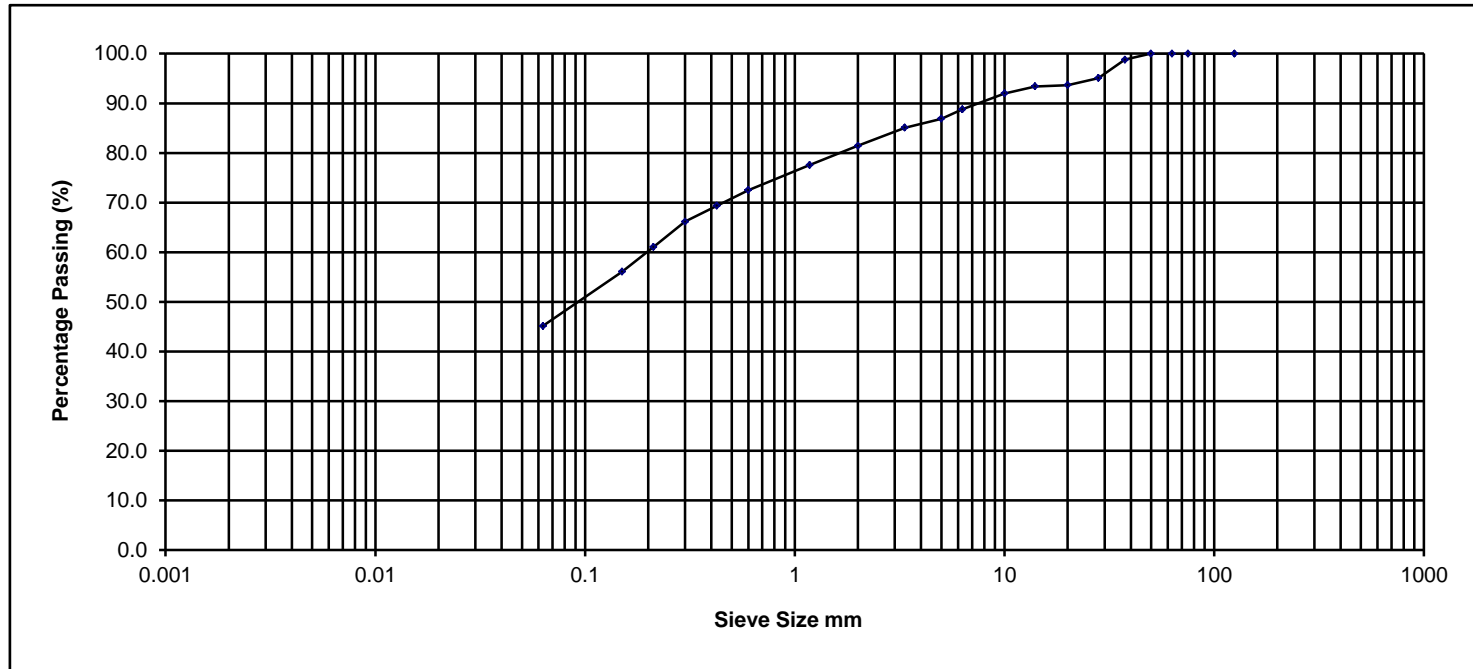
**NM**  
**TL**  
**Ltd**

Operator	Tzr	Checked	Nc	Approved	Bc	Date sample tested	15/11/2018	Depth	1.50m
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**NMTL Ltd**

Sieve Size mm	% Passing
125.000	100.0
75.000	100.0
63.000	100.0
50.000	100.0
37.500	98.8
28.000	95.1
20.000	93.7
14.000	93.4
10.000	92.0
6.300	88.8
5.000	86.9
3.350	85.1
2.000	81.4
1.180	77.6
0.600	72.5
0.425	69.3
0.300	66.2
0.212	61.1
0.150	56.1
0.063	45.1

### Determination of Particle Size Distribution BS 1377 : 1990 : Part 2 : Clauses 9.2 & 9.5



Percentage Particle Size

Clay	Fine			Medium			Coarse			Cobbles	Boulder
	Fine	Medium	Coarse	Fine	Medium	Coarse	Fine	Medium	Coarse		
	Silt			Sand			Gravel				
	45.1			36.3			18.6			0.0	0.0

Sample Description Brown slightly gravelly sandy silty CLAY.

Project No. NMTL 2738

BH/TP No. BH05

Project Farankelly

Sample No. B

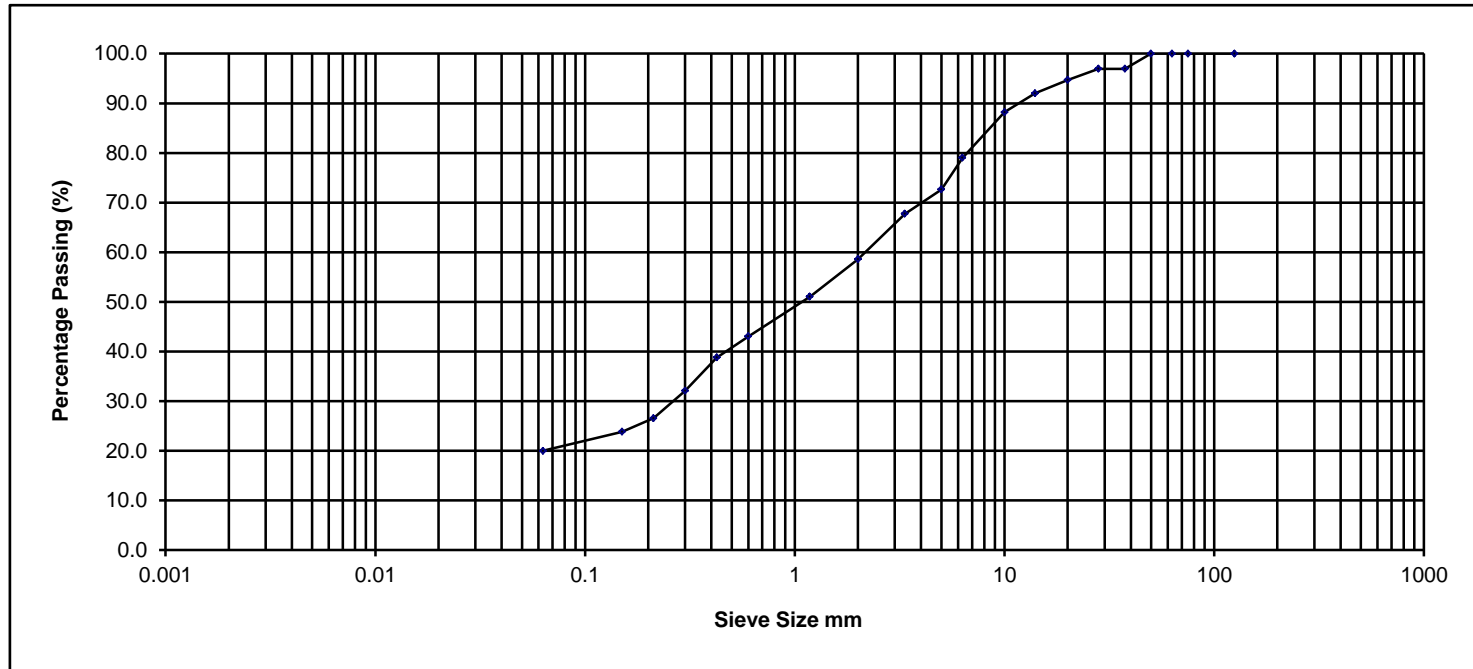
**NM**  
**TL**  
**Ltd**

Operator	Tzr	Checked	Nc	Approved	Bc	Date sample tested	15/11/2018	Depth	1.00m
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**NMTL Ltd**

Sieve Size mm	% Passing
125.000	100.0
75.000	100.0
63.000	100.0
50.000	100.0
37.500	97.0
28.000	97.0
20.000	94.7
14.000	92.0
10.000	88.2
6.300	79.0
5.000	72.6
3.350	67.7
2.000	58.6
1.180	51.0
0.600	43.0
0.425	38.8
0.300	32.1
0.212	26.6
0.150	23.8
0.063	20.0

### Determination of Particle Size Distribution BS 1377 : 1990 : Part 2 : Clauses 9.2 & 9.5



Percentage Particle Size

Clay	Fine			Medium			Coarse			Cobbles	Boulder
	Fine	Medium	Coarse	Fine	Medium	Coarse	Fine	Medium	Coarse		
	Silt			Sand			Gravel				
	20.0			38.6			41.4			0.0	0.0

Sample Description Brown sandy gravelly silty CLAY.

Project No. NMTL 2738

BH/TP No. BH07

Project Farankelly

Sample No. B

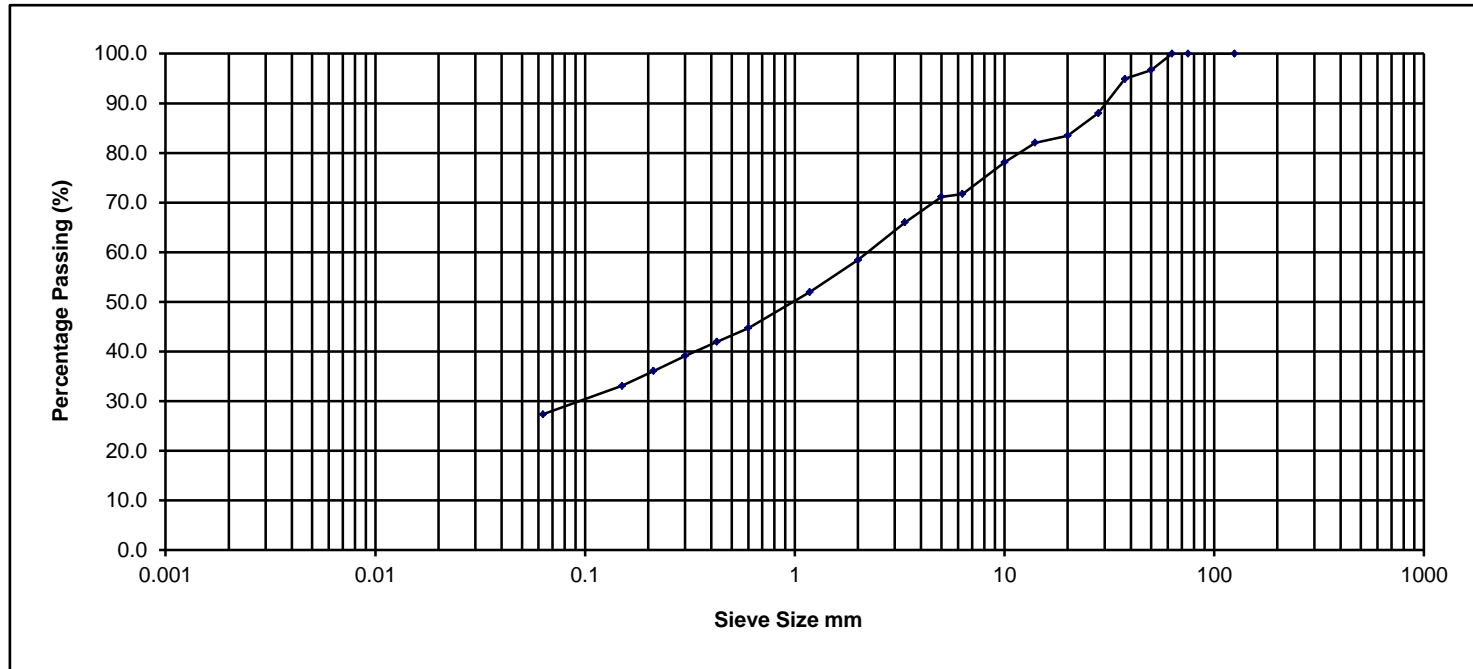
**NM**  
**TL**  
**Ltd**

Operator	Tzr	Checked	Nc	Approved	Bc	Date sample tested	15/11/2018	Depth	2.00m
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**NMTL Ltd**

Sieve Size mm	% Passing
125.000	100.0
75.000	100.0
63.000	100.0
50.000	96.7
37.500	94.9
28.000	88.0
20.000	83.5
14.000	82.1
10.000	78.1
6.300	71.7
5.000	71.2
3.350	66.0
2.000	58.4
1.180	52.0
0.600	44.7
0.425	41.9
0.300	39.1
0.212	36.1
0.150	33.1
0.063	27.3

### Determination of Particle Size Distribution BS 1377 : 1990 : Part 2 : Clauses 9.2 & 9.5



Percentage Particle Size

Clay	Fine			Medium			Coarse			Cobbles	Boulder
	Fine	Medium	Coarse	Fine	Medium	Coarse	Fine	Medium	Coarse		
	Silt			Sand			Gravel				
	27.3			31.1			41.6			0.0	0.0

Sample Description Brown slightly sandy gravelly clayey SILT.

Project No. NMTL 2738

BH/TP No. BH09

Project Farankelly

Sample No. B

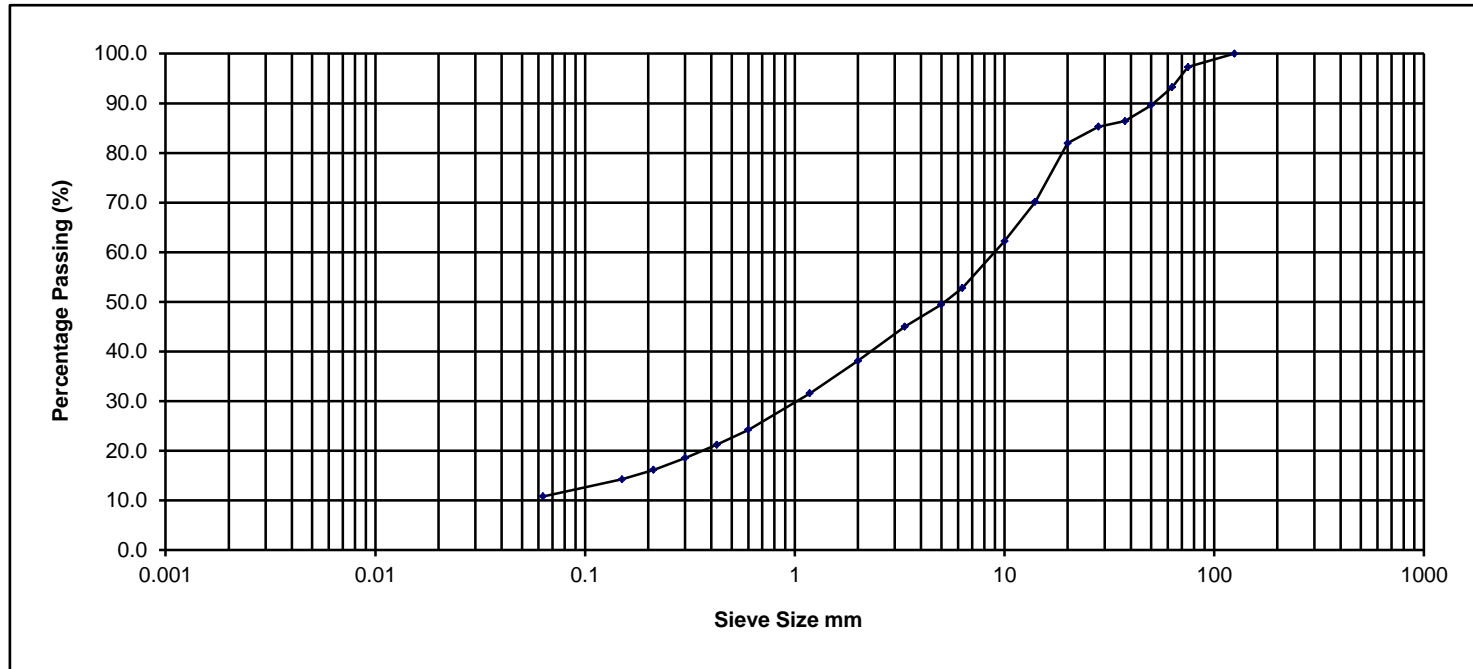
**NM**  
**TL**  
**Ltd**

Operator	Tzr	Checked	Nc	Approved	Bc	Date sample tested	15/11/2018	Depth	1.050m
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**NMTL Ltd**

Sieve Size mm	% Passing
125.000	100.0
75.000	97.3
63.000	93.3
50.000	89.6
37.500	86.4
28.000	85.3
20.000	82.0
14.000	70.1
10.000	62.2
6.300	52.8
5.000	49.5
3.350	45.0
2.000	38.1
1.180	31.6
0.600	24.2
0.425	21.2
0.300	18.5
0.212	16.1
0.150	14.2
0.063	10.8

### Determination of Particle Size Distribution BS 1377 : 1990 : Part 2 : Clauses 9.2 & 9.5



Percentage Particle Size

Clay	Fine			Medium			Coarse			Cobbles	Boulder
	Fine	Medium	Coarse	Fine	Medium	Coarse	Fine	Medium	Coarse		
	Silt			Sand			Gravel				
	10.8			27.3			55.1			6.7	0.0

Sample Description Brown silty/clayey sandy GRAVEL with some cobbles.

Project No. NMTL 2738

BH/TP No. BH10

Project Farankelly

Sample No. B

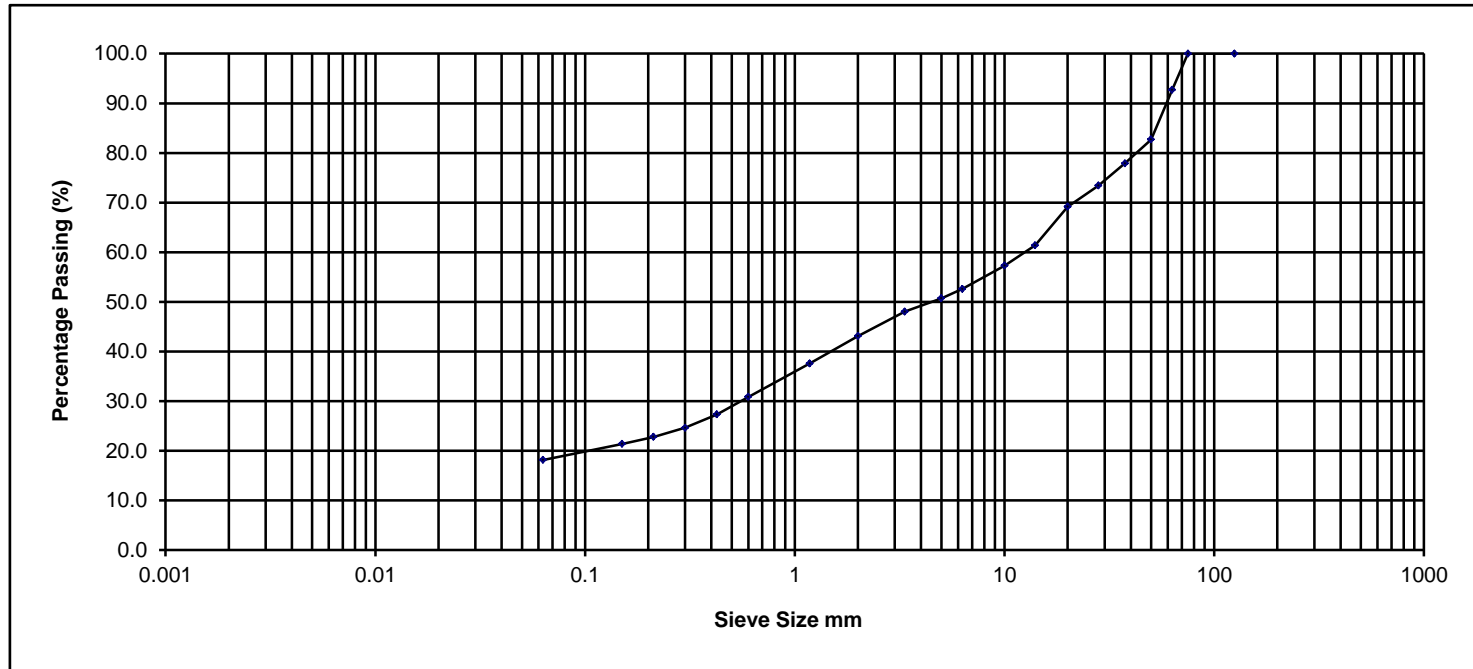
**NMTL Ltd**

Operator	Tzr	Checked	Nc	Approved	Bc	Date sample tested	15/11/2018	Depth	1.50m
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**NMTL Ltd**

Sieve Size mm	% Passing
125.000	100.0
75.000	100.0
63.000	92.7
50.000	82.7
37.500	77.9
28.000	73.4
20.000	69.2
14.000	61.4
10.000	57.3
6.300	52.6
5.000	50.7
3.350	48.0
2.000	43.1
1.180	37.6
0.600	30.8
0.425	27.3
0.300	24.6
0.212	22.8
0.150	21.4
0.063	18.2

### Determination of Particle Size Distribution BS 1377 : 1990 : Part 2 : Clauses 9.2 & 9.5



Percentage Particle Size

Clay	Fine			Medium			Coarse			Cobbles	Boulder
	Fine	Medium	Coarse	Fine	Medium	Coarse	Fine	Medium	Coarse		
	Silt			Sand			Gravel				
	18.2			25.0			49.6			7.3	0.0

Sample Description: Brown slightly sandy gravelly silty CLAY with some cobbles.

Project No. NMTL 2738

BH/TP No. BH11

Project Farankelly

Sample No. B

**NM**  
**TL**  
**Ltd**

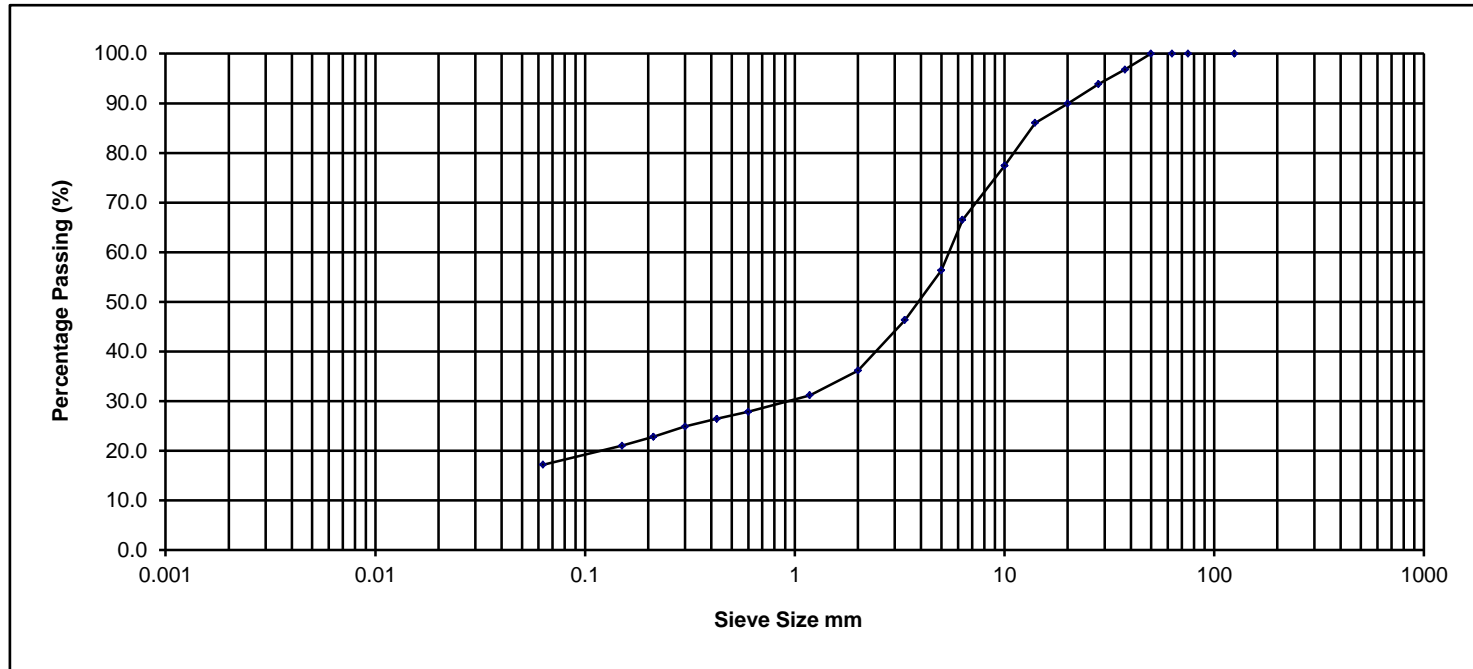
Operator	Tzr	Checked	Nc	Approved	Bc	Date sample tested	15/11/2018	Depth	2.00m
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**NMTL Ltd**

Sieve Size mm	% Passing
125.000	100.0
75.000	100.0
63.000	100.0
50.000	100.0
37.500	96.8
28.000	93.9
20.000	89.9
14.000	86.1
10.000	77.4
6.300	66.5
5.000	56.3
3.350	46.3
2.000	36.2
1.180	31.2
0.600	27.9
0.425	26.4
0.300	24.9
0.212	22.8
0.150	21.0
0.063	17.2

### Determination of Particle Size Distribution BS 1377 : 1990 : Part 2 : Clauses 9.2 & 9.5



Percentage Particle Size

Clay	Fine			Medium			Coarse			Cobbles	Boulder
	Fine	Medium	Coarse	Fine	Medium	Coarse	Fine	Medium	Coarse		
	Silt			Sand			Gravel				
	17.2			19.0			63.8			0.0	0.0

Sample Description: Brown clayey/silty sandy fine to coarse GRAVEL.

Project No. NMTL 2738

BH/TP No. BH12

Project Farankelly

Sample No. B

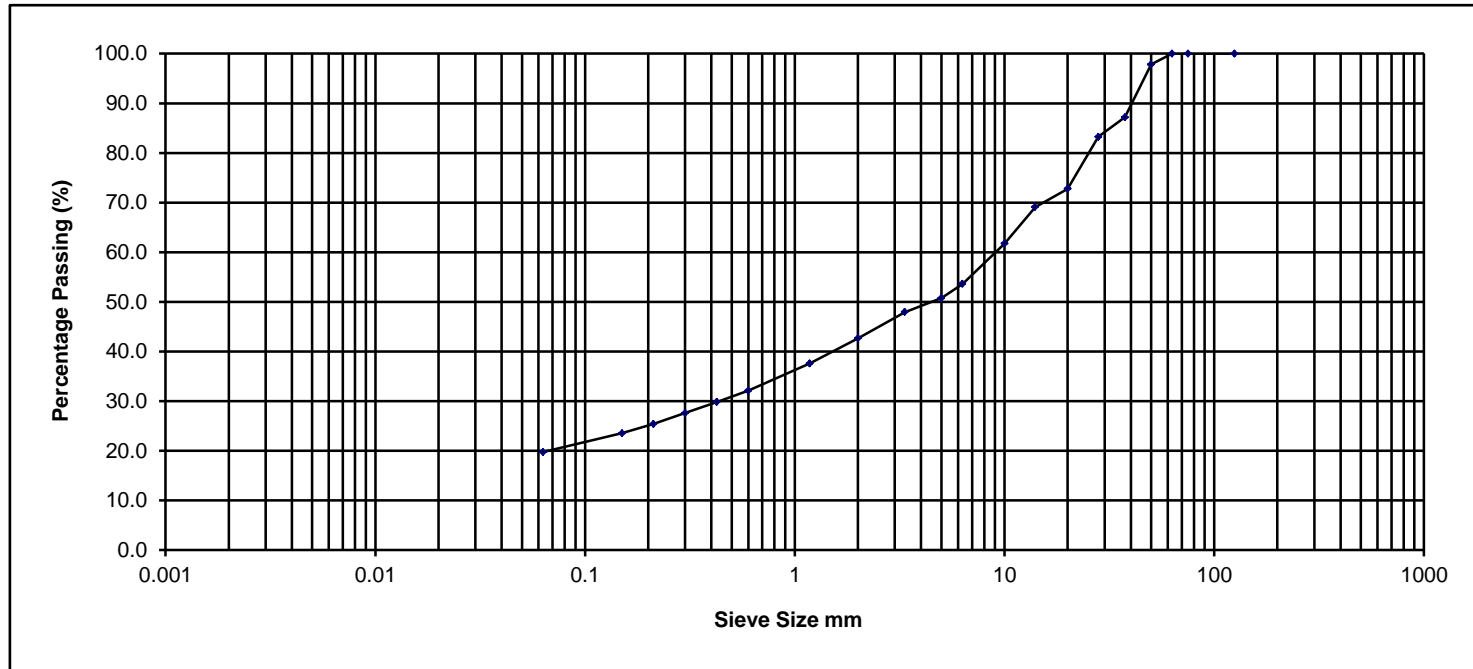
**NMTL Ltd**

Operator	Tzr	Checked	Nc	Approved	Bc	Date sample tested	15/11/2018	Depth	3.00m
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**NMTL Ltd**

Sieve Size mm	% Passing
125.000	100.0
75.000	100.0
63.000	100.0
50.000	97.8
37.500	87.2
28.000	83.3
20.000	72.8
14.000	69.1
10.000	61.7
6.300	53.6
5.000	50.7
3.350	47.9
2.000	42.7
1.180	37.6
0.600	32.1
0.425	29.8
0.300	27.6
0.212	25.4
0.150	23.5
0.063	19.7

### Determination of Particle Size Distribution BS 1377 : 1990 : Part 2 : Clauses 9.2 & 9.5



Percentage Particle Size

Clay	Fine			Medium			Coarse			Cobbles	Boulder
	Fine	Medium	Coarse	Fine	Medium	Coarse	Fine	Medium	Coarse		
	Silt			Sand			Gravel				
	19.7			22.9			57.3			0.0	0.0

Sample Description Brown slightly sandy gravelly silty CLAY.

Project No. NMTL 2738

BH/TP No. BH13

Project Farankelly

Sample No. B

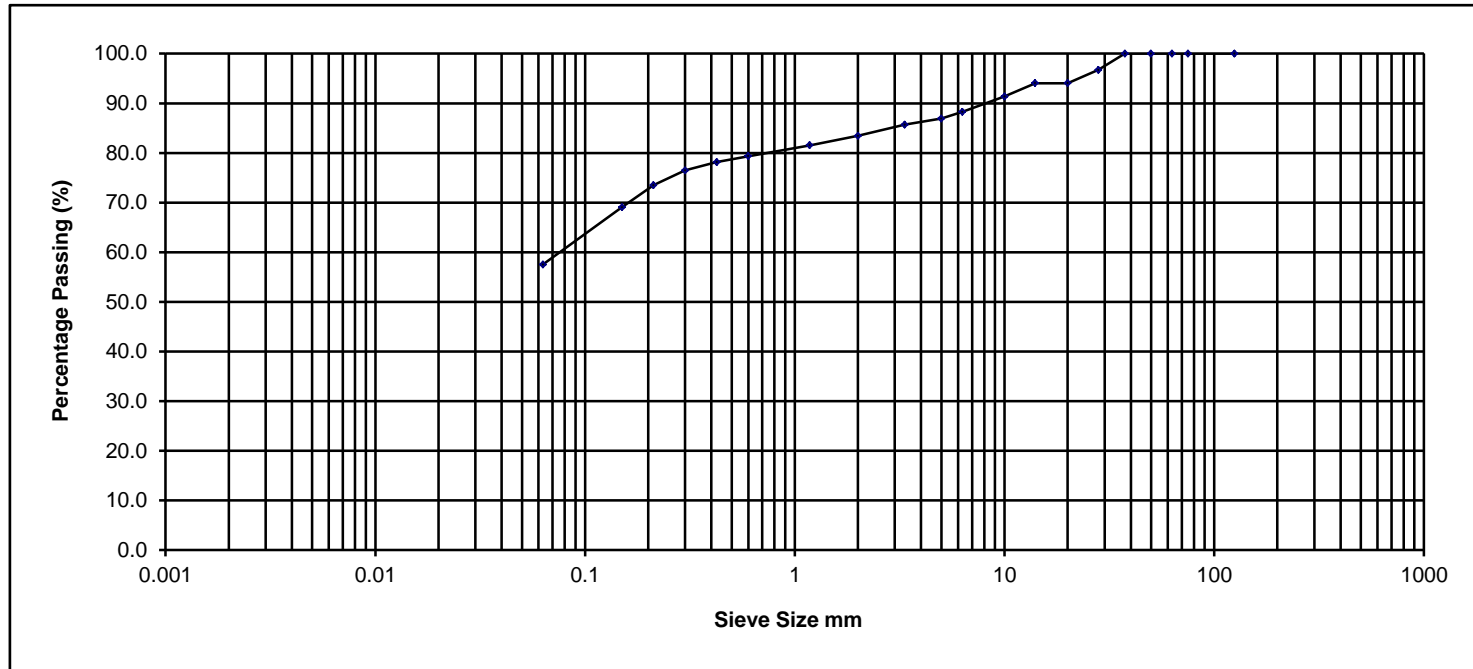
**NMTL Ltd**

Operator	Tzr	Checked	Nc	Approved	Bc	Date sample tested	15/11/2018	Depth	2.00m
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**NMTL Ltd**

Sieve Size mm	% Passing
125.000	100.0
75.000	100.0
63.000	100.0
50.000	100.0
37.500	100.0
28.000	96.7
20.000	94.1
14.000	94.1
10.000	91.4
6.300	88.3
5.000	86.9
3.350	85.7
2.000	83.4
1.180	81.5
0.600	79.4
0.425	78.2
0.300	76.5
0.212	73.5
0.150	69.1
0.063	57.5

### Determination of Particle Size Distribution BS 1377 : 1990 : Part 2 : Clauses 9.2 & 9.5



Percentage Particle Size

Clay	Fine			Medium			Coarse			Cobbles	Boulder
	Fine	Medium	Coarse	Fine	Medium	Coarse	Fine	Medium	Coarse		
	Silt			Sand			Gravel			0.0	0.0
	57.5			25.9			16.6				

Sample Description Brown slightly gravelly slightly sandy silty CLAY.

Project No. NMTL 2738

BH/TP No. BH16

Project Farankelly

Sample No. B

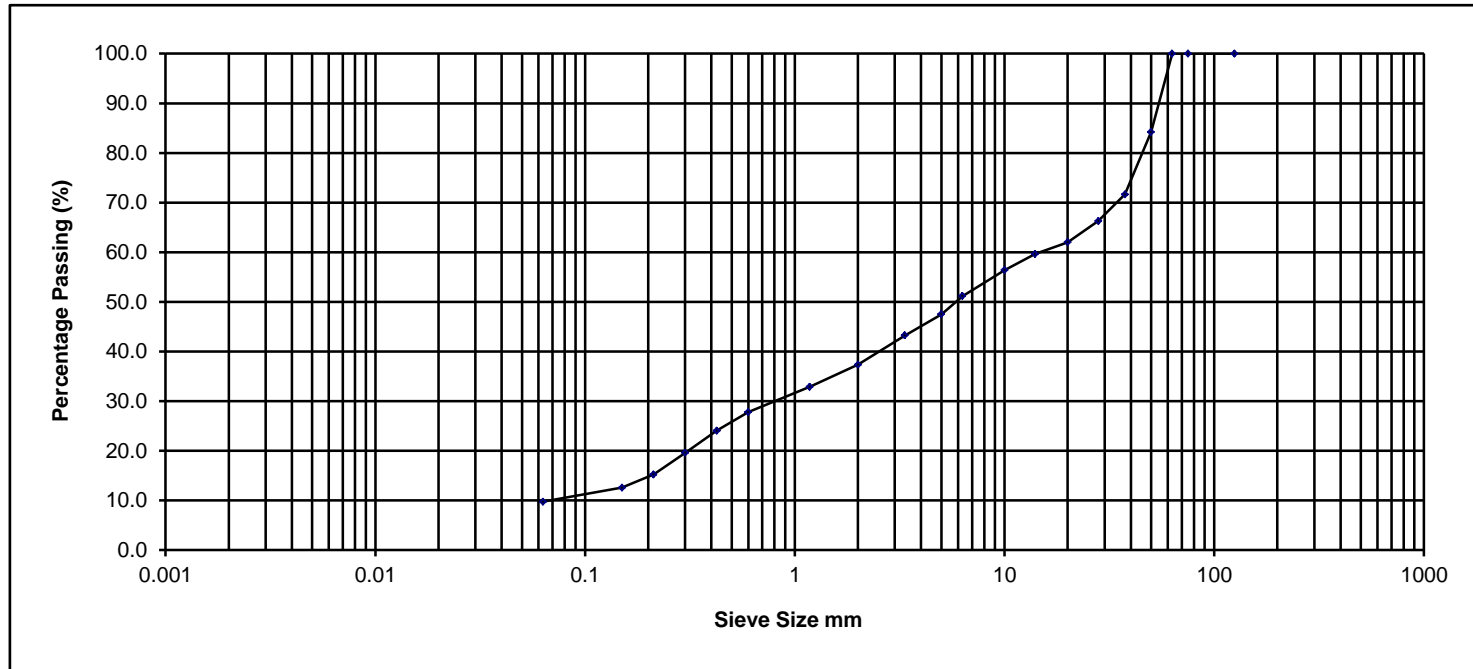
**NM**  
**TL**  
**Ltd**

Operator	Tzr	Checked	Nc	Approved	Bc	Date sample tested	16/11/2018	Depth	2.00m
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**NMTL Ltd**

Sieve Size mm	% Passing
125.000	100.0
75.000	100.0
63.000	100.0
50.000	84.2
37.500	71.6
28.000	66.3
20.000	62.0
14.000	59.7
10.000	56.4
6.300	51.2
5.000	47.5
3.350	43.2
2.000	37.3
1.180	32.9
0.600	27.8
0.425	24.1
0.300	19.6
0.212	15.2
0.150	12.6
0.063	9.7

### Determination of Particle Size Distribution BS 1377 : 1990 : Part 2 : Clauses 9.2 & 9.5



Percentage Particle Size

Clay	Fine			Medium			Coarse			Cobbles	Boulder
	Fine	Medium	Coarse	Fine	Medium	Coarse	Fine	Medium	Coarse		
	Silt			Sand			Gravel				
	9.7			27.6			62.7			0.0	0.0

Sample Description Brown silty very sandy fine to coarse GRAVEL.

Project No. NMTL 2738

BH/TP No. BH18

Project Farankelly

Sample No. B

**NMTL Ltd**

Operator	Tzr	Checked	Nc	Approved	Bc	Date sample tested	16/11/2018	Depth	1.50m
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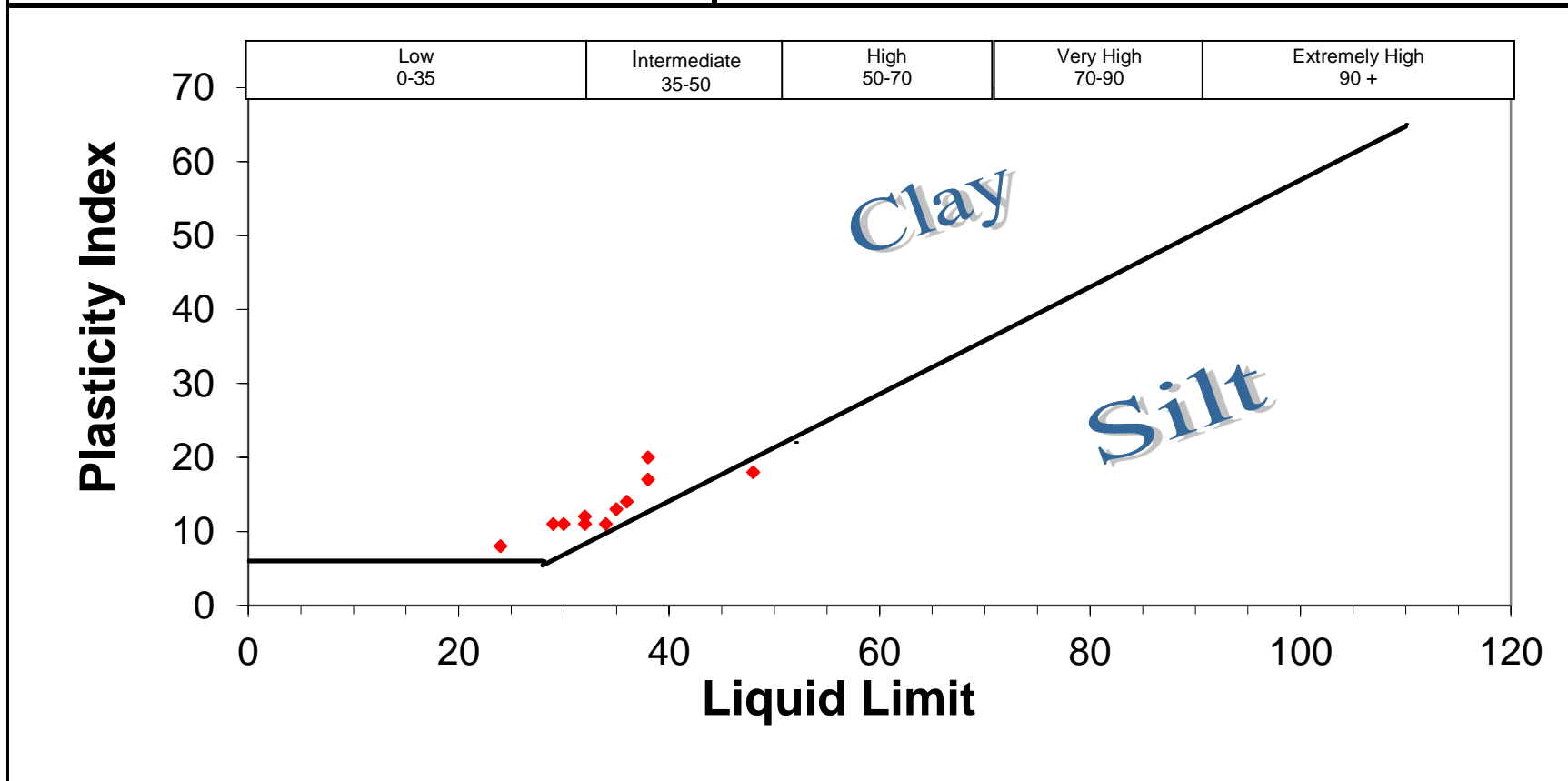
**National Materials Testing Laboratory Ltd.**

**SUMMARY OF TEST RESULTS**

				Particle		Index Properties			Bulk	Cell	Undrained Triaxial Tests		Lab	
BH/TP	Depth	sample	Moisture	Density	<425um	LL	PL	PI	Density	Pressure	Compressive	Strain at	Vane	Remarks
No	m	No.	%	Mg/m3	%	%	%	%	Mg/m3	kPa	Stress kPa	Failure %	kPa	
BH01	1.00	B	13.7		33.8	32	21	11						
BH02	1.00	B	15.0		64.9	29	18	11						
BH03	1.50	B	17.8		63.7	38	21	17						
BH05	1.00	B	20.8		69.3	34	23	11						
BH07	2.00	B	10.3		38.8	35	22	13						
BH09	1.50	B	14.6		41.9	48	13	18						
BH10	1.50	B	8.6		13.4	36	22	14						
BH11	2.00	B	13.7		27.3	30	20	11						
BH12	3.00	B	8.9		27.2	24	16	8						
BH13	2.00	B	10.1		28.9	32	20	12						
BH16	2.00	B	22.2		78.2	38	18	20						
BH18	1.50	B	12.6		24.1	22	Non Plastic							
NMTL		Notes :									Job ref No.	NMTL 2738	Table	
		1. All BS tests carried out using preferred (definitive) method unless otherwise stated.									Location	Farankelly		

**NMTL LTD**  
**Unit 18c, Tullow Industrial Estate**  
**Tullow**  
**County Carlow**  
Tel: 00353 59 9180822  
Mob: 00353 872575508  
[billachana@eircom.net](mailto:billachana@eircom.net)

**Contract:** Farankelly  
**Client:** Ground Investigations Ireland Ltd  
**Engineer:** N/A  
**Date:** 27/11/2018  
**Tested By:** Tzr **Checked:** Bc  
**Job ref No.** NMTL 2738



## **APPENDIX E – BIODIVERSITY**

### Species List

## Species List

The nomenclature for vascular plants is taken from the New Flora of the British Isles (Stace, 2010).

Scientific names for mosses comes from A Checklist and Census Catalogue of British and Irish Bryophytes (Hill et al., 2008) while common names are taken from Mosses and Liverworts of Britain and Ireland (Atherton et al. eds., 2010).

Species indicated with an asterisk '\*\*' are known to have been introduced to Ireland by humans.

<b>Hedgerow - WL1</b>		<b>DAFOR</b>
<i>Acer pseudoplatanus</i> *	Sycamore	R
<i>Alliaria petiolata</i>	Garlic Mustard	O
<i>Anthriscus sylvestris</i>	Cow Parsley	O
<i>Arctium minus</i>	Lesser Burdock	R
<i>Brachypodium sylvaticum</i>	False Brome	O
<i>Bromus hordeaceus</i>	Soft-brome	O
<i>Calystegia sepium</i>	Hedge Bindweed	O
<i>Cirsium arvense</i>	Creeping Thistle	O
<i>Crataegus monogyna</i>	Hawthorn	R-F
<i>Fallopia convolvulus</i>	Black-bindweed	R
<i>Fraxinus excelsior</i>	Ash	R-O
<i>Galium aparine</i>	Cleavers	O
<i>Geranium robertianum</i>	Herb-Robert	O
<i>Geum urbanum</i>	Wood Avens	O
<i>Glechoma hederacea</i>	Ground-ivy	R
<i>Hedera helix</i>	Common Ivy	O
<i>Heracleum sphondylium</i>	Hogweed	O
<i>Ilex aquifolium</i>	Holly	R
<i>Myosotis arvensis</i> *	Field Forget-me-not	R
<i>Petasites fragrans</i> *	Winter Heliotrope	O
<i>Poa annua</i>	Annual Meadow-grass	O
<i>Polystichum setiferum</i>	Soft Shield-fern	O
<i>Pinus sylvestris</i>	Scots Pine	O
<i>Prunus laurocerasus</i> *	Cherry Laurel	R
<i>Pteridium aquilinum</i>	Bracken	O



<i>Ranunculus repens</i>	Creeping Buttercup	O
<i>Rosa sp.</i>	Roses	O
<i>Rubus fruticosus agg.</i>	Brambles	O
<i>Rumex sanguineus</i>	Wood Dock	O
<i>Sambucus nigra</i>	Elder	O
<i>Smyrniolum olusatrum*</i>	Alexanders	O
<i>Symphoricarpos albus*</i>	Snowberry	R
<i>Urtica dioica</i>	Common Nettle	A
<i>Veronica chamaedrys</i>	Germander Speedwell	O
<i>Veronica persica</i>	Common Field-speedwell*	O
<i>Vicia sepium</i>	Bush Vetch	F

<b>Improved agricultural grassland - GA1</b>		<b>DAFOR</b>
<i>Anthoxanthum odoratum</i>	Sweet Vernal-grass	O
<i>Bellis perennis</i>	Daisy	O
<i>Bromus hordeaceus</i>	Soft-brome	F
<i>Cardamine pratensis</i>	Cuckooflower	R
<i>Dactylis glomerata</i>	Cock's-foot	O
<i>Heracleum sphondylium</i>	Hogweed	O
<i>Hieracium sp.</i>	Hawkweed	R
<i>Holcus lanatus</i>	Yorkshire-fog	O
<i>Plantago lanceolata</i>	Ribwort Plantain	F
<i>Poa pratensis</i>	Smooth Meadow-grass	O
<i>Potentilla anserina</i>	Silverweed	O
<i>Potentilla reptans</i>	Creeping Cinquefoil	O
<i>Pteridium aquilinum</i>	Bracken	R
<i>Ranunculus acris</i>	Meadow Buttercup	O
<i>Ranunculus repens</i>	Creeping Buttercup	O-F
<i>Rumex obtusifolius</i>	Broad-leaved Dock	O
<i>Stellaria media</i>	Common Chickweed	O
<i>Taraxacum sp.</i>	Dandelions	O

<i>Trifolium repens</i>	White Clover	F
<i>Urtica dioica</i>	Common Nettle	O-F
<i>Veronica chamaedrys</i>	Germander Speedwell	O
<i>Vicia sativa</i>	Common Vetch	R

<b>Treeline - WL2</b>		<b>DAFOR</b>
<i>Acer pseudoplatanus</i> *	Sycamore	F
<i>Alnus glutinosa</i>	Alder	R
<i>Crataegus monogyna</i>	Hawthorn	R
<i>Fagus sylvatica</i> *	Beech	R-O
<i>Fraxinus excelsior</i>	Ash	O
<i>Pinus sylvestris</i>	Scots Pine	O
<i>Prunus laurocerasus</i> *	Cherry Laurel	R
<i>Rubus fruticosus agg.</i>	Brambles	F
<i>Salix caprea</i>	Goat Willow	R
<i>Salix fragilis</i> *	Crack-willow	R
<i>Sambucus nigra</i>	Elder	O
<i>Symphoricarpos albus</i> *	Snowberry	R
<i>Ulmus glabra</i>	Wych Elm	R

<b>Eroding River - FW1</b>		<b>DAFOR</b>
<i>Carex pendula</i>	Pendulus Sedge	O
<i>Circaea lutetiana</i>	Enchanter's-nightshade	O
<i>Conocephalum conicum</i>	Great Scented Liverwort	O
<i>Gunnera tinctoria</i> *	Giant-rhubarb	O
<i>Iris pseudacorus</i>	Yellow Iris	O
<i>Nasturtium officinale</i>	Water-cress	O
<i>Oenanthe crocata</i>	Hemlock Water-dropwort	O
<i>Scrophularia nodosa</i>	Common Figwort	O
<i>Veronica beccabunga</i>	Brooklime	O

<b>Scrub - WS1</b>		<b>DAFOR</b>
<i>Conopodium majus</i>	Pignut	O
<i>Filipendula ulmaria</i>	Meadowsweet	O
<i>Galium odoratum</i>	Woodruff	O
<i>Prunus spinosa</i>	Blackthorn	D-O
<i>Rubus fruticosus agg.</i>	Brambles	A
<i>Salix cinerea</i>	Grey Willow	A
<i>Stellaria holostea</i>	Greater Stitchwort	O
<i>Ulex europaeus</i>	Gorse	A

<b>Wetgrassland - GS4</b>		<b>DAFOR</b>
<i>Angelica sylvestris</i>	Wild Angelica	O
<i>Anthriscus sylvestris</i>	Cow Parsley	O
<i>Heracleum sphondylium</i>	Hogweed	O
<i>Iris pseudacorus</i>	Yellow Iris	F
<i>Juncus effusus</i>	Soft-Rush	O
<i>Ranunculus acris</i>	Meadow Buttercup	F
<i>Ranunculus repens</i>	Creeping Buttercup	F

<b>Drainage ditch - FW4</b>		<b>DAFOR</b>
<i>Carex remota</i>	Remote Sedge	O
<i>Mentha aquatica</i>	Water Mint	O
<i>Apium nodiflorum</i>	Fool's-water-cress	A-D

<b>Recolonising bare ground - ED3</b>		<b>DAFOR</b>
<i>Anagallis arvensis</i>	Scarlet Pimpernel	O
<i>Chamerion angustifolium</i>	Rosebay Willowherb	O
<i>Cirsium vulgare</i>	Spear Thistle	O
<i>Hieracium sp.</i>	Hawkweed	O
<i>Holcus lanatus</i>	Yorkshire-fog	O
<i>Medicago lupulina</i>	Black Medick	O

<i>Myosotis discolor</i>	Chaning Forget-me-not	O
<i>Papaver somniferum*</i>	Opium Poppy	O
<i>Plantago lanceolata</i>	Ribwort Plantain	O
<i>Ranunculus repens</i>	Creeping Buttercup	O
<i>Reseda luteola</i>	Weld	O
<i>Rubus fruticosus agg.</i>	Brambles	O
<i>Rumex crispus</i>	Curled Dock	O
<i>Senecio jacobaea</i>	Common Ragwort	O
<i>Sisymbrium officinale</i>	Hedge Mustard	O
<i>Sonchus asper</i>	Prickly Sowthistle	O
<i>Ulex europaeus</i>	Gorse	O
<i>Urtica dioica</i>	Common Nettle	O
<i>Vicia cracca</i>	Tufted Vetch	O