THORNTON O'CONNOR
TOWN PLANNING

Volume III - Appendices

Environmental Impact Assessment Report

In respect of a Build-to-Rent Residential Development

at

The former Aldi Site, Carmenhall Road, Sandyford Industrial Estate, Dublin 18

Submitted on Behalf of Sandyford GP Limited (acting in its capacity as general partner for the Sandyford Central Partnership

November 2019

Volume III Appendix – Table of Contents

Appendix 6.1

Archaeology and Cultural Heritage

APPENDIX 6.1 LEGISLATION, POLICIES AND GUIDANCE

6.1 Conventions & Directives

Ireland has ratified several European and international conventions in relation to the protection of its cultural heritage. This section summarises Ireland's obligations as a signatory to a number of International and European conventions relating to the protection and conservation of cultural heritage sites. Also included is a synopsis of existing national legislation governing the care and protection of our cultural heritage resource.

6.1.1 ICOMOS Xi'an Declaration, 2005

Ireland is a signatory to an international declaration sponsored by International Council on Monuments and Sites (ICOMOS), the Xi'an Declaration on the Conservation of the Setting of Heritage Structures, Sites and Areas, 2005, that endeavours to ensure the safeguard and conservation of the World's cultural heritage as part of its sustainable and human development.

6.1.2 EIA Directive 85/337/EEC as amended

In order to assist planning and other consent authorities in deciding if significant effects on the environment are likely to arise in the case of development below the national mandatory EIA thresholds, the Minister for the Environment, Heritage and Local Government published a Guidance document in August 2003.

6.1.3 The European Landscape Convention 2000

In 2002 Ireland ratified the European Landscape Convention - also known as the Florence Convention, which promotes the protection, management and planning of European landscapes and organises European co-operation on landscape issues. It is the first international treaty to be exclusively concerned with all dimensions of European landscape.

6.1.4 Valletta Convention, 1997

In 1997 the Republic of Ireland ratified the Council of Europe, European Convention on the Protection of the Archaeological Heritage (the 'Valletta Convention'). Obligations under the Convention include: provision for statutory protection measures, including the maintenance of an inventory of the archaeological heritage and the designation of protected monuments and areas.

6.1.5 Granada Convention, 1997

Under the European Convention on the Protection of the Architectural Heritage (Granada Convention), 1997, the Republic of Ireland is obliged to maintain inventories of architectural heritage, to protect the architectural heritage and adopt conservation policies as integrated planning objectives.

6.1.6 UNESCO World Heritage Convention, 1972

This Convention provides for the identification, conservation and preservation of cultural and natural sites of outstanding universal value for inclusion in a world heritage list. The World Heritage status is a non-statutory designation and no additional statutory controls result from this designation. However the impact of proposed development upon a World Heritage Site will be a key material consideration in determining planning applications.

6.2 Legislation

6.2.1 The Planning and Development Act 2006-2009;

The Planning and Development (Strategic Infrastructure) Act 2006 ensures the protection of the archaeological heritage resource by requiring that all applications under this Act are accompanied by an EIS (EIAR) including information on material assets, including the architectural and archaeological heritage, and the cultural heritage.

6.2.2 The National Monuments Act 1930 to 2004

Irish legislation for the protection of archaeological heritage is based on the National Monuments Acts 1930 and amendments of 1954, 1987, 1994 and 2004. These acts are the principal statutes governing the care of monuments in the Irish Republic. They provide for the protection of national monuments through the use of preservation orders. The overall state archaeological service is provided by the Department of Arts, Heritage, Rural, Regional and Gaeltacht Affairs (DAHRRGA) and delivered through the Planning and Heritage Section of the DAHRRGA and the National Museum of Ireland (Irish Antiquities Division) on behalf of the Minister.

Monuments are protected under the National Monuments Acts in a number of ways:

- National Monuments in the ownership or guardianship of the Minister or a local authority.
- National Monuments, which are subject to a preservation order.
- Historic monuments or archaeological areas recorded in the Register of Historic Monuments.
- Monuments recorded in the Record of Monuments and Places (RMP).

6.2.3 The Planning and Development Act 2000, as amended

Under arrangements which came into operation on 1 January 2000 (The Planning and Development Act 2000), the system of listing buildings was replaced with strengthened procedures for the preservation of protected structures and structures in architectural conservation areas (ACA).

6.2.4 The Architectural Heritage and Historic Properties Act, 1999

This Act provides for the establishment of a national inventory of architectural heritage which forms the basis for recommendation from the Minister to local authorities of sites for inclusion in the local authorities Record of Protected Structures.

6.2.5 The Framework and Principles for the Protection of the Archaeological Heritage guidelines, 1999

This document sets out the basic principles of national policy on the protection of the archaeological heritage. A key principle set out in these guidelines is that there should always be a presumption in favour of avoidance of developmental impacts on the archaeological heritage and preservation in-situ of archaeological sites and monuments must be presumed to be the preferred option.

6.2.6 The Dun Laoghaire Rathdown County Development Plan 2016-22

The Built Heritage and Archaeological policies relevant to the proposed development as outlined in the CDP area as follows:

Policy AH1: Protection of Archaeological Heritage
It is Council policy to protect archaeological sites, National Monuments (and their settings), which have been identified in the Record of Monuments and Places (RMP).

Policy AH2: Protection of Archaeological Material in Situ
It is Council policy to seek the preservation in situ (or where this is not possible or appropriate, as a minimum, preservation by record) of all archaeological monuments included in the Record of Monuments and Places, and of previously unknown sites, features and objects of archaeological interest that become revealed through development activity.

Policy AR1: Record of Protected Structures
It is Council policy to:

i. Include those structures that are considered in the opinion of the Planning Authority to be of special architectural, historical, archaeological, artistic, cultural, scientific, technical or social interest in the Record of Protected Structures (RPS).
ii. Protect structures included on the RPS from any works that would negatively impact their special character and appearance.

Policy AR2: Protected Structures Applications and Documentation
It is Council policy to require all planning applications relating to Protected Structures to contain the appropriate level of documentation in accordance with Article 23 (2) Planning Regulations and Chapter 6 and Appendix B of the Architectural Heritage Protection Guidelines for Planning Authorities, or any variation thereof.

Policy AR4: National Inventory of Architectural Heritage (NIAH)
It is Council policy to review and update the RPS on foot of any Ministerial recommendations following the completion of the National Inventory of Architectural Heritage (NIAH).

Policy AR5: Buildings of Heritage Interest

It is Council policy to:

i. Retain, where appropriate, and encourage the rehabilitation and suitable reuse of existing older buildings/structures/features which make a positive contribution to the character and appearance of a streetscape in preference to their demolition and redevelopment.
ii. Identify buildings of vernacular significance with a view to assessing them for inclusion in the Record of Protected Structures.

6.3 Methodology in Evaluation of Impacts

In line with EPAs Guidelines on the Information to be Contained in Environmental Impact Assessment Reports and DoECLGs Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment; the impact upon designated and undesignated archaeological, architectural and cultural heritage sites, structures, monuments or features have been evaluated using the following criteria:

6.3.1 Quality of Effects

- Positive Impact: A change that improves or enhances an archaeological, architectural or cultural heritage site, structure, monument or feature or its setting;
- Neutral Impact: A change that does not affect, or has an imperceptible effect on an archaeological, architectural or cultural heritage site, structure, monument or feature or its setting; and
- Negative Impact: A change that will remove or negatively alter, whether in its entirety or not, an archaeological, architectural or cultural heritage site, structure, monument or feature, or detract from an observer's enjoyment or appreciation of its setting.

6.3.2 Duration of Effects

- Momentary Effects: Effects lasting from seconds to minutes;
- Brief Effects: Effects lasting less than one day;
- Temporary Effects; Effects lasting less than a year;
- Short term Effects, Effects lasting one to seven years;
- Medium-term Effects, Effects lasting seven to fifteen years;
- Long-term Effects, Effects lasting fifteen to sixty years;
- Permanent Effects, Effects lasting over sixty years; and
- Reversible Effects: Effects that can be undone, for example through remediation or restoration.

6.3.3 Types of Effects

- Indirect Effects: Impacts on the environment, which are not a direct result of the project, often produced away from the project site or because of a complex pathway;
- Cumulative Effects: The addition of many minor or significant effects, including effects of other projects, to create larger, more significant effects;
- 'Do-Nothing Effects': The environment as it would be in the future should the subject project not be carried out;
- 'Worst Case' Effects: The impacts arising from a development in the case where mitigation measures substantially fail;
- Indeterminable Effects: When the full consequences of a change in the environment cannot be described;
- Irreversible Effects: When the character, distinctiveness, diversity or reproductive capacity of an environment is permanently lost; and
- Residual Effects: The degree of environmental change that will occur after the proposed mitigation measures have taken effect.

Appendix 8.1

Verified View Montages

OCTOBER 2019

Photo-montage Report Sandyford Central

Photomontage Methodology

3D Modelling
Henry J. Lyons Architects supplied a Revit Block Model showing the proposed Extant scheme (ABP Ref.PL06D.301428). They also included a block model of the RB Central Building (ABP Ref.PL06D.304405). Existing topographical surveys were also provided by Henry J. Lyons Architects.

Photography
All photographs we taken by Enda Cavanagh Professional Photography using a high resolution Sony 7R2 35mm Camera with a 24 mm Cannon mark 2 shift lens.

A plumb line was used to mark the position of the centre of the camera and to confirm a camera height of 1.65m. A mark was sprayed on the ground at each camera position and a photograph taken of the camera position for reference. Additional detail photographs of the site area and surrounds were also taken for reference purposes using a variety of lenses.

Survey Information
In all cases the camera positions and control points were surveyed by CSS Surveys. Key static points that were visible in the photographs were also surveyed to serve as control points. The camera positions and control points were then related back and aligned into the Base Model (all at National Grid).

Base Model
The provided topographical survey and proposed model were over-laid and aligned to create a 'Base' model file. This Base model allowed for the accurate alignment of the proposed buildings, camera positions and reference points. This Base model was updated throughout the design process.

Photo matching
Using 3D Studio Max software a virtual camera was positioned using the camera locations from surveyed information and an accurate fit between the camera and the photograph was achieved by precisely matching the surveyed static features (control points) in the rendering to the corresponding points in the background photograph.

Rendering
The models were textured and rendered using VRAY rendering engine. The materials and lighting were adjusted to try an mimic real work scenarios - building within the scene were used as a reference to obtain valuable visual clues as to how the light would react with the proposed building. A computer image was produced (rendered) and then combined with the background photograph using digital compositing software.
Using the detail photographs for reference the images were then cropped to remove any parts that would be screened by existing trees, topography or buildings, leaving only the parts, which would be visible. The photomontages are presented as "proposed", with additional proposed planting.

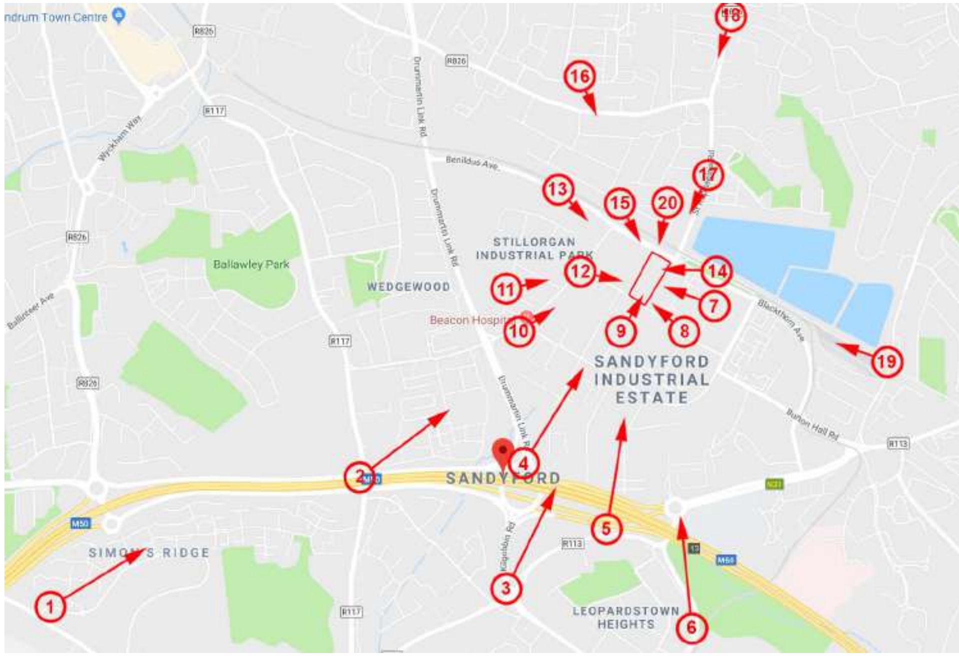
Presentation
As photography cannot present what the eye sees in reality, it is intended that the photomontages are used as a tool to aid visual assessment. They should be viewed on site and compared with the real scene.

Each view is presented on 4 sheets:
Sheet 1 - Existing site pre construction
Sheet 2 - Extant Scheme (Tivway) ABP-304405-19
Sheet 3 - Proposed Scheme
Sheet 4 - Analysis sheet showing:

- Extant Scheme (Tivway) at Subject Site – Shown in Red Outline
- Current Proposed Scheme – Shown in Yellow Outline
- Permitted Scheme at Rockbrook Central Site – Shown in Green Outline with Transparent Massing when in Front of Site

Conclusion
We have outlined our procedure for the generation of the photo-match. We have re-verified our results and we are confident that these images give a fair and true representation of the proposed development.

Notes
Subject to accurate survey information, the position and scale of a building in a scene can be verified mathematically. Whilst position, height and scale will be objectively accurate, subjective judgement must be used when lighting is being assessed and therefore a definitive and objectively verified agreement on lighting is not possible.
Visual Lab recommends that all parties are mindful that Environmental Statement photomontage should be used as a complement to site based assessment.



Location of Camera's

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B. Eng
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visual lab

PHOTO-MONTAGE REPORT: SANDYFORD CENTRAL

Date: 10/01/2018 Time: 17:33 Lens: 24 mm

Field of view for a 50 mm Lens

Field of view for a 24 mm Lens

Date: 10/01/2018 Time: 11:29 Lens: 24 mm

Field of view for a 50 mm Lens

Field of view for a 24 mm Lens

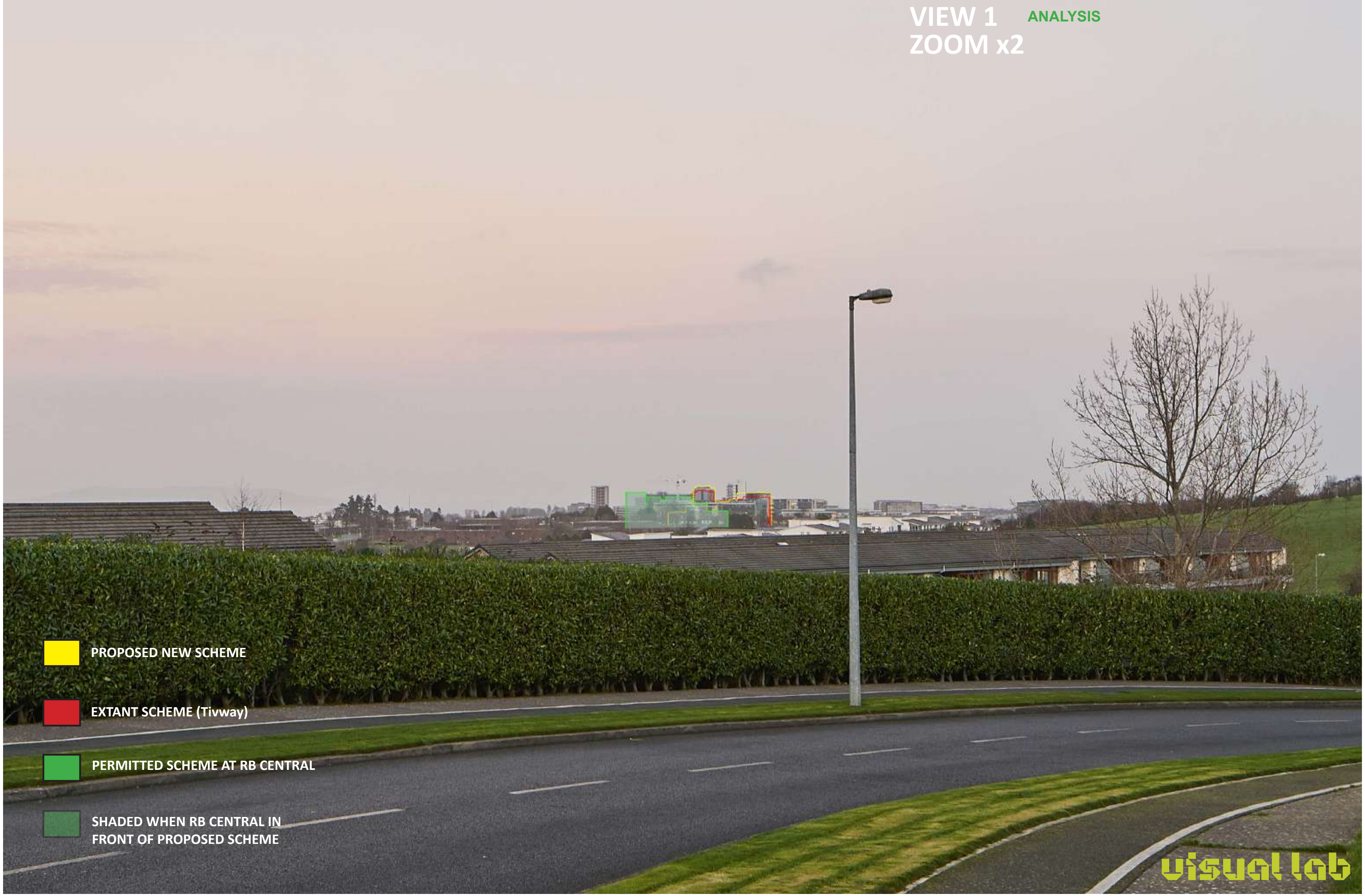
VIEW 1

PROPOSED SCHEME

Date: 10/01/2018 Time: 11:29 Lens: 24 mm

Field of view for a 50 mm Lens

Field of view for a 24 mm Lens



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Date: 10/01/2017 Time: 17:14 Lens: 24 mm

Field of view for a 50 mm Lens

Field of view for a 24 mm Lens

VIEW 2 EXTANT SCHEME (Tivway) ABP-304405-19

Field of view for a 50 mm Lens

Date: 10/01/2017 Time: 17:14 Lens: 24 mm

Field of view for a 24 mm Lens

VIEW 2

PROPOSED SCHEME

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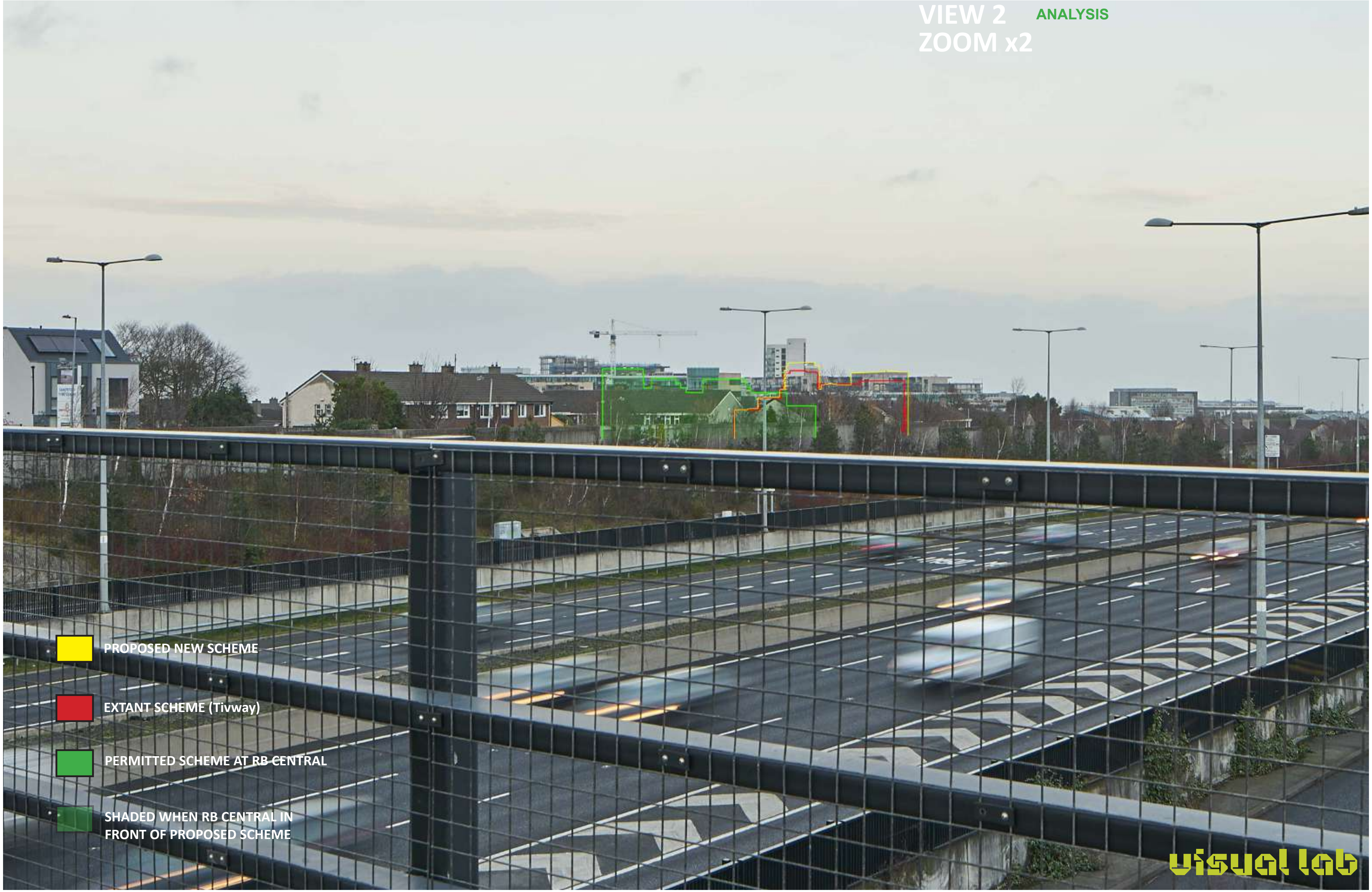
Field of view for a 50 mm Lens

Field of view for a 24 mm Lens



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Date: 09/01/2017 Time: 16:05 Lens: 24 mm

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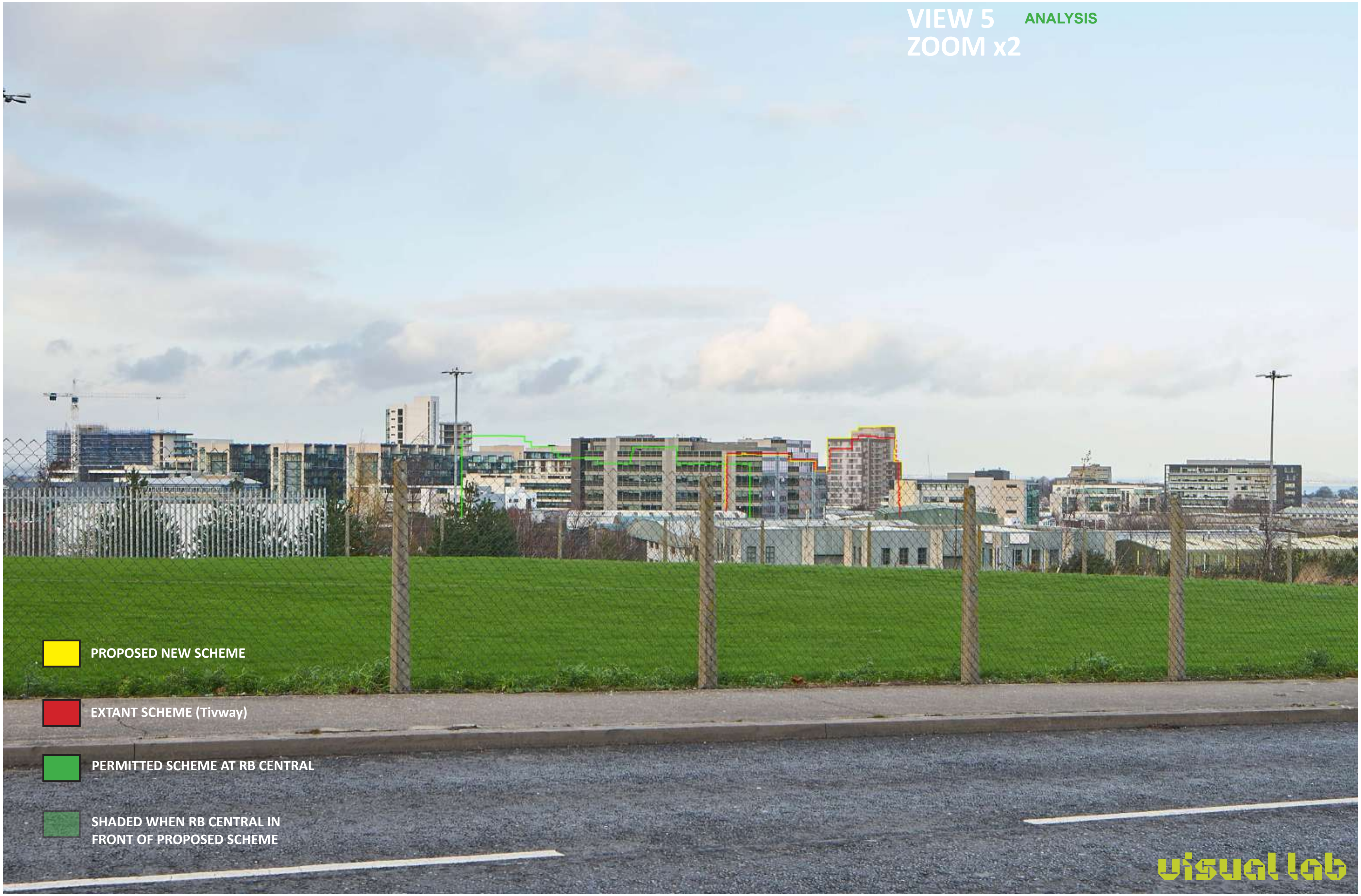

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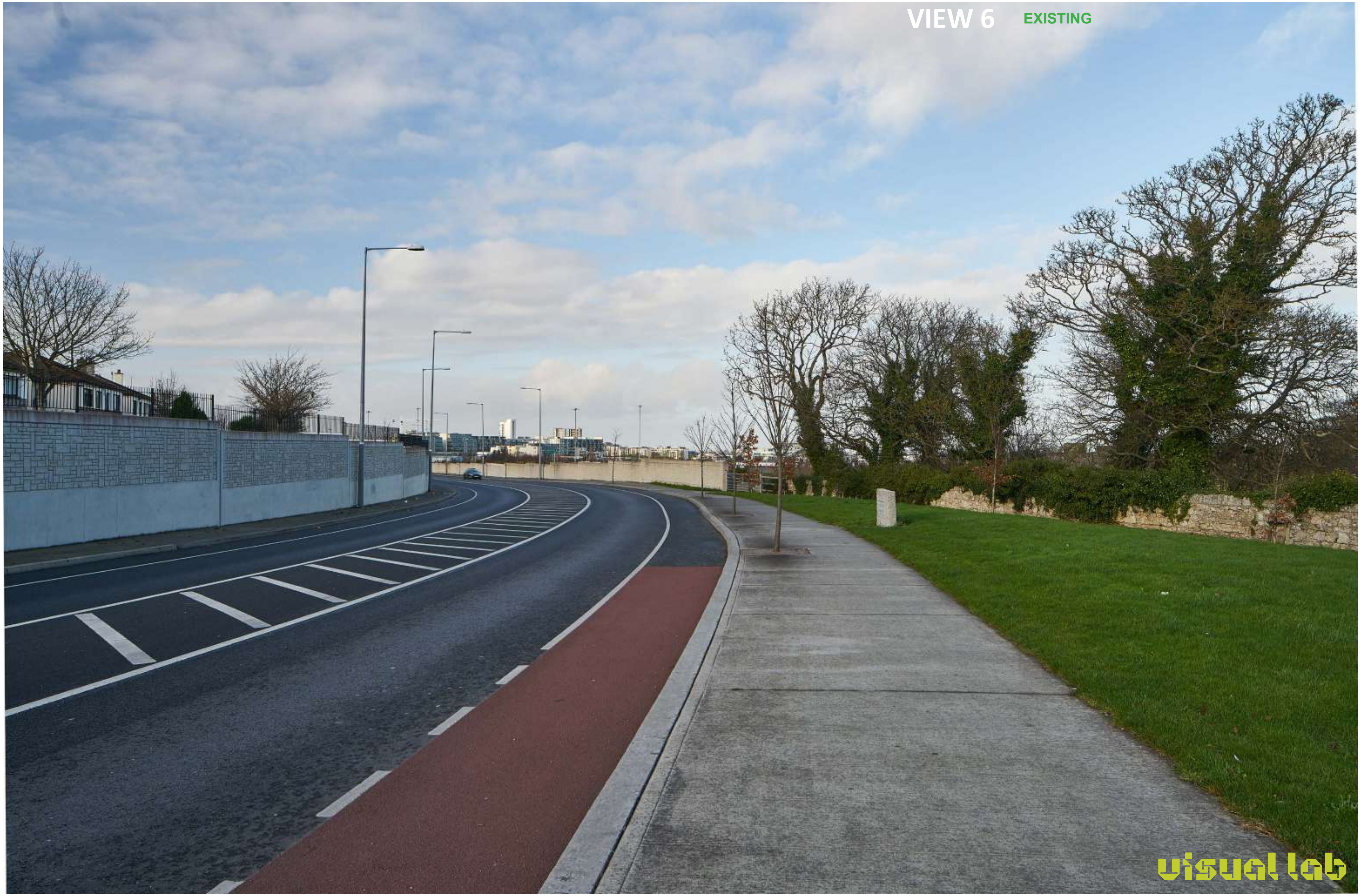

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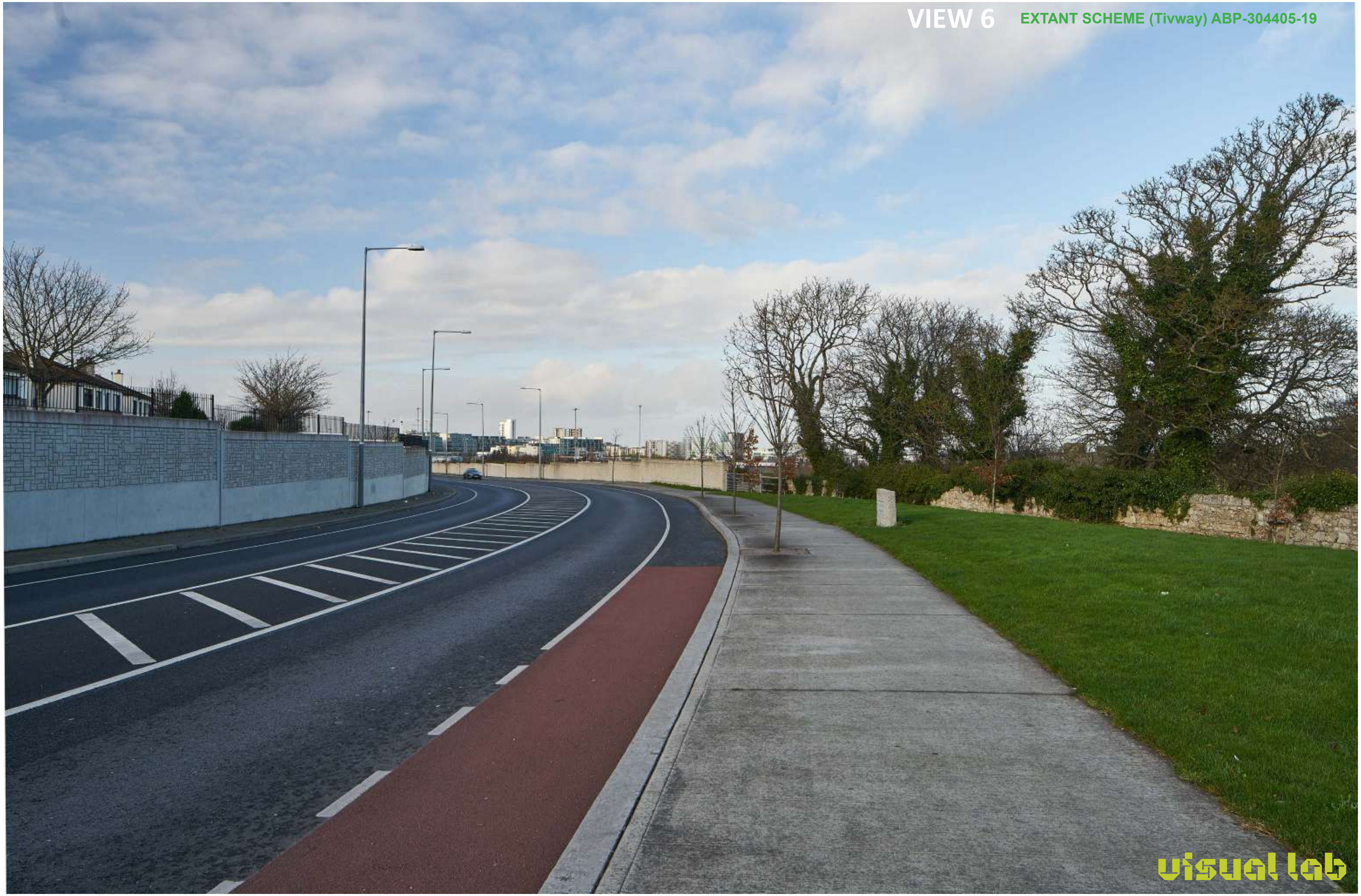
Field of view for a 50 mm Lens

Field of view for a 24 mm Lens



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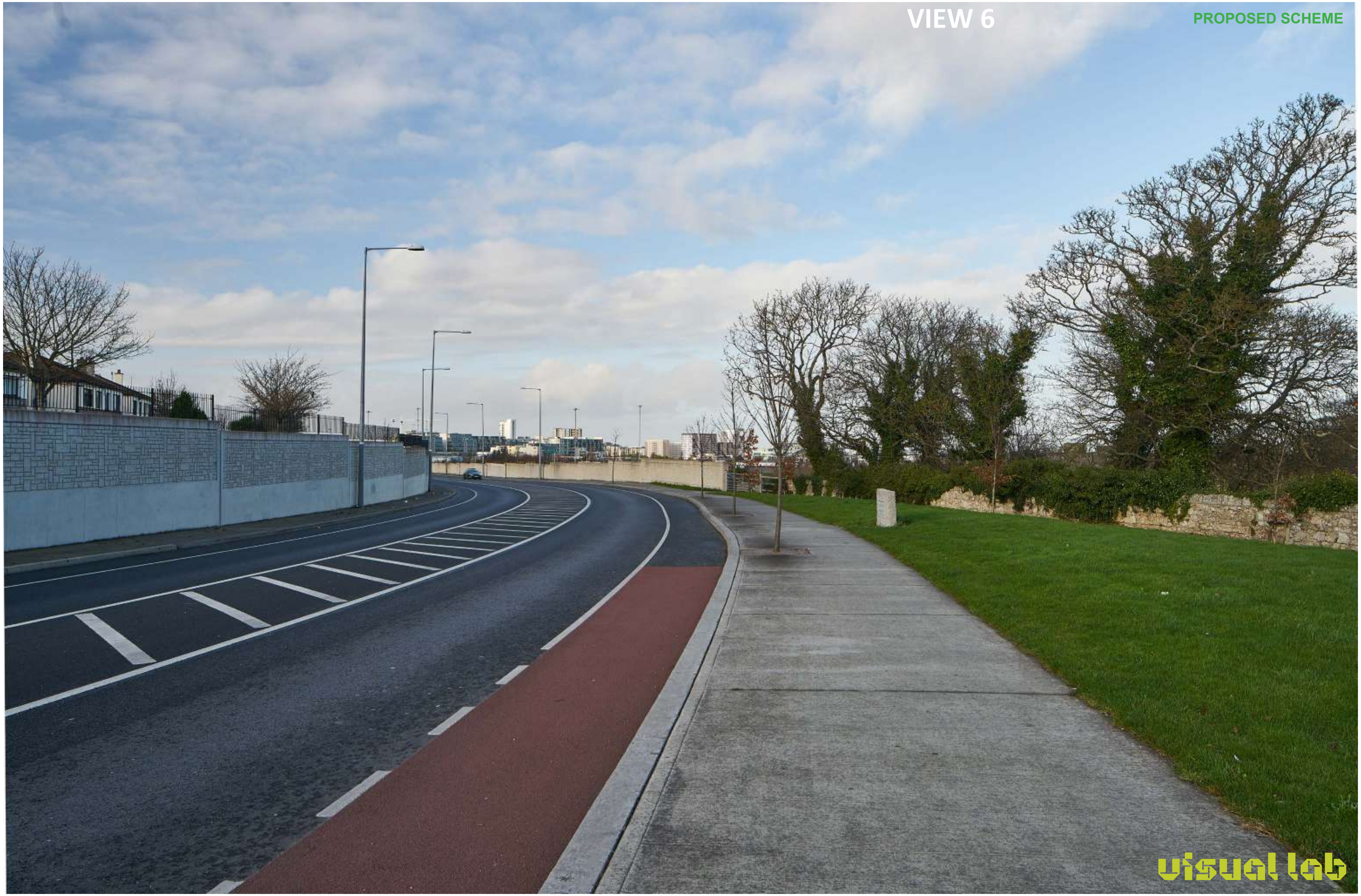

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Date: 28/04/2017 Time: 11:48 Lens: 24 mm

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PHOTO-MONTAGE REPORT: SANDYFORD CENTRAL

Date: 28/04/2017 Time: 11:48 Lens: 24 mm

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Date: 28/04/2017 Time: 13:27 Lens: 24 mm

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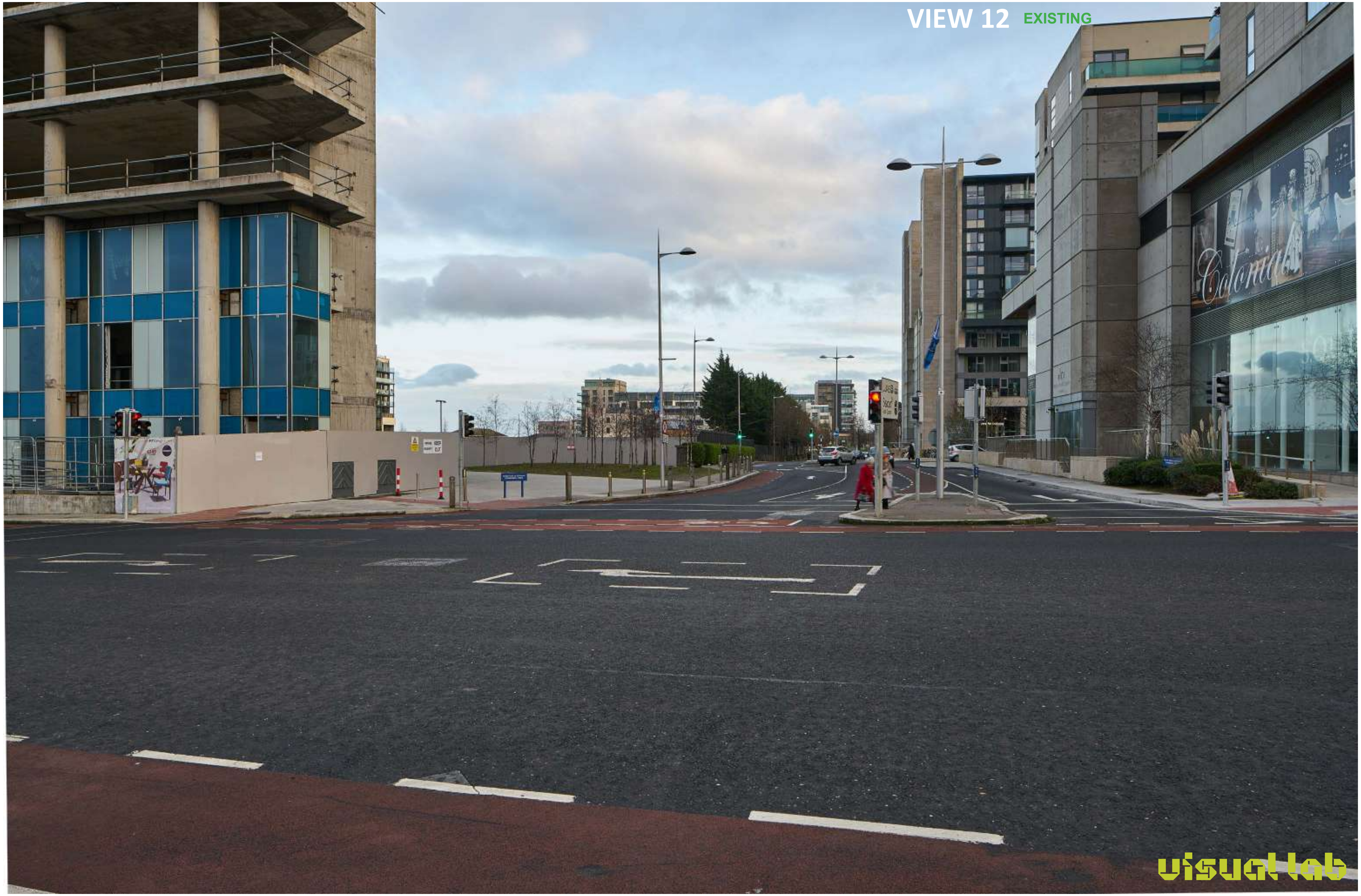

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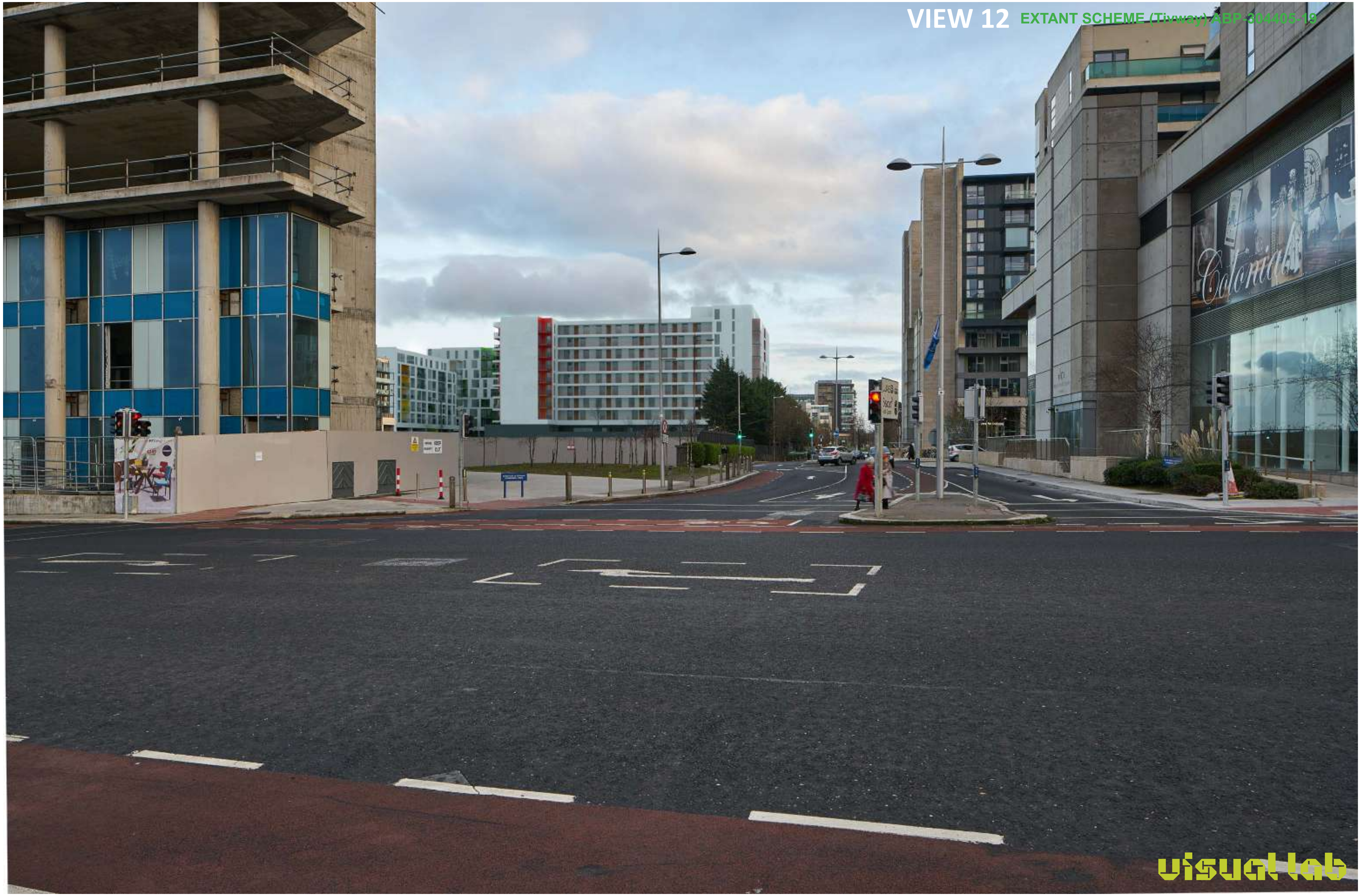
Field of view for a 24 mm Lens



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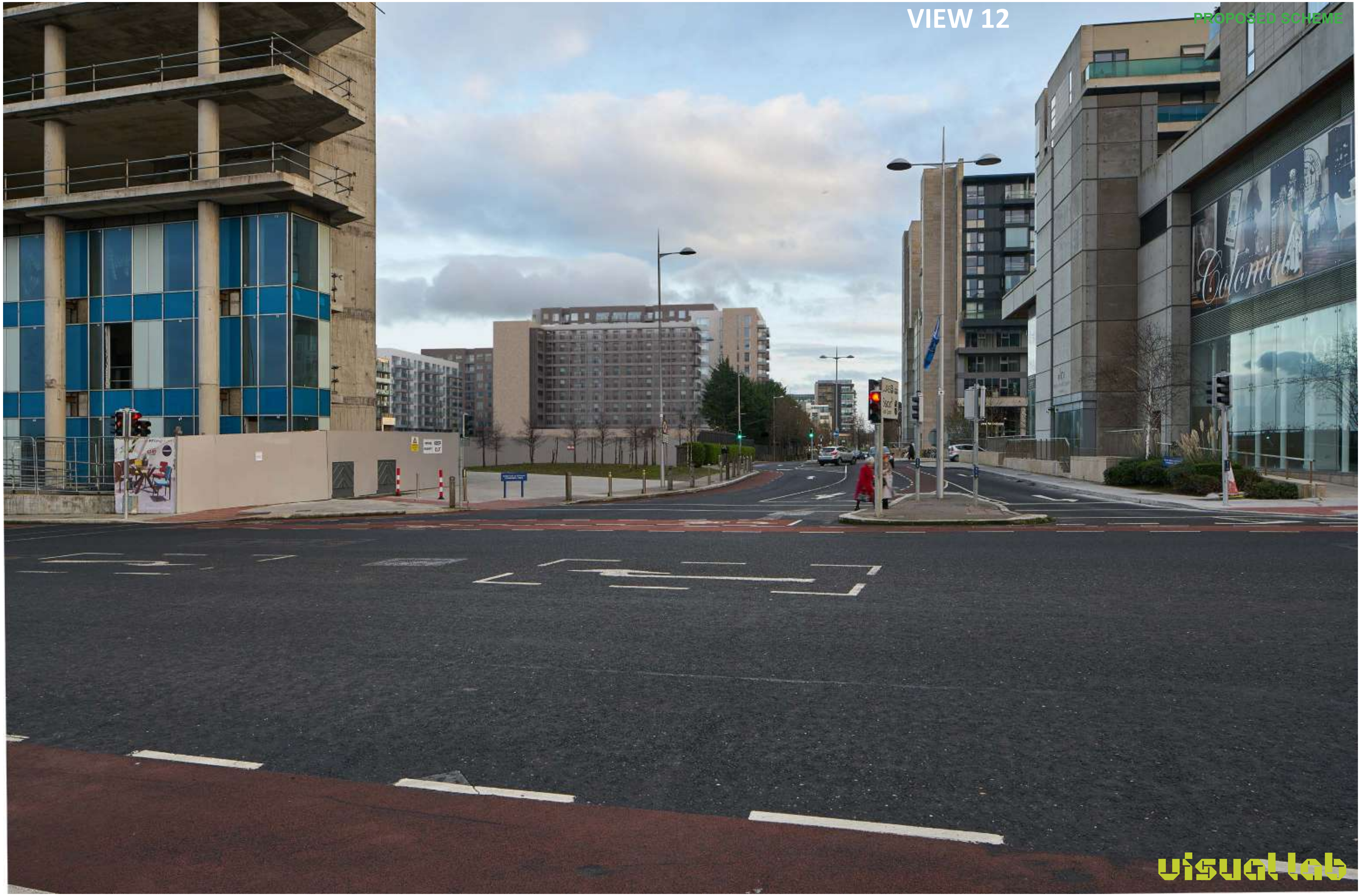

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VIEW 13 EXTANT SCHEME (Tivway) ABP-304405-19

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Date: 28/04/2017 Time: 11:10 Lens: 24 mm

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VIEW 14 EXISTING

Date: 28/04/2017 Time: 11:31 Lens: 24 mm

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VIEW 14 **EXTANT SCHEME (Tivway) ABP-304405-19**

Date: 28/04/2017 Time: 11:31 Lens: 24 mm

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Date: 28/04/2017 Time: 11:31 Lens: 24 mm

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VIEW 14 ANALYSIS

Date: 28/04/2017 Time: 11:31 Lens: 24 mm

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Date: 28/04/2017 Time: 09:54 Lens: 24 mm

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VIEW 16 EXTANT SCHEME (Tivway) ABP-304405-19

Date: 28/04/2017 Time: 09:54 Lens: 24 mm

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VIEW 18 EXTANT SCHEME (Tivway) ABP-304405-19

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VIEW 20 EXISTING

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Appendix 8.2

Methodology for the production of photomontages

APPENDIX 8.2: METHODOLOGY FOR THE PRODUCTION OF PHOTOMONTAGES

Photography of Site

1. Photographs are taken from locations as advised by client with a professional SLR digital camera. The photographs are taken horizontally with a survey level attached to the camera. The photographic positions are marked (for later surveying), the height of the camera and the focal length of the image recorded.

2. In each photograph, a minimum of 2No visible fixed points are marked for surveying. These are control points for model alignment within the photograph.

3. The photographic positions and the control points are geographically surveyed and these positions are plotted on the site survey drawing as supplied by the Architect.

3D Computer Model, Rendered Views and Photomontage Preparation

4. The buildings are accurately modelled, and materials applied according to plans, elevations and finished supplied by the Architect and aligned to the survey drawing with the camera positions.

5. Within the 3d software virtual 3d cameras are positioned according to the survey co-ordinates. The focal length of the photograph is input. Pitch and rotation are adjusted using the survey control points to align the virtual camera to the photograph.

6. The proposed development is output from the 3D software using this camera and the image is then blended with the original photograph to give an accurate image of what the proposed development will look like in its proposed setting. A highly accurate 3D-computer model of the proposed development was created with photo-realistic materials, finishes and colours. Rendered views of the proposed

7. In the event of the development not being visible, the roof line of the development will be outlined in red if requested.

8. A document is produced with the following information:

a) Site location map with view locations plotted.
b) Photo-montage sheet showing:

- Existing and proposed conditions
- View with surveyed control alignment points
- Reference information including field of view/focal length, range to site/development
- Date of photograph.

9. All surveying is carried out by a qualified topographical surveyor. Where GPS devices are used, they are Survey grade.

Appendix 8.3

Criteria for the Rating of Impacts

Appendix 8.3: Criteria for the Rating of Impacts

The appropriate significance criteria for this landscape and visual assessment (LVIA) are based on those given in the EPA 'Guidelines on the information to be contained in Environmental Impact Statements', 2002, (Section 5 Glossary of Impacts) and the DRAFT 'Guidelines on the information to be contained in Environmental Impact Assessment Reports' - Environmental Protection Agency (EPA), August 2017.

For this LVIA they may be described as follows:

Degree or magnitude of effects (significance)

Imperceptible / Not Significant: The development proposal is either distant or adequately screened by existing landform, vegetation or built environment.

Slight Effects: The development proposal forms only a small element in the overall panorama / field of view, or there is substantial intervening screening by the existing landform, topography and/or vegetation. The view or character of the landscape is noticeably changed but without affecting its sensitivities.

Moderate Effects: An appreciable segment of the existing view is affected by the proposed development or the development creates visual intrusion in the foreground. The view or the character of the landscape is altered but in a manner that is consistent with existing and emerging baseline trends.

Significant Effects: Effects which, by their character, magnitude, duration or intensity alter a sensitive aspect of the environment.

Very Significant Effects: Effects which, by their character, magnitude, duration or intensity alter most of a sensitive aspect of the environment.

Profound Effects: Effects which obliterate sensitive characteristics.

Quality of effects

The quality of potential visual and landscape effects are assessed according to EPA guidelines as follows:

Positive Effects: Changes which improve the quality of the landscape/view.
Neutral Effects: Changes which do not affect the quality of the landscape/view.
Negative Effects: Changes which reduce the quality of the visual environment or adversely affect the character of the landscape.

Duration of effects

Potential effects arising from a proposed development may also be considered in terms of duration as described in the EPA Guidelines:

Temporary: Effects lasting less than one year
Short-term: Effects lasting one to seven years
Medium-term: Effects lasting seven to fifteen years
Long-term: Effects lasting fifteen to sixty years
Permanent: Effects lasting over sixty years

Appendix 9.1

Ground Investigation Report

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Ground Investigations Ireland

Sandyford Central

Ground Investigation Report

DOCUMENT CONTROL SHEET

Project Title	Sandyford Central
Engineer	OCSC
Client	Richmond Homes
Project No	8408-01-19
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CONTENTS

APPENDICES

1.0 Preamble

On the instructions of Richmond Homes and OCSC Consulting Engineers, a site investigation was carried out by Ground Investigations Ireland Ltd., between February & March 2019 at the site of the proposed development in Sandyford Business Park in South Co. Dublin.

2.0 Overview

2.1. Background

It is proposed to construct a new commercial/residential development with associated services, access roads and car parking at the proposed site. The site is currently vacant and was previously occupied by industrial/commercial buildings which have been removed over the majority of the site. The south portion of the site has a building in place and is being used as a temporary compound by Colleen Construction for works on the adjacent building. The proposed construction is envisaged to consist of conventional foundations and pavement make up with some local excavations for services and plant. There is proposed to be an under croft car park area constructed generally off the existing site level, however at the southern end of the site there will be a small amount of retaining/cutting into the rock required.

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 8 No. Trial Pits to a maximum depth of 3.10m BGL
- Carry out 2 No. Foundation Pits to a maximum depth of 3.20m BGL
- Carry out 2 No. Soakaways to determine a soil infiltration value to BRE digest 365
- Carry out 10 No. Rotary Core Boreholes to a maximum depth of 10.6m BGL
- Installation of 6 No. Groundwater monitoring wells
- Rock, Chemical & 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 JCB 3CX 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. Foundation Pits

The foundation inspection pits were excavated at the locations shown in the exploratory hole location plan in Appendix 1. The exposed foundations were logged and sketched prior to backfilling and reinstatement. The logs and sketches are provided in Appendix 3 of this Report.

3.4. 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 4 of this Report.

3.5. Rotary Boreholes

The rotary coring was carried out by a track mounted T44 Beretta rig at the locations shown on the location plan in Appendix 1. The rotary boreholes were completed from the ground surface or alternatively, where noted on the individual borehole log, from the base of the cable percussion borehole where a temporary liner was installed to facilitate follow-on rotary coring.

The T44 Beretta is equipped with rubber tracks which allow for short travel on pavement surfaces avoiding any damage to the surface. The T44 Beretta utilises a triple tube core barrel system operated using a wireline drilling process. The outer barrel is rotated by the drill rods and at its lower end, carries the coring bit. The inner barrel is mounted on a swivel so that it does not rotate during the process. The third barrel or liner is placed within the second one to retain the core intact and to preserve as much as possible the fabric of the drilling stratum. The core is cut by the coring bit and passes to the inner liner. The core is brought up to the surface within the inner barrel on a small diameter wire rope or line attached to the "overshoot" recovery tool which is then placed into a core box in order of recovery. A drilling fluid, typically air mist or water flush is passed from the surface through hollow drill rods to the drill bit, and is used to cool the drill bit. Temporary casing is used in some situations to support unstable ground or to seal off fissures or voids.

It should be noted that the rotary coring can only achieve limited recovery in overburden, particularly granular or weakly cemented strata due to the flushing medium washing away the cohesive fraction during coring. The recovery achieved, where required is noted on the borehole logs and core photographs are provided to allow assessment of the core recovered. The rotary borehole logs are provided in Appendix 5 of this Report.

3.6. 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.

3.7. Groundwater/Gas Monitoring Installations

Groundwater and or Gas 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.

3.8. Laboratory Testing

Samples were selected from the exploratory holes for a range of environmental testing to assist in the classification of soils and to provide information for the proposed design.

Environmental testing, including the Rialta Suite consisting of Solid and Leachate testing including Waste Acceptance Criteria (WAC), Loss on Ignition, pH and sulphate testing was carried out by the Exova Environmental Laboratory in the UK.

Rock strength testing including Point Load (Is_{50}) and Unconfined Compressive Strength (UCS) testing was carried out in Trinity College Dublin’s Geotechnical Laboratory.

The results of the laboratory testing are included in Appendix 6 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;

- Surfacing
- FILL/ Made Ground
- Cohesive Deposits
- Granite Bedrock

SURFACING: Tarmac or Reinforced Concrete was encountered in all the exploratory holes and was present to a maximum depth of 0.15 to 0.3m BGL. Tarmac surfacing was present typically to a depth of 0.05m to 0.24m BGL.

FILL/MADE GROUND: Fill deposits were encountered beneath the Surfacing and was present to a relatively consistent depth of between 0.6m and 0.9m BGL and was typically described as Brown or Grey sandy clayey angular to sub angular Gravel (Crushed Rock Fill). Made Ground Deposits were encountered in TP3 and TP5 to a depth of 3.1m and 0.9m BGL respectively. These deposits were described generally as *brown or grey slightly sandy very gravelly CLAY with some cobbles and boulders and contained occasional fragments of plastic, concrete, red brick, metal glass and plastic.* The full details of these deposits are recorded on the trial pit logs in Appendix 2.

COHESIVE DEPOSITS: Cohesive deposits were encountered beneath the Fill or Made Ground and were described typically as *firm or stiff brown, grey or dark grey 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 with the exception of TP5 where it was noted as Firm to a depth of 3.1m BGL above rock. These deposits had some, occasional or frequent cobble and boulder content where noted on the exploratory hole logs.

GRANITE BEDROCK: In trial pits TP1 and TP2 weathered rock was encountered which was digable with the JCB 3CX excavator to a depth of up to 0.8m below the top of the stratum. The trial pits were terminated upon encountering the more competent bedrock, in which further excavation became more difficult. This material was recovered typically as angular gravel and cobbles of Granite however there was some variability in the fracture spacing and the ease at which the excavator could progress. Some clay and sand were also present with the rock mass either from weathering or as infilling to fractures which were opened upon excavation.

The rotary core boreholes recovered Granite Bedrock in each of the boreholes at depths of 1.5m to 5.5m BGL. The depth to rock varies from 1.5m BGL (79.8m OD) in BH04 and BH06 in the central portion of the site and is deeper towards the north eastern portion of the site to a maximum depth of 4.7m BGL (75.6m OD) in BH10. The total core recovery is good in the granite bedrock, typically 100% with some of the uppermost runs dropping to 80 or 90%. The SCR and RQD both are relatively poor in the upper weathered zone, often recovered as non-intact, however both indices show an increase with depth in each of the boreholes. The strength of the stratum varies from Extremely weak to Very Strong as noted on the logs with some portions of the core recovered as non-intact. The weathering is noted on the core logs and is typically distinctly weathered to partially weathered with occasional zones of where the granite was unweathered.

4.2. Groundwater

Groundwater strikes are noted on the exploratory hole logs where they occurred and where possible drilling was suspended for twenty minutes to allow the subsequent rise in groundwater to be recorded. 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 tide, time of year, rainfall, nearby construction and other factors. For this reason, standpipes were installed in BH01, BH02, BH06, BH09 and BH10 to allow the equilibrium groundwater level to be determined. The groundwater levels vary from a maximum of 0.7m BGL (79.45m OD) in RC09 to 4.0m BGL (78.45m OD) in RC02. The groundwater level was not apparent in the trial pits due to the short duration of the excavation and the impermeable nature of the cohesive deposits. The deeper response zone of the standpipes installed in the underlying bedrock present the readings from the aquifer within the bedrock and is likely to be confined by the boulder Clay present. The trial pits where weathered rock was encountered typically terminated above the elevations where groundwater was encountered in the standpipes. The groundwater monitoring is included in Appendix 7 of this Report.

4.3. Laboratory Testing

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 pH of the Made Ground in TP03 is above the normal range for the overburden at 10.65 and 10.74 at 0.0-1.0m and 2.0-3.1m BGL respectively.

The rock testing carried out on samples recovered from the boreholes reported Unconfined Compressive Strength (UCS) values ranging between 10.5 and 60.8 MPa while the point load testing gave Is50 values ranging between 0.17 to 1.99 MPa. The Is_{50} results correlate to the UCS values using a factor of approximately 20, giving values of 3.4 MPa and 39.8 MPa. These results correlate to the strength descriptions ranging between of Extremely Weak to Strong and confirming the variability of this stratum and the descriptions on the logs. The average of the UCS testing and associated correlated values from the point loading suggest the rock is typically on the border of weak to medium strong.

A number of samples were analysed for a suite of parameters which allows for the assessment of the sampled material in terms of total pollutant content for classification of materials as *hazardous* or *non-hazardous*. The suite also allows for the assessment of the sampled material in terms of suitability for placement at licenced landfills (inert, stable non-reactive, hazardous etc.). The parameter list for the suite includes analysis of the solid samples for arsenic, barium, cadmium, chromium, copper, cyanide, lead, nickel, mercury, zinc, speciated aliphatic and aromatic petroleum hydrocarbons, pH, sulphate, sulphide, moisture content, soil organic matter and an asbestos screen.

The suite also includes those parameters specified in the EU Council Decision establishing criteria for the acceptance of waste at Landfills (Council Decision 2003/33/EC), which for the solid samples are total organic carbon (TOC), speciated aliphatic and aromatic petroleum hydrocarbons, BTEX, phenol, polychlorinated biphenyls (PCB) and PAH.

As part of the suite a leachate is generated from the solid sample which is analysed for antimony, arsenic, barium, cadmium, chromium, copper, lead, mercury, molybdenum, nickel, selenium, zinc, chloride, fluoride, soluble sulphate, sulphide, phenols, dissolved organic carbon (DOC) and total dissolved solids (TDS).

While the laboratory report provides a comparison with the waste acceptance criteria limits it does not provide a waste classification of the material sampled. 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. The waste classification report is included under the cover of a sperate report by Ground Investigations Ireland.

The full laboratory report, which includes a section highlighting the waste acceptance criteria, is included in Appendix 6.

5.0 Geotechnical Design Parameters

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. Geotechnical Design Parameters

Preliminary geotechnical design parameters for the materials encountered during the ground investigation have been summarised in Table 1 Geotechnical Design Parameters. Both laboratory test and SPT N results, using standard empirical relationships, have been used to determine the geotechnical parameters of the overburden strata.

Shear strength parameters have been determined using laboratory testing and established empirical relationships for the relevant materials. Based on the relationship published by Stroud, the correlation of $Cu = f_1 \times N$ is used to estimate the undrained shear strength of the cohesive deposits, where f1 is determined using a correlation with the plasticity index.

The shear strength parameters from the granular stratum are provided using the effective shear strength parameters determined from the uncorrected SPT N values after Peck et al reported by Tomlinson Foundation Design and Construction 7th Ed. (2001).

A range is provided for the compressibility parameter mv based on correlations with the SPT N value based on the relationship published by Stroud, the correlation of $M_v = 1/(f_2 \times N)$ where f_2 is determined using a correlation with the plasticity index.

Table 1 Recommended Geotechnical Parameters based on GII GI Data

Stratum	Bulk Density (kN/m^3)	DPH Blow count	SPT 'N' Correlated	Undrained Shear Strength C_u (kN/m^2)	Effective Strength Parameters		Poisson's Ratio v (v_u)	Co-efficient of Compressibility
					Cohesion c' (kN/m^2)	ϕ' degrees		m_v (m^2/MN)
Granular Made Ground Deposits	18 – 22[*1]	1 – 10	1 - 20	n/a	-	28 – 30[*4]	0.1 – 0.3	n/a
Cohesive Made Ground Deposits	16 – 20[*1]	1 – 10	1 - 20	5 – 100[*2]	0	25 - 30[*4]	0.2 (0.5)	0.1-1.5[*3]
Soft Cohesive Deposits	16 – 20[*1]	1 - 3	1 - 8	5 - 40[*2]	0 - 1	25 - 28[*4]	0.2 (0.5)	0.1 – 1.5[*3]
Firm Cohesive Deposits	18 – 20[1]	4 – 7.5	8 – 15	40 - 75[*2]	0 - 3	28 – 30[*4]	0.2 (0.5)	0.1 – 0.3[*3]
Stiff Cohesive Deposits	20 – 22[*1]	7.5 - 25	15 - 50	75 - 150[*2]	0 - 5	28 - 33[*4]	0.2 (0.5)	0.05 – 0.1[*3]
Loose Granular Deposits[1]	16 – 18[*1]	1 - 5	1 - 10	n/a	n/a	28 – 30 [*4]	0.1 – 0.3	n/a
Medium Dense Granular Deposits[1]	18 – 21[*1]	5 - 15	10 - 30	n/a	n/a	30 – 36 [*4]	0.1 – 0.3	n/a
Dense Granular Deposits	20 – 23[*1]	15 - 25+	30 – 50+	n/a	n/a	35 – 40 [*4]	0.1 – 0.3	n/a

*1 Values for bulk density assumed

*2 Based on correlated SPT N values

*3 Based on correlated SPT N values and published data. Caution should be exercised when selecting design values for the variable Made Ground Stratum.

*4 Testing on undisturbed samples is recommended to determine the design value of this parameter for detailed design.

NOTE: The values in Table 1 represent a range of recommended values based on the typical soil types, insitu testing and laboratory testing scheduled by the Consulting Engineer. The values presented are recommended for outline guidance only and specific designs should derive design values based on the exploratory hole logs and lab testing for each specific site. To determine specific design values relevant to the design being undertaken in a particular area, reference should be made to the relevant specific exploratory hole logs. Further testing is recommended to determine the specific geotechnical parameters required for foundation design and temporary works design.

6.0 Recommendations & Conclusions

6.1. 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.

6.2. Foundations

Where shallow foundations are proposed on the stiff cohesive deposits, an allowable bearing capacity of 125 kN/m^2 is recommended with the exception of TP05 where 70 kN/m^2 is recommended for the firm cohesive deposits present to a depth of 3.1m BGL at this location.

An allowable bearing capacity of 500 kN/m^2 is recommended for conventional strip or pad foundations on the weathered Granite stratum where present at suitable depths for the proposed building.

An allowable bearing capacity of 1000 kN/m^2 is recommended for conventional strip or pad foundations on the intact Granite stratum where present at suitable depths for the proposed building, in the vicinity of BH07 and BH08 where the extremely weak to weak strength descriptions on the logs have been confirmed by the UCS and point load testing.

Elsewhere an allowable bearing capacity of 2000 kN/m^2 is recommended for conventional strip or pad foundations on the intact weak to medium strong Granite stratum where present at suitable depths. Any loose or weathered material should be excavated and removed with an excavator. Where a 13T excavator is unable to dig or easily remove the weathered granite, this is proposed as the suitable formation, subject to confirmation by inspection by the designer's representative. It should be noted that up to 0.9m of the weathered granite was excavated during the trial pitting completed with a JCB and 8T tracked excavator.

Where the rock is deeper in the northern portion of the site (BH09 and BH10 at 2.8m BGL (77.35m OD) and 4.7m BGL (75.6m OD) respectively), lean mix concrete or piles are recommended to bring the foundations to the same stratum as the southern portion. This would avoid problems with differential settlement should the foundations bear on strata of differing stiffness. The type, size and depth of the pile foundations should be confirmed by a specialist piling contractor based on the loading from the proposed building. The floor slab is recommended be suspended and also supported on the building piles.

In any part of the site, should part of the foundation bear on differing strata consisting of either cohesive, granular or bedrock units, we would recommend that all the foundations of the structure in question be lowered to the competent deeper stratum.

The possibility for variation in the depth of the cohesive or bedrock deposits in the vicinity of these foundations 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.

A ground bearing floor slab is recommended to be based on the firm cohesive deposits with an appropriate depth of compacted hardcore specified by the consulting engineer and in accordance with the limits and guidelines in SR21:2014+A1:2016 and/or NRA SRW CL808 Type E granular stone fill.

The pH and sulphate testing completed on samples recovered from the trial pits 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, however the Made Ground in TP03 has a high pH and should be removed and replaced with a well compacted granular fill.

6.3. Excavations

Excavations in the Made Ground will require to be appropriately battered or the sides supported due to the low strength of these deposits. 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. The groundwater and stability noted on the trial pit logs should be consulted when determining the most appropriate construction methods for excavations.

The groundwater monitoring undertaken indicates the water level is between 0.7m and 3.65m BGL in the boreholes where the standpipes were installed. Generally, where significant excavations are required in water bearing granular deposits a cut-off wall may be more cost effective than extensive dewatering. The proposed basement excavation will require dewatering during construction, particularly where granular lenses are present or where the fractures in the granite bedrock are closely spaced or was recovered as non-intact. An assessment by a specialist dewatering contractor is recommended to determine the most cost effective approach to the proposed excavation.

Excavations in the Made Ground Deposits will require to be appropriately battered or the sides supported due to the low strength of these deposits.

A temporary batter of 2(H):1(V) is recommended in the Made Ground and firm brown cohesive deposits. A steeper batter of 1(H):1(V) is possible in the very stiff black cohesive deposits for excavations of a duration of less than six months, subject to regular inspection. Any seepage from the slope should be addressed with the installation of drainage and a reduction in the batter to maintain face stability. The high groundwater levels, the seepage and instability noted in the trial pits suggest that the construction of steep slopes below a depth of 1.2m to 1.5m may be problematic.

Where the existing road is adjacent to the proposed excavation, a batter of 2(H):1(V) is recommended with a minimum set back of 2m from the edge of the slope to any footpath or carriageway for the entire slope depth. A global stability check would be required to demonstrate the stability of the slope where loading is imposed from any walkways, traffic or plant. A kingpost or piled retaining wall may be more appropriate solutions for the temporary retention of the excavation sides where traffic, loading or space constraints are expected. Any battered slopes should be covered to prevent erosion and to protect from moisture ingress.

The groundwater and stability noted on the trial pit logs should be consulted when determining the most appropriate construction methods for excavations.

Excavations in the upper cohesive and weathered rock deposits are expected to be excavatable with conventional excavation equipment, with zones of more intact bedrock below this depth requiring rock breaking techniques. Based on the fracture spacing, the rock strength descriptions and Pettifer & Fookes (1994) Revised Excavatability Graph, the Granite ranges from hard digging to extremely hard ripping with hydraulic breaking (D9), however the zones recovered as non-intact should be easy to hard digging with a CAT345. The JCB excavator was able to excavate to depth of 0.4m to 0.8m below the top of the weathered rock in TP01 and TP02 only. Due to the depth at which the stratum was encountered, the excavator was unable to progress once the granite was encountered as it became difficult to excavate within the confines of the trial pit on encountering this stratum.
Material excavated from the site, if required to be disposed of off-site should be assessed using the environmental testing completed during the ground investigation. This testing is interpreted using the criteria established by the EPA for the classification as waste and is reported under the cover of a separate Waste Classification Report and dig plan by Ground Investigations Ireland.

6.4. Soakaway Design

An Infiltration rate of $f=2.34 \times 10^{-5}$ m/s was calculated for the soakaway locations SA01 for the design and construction of a soakaway. At the location of SA02 the water level dropped too slowly to allow calculation of ‘f’ the soil infiltration rate. This location is therefore not recommended as suitable for soakaway design and construction.

The recommended SOIL type is S4 or 4 for the natural cohesive soils below the surfacing and made ground on the proposed site based on Table 4.5 from the Flood Studies Report. This is also confirmed by the approach advocated by the TII Publication DN-DNG-03064 Table 5/1 (adapted from the Agricultural Development and Advisory Service, ADAS).

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

GROUND INVESTIGATIONS IRELAND

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Newcastle, Co. Dublin
www.gii.ie 01-6015175/5176

Client:

Richmond Homes

0 10 20 30 40 m

Project Title:
Sandyford Central

Drawing Title: Figure 2
SI Locations

GII Project Reference:
8459-02-19

Drawn By:
BS

Date: 30.08.19

Site Boundary
Infiltration Test
Trial Pit
Borehole

APPENDIX 2 – Trial Pit Records

Ground Investigations Ireland Ltd
www.gii.ie

Site	Sandyford Central		**Trial Pit Number**	**SA01**
Machine : 3CX JCB **Method :** Trial pit	**Dimensions** 1.90m x 0.60m	**Ground Level (mOD)** 81.36	**Client** Richmond Homes	**Job Number** 8408-01-19
	Location (dGPS) 719157.3 E 726841.5 N	**Dates** 20/02/2019	**Project Contractor** Ground investigations Ireland Ltd	**Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
				81.21	(0.15) 0.15	Reinforced Concrete with DPM		
				80.86	(0.35) 0.50	MADE GROUND: Dark grey angular to sub-angular fine to coarse GRAVEL		
				79.96	(0.90) 1.40	Weathered Granite: Light brown slightly clayey sandy angular to sub-angular fine to coarse GRAVEL with angular to sub-angular cobbles		
						Obstruction due to gRANITE		
						Complete at 1.40m		

Plan

Remarks

No groundwater encountered
Trial pit stable
Trial pit backfilled on completion

Scale (approx)	Logged By	Figure No.
1:25	NM	8408-01-19.SA01

Ground Investigations Ireland Ltd www.gii.ie			Site Sandyford Central		Trial Pit Number **SA02**
Machine : 3CX JCB **Method :** Trial pit	**Dimensions** 2.00m x 0.60m	**Ground Level (mOD)** 80.37	**Client** Richmond Homes		**Job Number** 8408-01-19
	Location (dGPS) 719271.9 E 726894.6 N	**Dates** 20/02/2019	**Project Contractor** Ground investigations Ireland Ltd		**Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
					(0.22)	Reinforced Concrete		
				80.15	0.22	MADE GROUND: Dark grey slightly sandy slightly clayey angular to sub-angular fine to coarse GRAVEL		
					(0.28)			
0.50-1.00	EN			79.87	0.50	Soft to firm brown slightly sandy gravelly CLAY with rootlets		
					(0.30)			
1.00 1.00-1.80	B EN			79.57	0.80	Firm brown slightly sandy gravelly CLAY		
					(0.80)			
				78.77	1.60	Firm dark grey slightly sandy gravelly CLAY		
					(0.20)			
				78.57	1.80	Complete at 1.80m		

Plan

Remarks

No groundwater encountered
Trial pit stable
Trial pit backfilled on completion

Scale (approx)	Logged By	Figure No.
1:25	NM	8408-01-19.SA02

Ground Investigations Ireland Ltd www.gii.ie	Site: Sandyford Central	Trial Pit Number: **TP01**
Machine : 3CX JCB **Method :** Trial pit; **Dimensions** 3.50m x 0.60m; **Ground Level (mOD)** 82.04	**Client** Richmond Homes	**Job Number** 8408-01-19
Location (dGPS) 719234.4 E 726829.9 N; **Dates** 19/02/2019	**Project Contractor** Ground investigations Ireland Ltd	**Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description
					(0.18)	Tarmacadam
				81.86	0.18 (0.42)	MADE GROUND: Grey slightly sandy slightly clayey angular to sub-rounded fine to coarse GRAVEL
0.60-1.60	EN			81.44	0.60	Stiff brown mottled grey slightly sandy gravelly CLAY with some sub-angular to sub-rounded cobbles
0.80	B				(1.00)	
				80.44	1.60 (0.20)	Stiff light brown slightly sandy gravelly CLAY with some sub-angular to sub-rounded cobbles
				80.24	1.80 (0.50)	Weathered Granite: Light brown sandy clayey angular to sub-angular fine to coarse GRAVEL with many angular to sub-angular cobbles
				79.74	2.30	Obstruction due to Rock
						Complete at 2.30m

Plan

Remarks

No groundwater encountered
Trial pit stable
Trial pit backfilled on completion

Scale (approx)	Logged By	Figure No.
1:25	NM	8408-01-19.TP01

Ground Investigations Ireland Ltd www.gii.ie	Site: Sandyford Central	Trial Pit Number: TP02

Machine : 3CX JCB Method : Trial pit	Dimensions: 2.60m x. 0.60m	Ground Level (mOD): 81.39	Client: Richmond Homes	Job Number: 8408-01-19
	Location (dGPS): 719213.9 E 726862.5 N	Dates: 19/02/2019-19/03/2019	Project Contractor: Ground investigations Ireland Ltd	Sheet: 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
					(0.23)	Reinforced Concrete.		
				81.16	0.23	MADE GROUND: Dark grey slightly sandy slightly clayey fine to medium angular to sub-angular GRAVEL		
0.60-1.00	EN				(0.77)			
0.90	B							
1.00-2.10	EN			80.39	1.00	Firm brown sandy very gravelly CLAY with many angular to sub-angular cobbles and boulders		
					(0.30)			
				80.09	1.30	Weathered Granite: Light brown sandy clayey fine to coarse angular to sub-angular GRAVEL with many angular to sub-angular cobbles and boulders		
1.50	B							
					(0.80)			
				79.29	2.10	Obstruction due to Rock		
						Complete at 2.10m		

Plan

Remarks

No groundwater encountered
Trial pit stable
Trial pit backfilled on completion

Scale (approx)	Logged By	Figure No.
1:25	NM	8408-01-19.TP02

Ground Investigations Ireland Ltd www.gii.ie			Site: Sandyford Central	Trial Pit Number: TP03
Machine : 3CX JCB Method : Trial pit	Dimensions: 3.10m x 0.60m	Ground Level (mOD): 81.40	Client: Richmond Homes	Job Number: 8408-01-19
	Location (dGPS): 719194.8 E 726911.2 N	Dates: 19/02/2019	Project Contractor: Ground investigations Ireland Ltd	Sheet: 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.00-1.00	EN					MADE GROUND: Light brown grey slightly sand very gravelly CLAY with rebar, plastic, cloth and redbrick fragments with many some sub-angular to sub-rounded cobbles and boulders with grass rootlets.		
0.50	B				(1.00)			
1.00-2.00	EN			80.40	1.00	MADE GROUND: Brown grey slightly sandy very gravelly CLAY with many rebar, redbrick, cloth and plastic fragments with some sub-angular to sub-rounded boulders of tarmacadam and concrete.		
1.50	B				(1.40)			
2.00-3.10	EN							
2.50	B			79.00	2.40	MADE GROUND: Light brown slightly sandy very clayey angular to sub-rounded fine to coarse GRAVEL with many angular to sub-angular cobbles and boulders with old metal concrete fragments and plastic.		
					(0.70)			
				78.30	3.10	Obstruction due to Rock or Boulder Complete at 3.10m		

Plan

Remarks

No groundwater encountered
Trial pit stable
Trial pit backfilled on completion

Scale (approx)	Logged By	Figure No.
1:25	NM	8408-01-19.TP03

Ground Investigations Ireland Ltd www.gii.ie	Site: Sandyford Central	Trial Pit Number: TP04

Machine : 3CX JCB Method : Trial Pit	Dimensions: 4.00m x 1.00m	Ground Level (mOD): 81.14	Client: Richmond Homes	Job Number: 8408-01-19
	Location (dGPS): 719242.9 E 726864.2 N	Dates: 19/03/2019	Project Contractor: Ground investigations Ireland Ltd	Sheet: 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
					(0.18)	Tarmacadam		
				80.96	0.18 (0.27)	MADE GROUND: Grey slightly sandy slightly gravelly angular to sub-angular fine to medium GRAVEL.		
0.45-0.90 0.50	EN B			80.69	0.45 (0.45)	MADE GROUND: Grey/brown slightly sandy clayey angular to sub-angular fine to course GRAVEL with some sub-angular to sub-rounded cobbles.		
0.90-2.00 1.20	EN B			80.24	0.90 (0.40)	Stiff brown mottled grey slightly sandy gravelly CLAY		
1.50	B			79.84	1.30 (0.50)	Stiff dark grey slightly sandy gravelly CLAY with some sub-angular to sub-rounded cobbles.		
2.30	B			79.34	1.80 (0.60)	Stiff light brown slightly sandy very gravelly CLAY with many sub-angular to sub-rounded cobbles.		
				78.74	2.40	Obstruction due to Rock. Complete at 2.40m		

Plan

Remarks

No groundwater encountered
Trial pit stable
Trial pit backfilled on completion

Scale (approx)	Logged By	Figure No.
1:25	NM	8408-01-19.TP04

Ground Investigations Ireland Ltd www.gii.ie		Site: Sandyford Central	Trial Pit Number: TP05
Machine : 3CX JCB Method : Trial Pit	Dimensions: 3.50m x 0.60m	Ground Level (mOD): 80.14	Client: Richmond Homes	Job Number: 8408-01-19
	Location (dGPS): 719262.4 E 726902.8 N	Dates: 19/02/2019	Project Contractor: Ground investigations Ireland Ltd	Sheet: 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
					(0.25)	Reinforced Concrete		
				79.89	0.25 (0.10)	MADE GROUND: Grey slightly sandy slightly gravelly angular to sub-angular fine to coarse GRAVEL		
0.35-1.20	EN			79.79	0.35	MADE GROUND: Grey slightly sandy very gravelly CLAY with rare wood fragments occasional cobbles and sandy lenses		
0.50	B				(0.65)			
				79.14	1.00	Firm grey slightly sandy slightly gravelly CLAY with some sub-angular to sub-rounded cobbles		
1.20-2.00	EN							
1.30	B				(1.10)			
2.00-2.20	EN			78.04	2.10	Firm grey slightly sandy slightly gravelly CLAY with many sub-angular to sub-rounded cobbles		
2.20	B				(1.00)			
				77.04	3.10	Obstruction due to boulder. Complete at 3.10m		

Plan

Remarks

No groundwater encountered
Trial pit stable
Trial pit backfilled on completion

Scale (approx)	Logged By	Figure No.
1:25	NM	8408-01-19.TP05

Ground Investigations Ireland Ltd www.gii.ie			Site: Sandyford Central	Trial Pit Number: **TP06**
Machine : 3CX JCB **Method :**	**Dimensions** 4.00m x 0.60m	**Ground Level (mOD)** 79.99	**Client** Richmond Homes	**Job Number** 8408-01-19
	Location (dGPS) 719242.6 E 726924.6 N	**Dates** 01/03/2019	**Project Contractor** Ground investigations Ireland Ltd	**Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
					(0.28)	Reinforced Concrete		
				79.71	0.28 (0.17)	MADE GROUND: Brown grey slightly sandy slightly clayey angular to sub-angular fine to coarse GRAVEL		
				79.54	0.45 (0.35)	MADE GROUND: Brown slightly sandy clayey angular to sub-angular fine to coarse GRAVEL with many angular to sub-angular cobbles		
0.80-1.00 1.00 1.00-2.00	EN B EN			79.19	0.80 (0.40)	Firm brown slightly sandy gravelly CLAY with some sub-angular to sub-rounded cobbles		
1.50 2.00-2.40	B EN			78.79	1.20 (1.20)	Stiff dark grey slightly sandy slightly gravelly CLAY with some sub-angular to sub-rounded cobbles		
2.40	B			77.59	2.40	Obstruction due to Boulder Complete at 2.40m		

Plan

Remarks

No groundwater encountered
Trial pit stable
Trial pit backfilled on completion

Scale (approx)	Logged By	Figure No.
1:25	NM	8408-01-19.TP06

Ground Investigations Ireland Ltd www.gii.ie	Site Sandyford Central	Trial Pit Number **TP101**

Machine : JCB 3CX Method : Trial Pit	Dimensions	Ground Level (mOD)	Client Richmond Homes	Job Number 8408-01-19
	Location	Dates 28/06/2019	Project Contractor Ground investigations Ireland Ltd	Sheet 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
					0.05	MADE GROUND: Grey slightly sandy angular fine to coarse Gravel.		
0.20-1.00	EN					Firm brown slightly sandy slightly gravelly CLAY with rare sub-angular to sub-rounded cobbles.		
0.40	B				(0.80)			
					0.85	Brown gravelly clayey fine to coarse SAND.		
1.00-2.00	EN				(0.65)			
1.50	B				1.50	Stiff brown/reddish brown slightly sandy gravelly CLAY with frequent sub-rounded cobbles and rare boulders.		
2.00-3.10	EN				(1.00)			
2.50	B				2.50	Stiff brown/reddish brown/black slightly sandy gravelly CLAY with occasional sub-angular to sub-rounded cobbles.		
					(0.60)			
3.10	B				3.10	Obstruction: Presumed boulders of granite.		
						Complete at 3.10m		

Plan

Remarks

No Groundwater encountered.
Trial pit sidewalls spalling.
Trial pit backfilled on completion.

Scale (approx)	Logged By	Figure No.
1:25	Tmcl	8408-01-19.TP101

Ground Investigations Ireland Ltd www.gii.ie			Site: Sandyford Central	Trial Pit Number: TP102
Machine : JCB 3CX Method : Trial Pit	Dimensions	Ground Level (mOD)	Client: Richmond Homes	Job Number: 8408-01-19
	Location	Dates: 28/06/2019	Project Contractor: Ground investigations Ireland Ltd	Sheet: 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.00-1.00	B				(0.20) 0.20	TARMACADAM.		
0.20-1.00	EN				(0.40) 0.60	MADE GROUND: Brown sandy gravelly Clay with fragments of concrete and roots.		
1.00-2.00	EN				(0.70) 1.30	MADE GROUND: Grey/brown slightly sandy gravelly Clay with rare fragments of concrete and ash.		
1.80	B				(0.70) 2.00	Stiff brown/black slightly sandy gravelly CLAY with occasional boulders.		
						Obstruction: Boulders. Complete at 2.00m		

Plan

Remarks

No Groundwater encountered.
Trial pit sidewalls spalling.
Trial pit backfilled on completion.

Scale (approx)	Logged By	Figure No.
1:25	Tmcl	8408-01-19.TP102

Sandyford Central -Richmond Homes

8408-01-19

TP-01

TP-01

TP-01

TP-02

TP-02

TP-02

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TP-03

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SA02

SA02

SA02

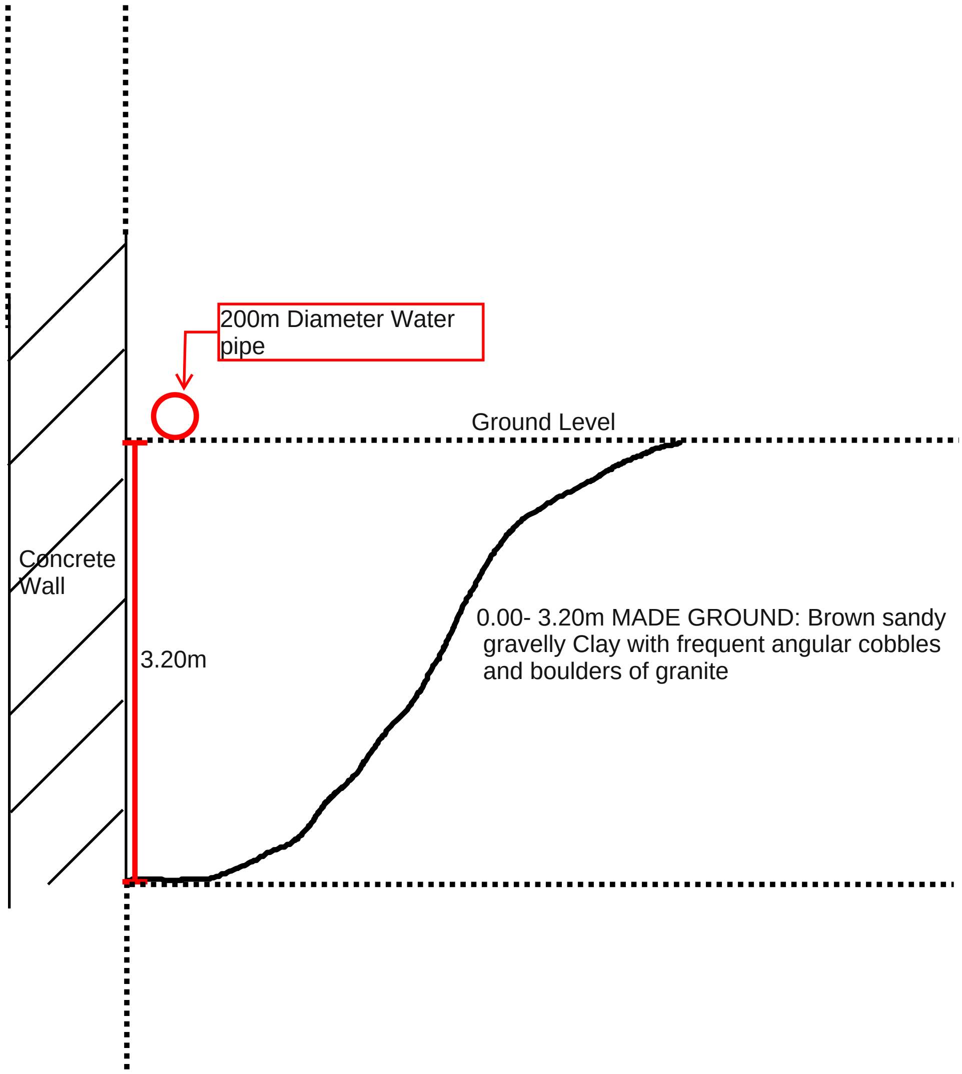
Sandyford Central Phase 2 – Trail Pit Photographs

TP101

TP102

APPENDIX 3 – Foundation Pit Records

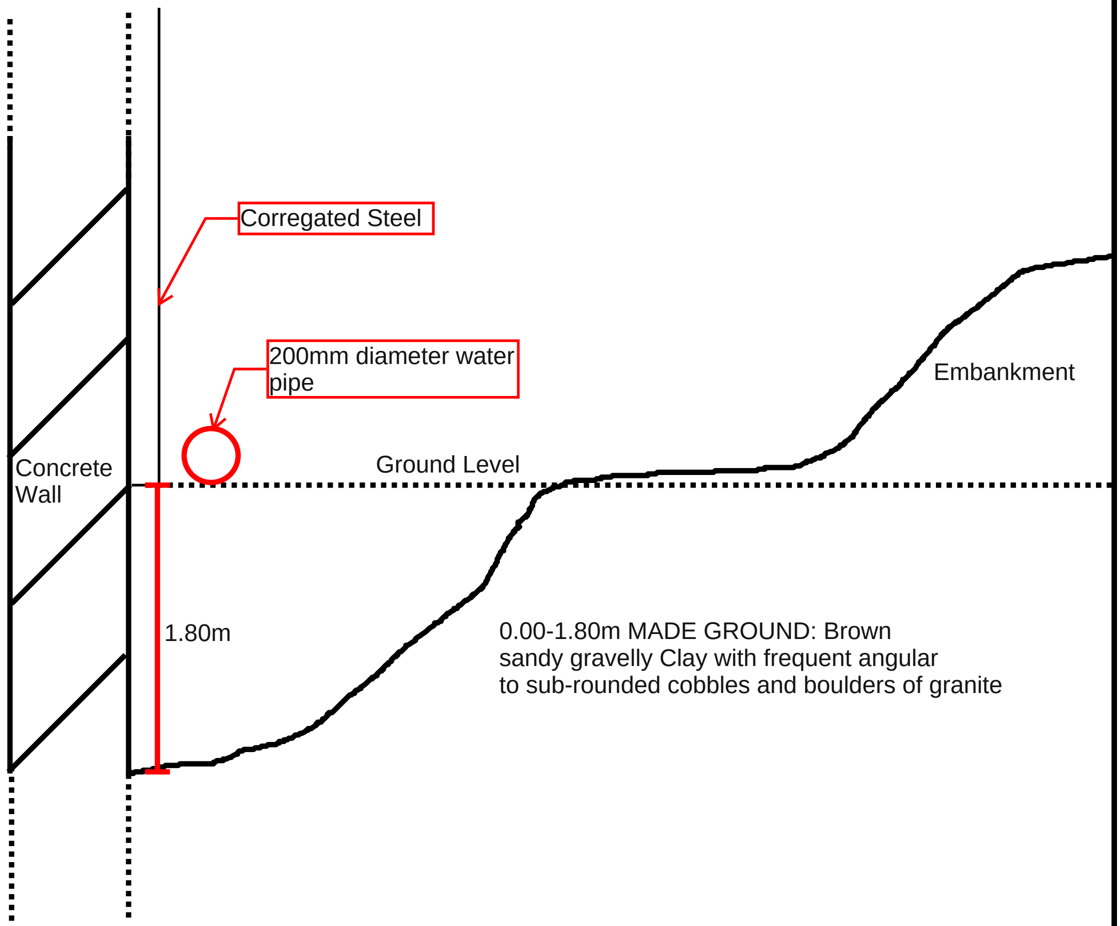
Foundation Pit



*Foundation Pit terminated before the foundation could be found due to the sidewalls collapsing

Project:	Sandyford Central	FP01	
Client:	Richmond Homes		
Contractor:	Ground Investigations Ireland	Date	05/07/2019

Foundation Pit



*Foundation Pit terminated before the foundation could be found due to sidewalls collapsing

Project:	Sandyford Central	FP02	
Client:	Richmond Homes		
Contractor:	Ground Investigations Ireland	Date	29/06/2019

Sandyford Central Phase 2 – Foundation Pit Photographs

FP01

FP02


JCB

APPENDIX 4 -Soakaway Records

SA01

Soakaway Test to BRE Digest 365

Trial Pit Dimensions: 1.90m x 0.60m 1.10m (L x W x D)

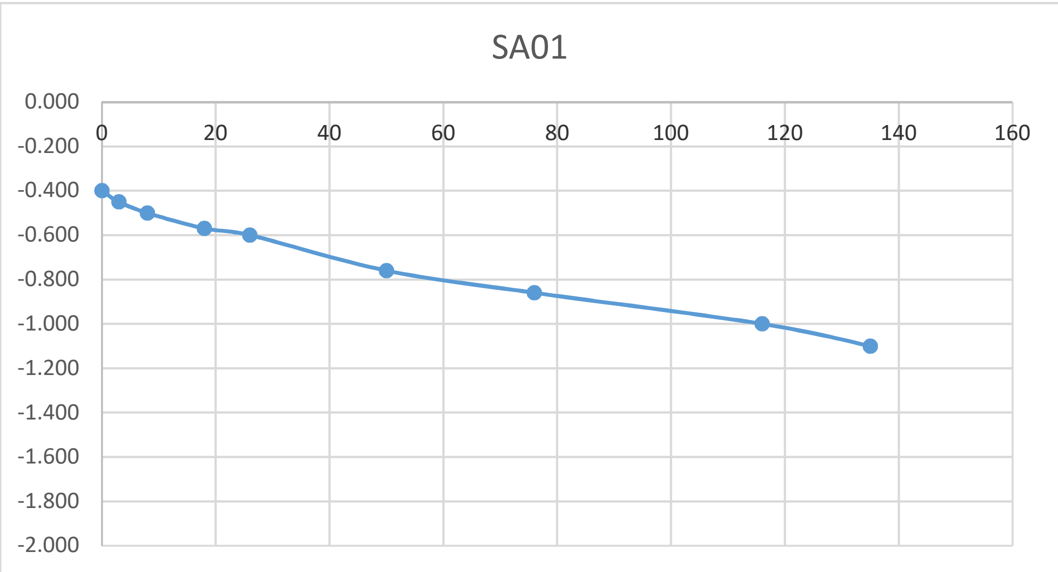
Date	Time	Water level (m bgl)
20/03/2019	0	-0.400
20/03/2019	3	-0.450
20/03/2019	8	-0.500
20/03/2019	18	-0.570
20/03/2019	26	-0.600
20/03/2019	50	-0.760
20/03/2019	76	-0.860
20/03/2019	116	-1.000
20/03/2019	135	-1.100

Start depth	Depth of Pit	Diff	75% full	25%full
0.40	1.100	0.700	0.575	0.925

Length of pit (m)	Width of pit (m)	75-25Ht (m)	Vp75-25 (m3)
1.900	0.600	0.350	0.40

Tp75-25 (from graph) (s)		50% Eff Depth	ap50 (m2)
	5400	0.350	2.89

f = 2.557E-05 m/s



SA02

Soakaway Test to BRE Digest 365
Trial Pit Dimensions: 2.00m x 0.60m 1.80m (L x W x D)

Date	Time	Water level (m bgl)
20/03/2019	0	-0.800
20/03/2019	15	-0.820
20/03/2019	40	-0.840
20/03/2019	81	-0.840
20/03/2019	124	-0.860
20/03/2019	190	-0.870
20/03/2019	215	-0.870
20/03/2019	253	-0.870

***Soakaway failed**

Start depth	Depth of Pit	Diff	75% full	25%full
0.80	1.800	1.000	1.05	1.55

APPENDIX 5 - Rotary Borehole Records

Ground Investigations Ireland Ltd www.gii.ie	Site Sandyford Central	Borehole Number **BH01**

Machine : Beretta T46 Flush : water Core Dia : 68 mm Method : Rotary Cored	Casing Diameter 100mm cased to 8.40m	Ground Level (mOD)	Client Richmond Homes	Job Number 8408-01-19
	Location	Dates 08/03/2019	Project Contractor Ground investigations Ireland Ltd	Sheet 1/1

Depth (m)	TCR	SCR	RQD	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
0.00							0.10	Tarmacadam.			
	42						(1.70)	Driller notes: Dark brown sandy gravelly CLAY. Returns of sub-rounded to sub-angular gravel.			
							1.80	Driller notes: Boulder. Returns of granite boulder			
							(0.60)				
2.40							2.40	Driller notes: Brown clay with rare cobbles Returns of stiff dark brown grey slightly sandy gravelly CLAY.			
	92						(1.05)				
3.45							3.45	Weak to medium strong pinkish orange white coarsely crystalline GRANITE. Distinctly weathered.			
3.90	100	19	0	12			(1.15)	3.45-4.60m - Two fracture sets. F1: very close to close spaced, 10-30 degrees, stepped rough, tight to open, stained brown, clay smearing. F2: closely spaced, 70-90 degrees, stepped rough, tight to open, stained brown, clay smearing.			
4.60	100	0	0	10			4.60	Weak pinkish white coarsely crystalline GRANITE. Distinctly weathered. 4.60-5.40m - Two fracture set. F1: very close spaced, 80-90 degrees, stepped rough, tight to open with some clay smearing. F2: Very close to close 10-30 degrees undulating smooth tight to open with staining.			
5.40	100	37	13	N.I			(2.30)	5.40-6.50m - Predominately non intact. Indicating two fracture sets of 10-30 degrees and 60-80 degrees.			
6.50											
6.90	100	68	48	11			6.90	Strong white coarsely crystalline GRANITE. Partially weathered. 6.50-7.90m - Two fracture sets. F1: closely spaced, 10-30 degrees, stepped rough, tight to open with some clay smearing and quartz sand. F2: close to medium spaced, 50-70 degrees, stepped rough, tight to open with some clay smearing.			
7.40							(1.50)				
7.90	100	50	35	N.I				7.90-8.20m - Mostly non intact			
8.40							8.40	Complete at 8.40m			

Remarks
No groundwater encountered.
50mm slotted standpipe installed from 8.40m to 1.00m with pea gravel surround, plain pipe installed from 1.00m to ground level with bentonite seal and flush cover.
Borehole backfilled on completion.

Scale (approx)	Logged By
1:50	NM

Figure No. 8408-01-19.BH01

Ground Investigations Ireland Ltd
www.gii.ie

Site	Borehole Number
Sandyford Central	BH02

Machine : Beretta T46 Flush : water Core Dia : 68 mm Method : Rotary Cored	Casing Diameter	Ground Level (mOD)	Client	Job Number
	100mm cased to 10.60m	82.45	Richmond Homes	8408-01-19
	Location	**Dates**	**Project Contractor**	**Sheet**
	719228.8 E 726817.8 N	26/02/2019	Ground investigations Ireland Ltd	1/2

Depth (m)	TCR	SCR	RQD	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
0.00	21					82.30	(0.15) 0.15	Tarmacadam.			
								Driller notes: Dark grey slightly sandy gravelly CLAY. Returns of sub-rounded to sub-angular gravel and cobbles.			
1.50 1.50-1.55	16				25/50 SPT(C) 25*/50 50/0						
2.50 2.50-2.55	17				25/50 SPT(C) 25*/50 50/0		(5.35)				
4.00 4.00-4.05	13				25/50 SPT(C) 25*/50 50/0						
5.50 5.50-5.50	100	73	73	6	25/50 SPT(C) 25*/0 50/0	76.95	5.50	Medium strong to strong orangish white coarsely crystalline GRANITE partially weathered 5.50-8.10m - Three fracture sets. F1: close to wide spaced, 0-20 degrees, stepped rough, tight to open, stained brown. F2: close to medium spaced, 70-80 degrees, planar smooth to rough, tight to open stained black. F3: wide spaced 80-90 degrees, planar smooth to rough, tight to open stained brown.			
6.60	100	11	11				(2.60)				
8.10	100	93	65	6		74.35	8.10	Strong greyish white coarsely crystalline GRANITE unweathered to partially weathered. 8.10-10.60m - Two fracture sets. F1: close to medium spaced, 10-30 degrees, stepped rough, tight to open, stained brown with some clay smearing. F2: close to medium spaced, 70-80 degrees, planar rough, tight to open stained brown.			
9.60							(2.50)				

Remarks
No groundwater encountered.
50mm slotted standpipe installed from 10.00m to 1.00m with pea gravel surround, plain pipe installed from 1.00m to ground level with bentonite seal and flush cover.
Borehole backfilled on completion.

Scale (approx)	Logged By
1:50	NM

Figure No. 8408-01-19.BH02

Ground Investigations Ireland Ltd www.gii.ie	Site: Sandyford Central	Borehole Number: BH02

Machine : Beretta T46	Casing Diameter	Ground Level (mOD)	Client	Job Number
Flush : water	100mm cased to 10.60m	82.45	Richmond Homes	8408-01-19
Core Dia : 68 mm	**Location**	**Dates**	**Project Contractor**	**Sheet**
Method : Rotary Cored	719228.8 E 726817.8 N	26/02/2019	Ground investigations Ireland Ltd	2/2

Depth (m)	TCR	SCR	RQD	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
	100	62	62								
10.60						71.85	10.60	Complete at 10.60m			

Remarks	Scale (approx)	Logged By
	1:50	NM
	Figure No. 8408-01-19.BH02	

Ground Investigations Ireland Ltd
www.gii.ie

Machine : Beretta T46 Flush : water Core Dia: 68 mm Method : Rotary Cored	Casing Diameter 100mm cased to 8.00m	Ground Level (mOD) 81.37	Client Richmond Homes	Job Number 8408-01-19
	Location 719188.9 E 726824.6 N	Dates 26/02/2019	Project Contractor Ground investigations Ireland Ltd	Sheet 1/1
			Site Sandyford Central	Borehole Number BH03

Depth (m)	TCR	SCR	RQD	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.00	18					81.14	(0.23) 0.23	Reinforced concrete.		
							(2.27)	Driller notes: Brown slightly sandy slightly gravelly CLAY with cobbles and boulders. Returns of gravel to boulder sized fragments.		
1.50 1.50-1.55	57				25/50 SPT(C) 25*/50 50/0					
2.20 2.20-2.20 2.50 2.90	75	41	39	6 10	25/50 SPT(C) 25*/0 50/0	78.87	2.50 (1.30)	Weak to medium strong brownish white fine to coarse crystalline GRANITE with quartz veins distinctly weathered. 2.50-2.90m - One fracture sets. F1: very close to medium spaced, 10-30 degrees, stepped rough, tight to open, some clay smearing. 2.90-3.80m - Two fracture sets. F1: closely spaced, 10-30 degrees, stepped rough, tight to open. F2: Very closely spaced 60-80 degrees, undulating rough, open, stained brown.		
3.80	98	92	85	4		77.57	3.80 (2.30)	Strong to weak orangish grey white coarsely crystalline GRANITE. Partially weathered. 3.80-6.10m - Two fracture sets. F1: close to medium spaced, 10-30 degrees, stepped rough, tight to open, stained orangish brown. F2: widely spaced, 80 degrees, undulating rough, open, stained brown.		
4.80	100	100	100							
5.00	93	77	73							
6.10				6		75.27	6.10 (0.40)	Weak to medium strong brownish white fine to coarse crystalline GRANITE with quartz veins distinctly weathered. 6.10-6.55m - One fracture set. F1:very closely spaced, 0-30 degrees, stepped rough, tight to open, quartz sand smearing.		
6.50 6.55 6.80	100	67	53	N.I 8		74.87	6.50 (1.50)	Weak to medium strong orangish white fine to coarse crystalline GRANITE. Partially weathered. 6.55-6.80m - Non Intact. 6.80-8.00m - Two fracture sets. F1: closely spaced, 10-20 degrees, stepped rough, tight to open, stained brown. F2: very close to medium spaced, 60-80 degrees, stepped rough, tight to open, stained brown.		
8.00						73.37	8.00	Complete at 8.00m		

Remarks
No groundwater encountered.
No standpipe installed.
Borehole backfilled on completion.

Scale (approx)	Logged By
1:50	NM

Figure No.
8408-01-19.BH03

Ground Investigations Ireland Ltd www.gii.ie	Site: Sandyford Central	Borehole Number: BH04

Machine : Beretta T46 / Flush : water / Core Dia : 68 mm / Method : Rotary Cored	Casing Diameter: 100mm cased to 5.00m	Ground Level (mOD): 81.37	Client: Richmond Homes	Job Number: 8408-01-19
	Location: 719176.6 E 726849.9 N	Dates: 25/02/2019	Project Contractor: Ground investigations Ireland Ltd	Sheet: 1/1

Depth (m)	TCR	SCR	RQD	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.00						81.12	(0.25) 0.25	Reinforced concrete.		
	11						(1.25)	Driller notes: Dark grey slightly sandy gravelly CLAY with occasional sub-angular to sub-rounded cobbles. Returns of gravel sized fragments.		
1.50 1.50-1.55	100	34	20	N.I	25/50 SPT(C) 25*/50 50/0	79.87	1.50 (0.50)	Weak to medium strong orangish white coarsely crystalline GRANITE Distinctly weathered. 1.50-2.00m - Non Intact.		
2.00	100	87	73	7		79.37	2.00 (1.50)	Medium strong orangish grey white coarsely crystalline GRANITE. Partially weathered. 2.00-3.50m - Two fracture sets. F1: very close to medium spaced, 10-30 degrees, stepped rough, tight to open, clay smearing. F2: close to medium spaced, 60-80 degrees, stepped rough, tight to open, stained brown.		
3.50	100	98	92	6		77.87	3.50 (1.50)	Strong greyish white pink coarsely crystalline GRANITE with occasional quartz veins partially weathered. 3.50-5.00m - Two fracture sets. F1: very close to medium spaced, 10-30 degrees, stepped rough, tight to open, stained brown. F2: close to medium spaced, 50-70 degrees, stepped rough, tight to open, stained brown.		
5.00						76.37	5.00	Complete at 5.00m		

Remarks
No groundwater encountered.
No standpipe installed.
Borehole backfilled on completion.

Scale (approx)	Logged By
1:50	NM

Figure No. 8408-01-19.BH04

Ground Investigations Ireland Ltd www.gii.ie	Site: Sandyford Central	Borehole Number: BH05

Machine : Beretta T46	Casing Diameter	Ground Level (mOD)	Client	Job Number
Flush : water	100mm cased to 7.00m	81.23	Richmond Homes	8408-01-19
Core Dia : 68 mm	**Location**	**Dates**	**Project Contractor**	**Sheet**
Method : Rotary Cored	719194.7 E 726906.4 N	28/02/2019	Ground investigations Ireland Ltd	1/1

Depth (m)	TCR	SCR	RQD	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.00	50						(1.00)	Driller notes: Fill. Returns of angular gravel sized granite and quartz with angular cobbles of granite concrete and Mudstone.		
1.00 1.00-1.10	0				25/50 SPT(C) 25*/50 50/50	80.23	1.00 (1.50)	Returns of gravel to cobble sized fragments.		
2.50 2.50-2.50	100	20	20	8	25/50 SPT(C) 25*/0 50/0	78.73	2.50 (0.50)	Weak to medium strong orangish white coarsely crystalline GRANITE. Partially weathered. 2.50-3.00m - Two fracture sets. F1: closely spaced, 60-80 degrees, stepped rough, tight to open, stained brown. F2: close to medium spaced, 20-40 degrees, stepped rough, tight to open, stained brown.		
3.00	100	60	52	5		78.23	3.00 (1.50)	Strong orangish grey coarsely crystalline GRANITE. Partially weathered 3.00-6.00m - Three fracture sets. F1: close to medium spaced, 0-20 degrees, stepped rough, tight to open, stained brown, clay smearing. F2: close to medium spaced, 40-60 degrees, stepped rough, tight to open, stained brown with some quartz sand on fractures. F3: closely spaced, 70-80 degrees stepped rough, tight to open stained brown.		
4.50	94	55	55			76.73	4.50 (1.50)	Strong greyish whitish grey coarsely crystalline GRANITE with frequent quartz veins. Partially weathered		
6.00	100	100	100	3		75.23	6.00 (1.00)	Strong to very strong grey coarsely crystalline GRANITE. Partially weathered 6.00-7.00m - One fracture set. F1: close to medium spaced, 10-20 degrees, stepped rough, tight to open, stained brown.		
7.00						74.23	7.00	Complete at 7.00m		

Remarks
No groundwater encountered.
No standpipe installed.
Borehole backfilled on completion.

Scale (approx)	Logged By
1:50	NM

Figure No. 8408-01-19.BH05

Ground Investigations Ireland Ltd www.gii.ie	Site: Sandyford Central	Borehole Number: BH06

Machine : Beretta T46 **Flush :** water **Core Dia :** 68 mm **Method :** Rotary Cored	**Casing Diameter** 100mm cased to 6.50m	**Ground Level (mOD)** 81.39	**Client** Richmond Homes	**Job Number** 8408-01-19
	Location 719216 E 726863.8 N	**Dates** 26/02/2019	**Project Contractor** Ground investigations Ireland Ltd	**Sheet** 1/1

Depth (m)	TCR	SCR	RQD	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
0.00	34					81.15	(0.24) 0.24	Reinforced concrete.			
								Driller Notes: Dark grey slightly sandy gravelly CLAY with occasional cobbles.			
0.75 0.75-0.85	59				25/50 SPT(C) 25*/50 50/50		(1.26)				
1.50 1.50-1.60	30			N.I	25/50 SPT(C) 25*/50 50/50	79.89	1.50 (0.70)	Extremely weak to weak orangish white coarsely crystalline GRANITE. Distinctly weathered. 1.50-2.20m - Non intact.			
2.00 2.20 2.70 2.93	47	55	55	4 N.I		79.19	2.20	Medium strong to strong orangish pink grey coarsely crystalline GRANITE. Partially weathered to weathered. 2.20-2.70m - One fracture set. F1: closely spaced, 60-80 degrees, stepped rough, tight to open, some clay smearing. 2.70-2.93m - Non intact.			
3.50	100	53	53	6			(4.30)	2.93-5.00m - Two fracture set. F1: closely spaced, 70-90 degrees, stepped rough, tight to open, stained dark brown. F2: Closely spaced 0-20 degrees, undulating rough, tight to open.			
5.00	100	65	45	10				5.00-6.50m - Two fracture sets. F1: close to medium spaced, 80-90 degrees undulating rough, tight to open, stained brown. F2: close to medium spaced, 40-50 degrees, planar smooth to rough, stained brown.			
6.50						74.89	6.50	Complete at 6.50m			

Remarks
No groundwater encountered.
50mm slotted standpipe installed from 6.50m to 1.00m with pea gravel surround, plain pipe installed from 1.00m to ground level with bentonite seal and flush cover.
Borehole backfilled on completion.

Scale (approx)	Logged By
1:50	NM

Figure No. 8408-01-19.BH06

Ground Investigations Ireland Ltd www.gii.ie	Site: Sandyford Central	Borehole Number: BH07

Machine : Beretta T46	Casing Diameter	Ground Level (mOD)	Client	Job Number
Flush : water	100mm cased to 7.00m	81.24	Richmond Homes	8408-01-19
Core Dia : 68 mm	Location	Dates	Project Contractor	Sheet
Method : Rotary Cored	719241.8 E 726862.5 N	27/02/2019	Ground investigations Ireland Ltd	1/1

Depth (m)	TCR	SCR	RQD	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.00	33					81.00	(0.24) 0.24	Tarmacadam.		
								Recovery consists of dark grey, slightly sandy slightly gravelly CLAY with occasional sub-angular to sub-rounded cobbles		
1.00 1.00-1.10	32				25/50 SPT(C) 25*/50 50/50		(1.76)			
2.00 2.00-2.00	100	30	30	N.I	25/50 SPT(C) 25*/0 50/0	79.24	2.00	Weak whitish grey coarsely crystalline GRANITE. Distinctly weathered.		
2.50							(0.90)	2.00-2.90m - Non intact.		
2.90	100	49	40	10		78.34	2.90	Medium strong to strong whitish grey orange coarsely crystalline GRANITE. Partially weathered. 2.90-4.20m - Two fracture sets. F1: close to medium spaced, 0-20 degrees, stepped rough, tight to open, stained brown and some clay smearing. F2: Close to medium spaced 30-50 degrees, undulating rough, tight to open		
						77.54	(0.80) 3.70	Extremely weak to weak greyish orange coarsely crystalline GRANITE. Distinctly to partially weathered		
4.00 4.20	100	62	62	N.I						
4.70							(2.00)	4.20-4.70m - Non intact.		
5.00	100	78	69	8		75.54	5.70	Medium strong to strong pinkish white grey coarsely crystalline GRANITE. Partially weathered. 4.70-7.00m - Two fracture sets. F1: close to medium spaced, 10-30 degrees, stepped rough, tight to open, stained brown and some clay smearing. F2: closely spaced, 60-80 degrees, stepped rough, stained brown.		
6.50	100	86	56				(1.30)			
7.00						74.24	7.00	Complete at 7.00m		

Remarks
No groundwater encountered.
No standpipe installed.
Borehole backfilled on completion.

Scale (approx)	Logged By
1:50	NM

Figure No. 8408-01-19.BH07

Ground Investigations Ireland Ltd www.gii.ie	Site: Sandyford Central	Borehole Number: BH08

Machine : Beretta T46	Casing Diameter	Ground Level (mOD)	Client	Job Number
Flush : water	100mm cased to 10.00m	81.40	Richmond Homes	8408-01-19
Core Dia : 68 mm	Location	Dates	Project Contractor	Sheet
Method : Rotary Cored	719235.4 E 726909.9 N	27/02/2019	Ground investigations Ireland Ltd	1/2

Depth (m)	TCR	SCR	RQD	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
0.00	36						(0.30)	Reinforced concrete.			
						81.10	0.30	Driller notes: Fill. Dark grey slightly clayey medium to coarse sub angular GRAVEL with occasional sub-angular cobbles.Returns of gravel to cobble sized fragments			
1.00	19										
2.20 2.20-2.30	26				25/50 SPT(C) 25*/50 50/50		(4.40)				
3.50 3.50-3.60	50	0	0		25/50 SPT(C) 25*/50 50/50						
4.50 4.50-4.60 4.70	100	30	0		25/50 SPT(C) 25*/50 50/50	76.70	4.70	Extremely weak to weak pinkish orange coarsely crystalline GRANITE. Distinctly weathered.			
5.00	96	57	40	10			(2.60)	4.70-7.30m - One fracture set. F1: very close to close spaced, 10-20 degrees, stepped rough, tight to open, stained brown and black with some clay smearing and quartz sand on fracture surfaces.			
6.50											
7.30	88	46	39			74.10	7.30	Extremely weak to medium strong pinkish orange coarsely crystalline GRANITE. Distinctly weathered.			
							(1.20)	7.30-9.30m - Non intact.			
8.00	93	17	17	N.I		72.90	8.50	Extremely weak to medium strong pinkish orange coarsely crystalline GRANITE. Distinctly weathered to de-structured			
							(0.80)				
9.30				4		72.10	9.30	Extremely weak to weak pink coarsely crystalline GRANITE. Distinctly weathered. 9.30-10.00m - Two fracture sets. F1: close to medium spaced, 10-20 degrees, stepped rough, tight to open, stained brown with some			
							(0.70)				
10.00											

Remarks
No groundwater encountered.
50mm slotted standpipe installed from 10.00m to 1.00m with pea gravel surround, plain pipe installed from 1.00m to ground level with bentonite seal and flush cover.
Borehole backfilled on completion.

Scale (approx)	Logged By
1:50	NM

Figure No. 8408-01-19.BH08

Ground Investigations Ireland Ltd www.gii.ie	Site Sandyford Central	Borehole Number BH08

Machine : Beretta T46 Flush : water Core Dia : 68 mm Method : Rotary Cored	Casing Diameter 100mm cased to 10.00m	Ground Level (mOD) 81.40	Client Richmond Homes	Job Number 8408-01-19
	Location 719235.4 E 726909.9 N	Dates 27/02/2019	Project Contractor Ground investigations Ireland Ltd	Sheet 2/2

Depth (m)	TCR	SCR	RQD	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
						71.40	10.00	clay smearing and quartz sand on fracture surfaces. F2: closely spaced, 80-90 degrees, stepped rough, tight to open with some clay smearing on fracture surfaces.			
								Complete at 10.00m			

Remarks	Scale (approx)	Logged By
	1:50	NM
	Figure No. 8408-01-19.BH08	

Ground Investigations Ireland Ltd
www.gii.ie

Site	Borehole Number
Sandyford Central	BH09

Machine : Beretta T46 Flush : water Core Dia : 68 mm Method : Rotary Cored	Casing Diameter 100mm cased to 7.50m	Ground Level (mOD) 80.15	Client Richmond Homes	Job Number 8408-01-19
	Location 719218.9 E 726934.1 N	Dates 28/02/2019	Project Contractor Ground investigations Ireland Ltd	Sheet 1/1

Depth (m)	TCR	SCR	RQD	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
0.00	45							Driller notes: Brown grey slightly sandy gravelly CLAY with occasional cobble sized fragments.Returns of gravel to cobble sized fragments.			
1.00 1.00-1.10	47				25/50 SPT(C) 25*/50 50/50		(2.80)				
2.20 2.20-2.30	67				25/50 SPT(C) 25*/50 50/50						
2.80	100	50	27	N.I		77.35	2.80	Weak to medium strong brownish white coarsely crystalline GRANITE. Distinctly weathered. 2.80-3.20m - Non intact.			
3.20				8			(1.50)	3.20-4.30m - Two fracture sets. F1: very close to closely spaced, 0-20 degrees, stepped rough, tight to open, stained brown. F2: medium to widely spaced, 45-55 degrees, stepped rough, tight to open, stained brown.			
4.30	100	63	43	N.I		75.85	4.30	Medium strong greyish white coarsely crystalline GRANITE. Weathered to partially weathered 4.30-4.50m - Non intact.			
4.50				8			(1.20)	4.30-5.50m - Two fracture sets. F1: very close to closely spaced, 0-30 degrees, stepped rough, tight to open, stained brown. F2: close to medium spaced, 70-80 degrees, stepped rough, tight to open, stained brown grey.			
5.50	100	97	91	5		74.65	5.50	Medium strong to strong whitish greyish pink coarse to fine crystalline GRANITE. Partially weathered 5.50-7.50m - One fracture set. F1: close to widely spaced, 50-70 degrees, stepped rough, tight to open, stained brown.			
7.00	80	40	20				(2.00)				
7.50						72.65	7.50	Complete at 7.50m			

Remarks
No groundwater encountered.
50mm slotted standpipe installed from 7.50m to 1.00m with pea gravel surround, plain pipe installed from 1.00m to ground level with bentonite seal and flush cover.
Borehole backfilled on completion.

Scale (approx)	Logged By
1:50	NM

Figure No.
8408-01-19.BH09

Ground Investigations Ireland Ltd www.gii.ie	Site: Sandyford Central	Borehole Number: BH10

Machine : Beretta T46 Flush : water Core Dia : 68 mm Method : Rotary Cored	Casing Diameter: 100mm cased to 10.00m	Ground Level (mOD): 80.32	Client: Richmond Homes	Job Number: 8408-01-19
	Location: 719273.8 E 726899.4 N	Dates: 28/02/2019	Project Contractor: Ground investigations Ireland Ltd	Sheet: 1/1

Depth (m)	TCR	SCR	RQD	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description
0.00	27					80.08	(0.24) 0.24	Tarmacadam.
						79.84	(0.24) 0.48	Driller notes: Dark grey medium to coarse sub-angular to sub-rounded GRAVEL.
								Recovery consists of stiff brown slightly sandy slightly gravelly CLAY with sub-angular to sub-rounded cobbles.
1.00 1.00-1.10	17				25/50 SPT(C) 25*/50 50/50			
2.20 2.20-2.30	41				25/50 SPT(C) 25*/50 50/50		(4.22)	
3.70 3.70-3.80	50				25/50 SPT(C) 25*/50 50/50			
4.70 4.70-4.70	100	100	100		25/50 SPT(C) 25*/0 50/0	75.62	4.70 (0.40)	Weak to medium strong orangish coarsely crystalline GRANITE. Partially weathered.
5.10	94	34	30	5		75.22	5.10 (0.90)	Weak to strong orangish greyish white coarsely crystalline GRANITE. Partially weathered 4.70-6.00m - Two fracture sets. F1: widely spaced, 60-70 degrees, stepped rough, tight to open, stained brown with quartz sand on fracture surfaces. F2: close to medium spaced, 20-30 degrees, stepped rough, tight to open, stained brown with clay smearing.
6.00						74.32	6.00	Extremely weak to weak orange coarsely crystalline GRANITE. Distinctly weathered. 6.00-7.80m - Two fracture sets. F1: close to medium spaced, 70-80 degrees, stepped rough, tight to open, stained brown with clay smearing. F2: close to medium spaced, 0-20 degrees, stepped rough, tight to open, stained brown with quartz sand on fracture surfaces.
6.70	100	49	41	8			(1.80)	
7.80						72.52	7.80	Strong to very strong greyish white coarsely crystalline GRANITE. Partially weathered
8.20	100	88	77	7			(2.20)	7.80-10.00m - Two fracture sets. F1: close to medium spaced, 0-20 degrees, stepped rough, tight to open, stained brown with quartz sand on fracture surfaces. F2: widely spaced, 70-80 degrees, stepped rough, tight to open, stained brown with some clay smearing.
9.70	100	100	100					
10.00						70.32	10.00	

Remarks
No groundwater encountered.
50mm slotted standpipe installed from 10.00m to 1.00m with pea gravel surround, plain pipe installed from 1.00m to ground level with bentonite seal and flush cover.
Borehole backfilled on completion.

Scale (approx)	Logged By
1:50	NM

Figure No. 8408-01-19.BH010

Sandyford Central Rotary Core Photographs

RC 2
BOX 1

RC 2
BOX 2

RC 2
BOX 3

RC 3
BOX 1

RC 3
BOX 2

RC 3
BOX 3

RC 4
BOX 1

RC 4
BOX 2

RC 5
BOX 1

RC 5
BOX 2

RC 6
BOX 1

RC 6
BOX 2

RC 7
BOX 1

RC 7
BOX 2

RC 7
BOX 3

RC 8
BOX 1

RC 8
BOX 2

RC 8
BOX 3

RC 9
BOX 1

RC 9
BOX 2

RC 9
BOX 3

RC 10
BOX 1

RC 10
BOX 2

RC 10
BOX 3

APPENDIX 6 – Laboratory Testing

Trinity College Dublin
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Ground Investigations Ireland Ltd,
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Co. Dublin

Point Load Index Tests (single diametral determination)

Project: Sandyford Central

Project No: 8408 - 01 - 19

Delivery date: 27.03.2019

Test Date: 02.04.2019

Diametric samples

Borehole No.	Depth (m)	Is(50) (Mpa)
BH - 01	7.00 - 7.09	1.73
BH - 02	5.70 - 5.82	1.48
BH - 03	2.74 - 2.84	1.55
BH - 04	2.77 - 2.90	1.48
BH - 05	2.80 - 2.89	1.45
BH - 06	2.60 - 2.74	1.99
BH - 07	2.75 - 2.84	1.34
BH - 08	5.05 - 5.15	0.17
BH - 09	4.15 - 4.24	0.86
BH - 10	5.10 - 5.23	1.39

Prof. Brendan O'Kelly

Specimens prepared and tested in accordance with suggested method from International Society for Rock Mechanics (ISRM), 1985

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Co. Dublin

Unconfined Compression Tests On Rock Cores

Project: Sandyford Central

Project No: 8408 - 01 - 19

Delivery Date: 27.03.2019

Test Date: 01.04.2019

Borehole Number	Depth (m)	Average Diameter (mm)	Height (mm)	Length/Dia. (Ratio)	Unconfined Compressive Strength (Mpa)	Density (Mg/m^3)
BH - 02	8.83 - 9.03	63.2	159.0	2.52	36.1	2.56
BH - 03	2.50 - 2.74	63.2	158.8	2.51	60.8	2.61
BH - 04	2.20 - 2.37	63.1	149.5	2.37	47.7	2.58
BH - 05	3.70 - 4.08	63.1	158.7	2.51	48.9	2.60
BH - 06	2.28 - 2.46	63.0	133.4	2.12	35.2	2.51
BH - 07	3.13 - 3.29	63.3	149.7	2.36	16.3	2.52
BH - 08	5.35 - 5.53	63.2	136.0	2.15	10.5	2.38
BH - 09	5.50 - 5.98	63.1	158.8	2.52	20.8	2.59
BH - 10	4.92 - 5.10	63.1	153.3	2.43	33.8	2.56

Prof. B. O'Kelly

Specimens prepared and tested in accordance with suggested method from International Society for Rock Mechanics (ISRM), 1985

APPENDIX 7 – Groundwater Monitoring

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GROUNDWATER MONITORING

Sandyford Central

BOREHOLE	DATE	TIME	GROUNDWATER (mBGL)	GROUNDWATER (mOD)	Comment
RC02	05.03.19	10.00	4.00	78.45	
RC06	05.03.19	10.05	3.00	78.39	
RC08	05.03.19	10.10	1.90	79.50	
RC09	05.03.19	9.50	0.70	79.45	
RC10	05.03.19	9.55	1.30	79.02	
RC02	08.03.19	8.20	3.65	78.80	
RC06	08.03.19	8.24	2.85	78.54	
RC08	08.03.19	8.30	1.90	79.50	
RC09	08.03.19	8.10	0.80	79.35	
RC10	08.03.19	8.15	1.40	78.92	

Appendix 9.2

Waste Classification Report

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Ground Investigations Ireland

Sandyford Central

Waste Classification Report

DOCUMENT CONTROL SHEET

Project Title	Sandford Central
Engineer	OCSC
Client	Richmond Homes
Project No	8408-01-19
Document Title	Waste Classification Report

Rev.	Status	Author(s)	Reviewed By	Approved By	Office of Origin	Issue Date
A	Final	P Moloney	B Sexton	C Finnerty	Dublin	07 August 2019

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LIST OF TABLES

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APPENDICES

1.0 Preamble

Ground Investigations Ireland Limited (GII) was appointed by O'Connor Sutton Cronin Consulting Engineers on behalf of Richmond Homes to carry out a Waste Classification assessment for a proposed development at Sandyford, Dublin 18. The site investigation works were completed between February and June 2019.

2.0 Purpose & Scope

GII understand that as part of the proposed development there will be an excavation to accommodate the construction of a basement. As such the material which may be excavated and removed from site needs to be assessed in terms of waste disposal outlets.

The purpose of the waste classification exercise was as follows.

- Classification, in terms of waste management and final disposal outlets, of material that may require disposal following excavation during the construction phase.

The scope of the work undertaken to facilitate the waste classification exercise included the following:

- Excavation of eight (8 No.) trial pits;
- Excavation of two (2 No.) infiltration test trial pits;
- Excavation of ten (10 No.) rotary core boreholes; and
- Collection of subsoil samples for chemical analysis.

3.0 Standards

The works were undertaken on a phased basis and in sequence, as is industry best practice, and were carried out with cognisance of the following:

- BS 10175:2011, Investigation of Potentially Contaminated Sites. Code of practice;
- Eurocode 7 Part 2: Ground Investigation and testing (ISEN 1997 – 2:2007); and
- BS 5930:2015, Code of Practice for ground investigations;

4.0 Limitations

GII has prepared this report for the sole use of Richmond Homes. No other warranty, express or implied, is made as to the professional advice included in this report or other services provided by GII.

The conclusions and recommendations contained in this report are based upon information provided by others and the assumption that all relevant information has been provided by those bodies from whom it has been requested. Information obtained from third parties has not been independently verified by GII, unless otherwise stated in this report.

This report has been prepared in line with best industry standards and within the project's budgetary and time constraints. The methodology adopted, and the sources of information used by GII in providing its services are outlined in this report.

All investigations were competed at the locations specified by the design engineer.

GII disclaim any undertaking or obligation to advise any person of any change in any matter affecting the Report, which may come or be brought to GII's attention after the date of the Report.

The conclusions presented in this report represent GII's best professional judgement based on review of site conditions observed during the site visit and the relevant information available at the time of writing. The opinions and conclusions presented are valid only to the extent that the information provided was accurate and complete.

It was not possible to collect a sample between 2m BGL and 3m BGL at TP-02 due to an obstruction, this has resulted in an interpolation of WAC status of the subsoils between 79mOD and 80mOD at TP-02.

The waste classification exercise is reflective of and applicable to the ground conditions on site at the time of the site investigation and sampling. Alterations to the ground conditions or any further excavations carried out on site since the site investigation phase are not reflected in this report and GII are not liable for any such alterations if they have occurred.

5.0 Site Location and Layout

The site is located on the junction of Saint Raphaela's Road and Blackthorn Drive in Sandyford, Dublin 18 (Figure 1). The site is located within the Sandyford Business Park. The site is bounded to the west, south and east by commercial buildings which form park of the Business Park. The site is bounded the north by Blackthorn Drive and the Luas Green Line and housing beyond that. The Stillorgan Reservoir is located to the north east of the site beyond Blackthorn Drive.

The site is an open yard in the northern and central section with an industrial/commercial building located in the southern section. The southern section is more elevated than the central and northern sections with a ramp located along the eastern boundary linking the areas.

6.0 Site History

GII reviewed the aerial photographs and historical maps maintained by the Ordnance Survey of Ireland (OSI) and the google imagery records. These included the 6-inch maps that were produced between 1829 and 1842, the 25-inch maps that were produced between 1888 and 1913 and the 6-inch Cassini Maps that were produced between the 1830's and 1930's. The site is undeveloped on all historical maps reviewed.

A review of the google earth aerial photograph record and the aerial photograph records held by the OSI indicates that the site had been undeveloped until at last 1995. The lands surrounding the site had been developed prior to 1995. The building in the stern section of the site is present on the aerial photos from at least the year 2000. From at least 2000 the southern norther and central sections of the site are occupied by a commercial building possibly a warehouse. This building is absent from the aerial record from 2008.

7.0 Subsurface Exploration

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.

7.1. Trial Pits

The trial pits were excavated using a JCB 3CX excavator at the locations shown in Figure 2 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.

7.1. Soakaway Testing

The soakaway testing was carried out in selected trial pits at the locations shown in Figure 2 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.

7.2. Rotary Boreholes

The rotary coring was carried out by a track mounted T44 Beretta rig at the locations shown on Figure 2 location plan in Appendix 1. The rotary boreholes were completed from the ground surface or alternatively, where noted on the individual borehole log, from the base of the cable percussion borehole where a temporary liner was installed to facilitate follow-on rotary coring.
The T44 Beretta is equipped with rubber tracks which allow for short travel on pavement surfaces avoiding any damage to the surface. The T44 Beretta utilises a triple tube core barrel system operated using a wireline drilling process. The outer barrel is rotated by the drill rods and at its lower end, carries the coring bit. The inner barrel is mounted on a swivel so that it does not rotate during the process. The third barrel or liner is placed within the second one to retain the core intact and to preserve as much as possible the fabric of the drilling stratum. The core is cut by the coring bit and passes to the inner liner. The core is brought up to the surface within the inner barrel on a small diameter wire rope or line attached to the "overshoot"

recovery tool which is then placed into a core box in order of recovery. A drilling fluid, typically air mist or water flush is passed from the surface through hollow drill rods to the drill bit, and is used to cool the drill bit. Temporary casing is used in some situations to support unstable ground or to seal off fissures or voids. It should be noted that the rotary coring can only achieve limited recovery in overburden, particularly granular or weakly cemented strata due to the flushing medium washing away the cohesive fraction during coring. The recovery achieved, where required is noted on the borehole logs and core photographs are provided to allow assessment of the core recovered. The rotary borehole logs are provided in Appendix 3 of this Report.

7.3. 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.

7.1. Groundwater/Gas Monitoring Installations

Groundwater and or Gas 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.

8.0 Ground Conditions

8.1. 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;

- Surfacing
- FILL/ Made Ground
- Cohesive Deposits
- Granite Bedrock

SURFACING: Tarmac or Reinforced Concrete was encountered in all the exploratory holes and was present to a maximum depth of 0.15 to 0.3m BGL. Tarmac surfacing was present typically to a depth of 0.05m to 0.24m BGL.

FILL/MADE GROUND: Fill deposits were encountered beneath the Surfacing and was present to a relatively consistent depth of between 0.6m and 0.9m BGL and was typically described as Brown or Grey sandy clayey angular to sub angular Gravel (Crushed Rock Fill). Made Ground Deposits were encountered in TP3 and TP5 to a depth of 3.1m and 0.9m BGL respectively. These deposits were described generally as *brown or grey slightly sandy very gravelly CLAY with some cobbles and boulders and contained occasional fragments of plastic, concrete, red brick, metal glass and plastic.* The full details of these deposits are recorded on the trial pit logs in Appendix 2.

COHESIVE DEPOSITS: Cohesive deposits were encountered beneath the Fill or Made Ground and were described typically as *firm or stiff brown, grey or dark grey 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 with the exception of TP5 where it was noted as Firm to a depth of 3.1m BGL above rock. These deposits had some, occasional or frequent cobble and boulder content where noted on the exploratory hole logs.

GRANITE BEDROCK: In trial pits TP1 and TP2 weathered rock was encountered which was digable with the JCB 3CX excavator to a depth of up to 0.8m below the top of the stratum. The trial pits were terminated upon encountering the more competent bedrock, in which further excavation became more difficult. This material was recovered typically as angular gravel and cobbles of Granite however there was some variability in the fracture spacing and the ease at which the excavator could progress. Some clay and sand were also present with the rock mass either from weathering or as infilling to fractures which were opened upon excavation.

The rotary core boreholes recovered Granite Bedrock in each of the boreholes at depths of 1.5m to 5.5m BGL. The depth to rock varies from 1.5m BGL (79.8m OD) in BH04 and BH06 in the central portion of the site and is deeper towards the north eastern portion of the site to a maximum depth of 4.7m BGL (75.6m OD) in BH10. The total core recovery is good in the granite bedrock, typically 100% with some of the uppermost runs dropping to 80 or 90%. The SCR and RQD both are relatively poor in the upper weathered zone, often recovered as non-intact, however both indices show an increase with depth in each of the boreholes. The strength of the stratum varies from Extremely weak to Very Strong as noted on the logs with some portions of the core recovered as non-intact. The weathering is noted on the core logs and is typically distinctly weathered to partially weathered with occasional zones of where the granite was unweathered.

8.2. Laboratory Testing

8.2.1. Waste Classification Analysis

In order to assess materials, which may be excavated from site, in terms of waste classification, the samples collected were analysed for a suite of parameters which allows for the assessment of the soils in terms of total pollutant content for classification of materials as *hazardous* or *non-hazardous* (RILTA Suite). The suite also allows for the assessment of the soils in terms of suitability for placement at licenced landfills (inert, stable non-reactive, hazardous etc.). The parameter list for the RILTA suite includes analysis of the solid samples for arsenic, barium, cadmium, chromium, copper, cyanide, lead, nickel, mercury, zinc, speciated aliphatic and aromatic petroleum hydrocarbons, pH, sulphate, sulphide, moisture content, soil organic matter and an asbestos screen.

The RILTA suite also includes those parameters specified in the EC Council Decision establishing criteria for the acceptance of waste at Landfills (Council Decision 2003/33/EC), which for the solid samples are pH, total organic carbon (TOC), speciated aliphatic and aromatic petroleum hydrocarbons, BTEX, phenol, polychlorinated biphenyls (PCB) and PAH.

As part of the RILTA suite a leachate is generated from the solid samples which is analysed for antimony, arsenic, barium, cadmium, chromium, copper, lead, mercury, molybdenum, nickel, selenium, zinc, chloride, fluoride, soluble sulphate, sulphide, phenols, dissolved organic carbon (DOC) and total dissolved solids (TDS). The full laboratory reports for all analysis are presented in Appendix 4.

9.0 Waste Classification

GII understand that any materials which may be excavated from site would meet the definition of waste under the Waste Framework Directive. This may not be the case at the time of excavation when all or some of the materials may have been declared a by-product in line with Article 27 of the European Communities (Waste Directive) Regulations 2011[1].

Excess soil and stone resulting from excavation works (the primary purpose of which is not the production of soil and stone) may be declared a by-product if all four by-product conditions are met.[2]

a) further use of the soil and stone is certain;

b) the soil and stone can be used directly without any further processing other than normal industrial practice;

c) the soil and stone is produced as an integral part of a production process; and

d) further use is lawful in that the soil and stone fulfils all relevant requirements for the specific use and will not lead to overall adverse environmental or human health impacts.

Due to the varying levels of anthropogenic materials encountered in the made ground there are potentially two sets of List of Waste (LoW) with a “mirror” entry LoW (formerly EWC) codes which may be applied to excavated materials to be removed from site.

[1] S.I. No. 126/2011 - European Communities (Waste Directive) Regulations 2011 (Article 27).
[2] As set out in Article 5 of the 2008 Waste Framework Directive and Article 27 of the Waste Directive Regulations 2011.

1. 17-05-03* (soil and stone containing dangerous substances, classified as hazardous) or 17-05-04 (soil and stone other than those mentioned in 17-05-03, not hazardous); or
2. 17-09-03* (other construction and demolition wastes (including mixed wastes) containing hazardous substances) or 17-09-04 (mixed construction and demolition wastes other than those mentioned in 17 09 01, 17 09 02 and 17 09 03).

Where waste is a mirror entry in the LoW, it can be classified via a process of analysis against standard criteria set out in in the Waste Framework Directive. The assessment process is described in detail in guidance published by the UK regulatory authorities (Guidance on the Classification and Assessment of Waste: Technical Guidance WM3, 2015). The assessment involves comparison of the concentration of various parameters against defined threshold values.

The specific LoW code which should be applied to the material at each SI location is summarised in Table 1 below.

GII use HazWasteOnline™, a web-based commercial waste classification software tool which assists in the classification of potentially hazardous materials. This tool was used to determine whether the materials on site are classified as hazardous or non-hazardous. The use of the online tool is accepted by the EPA (EPA 2014).

The conclusions presented in the report are based on GII's professional opinion. **It should be noted that the environmental regulator (in this case the EPA) and the waste acceptor (in this case a landfill operator) shall decide whether a waste is hazardous or non-hazardous and suitable for disposal at their facility.**

10.0 HazWasteOnLine™ Results

In total twenty-one (21 No.) samples were assessed using the HazWasteOnLine™ Tool. All samples were classified as non-hazardous. The complete HazWasteOnLine™ reports for all samples are included in Appendix 5.

Table 1 Waste Classification Summary

Sample I.D.	Sample Depth (m)	LoW Code	Hazardous/Non-Hazardous	Asbestos Type Detected
TP01	0.60-1.60	17 05 04	Non-Hazardous	NAD[3]
TP02	0.60-1.00	17 05 04	Non-Hazardous	NAD

[3] NAD – no asbestos detected.

Sample I.D.	Sample Depth (m)	LoW Code	Hazardous/Non-Hazardous	Asbestos Type Detected
TP02	1.00-2.10	17 05 04	Non-Hazardous	NAD
TP03	0.00-1.00	17 05 04	Non-Hazardous	NAD
TP03	1.00-2.00	17 05 04	Non-Hazardous	NAD
TP03	2.00-3.10	17 05 04	Non-Hazardous	NAD
TP04	0.45-0.90	17 05 04	Non-Hazardous	NAD
TP04	0.90-2.00	17 05 04	Non-Hazardous	NAD
TP05	0.35-1.00	17 05 04	Non-Hazardous	NAD
TP05	1.00-2.00	17 05 04	Non-Hazardous	NAD
TP05	2.00-3.10	17 05 04	Non-Hazardous	NAD
TP06	0.80-1.00	17 05 04	Non-Hazardous	NAD
TP06	1.00-2.00	17 05 04	Non-Hazardous	NAD
TP06	2.00-2.40	17 05 04	Non-Hazardous	NAD
SA02	0.50-1.00	17 05 04	Non-Hazardous	NAD
SA02	1.00-1.80	17 05 04	Non-Hazardous	NAD
TP-101	0.20-1.00	17 05 04	Non-Hazardous	NAD
TP-101	1.00-.00	17 05 04	Non-Hazardous	NAD
TP-101	2.00-3.10	17 05 04	Non-Hazardous	NAD
TP-102	0.2-1.00	17 05 04	Non-Hazardous	NAD
TP-102	1.00-2.00	17 05 04	Non-Hazardous	NAD

11.0 Landfill Waste Acceptance Criteria

Waste Acceptance Criteria (WAC) have been agreed by the EC (Council Decision 2003/33/EC) and **are only applicable to material if it is to be disposed as a waste at a landfill facility**. Each individual member state and licensed operators of a licence landfill may apply more stringent WAC. WAC limits and the associated laboratory analysis are not suitable for use in the determination of whether a waste is hazardous or non-hazardous.

The level of selenium detected at TP-05 between 2m and3.1m and TP-06 between 1m and 2.4m exceeded the inert WAC.

The level of Selenium detected at TP-04 between 0.9m and 2m exceeded the stable non-reactive WAC.

All other samples were within the inert WAC. The WAC data is presented in Appendix 6.

12.0 Hydrocarbon Impacted Soils

TPH was detected in the samples collected from TP-03 between ground level and 3.1m. The levels detected ranged for 130mg/kg between 0m and 1m, 244mg/kg between 1m and 2m and 108m/kg between 2m and 3m. The levels of TPH are not significant enough to classify the waste as hazardous nor are the levels of mineral oil detected enough to exceed the inert criteria. The laboratory interpretation of the source of the TP is degrade diesel and lubricating oil. There was no identifiable source of diesel on site during the investigation and as such the diesel may be related to previous site activities.

13.0 Asbestos

Asbestos was **not** detected in any of the samples analysed.

14.0 Conclusions & Recommendations

The recommendations given and opinions expressed in this report are based on the findings of the site investigation works and laboratory testing undertaken. Where any opinion is expressed on the classification of material between site investigations 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 findings at the site investigation locations.

14.1. Waste Classification

The sampled materials on site are considered to be non-hazardous. Final waste classification is at the discretion of the landfill operator.

14.2. Waste Acceptance Criteria

The classification of the materials to be removed from site in terms of waste acceptance criteria and acceptance at landfill is presented in Figures 3 to 7 and as tabulated in Appendix 6.

14.3. Asbestos

Asbestos was **not** detected on site.

14.4. Waste Transfer

Any firm engaged to transport waste material from site and the operator of any waste facility that may accept material excavated from this site, should be furnished with, at a minimum, copies of the **full unabridged** laboratory reports and HazWasteOnLine^{TM} report for all samples presented in this report.

The LoW codes applied at the time of removal from site may be based on the observations made during the bulk excavation which may supersede the LoW codes applied in Table 1.

The made ground material which contains less than 2% anthropogenic material and which **meets** the inert WAC may be removed to an inert licensed facility under the LoW code 17 05 04. Where it contains more than 2% anthropogenic material the LoW code 17 09 04 may be applied.

The made ground material which contains less than 2% anthropogenic material and which **exceeds** the inert WAC may be removed to a non-hazardous licensed facility under the LoW code 17 05 04. Where it contains more than 2% anthropogenic material the LoW code 17 09 04 may be applied.

The natural ground material which meets the inert WAC may be removed to a soil recovery facility or inert landfill facility under the LoW code 17 09 04.

The natural ground material which exceeds the inert WAC may be removed to a non-hazardous licensed facility under the LoW code 17 05 04.

TPH has been detected in the natural occurring material at TP-03 as such these materials are not suitable for removal to a soil and stone recovery facility but may be removed to an inert landfill facility under the LoW code 17 09 04.

The waste classification presented in the report is based on GII's professional opinion. It should be noted that the environmental regulator (in this case the EPA) and the waste acceptor (in this case a landfill operator) shall decide whether a waste is hazardous or non-hazardous and suitable for disposal at their facility.

15.0 References

Official Journal of the European Communities 16.1.2003, L 11/27. *COUNCIL DECISION of 19 December 2002 establishing criteria and procedures for the acceptance of waste at landfills pursuant to Article 16 of and Annex II to Directive 1999/31/EC* (2003/33/EC)

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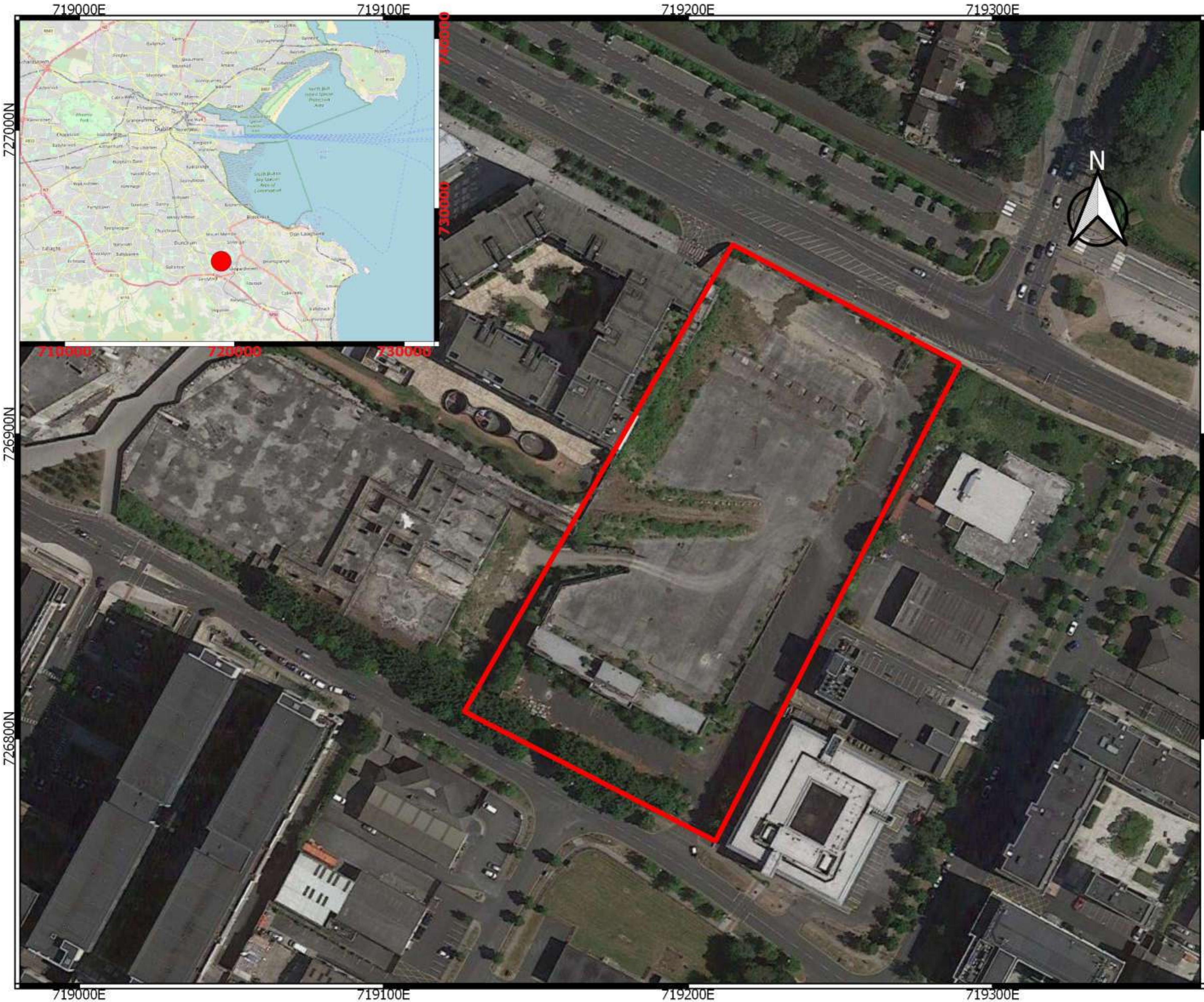
http://www.epa.ie/pubs/consultation/soilrecoveryconsultation/

APPENDIX 1 – Figures



Site Location
Site Boundary

Client:

Richmond Homes

Project Code:

8408-01-19

Project Title:

Sandyford Central

Drawing Title:

Figure 1 Site Location

GROUND INVESTIGATIONS IRELAND

Ground Investigations Ireland Ltd.
Catherinstown House,
Hazelhatch Road,
Newcastle, Co. Dublin
www.gii.ie 01-6015175/5176

0 10 20 30 40 50 60 m

Drawn By:	Date:
BS	27/03/2019

GROUND INVESTIGATIONS IRELAND

Ground Investigations Ireland Ltd.
Catherinstown House,
Hazelhatch Road,
Newcastle, Co. Dublin
www.gii.ie 01-6015175/5176

Client:

Richmond Homes

0 10 20 30 40 m

Project Title:
Sandyford Central

Drawing Title: Figure 2
SI Locations

GII Project Reference:
8459-02-19

Drawn By:
BS

Date:
07/08/2019

Site Boundary
Infiltration Test
Trial Pit
Borehole

GROUND INVESTIGATIONS IRELAND

Ground Investigations Ireland Ltd.
Catherinstown House,
Hazelhatch Road,
Newcastle, Co. Dublin
www.gii.ie 01-6015175/5176

Client: Richmond Homes

0 10 20 30 40 m

Project Title: Sandyford Central

Drawing Title: Figure 3
WAC 81 - 82 mOD

GII Project Reference:
8459-02-19

Drawn By: BS

Date: 07/08/2019

Site Boundary
Infiltration Test
Trial Pit
WAC Inert

GROUND INVESTIGATIONS IRELAND

Ground Investigations Ireland Ltd.
Catherinstown House,
Hazelhatch Road,
Newcastle, Co. Dublin
www.gii.ie 01-6015175/5176

Client:

Richmond Homes

0 10 20 30 40 m

Project Title:
Sandyford Central

Drawing Title: Figure 4
WAC 80 - 81 mOD

GII Project Reference:
8459-02-19

Drawn By:
BS

Date:
07/08/2019

Site Boundary
Infiltration Test
Trial Pit
WAC Inert

Ground Investigations Ireland

Ground Investigations Ireland Ltd.
Catherinstown House,
Hazelhatch Road,
Newcastle, Co. Dublin
www.gii.ie 01-6015175/5176

Client:

Richmond Homes

0 10 20 30 40 m

Project Title:
Sandyford Central

Drawing Title: Figure 5
WAC 79-80 mOD

GII Project Reference:
8459-02-19

Drawn By:
BS

Date:
07/08/2019

Legend
Site Boundary
Infiltration Test
Trial Pit
WAC Inert
WAC Exceeds Stable Non Reactive
Likely to Meet Inert WAC

GROUND INVESTIGATIONS IRELAND

Ground Investigations Ireland Ltd.
Catherinstown House,
Hazelhatch Road,
Newcastle, Co. Dublin
www.gii.ie 01-6015175/5176

Client: Richmond Homes

0 10 20 30 40 m

Project Title: Sandyford Central

Drawing Title: Figure 6
WAC 78-79 mOD

GII Project Reference:
8459-02-19

Drawn By: BS

Date: 07/08/2019

Site Boundary
Infiltration Test
Trial Pit
WAC Inert
WAC Non Haz

GROUND INVESTIGATIONS IRELAND

Ground Investigations Ireland Ltd.
Catherinstown House,
Hazelhatch Road,
Newcastle, Co. Dublin
www.gii.ie 01-6015175/5176

Client:
Richmond Homes

0 10 20 30 40 m

Project Title:
Sandyford Central

Drawing Title: Figure 7
WAC 77-78 mOD

GII Project Reference:
8459-02-19

Drawn By:
BS

Date:
07/08/2019

Site Boundary
Infiltration Test
Trial Pit
WAC Non Haz

APPENDIX 2 – Trial Pit

Ground Investigations Ireland Ltd www.gii.ie	Site Sandyford Central	Trial Pit Number SA01

Machine : 3CX JCB Method : Trial pit	Dimensions 1.90m x 0.60m	Ground Level (mOD) 81.36	Client Richmond Homes	Job Number 8408-01-19
	Location (dGPS) 719157.3 E 726841.5 N	Dates 20/02/2019	Project Contractor Ground investigations Ireland Ltd	Sheet 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
				81.21	(0.15) 0.15	Reinforced Concrete with DPM		
				80.86	(0.35) 0.50	MADE GROUND: Dark grey angular to sub-angular fine to coarse GRAVEL		
				79.96	(0.90) 1.40	Weathered Granite: Light brown slightly clayey sandy angular to sub-angular fine to coarse GRAVEL with angular to sub-angular cobbles		
						Obstruction due to gRANITE		
						Complete at 1.40m		

Plan

Remarks

No groundwater encountered
Trial pit stable
Trial pit backfilled on completion

Scale (approx)	Logged By	Figure No.
1:25	NM	8408-01-19.SA01

Ground Investigations Ireland Ltd www.gii.ie	Site: Sandyford Central	Trial Pit Number: **SA02**

Machine : 3CX JCB Method : Trial pit	Dimensions: 2.00m x 0.60m	Ground Level (mOD): 80.37	Client: Richmond Homes	Job Number: 8408-01-19
	Location (dGPS): 719271.9 E 726894.6 N	Dates: 20/02/2019	Project Contractor: Ground investigations Ireland Ltd	Sheet: 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
				80.15	(0.22) 0.22	Reinforced Concrete		
				79.87	(0.28) 0.50	MADE GROUND: Dark grey slightly sandy slightly clayey angular to sub-angular fine to coarse GRAVEL		
0.50-1.00	EN			79.57	(0.30) 0.80	Soft to firm brown slightly sandy gravelly CLAY with rootlets		
1.00 1.00-1.80	B EN			78.77	(0.80) 1.60	Firm brown slightly sandy gravelly CLAY		
				78.57	(0.20) 1.80	Firm dark grey slightly sandy gravelly CLAY		
						Complete at 1.80m		

Plan

Remarks

No groundwater encountered
Trial pit stable
Trial pit backfilled on completion

Scale (approx)	Logged By	Figure No.
1:25	NM	8408-01-19.SA02

Ground Investigations Ireland Ltd www.gii.ie		Site: Sandyford Central	Trial Pit Number: TP01
Machine : 3CX JCB Method : Trial pit	Dimensions: 3.50m x 0.60m Ground Level (mOD): 82.04	Client: Richmond Homes	Job Number: 8408-01-19
	Location (dGPS): 719234.4 E 726829.9 N Dates: 19/02/2019	Project Contractor: Ground investigations Ireland Ltd	Sheet: 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
					(0.18)	Tarmacadam		
				81.86	0.18	MADE GROUND: Grey slightly sandy slightly clayey angular to sub-rounded fine to coarse GRAVEL		
					(0.42)			
0.60-1.60	EN			81.44	0.60	Stiff brown mottled grey slightly sandy gravelly CLAY with some sub-angular to sub-rounded cobbles		
0.80	B				(1.00)			
				80.44	1.60 (0.20)	Stiff light brown slightly sandy gravelly CLAY with some sub-angular to sub-rounded cobbles		
				80.24	1.80 (0.50)	Weathered Granite: Light brown sandy clayey angular to sub-angular fine to coarse GRAVEL with many angular to sub-angular cobbles		
				79.74	2.30	Obstruction due to Rock Complete at 2.30m		

Plan

Remarks

No groundwater encountered
Trial pit stable
Trial pit backfilled on completion

Scale (approx)	Logged By	Figure No.
1:25	NM	8408-01-19.TP01

Ground Investigations Ireland Ltd
www.gii.ie

Machine : 3CX JCB **Method :** Trial pit	**Dimensions** 2.60m x. 0.60m	**Ground Level (mOD)** 81.39	**Client** Richmond Homes	**Job Number** 8408-01-19
	Location (dGPS) 719213.9 E 726862.5 N	**Dates** 19/02/2019-19/03/2019	**Project Contractor** Ground investigations Ireland Ltd	**Sheet** 1/1

Site: Sandyford Central — **Trial Pit Number:** TP02

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
					(0.23)	Reinforced Concrete.		
				81.16	0.23	MADE GROUND: Dark grey slightly sandy slightly clayey fine to medium angular to sub-angular GRAVEL		
0.60-1.00	EN				(0.77)			
0.90	B							
				80.39	1.00	Firm brown sandy very gravelly CLAY with many angular to sub-angular cobbles and boulders		
1.00-2.10	EN				(0.30)			
				80.09	1.30	Weathered Granite: Light brown sandy clayey fine to coarse angular to sub-angular GRAVEL with many angular to sub-angular cobbles and boulders		
1.50	B				(0.80)			
				79.29	2.10	Obstruction due to Rock		
						Complete at 2.10m		

Plan

Remarks

No groundwater encountered
Trial pit stable
Trial pit backfilled on completion

Scale (approx)	Logged By	Figure No.
1:25	NM	8408-01-19.TP02

Ground Investigations Ireland Ltd www.gii.ie		Site Sandyford Central	Trial Pit Number TP03
Machine : 3CX JCB **Method :** Trial pit	**Dimensions** 3.10m x 0.60m **Ground Level (mOD)** 81.40	**Client** Richmond Homes	**Job Number** 8408-01-19
	Location (dGPS) 719194.8 E 726911.2 N **Dates** 19/02/2019	**Project Contractor** Ground investigations Ireland Ltd	**Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.00-1.00	EN					MADE GROUND: Light brown grey slightly sand very gravelly CLAY with rebar, plastic, cloth and redbrick fragments with many some sub-angular to sub-rounded cobbles and boulders with grass rootlets.		
0.50	B				(1.00)			
1.00-2.00	EN			80.40	1.00	MADE GROUND: Brown grey slightly sandy very gravelly CLAY with many rebar, redbrick, cloth and plastic fragments with some sub-angular to sub-rounded boulders of tarmacadam and concrete.		
1.50	B				(1.40)			
2.00-3.10	EN							
2.50	B			79.00	2.40	MADE GROUND: Light brown slightly sandy very clayey angular to sub-rounded fine to coarse GRAVEL with many angular to sub-angular cobbles and boulders with old metal concrete fragments and plastic.		
					(0.70)			
				78.30	3.10	Obstruction due to Rock or Boulder Complete at 3.10m		

Plan

Remarks

No groundwater encountered
Trial pit stable
Trial pit backfilled on completion

Scale (approx)	Logged By	Figure No.
1:25	NM	8408-01-19.TP03

Ground Investigations Ireland Ltd www.gii.ie	Site: Sandyford Central	Trial Pit Number: TP04

Machine : 3CX JCB Method : Trial Pit	Dimensions: 4.00m x 1.00m	Ground Level (mOD): 81.14	Client: Richmond Homes	Job Number: 8408-01-19
	Location (dGPS): 719242.9 E 726864.2 N	Dates: 19/03/2019	Project Contractor: Ground investigations Ireland Ltd	Sheet: 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
				80.96	(0.18) 0.18	Tarmacadam		
				80.69	(0.27) 0.45	MADE GROUND: Grey slightly sandy slightly gravelly angular to sub-angular fine to medium GRAVEL.		
0.45-0.90 0.50	EN B			80.24	(0.45) 0.90	MADE GROUND: Grey/brown slightly sandy clayey angular to sub-angular fine to course GRAVEL with some sub-angular to sub-rounded cobbles.		
0.90-2.00 1.20	EN B			79.84	(0.40) 1.30	Stiff brown mottled grey slightly sandy gravelly CLAY		
1.50	B			79.34	(0.50) 1.80	Stiff dark grey slightly sandy gravelly CLAY with some sub-angular to sub-rounded cobbles.		
2.30	B			78.74	(0.60) 2.40	Stiff light brown slightly sandy very gravelly CLAY with many sub-angular to sub-rounded cobbles.		
						Obstruction due to Rock.		
						Complete at 2.40m		

Plan

Remarks

No groundwater encountered
Trial pit stable
Trial pit backfilled on completion

Scale (approx)	Logged By	Figure No.
1:25	NM	8408-01-19.TP04

Ground Investigations Ireland Ltd
www.gii.ie

Machine : 3CX JCB **Method :** Trial Pit	**Dimensions** 3.50m x 0.60m	**Ground Level (mOD)** 80.14	**Site** Sandyford Central **Client** Richmond Homes	**Trial Pit Number** TP05 **Job Number** 8408-01-19
	Location (dGPS) 719262.4 E 726902.8 N	**Dates** 19/02/2019	**Project Contractor** Ground investigations Ireland Ltd	**Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
					(0.25)	Reinforced Concrete		
				79.89	0.25 (0.10)	MADE GROUND: Grey slightly sandy slightly gravelly angular to sub-angular fine to coarse GRAVEL		
0.35-1.20	EN			79.79	0.35	MADE GROUND: Grey slightly sandy very gravelly CLAY with rare wood fragments occasional cobbles and sandy lenses		
0.50	B				(0.65)			
1.20-2.00	EN			79.14	1.00	Firm grey slightly sandy slightly gravelly CLAY with some sub-angular to sub-rounded cobbles		
1.30	B				(1.10)			
2.00-2.20	EN			78.04	2.10	Firm grey slightly sandy slightly gravelly CLAY with many sub-angular to sub-rounded cobbles		
2.20	B				(1.00)			
				77.04	3.10	Obstruction due to boulder. Complete at 3.10m		

Plan

Remarks

No groundwater encountered
Trial pit stable
Trial pit backfilled on completion

Scale (approx)	Logged By	Figure No.
1:25	NM	8408-01-19.TP05

Ground Investigations Ireland Ltd www.gii.ie		Site: Sandyford Central	Trial Pit Number: TP06
Machine : 3CX JCB Method :	Dimensions: 4.00m x 0.60m	Ground Level (mOD): 79.99	Client: Richmond Homes	Job Number: 8408-01-19
	Location (dGPS): 719242.6 E 726924.6 N	Dates: 01/03/2019	Project Contractor: Ground investigations Ireland Ltd	Sheet: 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
					(0.28)	Reinforced Concrete		
				79.71	0.28 (0.17)	MADE GROUND: Brown grey slightly sandy slightly clayey angular to sub-angular fine to coarse GRAVEL		
				79.54	0.45 (0.35)	MADE GROUND: Brown slightly sandy clayey angular to sub-angular fine to coarse GRAVEL with many angular to sub-angular cobbles		
0.80-1.00 1.00 1.00-2.00	EN B EN			79.19	0.80 (0.40)	Firm brown slightly sandy gravelly CLAY with some sub-angular to sub-rounded cobbles		
1.50 2.00-2.40	B EN			78.79	1.20 (1.20)	Stiff dark grey slightly sandy slightly gravelly CLAY with some sub-angular to sub-rounded cobbles		
2.40	B			77.59	2.40	Obstruction due to Boulder Complete at 2.40m		

Plan

Remarks

No groundwater encountered
Trial pit stable
Trial pit backfilled on completion

Scale (approx)	Logged By	Figure No.
1:25	NM	8408-01-19.TP06

Ground Investigations Ireland Ltd
www.gii.ie

Machine : JCB 3CX **Method :** Trial Pit	**Dimensions**	**Ground Level (mOD)**	**Client** Richmond Homes	**Job Number** 8408-01-19
	Location	**Dates** 28/06/2019	**Project Contractor** Ground investigations Ireland Ltd	**Sheet** 1/1

Site: Sandyford Central

Trial Pit Number: TP101

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
					0.05	MADE GROUND: Grey slightly sandy angular fine to coarse Gravel.		
0.20-1.00	EN					Firm brown slightly sandy slightly gravelly CLAY with rare sub-angular to sub-rounded cobbles.		
0.40	B				(0.80)			
					0.85	Brown gravelly clayey fine to coarse SAND.		
1.00-2.00	EN				(0.65)			
1.50	B				1.50	Stiff brown/reddish brown slightly sandy gravelly CLAY with frequent sub-rounded cobbles and rare boulders.		
2.00-3.10	EN				(1.00)			
2.50	B				2.50	Stiff brown/reddish brown/black slightly sandy gravelly CLAY with occasional sub-angular to sub-rounded cobbles.		
					(0.60)			
3.10	B				3.10	Obstruction: Presumed boulders of granite.		
						Complete at 3.10m		

Plan

Remarks

No Groundwater encountered.
Trial pit sidewalls spalling.
Trial pit backfilled on completion.

Scale (approx)	Logged By	Figure No.
1:25	Tmcl	8408-01-19.TP101

Ground Investigations Ireland Ltd www.gii.ie			Site: Sandyford Central	Trial Pit Number: TP102
Machine : JCB 3CX Method : Trial Pit	Dimensions	Ground Level (mOD)	Client: Richmond Homes	Job Number: 8408-01-19
	Location	Dates: 28/06/2019	Project Contractor: Ground investigations Ireland Ltd	Sheet: 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.00-1.00	B				(0.20) 0.20	TARMACADAM.		
0.20-1.00	EN				(0.40) 0.60	MADE GROUND: Brown sandy gravelly Clay with fragments of concrete and roots.		
1.00-2.00	EN				(0.70) 1.30	MADE GROUND: Grey/brown slightly sandy gravelly Clay with rare fragments of concrete and ash.		
1.80	B				(0.70) 2.00	Stiff brown/black slightly sandy gravelly CLAY with occasional boulders.		
						Obstruction: Boulders.		
						Complete at 2.00m		

Plan

Remarks

No Groundwater encountered.
Trial pit sidewalls spalling.
Trial pit backfilled on completion.

Scale (approx)	Logged By	Figure No.
1:25	Tmcl	8408-01-19.TP102

APPENDIX 3 – Rotary Borehole Logs

Ground Investigations Ireland Ltd
www.gii.ie

Machine : Beretta T46 **Flush :** water **Core Dia :** 68 mm **Method :** Rotary Cored	**Casing Diameter** 100mm cased to 8.40m	**Ground Level (mOD)** 82.20	**Site** Sandyford Central **Client** Richmond Homes	**Borehole Number** BH01 **Job Number** 8408-01-19
	Location 719153.4 E 726805.3 N	**Dates** 08/03/2019	**Project Contractor** Ground investigations Ireland Ltd	**Sheet** 1/1

Depth (m)	TCR	SCR	RQD	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
0.00	42					82.10	0.10	Tarmacadam.			
							(1.70)	Driller notes: Dark brown sandy gravelly CLAY. Returns of sub-rounded to sub-angular gravel.			
						80.40	1.80 (0.60)	Driller notes: Boulder. Returns of granite boulder			
2.40	92					79.80	2.40 (1.05)	Driller notes: Brown clay with rare cobbles Returns of stiff dark brown grey slightly sandy gravelly CLAY.			
3.45				12		78.75	3.45 (1.15)	Weak to medium strong pinkish orange white coarsely crystalline GRANITE. Distinctly weathered. 3.45-4.60m - Two fracture sets. F1: very close to close spaced, 10-30 degrees, stepped rough, tight to open, stained brown, clay smearing. F2: closely spaced, 70-90 degrees, stepped rough, tight to open, stained brown, clay smearing.			
3.90	100	19	0								
4.60	100	0	0	10		77.60	4.60 (2.30)	Weak pinkish white coarsely crystalline GRANITE. Distinctly weathered. 4.60-5.40m - Two fracture set. F1: very close spaced, 80-90 degrees, stepped rough, tight to open with some clay smearing. F2: Very close to close 10-30 degrees undulating smooth tight to open with staining. 5.40-6.50m - Predominately non intact. Indicating two fracture sets of 10-30 degrees and 60-80 degrees.			
5.40	100	37	13	N.I							
6.50				11							
6.90	100	68	48			75.30	6.90 (1.50)	Strong white coarsely crystalline GRANITE. Partially weathered. 6.50-7.90m - Two fracture sets. F1: closely spaced, 10-30 degrees, stepped rough, tight to open with some clay smearing and quartz sand. F2: close to medium spaced, 50-70 degrees, stepped rough, tight to open with some clay smearing. 7.90-8.20m - Mostly non intact			
7.40	100	50	35								
7.90				N.I							
8.40						73.80	8.40	Complete at 8.40m			

Remarks
No groundwater encountered.
50mm slotted standpipe installed from 8.40m to 1.00m with pea gravel surround, plain pipe installed from 1.00m to ground level with bentonite seal and flush cover.
Borehole backfilled on completion.

Scale (approx)	Logged By
1:50	NM

Figure No.
8408-01-19.BH01

Ground Investigations Ireland Ltd www.gii.ie	Site: Sandyford Central	Borehole Number: BH02

Machine : Beretta T46	Casing Diameter	Ground Level (mOD)	Client	Job Number
Flush : water	100mm cased to 10.60m	82.45	Richmond Homes	8408-01-19
Core Dia: 68 mm	**Location**	**Dates**	**Project Contractor**	**Sheet**
Method : Rotary Cored	719228.8 E 726817.8 N	26/02/2019	Ground investigations Ireland Ltd	1/2

Depth (m)	TCR	SCR	RQD	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
0.00	21					82.30	(0.15) 0.15	Tarmacadam.			
								Driller notes: Dark grey slightly sandy gravelly CLAY. Returns of sub-rounded to sub-angular gravel and cobbles.			
1.50 1.50-1.55	16				25/50 SPT(C) 25*/50 50/0						
2.50 2.50-2.55	17				25/50 SPT(C) 25*/50 50/0		(5.35)				
4.00 4.00-4.05	13				25/50 SPT(C) 25*/50 50/0						
5.50 5.50-5.50	100	73	73		25/50 SPT(C) 25*/0 50/0	76.95	5.50	Medium strong to strong orangish white coarsely crystalline GRANITE partially weathered			
6.60	100	11	11	6			(2.60)	5.50-8.10m - Three fracture sets. F1: close to wide spaced, 0-20 degrees, stepped rough, tight to open, stained brown. F2: close to medium spaced, 70-80 degrees, planar smooth to rough, tight to open stained black. F3: wide spaced 80-90 degrees, planar smooth to rough, tight to open stained brown.			
8.10	100	93	65	6		74.35	8.10	Strong greyish white coarsely crystalline GRANITE unweathered to partially weathered.			
							(2.50)	8.10-10.60m - Two fracture sets. F1: close to medium spaced, 10-30 degrees, stepped rough, tight to open, stained brown with some clay smearing. F2: close to medium spaced, 70-80 degrees, planar rough, tight to open stained brown.			
9.60											

Remarks
No groundwater encountered.
50mm slotted standpipe installed from 10.00m to 1.00m with pea gravel surround, plain pipe installed from 1.00m to ground level with bentonite seal and flush cover.
Borehole backfilled on completion.

Scale (approx)	Logged By
1:50	NM

Figure No. 8408-01-19.BH02

Ground Investigations Ireland Ltd www.gii.ie	Site: Sandyford Central	Borehole Number: BH02

Machine : Beretta T46 **Flush :** water **Core Dia :** 68 mm **Method :** Rotary Cored	**Casing Diameter** 100mm cased to 10.60m	**Ground Level (mOD)** 82.45	**Client** Richmond Homes	**Job Number** 8408-01-19
	Location 719228.8 E 726817.8 N	**Dates** 26/02/2019	**Project Contractor** Ground investigations Ireland Ltd	**Sheet** 2/2

Depth (m)	TCR	SCR	RQD	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
	100	62	62								
10.60						71.85	10.60	Complete at 10.60m			

Remarks

Scale (approx)	Logged By
1:50	NM

Figure No. 8408-01-19.BH02

Ground Investigations Ireland Ltd
www.gii.ie

Machine : Beretta T46 **Flush :** water **Core Dia :** 68 mm **Method :** Rotary Cored	**Casing Diameter** 100mm cased to 8.00m	**Ground Level (mOD)** 81.37	**Site** Sandyford Central	**Borehole Number** **BH03**
	Location 719188.9 E 726824.6 N	**Dates** 26/02/2019	**Client** Richmond Homes	**Job Number** 8408-01-19
			Project Contractor Ground investigations Ireland Ltd	**Sheet** 1/1

Depth (m)	TCR	SCR	RQD	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.00	18					81.14	(0.23) 0.23	Reinforced concrete.		
1.50 1.50-1.55	57				25/50 SPT(C) 25*/50 50/0		(2.27)	Driller notes: Brown slightly sandy slightly gravelly CLAY with cobbles and boulders. Returns of gravel to boulder sized fragments.		
2.20 2.20-2.20 2.50				6	25/50 SPT(C) 25*/0 50/0	78.87	2.50			
2.90	75	41	39	10			(1.30)	Weak to medium strong brownish white fine to coarse crystalline GRANITE with quartz veins distinctly weathered. 2.50-2.90m - One fracture sets. F1: very close to medium spaced, 10-30 degrees, stepped rough, tight to open, some clay smearing. 2.90-3.80m - Two fracture sets. F1: closely spaced, 10-30 degrees, stepped rough, tight to open. F2: Very closely spaced 60-80 degrees, undulating rough, open, stained brown.		
3.80	98	92	85	4		77.57	3.80			
4.80	100	100	100				(2.30)	Strong to weak orangish grey white coarsely crystalline GRANITE. Partially weathered. 3.80-6.10m - Two fracture sets. F1: close to medium spaced, 10-30 degrees, stepped rough, tight to open, stained orangish brown. F2: widely spaced, 80 degrees, undulating rough, open, stained brown.		
5.00	93	77	73							
6.10				6		75.27	6.10 (0.40)	Weak to medium strong brownish white fine to coarse crystalline GRANITE with quartz veins distinctly weathered. 6.10-6.55m - One fracture set. F1:very closely spaced, 0-30 degrees, stepped rough, tight to open, quartz sand smearing.		
6.50 6.55				N.I		74.87	6.50			
6.80	100	67	53	8			(1.50)	Weak to medium strong orangish white fine to coarse crystalline GRANITE. Partially weathered. 6.55-6.80m - Non Intact. 6.80-8.00m - Two fracture sets. F1: closely spaced, 10-20 degrees, stepped rough, tight to open, stained brown. F2: very close to medium spaced, 60-80 degrees, stepped rough, tight to open, stained brown.		
8.00						73.37	8.00	Complete at 8.00m		

Remarks
No groundwater encountered.
No standpipe installed.
Borehole backfilled on completion.

Scale (approx)	Logged By
1:50	NM

Figure No.
8408-01-19.BH03

Ground Investigations Ireland Ltd www.gii.ie	Site: Sandyford Central	Borehole Number: BH04

Machine : Beretta T46	Casing Diameter	Ground Level (mOD)	Client	Job Number
Flush : water	100mm cased to 5.00m	81.37	Richmond Homes	8408-01-19
Core Dia : 68 mm	**Location**	**Dates**	**Project Contractor**	**Sheet**
Method : Rotary Cored	719176.6 E 726849.9 N	25/02/2019	Ground investigations Ireland Ltd	1/1

Depth (m)	TCR	SCR	RQD	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.00						81.12	(0.25) 0.25	Reinforced concrete.		
	11					79.87	(1.25) 1.50	Driller notes: Dark grey slightly sandy gravelly CLAY with occasional sub-angular to sub-rounded cobbles. Returns of gravel sized fragments.		
1.50 1.50-1.55	100	34	20	N.I	25/50 SPT(C) 25*/50 50/0	79.37	(0.50) 2.00	Weak to medium strong orangish white coarsely crystalline GRANITE Distinctly weathered. 1.50-2.00m - Non Intact.		
2.00	100	87	73	7		77.87	(1.50) 3.50	Medium strong orangish grey white coarsely crystalline GRANITE. Partially weathered. 2.00-3.50m - Two fracture sets. F1: very close to medium spaced, 10-30 degrees, stepped rough, tight to open, clay smearing. F2: close to medium spaced, 60-80 degrees, stepped rough, tight to open, stained brown.		
3.50	100	98	92	6		76.37	(1.50) 5.00	Strong greyish white pink coarsely crystalline GRANITE with occasional quartz veins partially weathered. 3.50-5.00m - Two fracture sets. F1: very close to medium spaced, 10-30 degrees, stepped rough, tight to open, stained brown. F2: close to medium spaced, 50-70 degrees, stepped rough, tight to open, stained brown.		
5.00								Complete at 5.00m		

Remarks
No groundwater encountered.
No standpipe installed.
Borehole backfilled on completion.

Scale (approx)	Logged By
1:50	NM

Figure No. 8408-01-19.BH04

Ground Investigations Ireland Ltd www.gii.ie	Site: Sandyford Central	Borehole Number: BH05

Machine : Beretta T46 Flush : water Core Dia : 68 mm Method : Rotary Cored	Casing Diameter: 100mm cased to 7.00m	Ground Level (mOD): 81.23	Client: Richmond Homes	Job Number: 8408-01-19
	Location: 719194.7 E 726906.4 N	Dates: 28/02/2019	Project Contractor: Ground investigations Ireland Ltd	Sheet: 1/1

Depth (m)	TCR	SCR	RQD	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.00	50						(1.00)	Driller notes: Fill. Returns of angular gravel sized granite and quartz with angular cobbles of granite concrete and Mudstone.		
1.00 1.00-1.10	0				25/50 SPT(C) 25*/50 50/50	80.23	1.00 (1.50)	Returns of gravel to cobble sized fragments.		
2.50 2.50-2.50	100	20	20	8	25/50 SPT(C) 25*/0 50/0	78.73	2.50 (0.50)	Weak to medium strong orangish white coarsely crystalline GRANITE. Partially weathered. 2.50-3.00m - Two fracture sets. F1: closely spaced, 60-80 degrees, stepped rough, tight to open, stained brown. F2: close to medium spaced, 20-40 degrees, stepped rough, tight to open, stained brown.		
3.00	100	60	52	5		78.23	3.00 (1.50)	Strong orangish grey coarsely crystalline GRANITE. Partially weathered 3.00-6.00m - Three fracture sets. F1: close to medium spaced, 0-20 degrees, stepped rough, tight to open, stained brown, clay smearing. F2: close to medium spaced, 40-60 degrees, stepped rough, tight to open, stained brown with some quartz sand on fractures. F3: closely spaced, 70-80 degrees stepped rough, tight to open stained brown.		
4.50	94	55	55			76.73	4.50 (1.50)	Strong greyish whitish grey coarsely crystalline GRANITE with frequent quartz veins. Partially weathered		
6.00	100	100	100	3		75.23	6.00 (1.00)	Strong to very strong grey coarsely crystalline GRANITE. Partially weathered 6.00-7.00m - One fracture set. F1: close to medium spaced, 10-20 degrees, stepped rough, tight to open, stained brown.		
7.00						74.23	7.00	Complete at 7.00m		

Remarks
No groundwater encountered.
No standpipe installed.
Borehole backfilled on completion.

Scale (approx)	Logged By
1:50	NM

Figure No. 8408-01-19.BH05

Ground Investigations Ireland Ltd www.gii.ie	Site: Sandyford Central	Borehole Number: BH06

Machine : Beretta T46 Flush : water Core Dia : 68 mm Method : Rotary Cored	Casing Diameter: 100mm cased to 6.50m	Ground Level (mOD): 81.39	Client: Richmond Homes	Job Number: 8408-01-19
	Location: 719216 E 726863.8 N	Dates: 26/02/2019	Project Contractor: Ground investigations Ireland Ltd	Sheet: 1/1

Depth (m)	TCR	SCR	RQD	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
0.00	34					81.15	(0.24) 0.24	Reinforced concrete.			
								Driller Notes: Dark grey slightly sandy gravelly CLAY with occasional cobbles.			
0.75 0.75-0.85	59				25/50 SPT(C) 25*/50 50/50		(1.26)				
1.50 1.50-1.60	30			N.I	25/50 SPT(C) 25*/50 50/50	79.89	1.50 (0.70)	Extremely weak to weak orangish white coarsely crystalline GRANITE. Distinctly weathered. 1.50-2.20m - Non intact.			
2.00 2.20 2.70 2.93	47	55	55	4 N.I		79.19	2.20	Medium strong to strong orangish pink grey coarsely crystalline GRANITE. Partially weathered to weathered. 2.20-2.70m - One fracture set. F1: closely spaced, 60-80 degrees, stepped rough, tight to open, some clay smearing. 2.70-2.93m - Non intact.			
3.50	100	53	53	6			(4.30)	2.93-5.00m - Two fracture set. F1: closely spaced, 70-90 degrees, stepped rough, tight to open, stained dark brown. F2: Closely spaced 0-20 degrees, undulating rough, tight to open.			
5.00	100	65	45	10				5.00-6.50m - Two fracture sets. F1: close to medium spaced, 80-90 degrees undulating rough, tight to open, stained brown. F2: close to medium spaced, 40-50 degrees, planar smooth to rough, stained brown.			
6.50						74.89	6.50	Complete at 6.50m			

Remarks
No groundwater encountered.
50mm slotted standpipe installed from 6.50m to 1.00m with pea gravel surround, plain pipe installed from 1.00m to ground level with bentonite seal and flush cover.
Borehole backfilled on completion.

Scale (approx)	Logged By
1:50	NM

Figure No. 8408-01-19.BH06

Ground Investigations Ireland Ltd www.gii.ie	Site: Sandyford Central	Borehole Number: BH07

Machine : Beretta T46	Casing Diameter	Ground Level (mOD)	Client	Job Number
Flush : water	100mm cased to 7.00m	81.24	Richmond Homes	8408-01-19
Core Dia : 68 mm	**Location**	**Dates**	**Project Contractor**	**Sheet**
Method : Rotary Cored	719241.8 E 726862.5 N	27/02/2019	Ground investigations Ireland Ltd	1/1

Depth (m)	TCR	SCR	RQD	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description
0.00	33					81.00	(0.24) 0.24	Tarmacadam.
								Recovery consists of dark grey, slightly sandy slightly gravelly CLAY with occasional sub-angular to sub-rounded cobbles
1.00 1.00-1.10	32				25/50 SPT(C) 25*/50 50/50		(1.76)	
2.00 2.00-2.00	100	30	30	N.I	25/50 SPT(C) 25*/0 50/0	79.24	2.00	Weak whitish grey coarsely crystalline GRANITE. Distinctly weathered.
2.50							(0.90)	2.00-2.90m - Non intact.
2.90	100	49	40	10		78.34	2.90	Medium strong to strong whitish grey orange coarsely crystalline GRANITE. Partially weathered. 2.90-4.20m - Two fracture sets. F1: close to medium spaced, 0-20 degrees, stepped rough, tight to open, stained brown and some clay smearing. F2: Close to medium spaced 30-50 degrees, undulating rough, tight to open
							(0.80)	
						77.54	3.70	Extremely weak to weak greyish orange coarsely crystalline GRANITE. Distinctly to partially weathered
4.00	100	62	62					
4.20				N.I			(2.00)	4.20-4.70m - Non intact.
4.70				8				
5.00	100	78	69			75.54	5.70	Medium strong to strong pinkish white grey coarsely crystalline GRANITE. Partially weathered. 4.70-7.00m - Two fracture sets. F1: close to medium spaced, 10-30 degrees, stepped rough, tight to open, stained brown and some clay smearing. F2: closely spaced, 60-80 degrees, stepped rough, stained brown.
							(1.30)	
6.50	100	86	56					
7.00						74.24	7.00	Complete at 7.00m

Remarks
No groundwater encountered.
No standpipe installed.
Borehole backfilled on completion.

Scale (approx)	Logged By
1:50	NM

Figure No. 8408-01-19.BH07

Ground Investigations Ireland Ltd www.gii.ie	Site: Sandyford Central	Borehole Number: BH08

Machine : Beretta T46 Flush : water Core Dia : 68 mm Method : Rotary Cored	Casing Diameter: 100mm cased to 10.00m	Ground Level (mOD): 81.40	Client: Richmond Homes	Job Number: 8408-01-19
	Location: 719235.4 E 726909.9 N	Dates: 27/02/2019	Project Contractor: Ground investigations Ireland Ltd	Sheet: 1/2

Depth (m)	TCR	SCR	RQD	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
0.00	36						(0.30)	Reinforced concrete.			
						81.10	0.30	Driller notes: Fill. Dark grey slightly clayey medium to coarse sub angular GRAVEL with occasional sub-angular cobbles.Returns of gravel to cobble sized fragments			
1.00	19										
2.20 2.20-2.30	26				25/50 SPT(C) 25*/50 50/50		(4.40)				
3.50 3.50-3.60	50	0	0		25/50 SPT(C) 25*/50 50/50						
4.50 4.50-4.60 4.70	100	30	0		25/50 SPT(C) 25*/50 50/50	76.70	4.70	Extremely weak to weak pinkish orange coarsely crystalline GRANITE. Distinctly weathered.			
5.00	96	57	40	10			(2.60)	4.70-7.30m - One fracture set. F1: very close to close spaced, 10-20 degrees, stepped rough, tight to open, stained brown and black with some clay smearing and quartz sand on fracture surfaces.			
6.50											
7.30	88	46	39			74.10	7.30	Extremely weak to medium strong pinkish orange coarsely crystalline GRANITE. Distinctly weathered.			
							(1.20)	7.30-9.30m - Non intact.			
8.00				N.I							
						72.90	8.50	Extremely weak to medium strong pinkish orange coarsely crystalline GRANITE. Distinctly weathered to de-structured			
	93	17	17				(0.80)				
9.30				4		72.10	9.30	Extremely weak to weak pink coarsely crystalline GRANITE. Distinctly weathered. 9.30-10.00m - Two fracture sets. F1: close to medium spaced, 10-20 degrees, stepped rough, tight to open, stained brown with some			
							(0.70)				
10.00											

Remarks
No groundwater encountered.
50mm slotted standpipe installed from 10.00m to 1.00m with pea gravel surround, plain pipe installed from 1.00m to ground level with bentonite seal and flush cover.
Borehole backfilled on completion.

Scale (approx)	Logged By
1:50	NM

Figure No.
8408-01-19.BH08

Ground Investigations Ireland Ltd www.gii.ie	Site: Sandyford Central	Borehole Number: BH08

Machine : Beretta T46 / Flush : water / Core Dia : 68 mm / Method : Rotary Cored	Casing Diameter: 100mm cased to 10.00m	Ground Level (mOD): 81.40	Client: Richmond Homes	Job Number: 8408-01-19
	Location: 719235.4 E 726909.9 N	Dates: 27/02/2019	Project Contractor: Ground investigations Ireland Ltd	Sheet: 2/2

Depth (m)	TCR	SCR	RQD	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
						71.40	10.00	clay smearing and quartz sand on fracture surfaces. F2: closely spaced, 80-90 degrees, stepped rough, tight to open with some clay smearing on fracture surfaces.			
								Complete at 10.00m			

Remarks

Scale (approx)	Logged By
1:50	NM

Figure No. 8408-01-19.BH08

Ground Investigations Ireland Ltd www.gii.ie	Site: Sandyford Central	Borehole Number: BH09

Machine : Beretta T46 **Flush :** water **Core Dia :** 68 mm **Method :** Rotary Cored	**Casing Diameter** 100mm cased to 7.50m	**Ground Level (mOD)** 80.15	**Client** Richmond Homes	**Job Number** 8408-01-19
	Location 719218.9 E 726934.1 N	**Dates** 28/02/2019	**Project Contractor** Ground investigations Ireland Ltd	**Sheet** 1/1

Depth (m)	TCR	SCR	RQD	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description
0.00	45							Driller notes: Brown grey slightly sandy gravelly CLAY with occasional cobble sized fragments.Returns of gravel to cobble sized fragments.
1.00 1.00-1.10	47				25/50 SPT(C) 25*/50 50/50		(2.80)	
2.20 2.20-2.30	67				25/50 SPT(C) 25*/50 50/50			
2.80	100	50	27	N.I		77.35	2.80	Weak to medium strong brownish white coarsely crystalline GRANITE. Distinctly weathered. 2.80-3.20m - Non intact.
3.20				8			(1.50)	3.20-4.30m - Two fracture sets. F1: very close to closely spaced, 0-20 degrees, stepped rough, tight to open, stained brown. F2: medium to widely spaced, 45-55 degrees, stepped rough, tight to open, stained brown.
4.30	100	63	43	N.I		75.85	4.30	Medium strong greyish white coarsely crystalline GRANITE. Weathered to partially weathered 4.30-4.50m - Non intact.
4.50				8			(1.20)	4.30-5.50m - Two fracture sets. F1: very close to closely spaced, 0-30 degrees, stepped rough, tight to open, stained brown. F2: close to medium spaced, 70-80 degrees, stepped rough, tight to open, stained brown grey.
5.50	100	97	91	5		74.65	5.50	Medium strong to strong whitish greyish pink coarse to fine crystalline GRANITE. Partially weathered 5.50-7.50m - One fracture set. F1: close to widely spaced, 50-70 degrees, stepped rough, tight to open, stained brown.
7.00	80	40	20				(2.00)	
7.50						72.65	7.50	Complete at 7.50m

Remarks
No groundwater encountered.
50mm slotted standpipe installed from 7.50m to 1.00m with pea gravel surround, plain pipe installed from 1.00m to ground level with bentonite seal and flush cover.
Borehole backfilled on completion.

Scale (approx)	Logged By
1:50	NM

Figure No. 8408-01-19.BH09

Ground Investigations Ireland Ltd www.gii.ie	Site: Sandyford Central	Borehole Number: BH10

Machine : Beretta T46 Flush : water Core Dia : 68 mm Method : Rotary Cored	Casing Diameter: 100mm cased to 10.00m	Ground Level (mOD): 80.32	Client: Richmond Homes	Job Number: 8408-01-19
	Location: 719273.8 E 726899.4 N	Dates: 28/02/2019	Project Contractor: Ground investigations Ireland Ltd	Sheet: 1/1

Depth (m)	TCR	SCR	RQD	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
0.00	27					80.08	(0.24) 0.24	Tarmacadam.			
						79.84	(0.24) 0.48	Driller notes: Dark grey medium to coarse sub-angular to sub-rounded GRAVEL.			
								Recovery consists of stiff brown slightly sandy slightly gravelly CLAY with sub-angular to sub-rounded cobbles.			
1.00 1.00-1.10	17				25/50 SPT(C) 25*/50 50/50						
2.20 2.20-2.30	41				25/50 SPT(C) 25*/50 50/50		(4.22)				
3.70 3.70-3.80	50				25/50 SPT(C) 25*/50 50/50						
4.70 4.70-4.70	100	100	100		25/50 SPT(C) 25*/0 50/0	75.62	4.70 (0.40)	Weak to medium strong orangish coarsely crystalline GRANITE. Partially weathered.			
5.10	94	34	30	5		75.22	5.10 (0.90)	Weak to strong orangish greyish white coarsely crystalline GRANITE. Partially weathered 4.70-6.00m - Two fracture sets. F1: widely spaced, 60-70 degrees, stepped rough, tight to open, stained brown with quartz sand on fracture surfaces. F2: close to medium spaced, 20-30 degrees, stepped rough, tight to open, stained brown with clay smearing.			
6.00						74.32	6.00 (1.80)	Extremely weak to weak orange coarsely crystalline GRANITE. Distinctly weathered. 6.00-7.80m - Two fracture sets. F1: close to medium spaced, 70-80 degrees, stepped rough, tight to open, stained brown with clay smearing. F2: close to medium spaced, 0-20 degrees, stepped rough, tight to open, stained brown with quartz sand on fracture surfaces.			
6.70	100	49	41	8							
7.80						72.52	7.80 (2.20)	Strong to very strong greyish white coarsely crystalline GRANITE. Partially weathered 7.80-10.00m - Two fracture sets. F1: close to medium spaced, 0-20 degrees, stepped rough, tight to open, stained brown with quartz sand on fracture surfaces. F2: widely spaced, 70-80 degrees, stepped rough, tight to open, stained brown with some clay smearing.			
8.20	100	88	77	7							
9.70	100	100	100								
10.00						70.32	10.00				

Remarks
No groundwater encountered.
50mm slotted standpipe installed from 10.00m to 1.00m with pea gravel surround, plain pipe installed from 1.00m to ground level with bentonite seal and flush cover.
Borehole backfilled on completion.

Scale (approx)	Logged By
1:50	NM

Figure No. 8408-01-19.BH010

APPENDIX 4 – Laboratory Testing

Exova Jones Environmental

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Ground Investigations Ireland
Catherinestown House
Hazelhatch Road
Newcastle
Co. Dublin
Ireland

Attention :	Conor Finnerty
Date :	21st March, 2019
Your reference :	8408.01.19
Our reference :	Test Report 19/3052 Batch 1
Location :	Sandyford Central
Date samples received :	25th February, 2019
Status :	Final report
Issue :	2

Sixteen samples were received for analysis on 25th February, 2019 of which sixteen 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:

Bruce Leslie
Project Co-ordinator

Client Name: Ground Investigations Ireland
Reference: 8408.01.19
Location: Sandyford Central
Contact: Conor Finnerty
JE Job No.: 19/3052

Report : **Solid**

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

Please see attached notes for all abbreviations and acronyms

J E Sample No.	1-3	4-6	7-9	10-12	13-15	16-18	19-21	22-24	25-27	28-30			
Sample ID	TP01	TP06	TP02	TP06	TP02	TP06	TP03	TP03	TP03	TP04			
Depth	0.60-1.60	0.80-1.00	0.60-1.00	1.00-2.00	1.00-2.10	2.00-2.40	0.00-1.00	1.00-2.00	2.00-3.10	0.45-0.90			
COC No / misc													
Containers	V J T	V J T	V J T	V J T	V J T	V J T	V J T	V J T	V J T	V J T			
Sample Date	19/02/2019	20/02/2019	20/02/2019	20/02/2019	20/02/2019	20/02/2019	19/02/2019	19/02/2019	19/02/2019	19/02/2019			
Sample Type	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil			
Batch Number	1	1	1	1	1	1	1	1	1	1	LOD/LOR	Units	Method No.
Date of Receipt	25/02/2019	25/02/2019	25/02/2019	25/02/2019	25/02/2019	25/02/2019	25/02/2019	25/02/2019	25/02/2019	25/02/2019			
Antimony	2	3	2	2	<1	2	<1	2	<1	1	<1	mg/kg	TM30/PM15
Arsenic #	11.6	24.5	16.1	8.1	4.3	13.1	9.0	11.3	9.0	20.1	<0.5	mg/kg	TM30/PM15
Barium #	66	312	50	59	32	70	43	59	48	99	<1	mg/kg	TM30/PM15
Cadmium #	1.9	1.8	0.8	2.0	0.5	1.5	0.8	1.2	0.4	0.3	<0.1	mg/kg	TM30/PM15
Chromium #	27.3	46.4	30.5	42.1	29.3	28.4	29.5	53.1	29.3	54.8	<0.5	mg/kg	TM30/PM15
Copper #	27	37	16	28	8	22	13	22	12	20	<1	mg/kg	TM30/PM15
Lead #	47	34	16	17	13	20	20	22	17	10	<5	mg/kg	TM30/PM15
Mercury #	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	mg/kg	TM30/PM15
Molybdenum #	2.1	4.8	2.0	4.6	1.9	3.0	1.2	2.3	2.3	2.1	<0.1	mg/kg	TM30/PM15
Nickel #	41.0	57.0	29.3	38.2	14.4	35.9	15.4	28.1	15.5	27.9	<0.7	mg/kg	TM30/PM15
Selenium #	<1	2	<1	3	<1	2	<1	1	<1	1	<1	mg/kg	TM30/PM15
Zinc #	100	146	75	94	55	92	61	85	66	97	<5	mg/kg	TM30/PM15
PAH MS													
Naphthalene #	<0.04	<0.04	<0.04	<0.04	<0.04	<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	<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	<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	<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	<0.03	0.15	<0.03	<0.03	<0.03	mg/kg	TM4/PM8
Anthracene #	<0.04	<0.04	<0.04	<0.04	<0.04	<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	<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	<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	<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	<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	<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	<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	<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	<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	<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	<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	<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	<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	<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	<0.02	<0.02	<0.02	<0.02	<0.02	mg/kg	TM4/PM8
Benzo(j)fluoranthene	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	mg/kg	TM4/PM8
PAH Surrogate % Recovery	91	90	92	94	93	79	94	95	94	95	<0	%	TM4/PM8
Mineral Oil (C10-C40)	<30	<30	<30	<30	<30	<30	130	164	74	<30	<30	mg/kg	TM5/PM8/PM16

Please include all sections of this report if it is reproduced
All solid results are expressed on a dry weight basis unless stated otherwise.

Exova Jones Environmental

Client Name:	Ground Investigations Ireland	**Report :**	**Solid**
Reference:	8408.01.19		
Location:	Sandyford Central	**Solids:** V=60g VOC jar, J=250g glass jar, T=plastic tub	
Contact:	Conor Finnerty		
JE Job No.:	19/3052		

Please see attached notes for all abbreviations and acronyms

J E Sample No.	1-3	4-6	7-9	10-12	13-15	16-18	19-21	22-24	25-27	28-30			
Sample ID	TP01	TP06	TP02	TP06	TP02	TP06	TP03	TP03	TP03	TP04			
Depth	0.60-1.60	0.80-1.00	0.60-1.00	1.00-2.00	1.00-2.10	2.00-2.40	0.00-1.00	1.00-2.00	2.00-3.10	0.45-0.90			
COC No / misc													
Containers	V J T	V J T	V J T	V J T	V J T	V J T	V J T	V J T	V J T	V J T			
Sample Date	19/02/2019	20/02/2019	20/02/2019	20/02/2019	20/02/2019	20/02/2019	19/02/2019	19/02/2019	19/02/2019	19/02/2019			
Sample Type	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil			
Batch Number	1	1	1	1	1	1	1	1	1	1	LOD/LOR	Units	Method No.
Date of Receipt	25/02/2019	25/02/2019	25/02/2019	25/02/2019	25/02/2019	25/02/2019	25/02/2019	25/02/2019	25/02/2019	25/02/2019			
TPH CWG													
Aliphatics													
>C5-C6#	<0.1	<0.1	<0.1	<0.1^{SV}	<0.1	<0.1^{SV}	<0.1	<0.1^{SV}	<0.1	<0.1	<0.1	mg/kg	TM36/PM12
>C6-C8#	<0.1	<0.1	<0.1	<0.1^{SV}	<0.1	<0.1^{SV}	<0.1	<0.1^{SV}	<0.1	<0.1	<0.1	mg/kg	TM36/PM12
>C8-C10	<0.1	<0.1	<0.1	<0.1^{SV}	<0.1	<0.1^{SV}	<0.1	<0.1^{SV}	<0.1	<0.1	<0.1	mg/kg	TM36/PM12
>C10-C12#	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	mg/kg	TM5/PM8/PM16
>C12-C16#	<4	<4	<4	<4	<4	<4	11	27	<4	<4	<4	mg/kg	TM5/PM8/PM16
>C16-C21#	<7	<7	<7	<7	<7	<7	37	78	15	<7	<7	mg/kg	TM5/PM8/PM16
>C21-C35#	<7	<7	<7	<7	<7	<7	72	59	59	<7	<7	mg/kg	TM5/PM8/PM16
>C35-C40	<7	<7	<7	<7	<7	<7	10	<7	<7	<7	<7	mg/kg	TM5/PM8/PM16
Total aliphatics C5-40	<26	<26	<26	<26	<26	<26	130	164	74	<26	<26	mg/kg	TM5/TM36/PM8/PM12/PM16
>C6-C10	<0.1	<0.1	<0.1	<0.1^{SV}	<0.1	<0.1^{SV}	<0.1	<0.1^{SV}	<0.1	<0.1	<0.1	mg/kg	TM36/PM12
>C10-C25	<10	<10	<10	<10	<10	<10	66	133	33	<10	<10	mg/kg	TM5/PM8/PM16
>C25-C35	<10	<10	<10	<10	<10	<10	48	19	48	<10	<10	mg/kg	TM5/PM8/PM16
Aromatics													
>C5-EC7#	<0.1	<0.1	<0.1	<0.1^{SV}	<0.1	<0.1^{SV}	<0.1	<0.1^{SV}	<0.1	<0.1	<0.1	mg/kg	TM36/PM12
>EC7-EC8#	<0.1	<0.1	<0.1	<0.1^{SV}	<0.1	<0.1^{SV}	<0.1	<0.1^{SV}	<0.1	<0.1	<0.1	mg/kg	TM36/PM12
>EC8-EC10#	<0.1	<0.1	<0.1	<0.1^{SV}	<0.1	<0.1^{SV}	<0.1	<0.1^{SV}	<0.1	<0.1	<0.1	mg/kg	TM36/PM12
>EC10-EC12#	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	4.6	<0.2^{SV}	<0.2	<0.2	mg/kg	TM5/PM8/PM16
>EC12-EC16#	<4	<4	<4	<4	<4	<4	<4	15	<4	<4	<4	mg/kg	TM5/PM8/PM16
>EC16-EC21#	<7	<7	<7	<7	<7	<7	9	38	<7	<7	<7	mg/kg	TM5/PM8/PM16
>EC21-EC35#	<7	<7	<7	<7	<7	<7	<7	22	34	<7	<7	mg/kg	TM5/PM8/PM16
>EC35-EC40	<7	<7	<7	<7	<7	<7	<7	<7	<7	<7	<7	mg/kg	TM5/PM8/PM16
Total aromatics C5-40	<26	<26	<26	<26	<26	<26	<26	80	34	<26	<26	mg/kg	TM5/TM36/PM8/PM12/PM16
Total aliphatics and aromatics(C5-40)	<52	<52	<52	<52	<52	<52	130	244	108	<52	<52	mg/kg	TM5/TM36/PM8/PM12/PM16
>EC6-EC10#	<0.1	<0.1	<0.1	<0.1^{SV}	<0.1	<0.1^{SV}	<0.1	<0.1^{SV}	<0.1	<0.1	<0.1	mg/kg	TM36/PM12
>EC10-EC25	<10	<10	<10	<10	<10	<10	11	59	<10	<10	<10	mg/kg	TM5/PM8/PM16
>EC25-EC35	<10	<10	<10	<10	<10	<10	<10	<10	31	<10	<10	mg/kg	TM5/PM8/PM16
MTBE#	<5	<5	<5	<5^{SV}	<5	<5^{SV}	<5	<5^{SV}	<5	<5	<5	ug/kg	TM31/PM12
Benzene#	<5	<5	<5	<5^{SV}	<5	<5^{SV}	<5	<5^{SV}	<5	<5	<5	ug/kg	TM31/PM12
Toluene#	<5	<5	<5	<5^{SV}	<5	<5^{SV}	<5	<5^{SV}	<5	<5	<5	ug/kg	TM31/PM12
Ethylbenzene#	<5	<5	<5	<5^{SV}	<5	<5^{SV}	<5	<5^{SV}	<5	<5	<5	ug/kg	TM31/PM12
m/p-Xylene#	<5	<5	<5	<5^{SV}	<5	<5^{SV}	<5	<5^{SV}	<5	<5	<5	ug/kg	TM31/PM12
o-Xylene#	<5	<5	<5	<5^{SV}	<5	<5^{SV}	<5	<5^{SV}	<5	<5	<5	ug/kg	TM31/PM12
PCB 28#	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	ug/kg	TM17/PM8
PCB 52#	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	ug/kg	TM17/PM8
PCB 101#	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	ug/kg	TM17/PM8
PCB 118#	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	ug/kg	TM17/PM8
PCB 138#	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	ug/kg	TM17/PM8
PCB 153#	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	ug/kg	TM17/PM8
PCB 180#	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	ug/kg	TM17/PM8
Total 7 PCBs#	<35	<35	<35	<35	<35	<35	<35	<35	<35	<35	<35	ug/kg	TM17/PM8

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Exova Jones Environmental

Client Name: Ground Investigations Ireland
Reference: 8408.01.19
Location: Sandyford Central
Contact: Conor Finnerty
JE Job No.: 19/3052

Report : **Solid**

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

Please see attached notes for all abbreviations and acronyms

J E Sample No.	1-3	4-6	7-9	10-12	13-15	16-18	19-21	22-24	25-27	28-30			
Sample ID	TP01	TP06	TP02	TP06	TP02	TP06	TP03	TP03	TP03	TP04			
Depth	0.60-1.60	0.80-1.00	0.60-1.00	1.00-2.00	1.00-2.10	2.00-2.40	0.00-1.00	1.00-2.00	2.00-3.10	0.45-0.90			
COC No / misc													
Containers	V J T	V J T	V J T	V J T	V J T	V J T	V J T	V J T	V J T	V J T			
Sample Date	19/02/2019	20/02/2019	20/02/2019	20/02/2019	20/02/2019	20/02/2019	19/02/2019	19/02/2019	19/02/2019	19/02/2019			
Sample Type	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil			
Batch Number	1	1	1	1	1	1	1	1	1	1	LOD/LOR	Units	Method No.
Date of Receipt	25/02/2019	25/02/2019	25/02/2019	25/02/2019	25/02/2019	25/02/2019	25/02/2019	25/02/2019	25/02/2019	25/02/2019			
Natural Moisture Content	12.1	25.2	14.6	9.4	8.6	10.5	10.0	11.9	12.1	10.2	<0.1	%	PM4/PM0
Moisture Content (% Wet Weight)	10.8	20.1	12.7	8.6	7.9	9.5	9.1	10.7	10.8	9.2	<0.1	%	PM4/PM0
Hexavalent Chromium #	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	mg/kg	TM38/PM20
Sulphate as SO4 (2:1 Ext) #	0.0644	-	-	0.1273	0.0856	-	-	0.2123	-	0.3265	<0.0015	g/l	TM38/PM20
Chromium III	27.3	46.4	30.5	42.1	29.3	28.4	29.5	53.1	29.3	54.8	<0.5	mg/kg	NONE/NONE
Total Organic Carbon #	0.36	0.40	0.22	0.66	0.15	0.44	0.34	0.34	0.20	0.26	<0.02	%	TM21/PM24
Loss on Ignition #	2.2	3.2	1.8	1.3	1.1	1.7	1.4	1.6	2.0	1.6	<1.0	%	TM22/PM0
pH #	8.67	8.59	8.56	8.48	8.80	8.52	10.65	9.35	10.74	8.97	<0.01	pH units	TM73/PM11
Mass of raw test portion	0.1004	0.1055	0.1019	0.0984	0.1007	0.0999	0.1005	0.1029	0.0982	0.0996		kg	NONE/PM17
Mass of dried test portion	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09		kg	NONE/PM17

Please include all sections of this report if it is reproduced
All solid results are expressed on a dry weight basis unless stated otherwise.

Client Name: Ground Investigations Ireland
Reference: 8408.01.19
Location: Sandyford Central
Contact: Conor Finnerty
JE Job No.: 19/3052

Report : **Solid**

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

Please see attached notes for all abbreviations and acronyms

J E Sample No.	31-33	34-36	37-39	40-42	43-45	46-48	LOD/LOR	Units	Method No.
Sample ID	TP04	TP05	TP05	TP05	SA02	SA02			
Depth	0.90-2.00	0.35-1.00	1.00-2.00	2.00-3.10	0.50-1.00	1.00-1.80			
COC No / misc									
Containers	V J T	V J T	V J T	V J T	V J T	V J T			
Sample Date	19/02/2019	19/02/2019	19/02/2019	19/02/2019	20/02/2019	20/02/2019			
Sample Type	Soil	Soil	Soil	Soil	Soil	Soil			
Batch Number	1	1	1	1	1	1			
Date of Receipt	25/02/2019	25/02/2019	25/02/2019	25/02/2019	25/02/2019	25/02/2019			
Antimony	2	2	2	2	3	1	<1	mg/kg	TM30/PM15
Arsenic #	10.1	11.0	12.9	9.2	21.3	4.6	<0.5	mg/kg	TM30/PM15
Barium #	91	178	99	71	230	42	<1	mg/kg	TM30/PM15
Cadmium #	2.3	1.6	3.4	1.5	3.5	1.6	<0.1	mg/kg	TM30/PM15
Chromium #	27.8	74.3	26.7	43.1	53.2	29.0	<0.5	mg/kg	TM30/PM15
Copper #	32	18	30	26	29	17	<1	mg/kg	TM30/PM15
Lead #	18	22	20	19	34	11	<5	mg/kg	TM30/PM15
Mercury #	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	mg/kg	TM30/PM15
Molybdenum #	4.0	4.4	3.6	3.8	3.6	2.2	<0.1	mg/kg	TM30/PM15
Nickel #	40.9	33.4	43.6	37.0	70.8	20.4	<0.7	mg/kg	TM30/PM15
Selenium #	2	<1	6	3	2	<1	<1	mg/kg	TM30/PM15
Zinc #	109	83	126	85	164	55	<5	mg/kg	TM30/PM15
PAH MS									
Naphthalene #	<0.04	<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	<0.03	mg/kg	TM4/PM8
Acenaphthene #	<0.05	<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	<0.04	mg/kg	TM4/PM8
Phenanthrene #	<0.03	<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	<0.04	mg/kg	TM4/PM8
Fluoranthene #	<0.03	<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	<0.03	mg/kg	TM4/PM8
Benzo(a)anthracene #	<0.06	<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	<0.02	mg/kg	TM4/PM8
Benzo(bk)fluoranthene #	<0.07	<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	<0.04	mg/kg	TM4/PM8
Indeno(123cd)pyrene #	<0.04	<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	<0.04	mg/kg	TM4/PM8
Benzo(ghi)perylene #	<0.04	<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	<0.04	mg/kg	TM4/PM8
PAH 6 Total #	<0.22	<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	<0.64	mg/kg	TM4/PM8
Benzo(b)fluoranthene	<0.05	<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	<0.02	mg/kg	TM4/PM8
Benzo(j)fluoranthene	<1	<1	<1	<1	<1	<1	<1	mg/kg	TM4/PM8
PAH Surrogate % Recovery	94	95	88	86	87	85	<0	%	TM4/PM8
Mineral Oil (C10-C40)	<30	<30	<30	<30	<30	<30	<30	mg/kg	TM5/PM8/PM16

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Exova Jones Environmental

Client Name:	Ground Investigations Ireland	**Report :**	**Solid**
Reference:	8408.01.19		
Location:	Sandyford Central	**Solids:** V=60g VOC jar, J=250g glass jar, T=plastic tub	
Contact:	Conor Finnerty		
JE Job No.:	19/3052		

Please see attached notes for all abbreviations and acronyms

J E Sample No.	31-33	34-36	37-39	40-42	43-45	46-48					LOD/LOR	Units	Method No.
Sample ID	TP04	TP05	TP05	TP05	SA02	SA02							
Depth	0.90-2.00	0.35-1.00	1.00-2.00	2.00-3.10	0.50-1.00	1.00-1.80							
COC No / misc													
Containers	V J T	V J T	V J T	V J T	V J T	V J T							
Sample Date	19/02/2019	19/02/2019	19/02/2019	19/02/2019	20/02/2019	20/02/2019							
Sample Type	Soil	Soil	Soil	Soil	Soil	Soil							
Batch Number	1	1	1	1	1	1							
Date of Receipt	25/02/2019	25/02/2019	25/02/2019	25/02/2019	25/02/2019	25/02/2019							
TPH CWG													
Aliphatics													
>C5-C6[#]	<0.1[SV]	<0.1	<0.1[SV]	<0.1[SV]	<0.1	<0.1					<0.1	mg/kg	TM36/PM12
>C6-C8[#]	<0.1[SV]	<0.1	<0.1[SV]	<0.1[SV]	<0.1	<0.1					<0.1	mg/kg	TM36/PM12
>C8-C10	<0.1[SV]	<0.1	<0.1[SV]	<0.1[SV]	<0.1	<0.1					<0.1	mg/kg	TM36/PM12
>C10-C12[#]	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2					<0.2	mg/kg	TM5/PM8/PM16
>C12-C16[#]	<4	<4	<4	<4	<4	<4					<4	mg/kg	TM5/PM8/PM16
>C16-C21[#]	<7	<7	<7	<7	<7	<7					<7	mg/kg	TM5/PM8/PM16
>C21-C35[#]	<7	<7	<7	<7	<7	<7					<7	mg/kg	TM5/PM8/PM16
>C35-C40	<7	<7	<7	<7	<7	<7					<7	mg/kg	TM5/PM8/PM16
Total aliphatics C5-40	<26	<26	<26	<26	<26	<26					<26	mg/kg	TM5/TM36/PM8/PM12/PM16
>C6-C10	<0.1[SV]	<0.1	<0.1[SV]	<0.1[SV]	<0.1	<0.1					<0.1	mg/kg	TM36/PM12
>C10-C25	<10	<10	<10	<10	<10	<10					<10	mg/kg	TM5/PM8/PM16
>C25-C35	<10	<10	<10	<10	<10	<10					<10	mg/kg	TM5/PM8/PM16
Aromatics													
>C5-EC7[#]	<0.1[SV]	<0.1	<0.1[SV]	<0.1[SV]	<0.1	<0.1					<0.1	mg/kg	TM36/PM12
>EC7-EC8[#]	<0.1[SV]	<0.1	<0.1[SV]	<0.1[SV]	<0.1	<0.1					<0.1	mg/kg	TM36/PM12
>EC8-EC10[#]	<0.1[SV]	<0.1	<0.1[SV]	<0.1[SV]	<0.1	<0.1					<0.1	mg/kg	TM36/PM12
>EC10-EC12[#]	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2					<0.2	mg/kg	TM5/PM8/PM16
>EC12-EC16[#]	<4	<4	<4	<4	<4	<4					<4	mg/kg	TM5/PM8/PM16
>EC16-EC21[#]	<7	<7	<7	<7	<7	<7					<7	mg/kg	TM5/PM8/PM16
>EC21-EC35[#]	<7	<7	<7	<7	<7	<7					<7	mg/kg	TM5/PM8/PM16
>EC35-EC40	<7	<7	<7	<7	<7	<7					<7	mg/kg	TM5/PM8/PM16
Total aromatics C5-40	<26	<26	<26	<26	<26	<26					<26	mg/kg	TM5/TM36/PM8/PM12/PM16
Total aliphatics and aromatics(C5-40)	<52	<52	<52	<52	<52	<52					<52	mg/kg	TM5/TM36/PM8/PM12/PM16
>EC6-EC10[#]	<0.1[SV]	<0.1	<0.1[SV]	<0.1[SV]	<0.1	<0.1					<0.1	mg/kg	TM36/PM12
>EC10-EC25	<10	<10	<10	<10	<10	<10					<10	mg/kg	TM5/PM8/PM16
>EC25-EC35	<10	<10	<10	<10	<10	<10					<10	mg/kg	TM5/PM8/PM16
MTBE[#]	<5[SV]	<5	<5[SV]	<5[SV]	<5	<5					<5	ug/kg	TM31/PM12
Benzene[#]	<5[SV]	<5	<5[SV]	<5[SV]	<5	<5					<5	ug/kg	TM31/PM12
Toluene[#]	<5[SV]	<5	<5[SV]	<5[SV]	<5	<5					<5	ug/kg	TM31/PM12
Ethylbenzene[#]	<5[SV]	<5	<5[SV]	<5[SV]	<5	<5					<5	ug/kg	TM31/PM12
m/p-Xylene[#]	<5[SV]	<5	<5[SV]	<5[SV]	<5	<5					<5	ug/kg	TM31/PM12
o-Xylene[#]	<5[SV]	<5	<5[SV]	<5[SV]	<5	<5					<5	ug/kg	TM31/PM12
PCB 28[#]	<5	<5	<5	<5	<5	<5					<5	ug/kg	TM17/PM8
PCB 52[#]	<5	<5	<5	<5	<5	<5					<5	ug/kg	TM17/PM8
PCB 101[#]	<5	<5	<5	<5	<5	<5					<5	ug/kg	TM17/PM8
PCB 118[#]	<5	<5	<5	<5	<5	<5					<5	ug/kg	TM17/PM8
PCB 138[#]	<5	<5	<5	<5	<5	<5					<5	ug/kg	TM17/PM8
PCB 153[#]	<5	<5	<5	<5	<5	<5					<5	ug/kg	TM17/PM8
PCB 180[#]	<5	<5	<5	<5	<5	<5					<5	ug/kg	TM17/PM8
Total 7 PCBs[#]	<35	<35	<35	<35	<35	<35					<35	ug/kg	TM17/PM8

Exova Jones Environmental

Client Name: Ground Investigations Ireland
Reference: 8408.01.19
Location: Sandyford Central
Contact: Conor Finnerty
JE Job No.: 19/3052

Report : Solid

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

Please see attached notes for all abbreviations and acronyms

J E Sample No.	31-33	34-36	37-39	40-42	43-45	46-48							
Sample ID	TP04	TP05	TP05	TP05	SA02	SA02							
Depth	0.90-2.00	0.35-1.00	1.00-2.00	2.00-3.10	0.50-1.00	1.00-1.80							
COC No / misc													
Containers	V J T	V J T	V J T	V J T	V J T	V J T							
Sample Date	19/02/2019	19/02/2019	19/02/2019	19/02/2019	20/02/2019	20/02/2019							
Sample Type	Soil	Soil	Soil	Soil	Soil	Soil							
Batch Number	1	1	1	1	1	1					LOD/LOR	Units	Method No.
Date of Receipt	25/02/2019	25/02/2019	25/02/2019	25/02/2019	25/02/2019	25/02/2019							
Natural Moisture Content	10.4	11.4	14.0	9.7	19.5	12.2					<0.1	%	PM4/PM0
Moisture Content (% Wet Weight)	9.4	10.2	12.3	8.8	16.3	10.9					<0.1	%	PM4/PM0
Hexavalent Chromium #	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3					<0.3	mg/kg	TM38/PM20
Sulphate as SO4 (2:1 Ext) #	-	0.0412	-	-	-	-					<0.0015	g/l	TM38/PM20
Chromium III	27.8	74.3	26.7	43.1	53.2	29.0					<0.5	mg/kg	NONE/NONE
Total Organic Carbon #	0.51	0.33	0.75	0.60	0.31	0.43					<0.02	%	TM21/PM24
Loss on Ignition #	2.3	1.9	2.2	1.6	2.9	1.5					<1.0	%	TM22/PM0
pH #	8.74	8.48	8.68	8.43	8.28	8.67					<0.01	pH units	TM73/PM11
Mass of raw test portion	0.0993	0.1045	0.1012	0.1003	0.1053	0.1098						kg	NONE/PM17
Mass of dried test portion	0.09	0.09	0.09	0.09	0.09	0.09						kg	NONE/PM17

Client Name: Ground Investigations Ireland
Reference: 8408.01.19
Location: Sandyford Central
Contact: Conor Finnerty
JE Job No.: 19/3052

Report : CEN 10:1 1 Batch

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

Please see attached notes for all abbreviations and acronyms

J E Sample No.	1-3	4-6	7-9	10-12	13-15	16-18	19-21	22-24	25-27	28-30			
Sample ID	TP01	TP06	TP02	TP06	TP02	TP06	TP03	TP03	TP03	TP04			
Depth	0.60-1.60	0.80-1.00	0.60-1.00	1.00-2.00	1.00-2.10	2.00-2.40	0.00-1.00	1.00-2.00	2.00-3.10	0.45-0.90			
COC No / misc													
Containers	V J T	V J T	V J T	V J T	V J T	V J T	V J T	V J T	V J T	V J T			
Sample Date	19/02/2019	20/02/2019	20/02/2019	20/02/2019	20/02/2019	20/02/2019	19/02/2019	19/02/2019	19/02/2019	19/02/2019			
Sample Type	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil			
Batch Number	1	1	1	1	1	1	1	1	1	1	LOD/LOR	Units	Method No.
Date of Receipt	25/02/2019	25/02/2019	25/02/2019	25/02/2019	25/02/2019	25/02/2019	25/02/2019	25/02/2019	25/02/2019	25/02/2019			
Dissolved Antimony #	<0.002	<0.002	<0.002	<0.002	<0.002	<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	<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	0.0044	0.0035	0.0051	0.0040	<0.0025	mg/l	TM30/PM17
Dissolved Arsenic (A10) #	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	0.044	0.035	0.051	0.040	<0.025	mg/kg	TM30/PM17
Dissolved Barium #	0.005	0.006	0.006	0.055	0.008	0.045	0.004	0.010	0.007	<0.003	<0.003	mg/l	TM30/PM17
Dissolved Barium (A10) #	0.05	0.06	0.06	0.55	0.08	0.45	0.04	0.10	0.07	<0.03	<0.03	mg/kg	TM30/PM17
Dissolved Cadmium #	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<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	<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	<0.0015	0.0020	0.0034	<0.0015	<0.0015	mg/l	TM30/PM17
Dissolved Chromium (A10) #	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	0.020	0.034	<0.015	<0.015	mg/kg	TM30/PM17
Dissolved Copper #	<0.007	<0.007	<0.007	<0.007	<0.007	<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	<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	<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	<0.05	<0.05	<0.05	<0.05	<0.05	mg/kg	TM30/PM17
Dissolved Molybdenum #	0.006	0.007	0.002	0.019	<0.002	0.015	<0.002	0.006	0.003	0.005	<0.002	mg/l	TM30/PM17
Dissolved Molybdenum (A10) #	0.06	0.07	0.02	0.19	<0.02	0.15	<0.02	0.06	0.03	0.05	<0.02	mg/kg	TM30/PM17
Dissolved Nickel #	<0.002	<0.002	<0.002	<0.002	<0.002	<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	<0.02	<0.02	<0.02	<0.02	<0.02	mg/kg	TM30/PM17
Dissolved Selenium #	<0.003	<0.003	<0.003	0.029	<0.003	0.019	<0.003	0.006	<0.003	<0.003	<0.003	mg/l	TM30/PM17
Dissolved Selenium (A10) #	<0.03	<0.03	<0.03	0.29	<0.03	0.19	<0.03	0.06	<0.03	<0.03	<0.03	mg/kg	TM30/PM17
Dissolved Zinc #	<0.003	<0.003	<0.003	0.003	<0.003	<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	<0.03	<0.03	<0.03	<0.03	<0.03	mg/kg	TM30/PM17
Mercury Dissolved by CVAF #	<0.00001	<0.00001	<0.00001	0.00011	<0.00001	0.00006	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	mg/l	TM61/PM0
Mercury Dissolved by CVAF #	<0.0001	<0.0001	<0.0001	0.0011	<0.0001	0.0006	<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	<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	<0.1	<0.1	<0.1	<0.1	<0.1	mg/kg	TM26/PM0
Fluoride	0.4	0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	mg/l	TM173/PM0
Fluoride	4	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	mg/kg	TM173/PM0
Sulphate as SO4 #	5.2	1.2	18.5	26.4	10.6	18.4	36.6	69.7	44.3	11.7	<0.5	mg/l	TM38/PM0
Sulphate as SO4 #	52	12	185	264	106	184	366	697	443	117	<5	mg/kg	TM38/PM0
Chloride #	0.4	0.3	<0.3	9.8	<0.3	6.4	<0.3	0.5	0.3	0.3	<0.3	mg/l	TM38/PM0
Chloride #	4	<3	<3	98	<3	64	<3	5	<3	<3	<3	mg/kg	TM38/PM0
Dissolved Organic Carbon	<2	<2	<2	<2	<2	<2	<2	<2	2	<2	<2	mg/l	TM60/PM0
Dissolved Organic Carbon	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	mg/kg	TM60/PM0
pH	7.49	7.89	8.20	8.00	8.25	8.08	10.58	10.71	10.98	8.57	<0.01	pH units	TM73/PM0
Total Dissolved Solids #	92	58	86	106	100	85	153	220	158	106	<35	mg/l	TM20/PM0
Total Dissolved Solids #	920	580	860	1060	1000	850	1530	2199	1579	1060	<350	mg/kg	TM20/PM0

Client Name: Ground Investigations Ireland
Reference: 8408.01.19
Location: Sandyford Central
Contact: Conor Finnerty
JE Job No.: 19/3052

Report : CEN 10:1 1 Batch

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

Please see attached notes for all abbreviations and acronyms

J E Sample No.	31-33	34-36	37-39	40-42	43-45	46-48					LOD/LOR	Units	Method No.
Sample ID	TP04	TP05	TP05	TP05	SA02	SA02							
Depth	0.90-2.00	0.35-1.00	1.00-2.00	2.00-3.10	0.50-1.00	1.00-1.80							
COC No / misc													
Containers	V J T	V J T	V J T	V J T	V J T	V J T							
Sample Date	19/02/2019	19/02/2019	19/02/2019	19/02/2019	20/02/2019	20/02/2019							
Sample Type	Soil	Soil	Soil	Soil	Soil	Soil							
Batch Number	1	1	1	1	1	1							
Date of Receipt	25/02/2019	25/02/2019	25/02/2019	25/02/2019	25/02/2019	25/02/2019							
Dissolved Antimony #	<0.002	<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					<0.02	mg/kg	TM30/PM17
Dissolved Arsenic #	<0.0025	<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					<0.025	mg/kg	TM30/PM17
Dissolved Barium #	<0.003	0.137	0.052	0.055	0.006	0.005					<0.003	mg/l	TM30/PM17
Dissolved Barium (A10) #	<0.03	1.37	0.52	0.55	0.06	0.05					<0.03	mg/kg	TM30/PM17
Dissolved Cadmium #	<0.0005	<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					<0.005	mg/kg	TM30/PM17
Dissolved Chromium #	<0.0015	<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					<0.015	mg/kg	TM30/PM17
Dissolved Copper #	<0.007	<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					<0.07	mg/kg	TM30/PM17
Dissolved Lead #	<0.005	<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					<0.05	mg/kg	TM30/PM17
Dissolved Molybdenum #	0.006	0.012	0.025	0.014	0.006	0.018					<0.002	mg/l	TM30/PM17
Dissolved Molybdenum (A10) #	0.06	0.12	0.25	0.14	0.06	0.18					<0.02	mg/kg	TM30/PM17
Dissolved Nickel #	<0.002	<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					<0.02	mg/kg	TM30/PM17
Dissolved Selenium #	0.069	<0.003	<0.003	0.024	<0.003	<0.003					<0.003	mg/l	TM30/PM17
Dissolved Selenium (A10) #	0.69	<0.03	<0.03	0.24	<0.03	<0.03					<0.03	mg/kg	TM30/PM17
Dissolved Zinc #	<0.003	<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					<0.03	mg/kg	TM30/PM17
Mercury Dissolved by CVAF #	<0.00001	<0.00001	<0.00001	0.00008	<0.00001	<0.00001					<0.00001	mg/l	TM61/PM0
Mercury Dissolved by CVAF #	<0.0001	<0.0001	<0.0001	0.0008	<0.0001	<0.0001					<0.0001	mg/kg	TM61/PM0
Phenol	<0.01	<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					<0.1	mg/kg	TM26/PM0
Fluoride	<0.3	<0.3	0.3	<0.3	0.8	<0.3					<0.3	mg/l	TM173/PM0
Fluoride	<3	<3	<3	<3	8	<3					<3	mg/kg	TM173/PM0
Sulphate as SO4 #	4.8	16.2	0.5	23.1	1.8	3.2					<0.5	mg/l	TM38/PM0
Sulphate as SO4 #	48	162	<5	231	18	32					<5	mg/kg	TM38/PM0
Chloride #	0.3	<0.3	<0.3	8.5	0.4	0.4					<0.3	mg/l	TM38/PM0
Chloride #	3	<3	<3	85	4	4					<3	mg/kg	TM38/PM0
Dissolved Organic Carbon	3	3	2	<2	<2	<2					<2	mg/l	TM60/PM0
Dissolved Organic Carbon	30	30	<20	<20	<20	<20					<20	mg/kg	TM60/PM0
pH	8.34	8.23	8.20	7.56	8.02	8.17					<0.01	pH units	TM73/PM0
Total Dissolved Solids #	72	174	66	130	88	148					<35	mg/l	TM20/PM0
Total Dissolved Solids #	720	1739	660	1299	880	1480					<350	mg/kg	TM20/PM0

Exova Jones Environmental

Client Name: Ground Investigations Ireland
Reference: 8408.01.19
Location: Sandyford Central
Contact: Conor Finnerty
JE Job No.: 19/3052

Report : **EN12457_2**

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

Please see attached notes for all abbreviations and acronyms

J E Sample No.	1-3	4-6	7-9	10-12	13-15	16-18	19-21	22-24	25-27	28-30						
Sample ID	TP01	TP06	TP02	TP06	TP02	TP06	TP03	TP03	TP03	TP04						
Depth	0.60-1.60	0.80-1.00	0.60-1.00	1.00-2.00	1.00-2.10	2.00-2.40	0.00-1.00	1.00-2.00	2.00-3.10	0.45-0.90						
COC No / misc																
Containers	V J T	V J T	V J T	V J T	V J T	V J T	V J T	V J T	V J T	V J T						
Sample Date	19/02/2019	20/02/2019	20/02/2019	20/02/2019	20/02/2019	20/02/2019	19/02/2019	19/02/2019	19/02/2019	19/02/2019						
Sample Type	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil						
Batch Number	1	1	1	1	1	1	1	1	1	1	Inert	Stable Non-reactive	Hazardous	LOD LOR	Units	Method No.
Date of Receipt	25/02/2019	25/02/2019	25/02/2019	25/02/2019	25/02/2019	25/02/2019	25/02/2019	25/02/2019	25/02/2019	25/02/2019						
Solid Waste Analysis																
Total Organic Carbon #	0.36	0.40	0.22	0.66	0.15	0.44	0.34	0.34	0.20	0.26	3	5	6	<0.02	%	TM21/PM24
Sum of BTEX	<0.025	<0.025	<0.025	<0.025[SV]	<0.025	<0.025[SV]	<0.025	<0.025[SV]	<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	<0.035	<0.035	<0.035	<0.035	<0.035	1	-	-	<0.035	mg/kg	TM17/PM8
Mineral Oil	<30	<30	<30	<30	<30	<30	130	164	74	<30	500	-	-	<30	mg/kg	TM5/PM8/PM16
PAH Sum of 6 #	<0.22	<0.22	<0.22	<0.22	<0.22	<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	<0.64	<0.64	<0.64	<0.64	<0.64	100	-	-	<0.64	mg/kg	TM4/PM8
CEN 10:1 Leachate																
Arsenic #	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	0.044	0.035	0.051	0.040	0.5	2	25	<0.025	mg/kg	TM30/PM17
Barium #	0.05	0.06	0.06	0.55	0.08	0.45	0.04	0.10	0.07	<0.03	20	100	300	<0.03	mg/kg	TM30/PM17
Cadmium #	<0.005	<0.005	<0.005	<0.005	<0.005	<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	<0.015	<0.015	0.020	0.034	<0.015	0.5	10	70	<0.015	mg/kg	TM30/PM17
Copper #	<0.07	<0.07	<0.07	<0.07	<0.07	<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	0.0011	<0.0001	0.0006	<0.0001	<0.0001	<0.0001	<0.0001	0.01	0.2	2	<0.0001	mg/kg	TM61/PM0
Molybdenum #	0.06	0.07	0.02	0.19	<0.02	0.15	<0.02	0.06	0.03	0.05	0.5	10	30	<0.02	mg/kg	TM30/PM17
Nickel #	<0.02	<0.02	<0.02	<0.02	<0.02	<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	<0.05	<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	<0.02	<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	0.29	<0.03	0.19	<0.03	0.06	<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	<0.03	<0.03	<0.03	<0.03	<0.03	4	50	200	<0.03	mg/kg	TM30/PM17
Total Dissolved Solids #	920	580	860	1060	1000	850	1530	2199	1579	1060	4000	60000	100000	<350	mg/kg	TM20/PM0
Dissolved Organic Carbon	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	500	800	1000	<20	mg/kg	TM60/PM0
Mass of raw test portion	0.1004	0.1055	0.1019	0.0984	0.1007	0.0999	0.1005	0.1029	0.0982	0.0996	-	-	-		kg	NONE/PM17
Dry Matter Content Ratio	90.1	85.7	88.2	91.2	88.9	90.3	89.2	87.6	91.4	90.4	-	-	-	<0.1	%	NONE/PM4
Leachant Volume	0.89	0.885	0.888	0.891	0.889	0.89	0.889	0.887	0.891	0.89	-	-	-		l	NONE/PM17
Eluate Volume	0.7	0.85	0.7	0.69	0.85	0.64	0.8	0.8	0.8	0.8	-	-	-		l	NONE/PM17
pH #	8.67	8.59	8.56	8.48	8.80	8.52	10.65	9.35	10.74	8.97	-	-	-	<0.01	pH units	TM73/PM11
Phenol	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	1	-	-	<0.1	mg/kg	TM26/PM0
Fluoride	4	<3	<3	<3	<3	<3	<3	<3	<3	<3	-	-	-	<3	mg/kg	TM173/PM0
Sulphate as SO4 #	52	12	185	264	106	184	366	697	443	117	1000	20000	50000	<5	mg/kg	TM38/PM0
Chloride #	4	<3	<3	98	<3	64	<3	5	<3	<3	800	15000	25000	<3	mg/kg	TM38/PM0

Exova Jones Environmental

Client Name:	Ground Investigations Ireland	**Report :**	**EN12457_2**
Reference:	8408.01.19		
Location:	Sandyford Central	**Solids:** V=60g VOC jar, J=250g glass jar, T=plastic tub	
Contact:	Conor Finnerty		
JE Job No.:	19/3052		

Please see attached notes for all abbreviations and acronyms

J E Sample No.	31-33	34-36	37-39	40-42	43-45	46-48	Inert	Stable Non-reactive	Hazardous	LOD LOR	Units	Method No.
Sample ID	TP04	TP05	TP05	TP05	SA02	SA02						
Depth	0.90-2.00	0.35-1.00	1.00-2.00	2.00-3.10	0.50-1.00	1.00-1.80						
COC No / misc												
Containers	V J T	V J T	V J T	V J T	V J T	V J T						
Sample Date	19/02/2019	19/02/2019	19/02/2019	19/02/2019	20/02/2019	20/02/2019						
Sample Type	Soil	Soil	Soil	Soil	Soil	Soil						
Batch Number	1	1	1	1	1	1						
Date of Receipt	25/02/2019	25/02/2019	25/02/2019	25/02/2019	25/02/2019	25/02/2019						
Solid Waste Analysis												
Total Organic Carbon #	0.51	0.33	0.75	0.60	0.31	0.43	3	5	6	<0.02	%	TM21/PM24
Sum of BTEX	<0.025[SV]	<0.025	<0.025[SV]	<0.025[SV]	<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	<0.035	1	-	-	<0.035	mg/kg	TM17/PM8
Mineral Oil	<30	<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	-	-	-	<0.22	mg/kg	TM4/PM8
PAH Sum of 17	<0.64	<0.64	<0.64	<0.64	<0.64	<0.64	100	-	-	<0.64	mg/kg	TM4/PM8
CEN 10:1 Leachate												
Arsenic #	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	0.5	2	25	<0.025	mg/kg	TM30/PM17
Barium #	<0.03	1.37	0.52	0.55	0.06	0.05	20	100	300	<0.03	mg/kg	TM30/PM17
Cadmium #	<0.005	<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	<0.015	0.5	10	70	<0.015	mg/kg	TM30/PM17
Copper #	<0.07	<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	0.0008	<0.0001	<0.0001	0.01	0.2	2	<0.0001	mg/kg	TM61/PM0
Molybdenum #	0.06	0.12	0.25	0.14	0.06	0.18	0.5	10	30	<0.02	mg/kg	TM30/PM17
Nickel #	<0.02	<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	<0.05	0.5	10	50	<0.05	mg/kg	TM30/PM17
Antimony #	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.06	0.7	5	<0.02	mg/kg	TM30/PM17
Selenium #	0.69	<0.03	<0.03	0.24	<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	<0.03	4	50	200	<0.03	mg/kg	TM30/PM17
Total Dissolved Solids #	720	1739	660	1299	880	1480	4000	60000	100000	<350	mg/kg	TM20/PM0
Dissolved Organic Carbon	30	30	<20	<20	<20	<20	500	800	1000	<20	mg/kg	TM60/PM0
Mass of raw test portion	0.0993	0.1045	0.1012	0.1003	0.1053	0.1098	-	-	-		kg	NONE/PM17
Dry Matter Content Ratio	90.8	86.1	89.4	89.4	85.9	81.6	-	-	-	<0.1	%	NONE/PM4
Leachant Volume	0.891	0.885	0.889	0.889	0.885	0.88	-	-	-		l	NONE/PM17
Eluate Volume	0.8	0.8	0.85	0.7	0.8	0.78	-	-	-		l	NONE/PM17
pH #	8.74	8.48	8.68	8.43	8.28	8.67	-	-	-	<0.01	pH units	TM73/PM11
Phenol	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	1	-	-	<0.1	mg/kg	TM26/PM0
Fluoride	<3	<3	<3	<3	8	<3	-	-	-	<3	mg/kg	TM173/PM0
Sulphate as SO4 #	48	162	<5	231	18	32	1000	20000	50000	<5	mg/kg	TM38/PM0
Chloride #	3	<3	<3	85	4	4	800	15000	25000	<3	mg/kg	TM38/PM0

Exova Jones Environmental **EPH Interpretation Report**

Client Name: Ground Investigations Ireland
Reference: 8408.01.19
Location: Sandyford Central
Contact: Conor Finnerty

Matrix : Solid

J E Job No.	Batch	Sample ID	Depth	J E Sample No.	EPH Interpretation
19/3052	1	TP01	0.60-1.60	1-3	No interpretation possible
19/3052	1	TP06	0.80-1.00	4-6	No interpretation possible
19/3052	1	TP02	0.60-1.00	7-9	No interpretation possible
19/3052	1	TP06	1.00-2.00	10-12	No interpretation possible
19/3052	1	TP02	1.00-2.10	13-15	No interpretation possible
19/3052	1	TP06	2.00-2.40	16-18	No interpretation possible
19/3052	1	TP03	0.00-1.00	19-21	Lubricating oil & Possible degraded diesel
19/3052	1	TP03	1.00-2.00	22-24	Degraded diesel
19/3052	1	TP03	2.00-3.10	25-27	Lubricating oil & Possible trace of degraded diesel
19/3052	1	TP04	0.45-0.90	28-30	No interpretation possible
19/3052	1	TP04	0.90-2.00	31-33	No interpretation possible
19/3052	1	TP05	0.35-1.00	34-36	No interpretation possible
19/3052	1	TP05	1.00-2.00	37-39	No interpretation possible
19/3052	1	TP05	2.00-3.10	40-42	No interpretation possible
19/3052	1	SA02	0.50-1.00	43-45	No interpretation possible
19/3052	1	SA02	1.00-1.80	46-48	No interpretation possible

Client Name: Ground Investigations Ireland
Reference: 8408.01.19
Location: Sandyford Central
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
19/3052	1	TP01	0.60-1.60	2	28/02/2019	**General Description (Bulk Analysis)**	soil-stones
					28/02/2019	**Asbestos Fibres**	NAD
					28/02/2019	**Asbestos ACM**	NAD
					28/02/2019	**Asbestos Type**	NAD
					28/02/2019	**Asbestos Level Screen**	NAD
19/3052	1	TP06	0.80-1.00	5	28/02/2019	**General Description (Bulk Analysis)**	soil-stones
					28/02/2019	**Asbestos Fibres**	NAD
					28/02/2019	**Asbestos ACM**	NAD
					28/02/2019	**Asbestos Type**	NAD
					28/02/2019	**Asbestos Level Screen**	NAD
19/3052	1	TP02	0.60-1.00	8	28/02/2019	**General Description (Bulk Analysis)**	soil-stones
					28/02/2019	**Asbestos Fibres**	NAD
					28/02/2019	**Asbestos ACM**	NAD
					28/02/2019	**Asbestos Type**	NAD
					28/02/2019	**Asbestos Level Screen**	NAD
19/3052	1	TP06	1.00-2.00	11	28/02/2019	**General Description (Bulk Analysis)**	soils-tones
					28/02/2019	**Asbestos Fibres**	NAD
					28/02/2019	**Asbestos ACM**	NAD
					28/02/2019	**Asbestos Type**	NAD
					28/02/2019	**Asbestos Level Screen**	NAD
19/3052	1	TP02	1.00-2.10	14	28/02/2019	**General Description (Bulk Analysis)**	soil-stones
					28/02/2019	**Asbestos Fibres**	NAD
					28/02/2019	**Asbestos ACM**	NAD
					28/02/2019	**Asbestos Type**	NAD
					28/02/2019	**Asbestos Level Screen**	NAD
19/3052	1	TP06	2.00-2.40	17	28/02/2019	**General Description (Bulk Analysis)**	soil-stones
					28/02/2019	**Asbestos Fibres**	NAD
					28/02/2019	**Asbestos ACM**	NAD
					28/02/2019	**Asbestos Type**	NAD
					28/02/2019	**Asbestos Level Screen**	NAD
19/3052	1	TP03	0.00-1.00	20	28/02/2019	**General Description (Bulk Analysis)**	Soil/Stones
					28/02/2019	**Asbestos Fibres**	NAD
					28/02/2019	**Asbestos ACM**	NAD

Client Name: Ground Investigations Ireland
Reference: 8408.01.19
Location: Sandyford Central
Contact: Conor Finnerty

J E Job No.	Batch	Sample ID	Depth	J E Sample No.	Date Of Analysis	Analysis	Result
19/3052	1	TP03	0.00-1.00	20	28/02/2019	**Asbestos Type**	NAD
					28/02/2019	**Asbestos Level Screen**	NAD
19/3052	1	TP03	1.00-2.00	23	28/02/2019	**General Description (Bulk Analysis)**	Soil/Stones
					28/02/2019	**Asbestos Fibres**	NAD
					28/02/2019	**Asbestos ACM**	NAD
					28/02/2019	**Asbestos Type**	NAD
					28/02/2019	**Asbestos Level Screen**	NAD
19/3052	1	TP03	2.00-3.10	26	28/02/2019	**General Description (Bulk Analysis)**	Soil/Stones
					28/02/2019	**Asbestos Fibres**	NAD
					28/02/2019	**Asbestos ACM**	NAD
					28/02/2019	**Asbestos Type**	NAD
					28/02/2019	**Asbestos Level Screen**	NAD
19/3052	1	TP04	0.45-0.90	29	28/02/2019	**General Description (Bulk Analysis)**	soil/stones
					28/02/2019	**Asbestos Fibres**	NAD
					28/02/2019	**Asbestos ACM**	NAD
					28/02/2019	**Asbestos Type**	NAD
					28/02/2019	**Asbestos Level Screen**	NAD
19/3052	1	TP04	0.90-2.00	32	28/02/2019	**General Description (Bulk Analysis)**	soil.stones
					28/02/2019	**Asbestos Fibres**	NAD
					28/02/2019	**Asbestos ACM**	NAD
					28/02/2019	**Asbestos Type**	NAD
					28/02/2019	**Asbestos Level Screen**	NAD
19/3052	1	TP05	0.35-1.00	35	28/02/2019	**General Description (Bulk Analysis)**	soil.stones
					28/02/2019	**Asbestos Fibres**	NAD
					28/02/2019	**Asbestos ACM**	NAD
					28/02/2019	**Asbestos Type**	NAD
					28/02/2019	**Asbestos Level Screen**	NAD
19/3052	1	TP05	1.00-2.00	38	28/02/2019	**General Description (Bulk Analysis)**	soil/stones
					28/02/2019	**Asbestos Fibres**	NAD
					28/02/2019	**Asbestos ACM**	NAD
					28/02/2019	**Asbestos Type**	NAD
					28/02/2019	**Asbestos Level Screen**	NAD
19/3052	1	TP05	2.00-3.10	41	28/02/2019	**General Description (Bulk Analysis)**	soil/stones
					28/02/2019	**Asbestos Fibres**	NAD
					28/02/2019	**Asbestos ACM**	NAD
					28/02/2019	**Asbestos Type**	NAD
					28/02/2019	**Asbestos Level Screen**	NAD
19/3052	1	SA02	0.50-1.00	44	28/02/2019	**General Description (Bulk Analysis)**	soil.stones
					28/02/2019	**Asbestos Fibres**	NAD
					28/02/2019	**Asbestos ACM**	NAD
					28/02/2019	**Asbestos Type**	NAD
					28/02/2019	**Asbestos Level Screen**	NAD
19/3052	1	SA02	1.00-1.80	47	28/02/2019	**General Description (Bulk Analysis)**	soil.stones
					28/02/2019	**Asbestos Fibres**	NAD

Client Name: Ground Investigations Ireland
Reference: 8408.01.19
Location: Sandyford Central
Contact: Conor Finnerty

J E Job No.	Batch	Sample ID	Depth	J E Sample No.	Date Of Analysis	Analysis	Result
19/3052	1	SA02	1.00-1.80	47	28/02/2019	**Asbestos ACM**	NAD
					28/02/2019	**Asbestos Type**	NAD
					28/02/2019	**Asbestos Level Screen**	NAD

Client Name: Ground Investigations Ireland
Reference: 8408.01.19
Location: Sandyford Central
Contact: Conor Finnerty

J E Job No.	Batch	Sample ID	Depth	J E Sample No.	Analysis	Reason
No deviating sample report results for job 19/3052						

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.: 19/3052

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 overesitimate 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.

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.: 19/3052

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 spectrometic 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 amouns of acid or base needed to cover the pH range

Notes:

*If not suitable due to LOD, precision, etc., any other suitable method can be used, e.g. AFS, ICP-MS
**PCB-28, PCB-52, PCB-101, PCB-118, PCB-138, PCB-153 and PCB-180

***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.

JE Job No: 19/3052

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/SANAS)	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: 19/3052

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/SANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM22	Modified BS1377-3:1990 Gravimetric determination of Loss on Ignition by temperature controlled Muffle Furnace (35C-440C). On request modified ASTM D2974-00 LOI (105C-440C)	PM0	No preparation is required.	Yes		AD	Yes
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 BS 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 Methyltertbutylether, 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 Methyltertbutylether, 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

JE Job No: 19/3052

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/SANAS)	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		AD	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		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 BS 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.				

JE Job No: 19/3052

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/SANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
NONE	No Method Code	PM17	Modified method BS 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	
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	

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Catherinestown House
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Ireland

Attention :	Conor Finnerty
Date :	17th July, 2019
Your reference :	8408.01.19
Our reference :	Test Report 19/10728 Batch 1
Location :	Sandyford Central
Date samples received :	3rd July, 2019
Status :	Final report
Issue :	1

Five samples were received for analysis on 3rd July, 2019 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:

Bruce Leslie
Project Manager

Please include all sections of this report if it is reproduced

Client Name: Ground Investigations Ireland
Reference: 8408.01.19
Location: Sandyford Central
Contact: Conor Finnerty
EMT Job No: 19/10728

Report : Solid

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

Please see attached notes for all abbreviations and acronyms

EMT Sample No.	1-3	4-6	7-9	10-12	13-15						LOD/LOR	Units	Method No.
Sample ID	TP101	TP101	TP101	TP102	TP102								
Depth	0.20-1.00	1.00-2.00	2.00-3.10	0.20-1.00	1.00-2.00								
COC No / misc													
Containers	V J T	V J T	V J T	V J T	V J T								
Sample Date	28/06/2019	28/06/2019	28/06/2019	28/06/2019	28/06/2019								
Sample Type	Soil	Soil	Soil	Soil	Soil								
Batch Number	1	1	1	1	1								
Date of Receipt	03/07/2019	03/07/2019	03/07/2019	03/07/2019	03/07/2019								
Antimony	2	1	2	1	1						<1	mg/kg	TM30/PM15
Arsenic #	27.6	8.8	20.4	14.2	13.4						<0.5	mg/kg	TM30/PM15
Barium #	203	65	81	57	47						<1	mg/kg	TM30/PM15
Cadmium #	3.3	0.7	1.1	0.6	1.5						<0.1	mg/kg	TM30/PM15
Chromium #	61.2	46.1	59.8	64.5	44.1						<0.5	mg/kg	TM30/PM15
Copper #	32	20	32	21	25						<1	mg/kg	TM30/PM15
Lead #	53	13	30	53	30						<5	mg/kg	TM30/PM15
Mercury #	<0.1	<0.1	<0.1	<0.1	<0.1						<0.1	mg/kg	TM30/PM15
Molybdenum #	3.3	1.9	2.3	2.9	3.2						<0.1	mg/kg	TM30/PM15
Nickel #	39.0	31.0	51.5	32.2	36.6						<0.7	mg/kg	TM30/PM15
Selenium #	2	<1	2	1	2						<1	mg/kg	TM30/PM15
Zinc #	170	66	140	103	116						<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	94	96	91	95	94						<0	%	TM4/PM8
Mineral Oil (C10-C40)	<30	<30	<30	<30	<30						<30	mg/kg	TM5/PM8/PM16

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All solid results are expressed on a dry weight basis unless stated otherwise.

Element Materials Technology

Client Name: Ground Investigations Ireland
Reference: 8408.01.19
Location: Sandyford Central
Contact: Conor Finnerty
EMT Job No: 19/10728

Report : **Solid**

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

Please see attached notes for all abbreviations and acronyms

EMT Sample No.	1-3	4-6	7-9	10-12	13-15						LOD/LOR	Units	Method No.
Sample ID	TP101	TP101	TP101	TP102	TP102								
Depth	0.20-1.00	1.00-2.00	2.00-3.10	0.20-1.00	1.00-2.00								
COC No / misc													
Containers	V J T	V J T	V J T	V J T	V J T								
Sample Date	28/06/2019	28/06/2019	28/06/2019	28/06/2019	28/06/2019								
Sample Type	Soil	Soil	Soil	Soil	Soil								
Batch Number	1	1	1	1	1								
Date of Receipt	03/07/2019	03/07/2019	03/07/2019	03/07/2019	03/07/2019								
TPH CWG													
Aliphatics													
>C5-C6 #	<0.1	<0.1	<0.1 SV	<0.1	<0.1						<0.1	mg/kg	TM36/PM12
>C6-C8 #	<0.1	<0.1	<0.1 SV	<0.1	<0.1						<0.1	mg/kg	TM36/PM12
>C8-C10	<0.1	<0.1	<0.1 SV	<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	TM5/PM8/PM16
>C12-C16 #	<4	<4	<4	<4	<4						<4	mg/kg	TM5/PM8/PM16
>C16-C21 #	<7	<7	<7	<7	<7						<7	mg/kg	TM5/PM8/PM16
>C21-C35 #	<7	<7	<7	<7	<7						<7	mg/kg	TM5/PM8/PM16
>C35-C40	<7	<7	<7	<7	<7						<7	mg/kg	TM5/PM8/PM16
Total aliphatics C5-40	<26	<26	<26	<26	<26						<26	mg/kg	TM5/TM36/PM8/PM12/PM16
>C6-C10	<0.1	<0.1	<0.1 SV	<0.1	<0.1						<0.1	mg/kg	TM36/PM12
>C10-C25	<10	<10	<10	<10	<10						<10	mg/kg	TM5/PM8/PM16
>C25-C35	<10	<10	<10	<10	<10						<10	mg/kg	TM5/PM8/PM16
Aromatics													
>C5-EC7 #	<0.1	<0.1	<0.1 SV	<0.1	<0.1						<0.1	mg/kg	TM36/PM12
>EC7-EC8 #	<0.1	<0.1	<0.1 SV	<0.1	<0.1						<0.1	mg/kg	TM36/PM12
>EC8-EC10 #	<0.1	<0.1	<0.1 SV	<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	TM5/PM8/PM16
>EC12-EC16 #	<4	<4	<4	<4	<4						<4	mg/kg	TM5/PM8/PM16
>EC16-EC21 #	<7	<7	<7	<7	<7						<7	mg/kg	TM5/PM8/PM16
>EC21-EC35 #	<7	<7	<7	<7	<7						<7	mg/kg	TM5/PM8/PM16
>EC35-EC40	<7	<7	<7	<7	<7						<7	mg/kg	TM5/PM8/PM16
Total aromatics C5-40	<26	<26	<26	<26	<26						<26	mg/kg	TM5/TM36/PM8/PM12/PM16
Total aliphatics and aromatics(C5-40)	<52	<52	<52	<52	<52						<52	mg/kg	TM5/TM36/PM8/PM12/PM16
>EC6-EC10 #	<0.1	<0.1	<0.1 SV	<0.1	<0.1						<0.1	mg/kg	TM36/PM12
>EC10-EC25	<10	<10	<10	<10	<10						<10	mg/kg	TM5/PM8/PM16
>EC25-EC35	<10	<10	<10	<10	<10						<10	mg/kg	TM5/PM8/PM16
MTBE #	<5	<5	<5 SV	<5	<5						<5	ug/kg	TM31/PM12
Benzene #	<5	<5	<5 SV	<5	<5						<5	ug/kg	TM31/PM12
Toluene #	<5	<5	<5 SV	<5	<5						<5	ug/kg	TM31/PM12
Ethylbenzene #	<5	<5	<5 SV	<5	<5						<5	ug/kg	TM31/PM12
m/p-Xylene #	<5	<5	<5 SV	<5	<5						<5	ug/kg	TM31/PM12
o-Xylene #	<5	<5	<5 SV	<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: 8408.01.19
Location: Sandyford Central
Contact: Conor Finnerty
EMT Job No: 19/10728

Report : Solid

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

Please see attached notes for all abbreviations and acronyms

EMT Sample No.	1-3	4-6	7-9	10-12	13-15								
Sample ID	TP101	TP101	TP101	TP102	TP102								
Depth	0.20-1.00	1.00-2.00	2.00-3.10	0.20-1.00	1.00-2.00								
COC No / misc													
Containers	V J T	V J T	V J T	V J T	V J T								
Sample Date	28/06/2019	28/06/2019	28/06/2019	28/06/2019	28/06/2019								
Sample Type	Soil	Soil	Soil	Soil	Soil								
Batch Number	1	1	1	1	1						LOD/LOR	Units	Method No.
Date of Receipt	03/07/2019	03/07/2019	03/07/2019	03/07/2019	03/07/2019								
Natural Moisture Content	30.4	9.8	12.1	12.6	14.3						<0.1	%	PM4/PM0
Moisture Content (% Wet Weight)	23.3	8.9	10.8	11.2	12.5						<0.1	%	PM4/PM0
Hexavalent Chromium #	<0.3	<0.3	<0.3	<0.3	<0.3						<0.3	mg/kg	TM38/PM20
Chromium III	61.2	46.1	59.8	64.5	44.1						<0.5	mg/kg	NONE/NONE
Total Organic Carbon #	1.75	0.16	0.20	0.47	0.20						<0.02	%	TM21/PM24
Loss on Ignition #	6.8	1.8	1.9	2.5	1.7						<1.0	%	TM22/PM0
pH #	8.19	8.88	8.91	9.72	8.91						<0.01	pH units	TM73/PM11
Mass of raw test portion	0.1104	0.0979	0.0982	0.1008	0.1038							kg	NONE/PM17
Mass of dried test portion	0.09	0.09	0.09	0.09	0.09							kg	NONE/PM17

Please include all sections of this report if it is reproduced
All solid results are expressed on a dry weight basis unless stated otherwise.

Element Materials Technology

Client Name:	Ground Investigations Ireland	**Report :**	**CEN 10:1 1 Batch**
Reference:	8408.01.19		
Location:	Sandyford Central	**Solids:**	V=60g VOC jar, J=250g glass jar, T=plastic tub
Contact:	Conor Finnerty		
EMT Job No:	19/10728		

Please see attached notes for all abbreviations and acronyms

EMT Sample No.	1-3	4-6	7-9	10-12	13-15	LOD/LOR	Units	Method No.
Sample ID	TP101	TP101	TP101	TP102	TP102			
Depth	0.20-1.00	1.00-2.00	2.00-3.10	0.20-1.00	1.00-2.00			
COC No / misc								
Containers	V J T	V J T	V J T	V J T	V J T			
Sample Date	28/06/2019	28/06/2019	28/06/2019	28/06/2019	28/06/2019			
Sample Type	Soil	Soil	Soil	Soil	Soil			
Batch Number	1	1	1	1	1			
Date of Receipt	03/07/2019	03/07/2019	03/07/2019	03/07/2019	03/07/2019			
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	0.0082	<0.0025	<0.0025	mg/l	TM30/PM17
Dissolved Arsenic (A10) #	<0.025	<0.025	<0.025	0.082	<0.025	<0.025	mg/kg	TM30/PM17
Dissolved Barium #	0.015	<0.003	0.005	<0.003	0.006	<0.003	mg/l	TM30/PM17
Dissolved Barium (A10) #	0.15	<0.03	0.05	<0.03	0.06	<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	0.0037	<0.0015	<0.0015	mg/l	TM30/PM17
Dissolved Chromium (A10) #	<0.015	<0.015	<0.015	0.037	<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 #	0.006	0.004	0.002	0.009	0.007	<0.002	mg/l	TM30/PM17
Dissolved Molybdenum (A10) #	0.06	0.04	<0.02	0.09	0.07	<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	0.005	<0.003	<0.003	mg/l	TM30/PM17
Dissolved Selenium (A10) #	<0.03	<0.03	<0.03	0.05	<0.03	<0.03	mg/kg	TM30/PM17
Dissolved Zinc #	0.004	<0.003	<0.003	<0.003	<0.003	<0.003	mg/l	TM30/PM17
Dissolved Zinc (A10) #	0.04	<0.03	<0.03	<0.03	<0.03	<0.03	mg/kg	TM30/PM17
Mercury Dissolved by CVAF #	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	mg/l	TM61/PM0
Mercury Dissolved by CVAF #	<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	0.3	<0.3	<0.3	<0.3	<0.3	<0.3	mg/l	TM173/PM0
Fluoride	<3	<3	<3	<3	<3	<3	mg/kg	TM173/PM0
Sulphate as SO4 #	24.1	1.8	1.3	11.0	2.1	<0.5	mg/l	TM38/PM0
Sulphate as SO4 #	241	18	13	110	21	<5	mg/kg	TM38/PM0
Chloride #	0.7	0.5	0.5	0.7	0.6	<0.3	mg/l	TM38/PM0
Chloride #	7	5	5	7	6	<3	mg/kg	TM38/PM0
Dissolved Organic Carbon	7	<2	2	5	2	<2	mg/l	TM60/PM0
Dissolved Organic Carbon	70	<20	<20	50	20	<20	mg/kg	TM60/PM0
pH	7.76	7.87	7.66	9.88	8.05	<0.01	pH units	TM73/PM0
Total Dissolved Solids #	126	43	186	108	48	<35	mg/l	TM20/PM0
Total Dissolved Solids #	1260	430	1859	1080	480	<350	mg/kg	TM20/PM0

Element Materials Technology

Client Name: Ground Investigations Ireland
Reference: 8408.01.19
Location: Sandyford Central
Contact: Conor Finnerty
EMT Job No: 19/10728

Report : **EN12457_2**

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

Please see attached notes for all abbreviations and acronyms

EMT Sample No.	1-3	4-6	7-9	10-12	13-15	Inert	Stable Non-reactive	Hazardous	LOD LOR	Units	Method No.
Sample ID	TP101	TP101	TP101	TP102	TP102						
Depth	0.20-1.00	1.00-2.00	2.00-3.10	0.20-1.00	1.00-2.00						
COC No / misc											
Containers	V J T	V J T	V J T	V J T	V J T						
Sample Date	28/06/2019	28/06/2019	28/06/2019	28/06/2019	28/06/2019						
Sample Type	Soil	Soil	Soil	Soil	Soil						
Batch Number	1	1	1	1	1						
Date of Receipt	03/07/2019	03/07/2019	03/07/2019	03/07/2019	03/07/2019						
Solid Waste Analysis											
Total Organic Carbon #	1.75	0.16	0.20	0.47	0.20	3	5	6	<0.02	%	TM21/PM24
Sum of BTEX	<0.025	<0.025	<0.025 SV	<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
CEN 10:1 Leachate											
Arsenic #	<0.025	<0.025	<0.025	0.082	<0.025	0.5	2	25	<0.025	mg/kg	TM30/PM17
Barium #	0.15	<0.03	0.05	<0.03	0.06	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	0.037	<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 #	0.06	0.04	<0.02	0.09	0.07	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	0.05	<0.03	0.1	0.5	7	<0.03	mg/kg	TM30/PM17
Zinc #	0.04	<0.03	<0.03	<0.03	<0.03	4	50	200	<0.03	mg/kg	TM30/PM17
Total Dissolved Solids #	1260	430	1859	1080	480	4000	60000	100000	<350	mg/kg	TM20/PM0
Dissolved Organic Carbon	70	<20	<20	50	20	500	800	1000	<20	mg/kg	TM60/PM0
Mass of raw test portion	0.1104	0.0979	0.0982	0.1008	0.1038	-	-	-		kg	NONE/PM17
Dry Matter Content Ratio	81.3	91.7	91.3	89.4	86.3	-	-	-	<0.1	%	NONE/PM4
Leachant Volume	0.879	0.892	0.891	0.889	0.886	-	-	-		l	NONE/PM17
Eluate Volume	0.7	0.65	0.57	0.78	0.85	-	-	-		l	NONE/PM17
pH #	8.19	8.88	8.91	9.72	8.91	-	-	-	<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	<3	<3	<3	<3	<3	-	-	-	<3	mg/kg	TM173/PM0
Sulphate as SO4 #	241	18	13	110	21	1000	20000	50000	<5	mg/kg	TM38/PM0
Chloride #	7	5	5	7	6	800	15000	25000	<3	mg/kg	TM38/PM0

Client Name: Ground Investigations Ireland
Reference: 8408.01.19
Location: Sandyford Central
Contact: Conor Finnerty

Matrix : Solid

EMT Job No.	Batch	Sample ID	Depth	EMT Sample No.	EPH Interpretation
19/10728	1	TP101	0.20-1.00	1-3	No interpretation possible
19/10728	1	TP101	1.00-2.00	4-6	No interpretation possible
19/10728	1	TP101	2.00-3.10	7-9	No interpretation possible
19/10728	1	TP102	0.20-1.00	10-12	No interpretation possible
19/10728	1	TP102	1.00-2.00	13-15	No interpretation possible

Client Name:	Ground Investigations Ireland
Reference:	8408.01.19
Location:	Sandyford Central
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 Element Materials Technology consultant, Element Materials Technology cannot be responsible for inaccurate or unrepresentative sampling.

Signed on behalf of Element Materials Technology:

Ryan Butterworth
Asbestos Team Leader

EMT Job No.	Batch	Sample ID	Depth	EMT Sample No.	Date Of Analysis	Analysis	Result
19/10728	1	TP101	0.20-1.00	2	05/07/2019	**General Description (Bulk Analysis)**	soil-stones
					05/07/2019	**Asbestos Fibres**	NAD
					05/07/2019	**Asbestos ACM**	NAD
					05/07/2019	**Asbestos Type**	NAD
					05/07/2019	**Asbestos Level Screen**	NAD
19/10728	1	TP101	1.00-2.00	5	05/07/2019	**General Description (Bulk Analysis)**	soil-stones
					05/07/2019	**Asbestos Fibres**	NAD
					05/07/2019	**Asbestos ACM**	NAD
					05/07/2019	**Asbestos Type**	NAD
					05/07/2019	**Asbestos Level Screen**	NAD
19/10728	1	TP101	2.00-3.10	8	05/07/2019	**General Description (Bulk Analysis)**	soil-stones
					05/07/2019	**Asbestos Fibres**	NAD
					05/07/2019	**Asbestos ACM**	NAD
					05/07/2019	**Asbestos Type**	NAD
					05/07/2019	**Asbestos Level Screen**	NAD
19/10728	1	TP102	0.20-1.00	11	04/07/2019	**General Description (Bulk Analysis)**	soil/stones
					04/07/2019	**Asbestos Fibres**	NAD
					04/07/2019	**Asbestos ACM**	NAD
					04/07/2019	**Asbestos Type**	NAD
					04/07/2019	**Asbestos Level Screen**	NAD
19/10728	1	TP102	1.00-2.00	14	04/07/2019	**General Description (Bulk Analysis)**	soil/stones
					04/07/2019	**Asbestos Fibres**	NAD
					04/07/2019	**Asbestos ACM**	NAD
					04/07/2019	**Asbestos Type**	NAD
					04/07/2019	**Asbestos Level Screen**	NAD

Client Name: Ground Investigations Ireland
Reference: 8408.01.19
Location: Sandyford Central
Contact: Conor Finnerty

EMT Job No.	Batch	Sample ID	Depth	EMT Sample No.	Analysis	Reason
No deviating sample report results for job 19/10728						

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.

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. Limits of detection for analyses carried out on as received samples are not moisture content corrected. 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.

Sufficient amount of sample must be received to carry out the testing specified. Where an insufficient amount of sample has been received the testing may not meet the requirements of our accredited methods, as such accreditation may be removed.

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 overesitimate 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

All samples should be submitted to the laboratory in suitable containers with sufficient ice packs to sustain an appropriate temperature for the requested analysis. The temperature of sample receipt is recorded on the confirmation schedules in order that the client can make an informed decision as to whether testing should still be undertaken.

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.

Measurement Uncertainty

Measurement uncertainty defines the range of values that could reasonably be attributed to the measured quantity. This range of values has not been included within the reported results. Uncertainty expressed as a percentage can be provided upon request.

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 Element Materials Technology 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)

EMT Job No: 19/10728

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 spectrometic methods after distillation)* (BY HPLC - EMT)
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 amouns of acid or base needed to cover the pH range

Notes:

*If not suitable due to LOD, precision, etc., any other suitable method can be used, e.g. AFS, ICP-MS
**PCB-28, PCB-52, PCB-101, PCB-118, PCB-138, PCB-153 and PCB-180

***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.

EMT Job No: 19/10728

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/SANAS)	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 8015B method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) within the range C8-C40 by GCFID. For waters the solvent extracts dissolved phase plus a sheen if present.	PM16	Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE.			AR	
TM5	Modified 8015B method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) within the range C8-C40 by GCFID. For waters the solvent extracts dissolved phase plus a sheen if present.	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 8015B method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) within the range C8-C40 by GCFID. For waters the solvent extracts dissolved phase plus a sheen if present.	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

EMT Job No: 19/10728

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/SANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM22	Modified BS1377-3:1990 Gravimetric determination of Loss on Ignition by temperature controlled Muffle Furnace (35C-440C). On request modified ASTM D2974-00 LOI (105C-440C)	PM0	No preparation is required.	Yes		AD	Yes
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 BS 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 Methyltertbutylether, 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 Methyltertbutylether, 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

EMT Job No: 19/10728

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/SANAS)	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			AD	Yes
NONE	No Method Code	PM17	Modified method BS 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 BS 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	

EMT Job No: 19/10728

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/SANAS)	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	

APPENDIX 5 – HazWasteOnLine™ Report

GROUND INVESTIGATIONS IRELAND

HazWasteOnline™

Waste Classification Report

LQEG2-25QRS-Z8VBT

Job name

Sandyford Central Phase 2

Description/Comments

Project

8408-01-19

Site

Sandyford Central

Related Documents

#	Name	Description
1	Sandyford Central Phase 2.hwol	.hwol file used to create the Job

Waste Stream Template

Example waste stream template for contaminated soils

Classified by

Name:
Barry Sexton
Date:
07 Aug 2019 09:23 GMT
Telephone:
00353876119640

Company:
Ground Investigations Ireland
Catherinestown House,
Hazelhatch Road, Newcastle
Co. Dublin

Report

Created by: Barry Sexton
Created date: 07 Aug 2019 09:23 GMT

Job summary

#	Sample Name	Depth [m]	Classification Result	Hazard properties	Page
1	TP101-28/06/2019-0.20-1.00m		Non Hazardous		2
2	TP101-28/06/2019-1.00-2.00m		Non Hazardous		5
3	TP101-28/06/2019-2.00-3.10m		Non Hazardous		8
4	TP102-28/06/2019-0.20-1.00m		Non Hazardous		11
5	TP102-28/06/2019-1.00-2.00m		Non Hazardous		14

Classification of sample: TP101-28/06/2019-0.20-1.00m

Non Hazardous Waste
Classified as **17 05 04**
in the List of Waste

Sample details

Sample Name:		LoW Code:	
TP101-28/06/2019-0.20-1.00m		Chapter:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Moisture content:			
23.3% (wet weight correction)		Entry:	17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 23.3% Wet Weight Moisture Correction applied (MC)

#	Determinand CLP index number / EC Number / CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
1	antimony { antimony trioxide } 051-005-00-X / 215-175-0 / 1309-64-4		2	mg/kg	1.197	1.836	mg/kg	0.000184 %	✓	
2	arsenic { arsenic trioxide } 033-003-00-0 / 215-481-4 / 1327-53-3		27.6	mg/kg	1.32	27.95	mg/kg	0.0028 %	✓	
3	cadmium { cadmium oxide } 048-002-00-0 / 215-146-2 / 1306-19-0		3.3	mg/kg	1.142	2.891	mg/kg	0.000289 %	✓	
4	chromium in chromium(III) compounds { chromium(III) oxide } 215-160-9 / 1308-38-9		61.2	mg/kg	1.462	68.606	mg/kg	0.00686 %	✓	
5	chromium in chromium(VI) compounds { chromium(VI) oxide } 024-001-00-0 / 215-607-8 / 1333-82-0		<0.3	mg/kg	1.923	<0.577	mg/kg	<0.0000577 %		<LOD
6	copper { dicopper oxide; copper (I) oxide } 029-002-00-X / 215-270-7 / 1317-39-1		32	mg/kg	1.126	27.634	mg/kg	0.00276 %	✓	
7	lead { lead chromate } 082-004-00-2 / 231-846-0 / 7758-97-6	1	53	mg/kg	1.56	63.408	mg/kg	0.00407 %	✓	
8	mercury { mercury dichloride } 080-010-00-X / 231-299-8 / 7487-94-7		<0.1	mg/kg	1.353	<0.135	mg/kg	<0.0000135 %		<LOD
9	molybdenum { molybdenum(VI) oxide } 042-001-00-9 / 215-204-7 / 1313-27-5		3.3	mg/kg	1.5	3.797	mg/kg	0.00038 %	✓	
10	nickel { nickel chromate } 028-035-00-7 / 238-766-5 / 14721-18-7		39	mg/kg	2.976	89.029	mg/kg	0.0089 %	✓	
11	selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex } 034-002-00-8		2	mg/kg	2.554	3.917	mg/kg	0.000392 %	✓	
12	zinc { zinc chromate } 024-007-00-3		170	mg/kg	2.774	361.721	mg/kg	0.0362 %	✓	
13	TPH (C6 to C40) petroleum group TPH		<52	mg/kg		<52	mg/kg	<0.0052 %		<LOD
14	tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane 603-181-00-X / 216-653-1 / 1634-04-4		<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<LOD

#	Determinand	CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
15	benzene	601-020-00-8	200-753-7	71-43-2		<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<LOD
16	toluene	601-021-00-3	203-625-9	108-88-3		<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<LOD
17	ethylbenzene	601-023-00-4	202-849-4	100-41-4		<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<LOD
18	xylene	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]		<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
19	pH			PH		8.19	pH		8.19	pH	8.19 pH		
20	naphthalene	601-052-00-2	202-049-5	91-20-3		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
21	acenaphthylene		205-917-1	208-96-8		<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<LOD
22	acenaphthene		201-469-6	83-32-9		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
23	fluorene		201-695-5	86-73-7		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
24	phenanthrene		201-581-5	85-01-8		<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<LOD
25	anthracene		204-371-1	120-12-7		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
26	fluoranthene		205-912-4	206-44-0		<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<LOD
27	pyrene		204-927-3	129-00-0		<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<LOD
28	benzo[a]anthracene	601-033-00-9	200-280-6	56-55-3		<0.06	mg/kg		<0.06	mg/kg	<0.000006 %		<LOD
29	chrysene	601-048-00-0	205-923-4	218-01-9		<0.02	mg/kg		<0.02	mg/kg	<0.000002 %		<LOD
30	benzo[b]fluoranthene	601-034-00-4	205-911-9	205-99-2		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
31	benzo[k]fluoranthene	601-036-00-5	205-916-6	207-08-9		<0.02	mg/kg		<0.02	mg/kg	<0.000002 %		<LOD
32	benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5	50-32-8		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
33	indeno[123-cd]pyrene		205-893-2	193-39-5		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
34	dibenz[a,h]anthracene	601-041-00-2	200-181-8	53-70-3		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
35	benzo[ghi]perylene		205-883-8	191-24-2		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
36	polychlorobiphenyls; PCB	602-039-00-4	215-648-1	1336-36-3		<0.035	mg/kg		<0.035	mg/kg	<0.0000035 %		<LOD
37	barium { barium oxide }		215-127-9	1304-28-5		203	mg/kg	1.117	173.841	mg/kg	0.0174 %	✓	
38	coronene		205-881-7	191-07-1		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
39	benzo[j]fluoranthene	601-035-00-X	205-910-3	205-82-3		<1	mg/kg		<1	mg/kg	<0.0001 %		<LOD
										Total:	0.0856 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
CLP: Note 1	Only the metal concentration has been used for classification

Classification of sample: TP101-28/06/2019-1.00-2.00m

Non Hazardous Waste
Classified as **17 05 04**
in the List of Waste

Sample details

Sample Name:	LoW Code:	
TP101-28/06/2019-1.00-2.00m	Chapter:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Moisture content: **8.9%** (wet weight correction)	Entry:	17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 8.9% Wet Weight Moisture Correction applied (MC)

#	Determinand	CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
1	antimony { antimony trioxide }	051-005-00-X	215-175-0	1309-64-4		1	mg/kg	1.197	1.091	mg/kg	0.000109 %	✓	
2	arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		8.8	mg/kg	1.32	10.585	mg/kg	0.00106 %	✓	
3	cadmium { cadmium oxide }	048-002-00-0	215-146-2	1306-19-0		0.7	mg/kg	1.142	0.728	mg/kg	0.0000728 %	✓	
4	chromium in chromium(III) compounds { chromium(III) oxide }		215-160-9	1308-38-9		46.1	mg/kg	1.462	61.381	mg/kg	0.00614 %	✓	
5	chromium in chromium(VI) compounds { chromium(VI) oxide }	024-001-00-0	215-607-8	1333-82-0		<0.3	mg/kg	1.923	<0.577	mg/kg	<0.0000577 %		<LOD
6	copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		20	mg/kg	1.126	20.514	mg/kg	0.00205 %	✓	
7	lead { lead chromate }	082-004-00-2	231-846-0	7758-97-6	1	13	mg/kg	1.56	18.473	mg/kg	0.00118 %	✓	
8	mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		<0.1	mg/kg	1.353	<0.135	mg/kg	<0.0000135 %		<LOD
9	molybdenum { molybdenum(VI) oxide }	042-001-00-9	215-204-7	1313-27-5		1.9	mg/kg	1.5	2.597	mg/kg	0.00026 %	✓	
10	nickel { nickel chromate }	028-035-00-7	238-766-5	14721-18-7		31	mg/kg	2.976	84.053	mg/kg	0.00841 %	✓	
11	selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }	034-002-00-8				<1	mg/kg	2.554	<2.554	mg/kg	<0.000255 %		<LOD
12	zinc { zinc chromate }	024-007-00-3				66	mg/kg	2.774	166.798	mg/kg	0.0167 %	✓	
13	TPH (C6 to C40) petroleum group			TPH		<52	mg/kg		<52	mg/kg	<0.0052 %		<LOD
14	tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane	603-181-00-X	216-653-1	1634-04-4		<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<LOD

#	Determinand	CLP index number	EC Number	CAS Number	CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
15	benzene	601-020-00-8	200-753-7	71-43-2		<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD
16	toluene	601-021-00-3	203-625-9	108-88-3		<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD
17	ethylbenzene	601-023-00-4	202-849-4	100-41-4		<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD
18	xylene	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]		<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
19	pH			PH		8.88 pH		8.88 pH	8.88 pH		
20	naphthalene	601-052-00-2	202-049-5	91-20-3		<0.04 mg/kg		<0.04 mg/kg	<0.000004 %		<LOD
21	acenaphthylene		205-917-1	208-96-8		<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
22	acenaphthene		201-469-6	83-32-9		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
23	fluorene		201-695-5	86-73-7		<0.04 mg/kg		<0.04 mg/kg	<0.000004 %		<LOD
24	phenanthrene		201-581-5	85-01-8		<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
25	anthracene		204-371-1	120-12-7		<0.04 mg/kg		<0.04 mg/kg	<0.000004 %		<LOD
26	fluoranthene		205-912-4	206-44-0		<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
27	pyrene		204-927-3	129-00-0		<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
28	benzo[a]anthracene	601-033-00-9	200-280-6	56-55-3		<0.06 mg/kg		<0.06 mg/kg	<0.000006 %		<LOD
29	chrysene	601-048-00-0	205-923-4	218-01-9		<0.02 mg/kg		<0.02 mg/kg	<0.000002 %		<LOD
30	benzo[b]fluoranthene	601-034-00-4	205-911-9	205-99-2		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
31	benzo[k]fluoranthene	601-036-00-5	205-916-6	207-08-9		<0.02 mg/kg		<0.02 mg/kg	<0.000002 %		<LOD
32	benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5	50-32-8		<0.04 mg/kg		<0.04 mg/kg	<0.000004 %		<LOD
33	indeno[123-cd]pyrene		205-893-2	193-39-5		<0.04 mg/kg		<0.04 mg/kg	<0.000004 %		<LOD
34	dibenz[a,h]anthracene	601-041-00-2	200-181-8	53-70-3		<0.04 mg/kg		<0.04 mg/kg	<0.000004 %		<LOD
35	benzo[ghi]perylene		205-883-8	191-24-2		<0.04 mg/kg		<0.04 mg/kg	<0.000004 %		<LOD
36	polychlorobiphenyls; PCB	602-039-00-4	215-648-1	1336-36-3		<0.035 mg/kg		<0.035 mg/kg	<0.0000035 %		<LOD
37	barium { barium oxide }		215-127-9	1304-28-5		65 mg/kg	1.117	66.114 mg/kg	0.00661 %	✓	
38	coronene		205-881-7	191-07-1		<0.04 mg/kg		<0.04 mg/kg	<0.000004 %		<LOD
39	benzo[j]fluoranthene	601-035-00-X	205-910-3	205-82-3		<1 mg/kg		<1 mg/kg	<0.0001 %		<LOD
								Total:	0.0483 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
CLP: Note 1	Only the metal concentration has been used for classification

Classification of sample: TP101-28/06/2019-2.00-3.10m

Non Hazardous Waste
Classified as **17 05 04**
in the List of Waste

Sample details

Sample Name:
TP101-28/06/2019-2.00-3.10m
Moisture content:
10.8%
(wet weight correction)

LoW Code:
Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 10.8% Wet Weight Moisture Correction applied (MC)

#	Determinand	CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
1	antimony { antimony trioxide }	051-005-00-X	215-175-0	1309-64-4		2	mg/kg	1.197	2.136	mg/kg	0.000214 %	✓	
2	arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		20.4	mg/kg	1.32	24.026	mg/kg	0.0024 %	✓	
3	cadmium { cadmium oxide }	048-002-00-0	215-146-2	1306-19-0		1.1	mg/kg	1.142	1.121	mg/kg	0.000112 %	✓	
4	chromium in chromium(III) compounds { chromium(III) oxide }		215-160-9	1308-38-9		59.8	mg/kg	1.462	77.962	mg/kg	0.0078 %	✓	
5	chromium in chromium(VI) compounds { chromium(VI) oxide }	024-001-00-0	215-607-8	1333-82-0		<0.3	mg/kg	1.923	<0.577	mg/kg	<0.0000577 %		<LOD
6	copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		32	mg/kg	1.126	32.137	mg/kg	0.00321 %	✓	
7	lead { lead chromate }	082-004-00-2	231-846-0	7758-97-6	1	30	mg/kg	1.56	41.741	mg/kg	0.00268 %	✓	
8	mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		<0.1	mg/kg	1.353	<0.135	mg/kg	<0.0000135 %		<LOD
9	molybdenum { molybdenum(VI) oxide }	042-001-00-9	215-204-7	1313-27-5		2.3	mg/kg	1.5	3.078	mg/kg	0.000308 %	✓	
10	nickel { nickel chromate }	028-035-00-7	238-766-5	14721-18-7		51.5	mg/kg	2.976	136.724	mg/kg	0.0137 %	✓	
11	selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }	034-002-00-8				2	mg/kg	2.554	4.556	mg/kg	0.000456 %	✓	
12	zinc { zinc chromate }	024-007-00-3				140	mg/kg	2.774	346.435	mg/kg	0.0346 %	✓	
13	TPH (C6 to C40) petroleum group			TPH		<52	mg/kg		<52	mg/kg	<0.0052 %		<LOD
14	tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane	603-181-00-X	216-653-1	1634-04-4		<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<LOD

#	Determinand	CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
15	benzene	601-020-00-8	200-753-7	71-43-2		<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<LOD
16	toluene	601-021-00-3	203-625-9	108-88-3		<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<LOD
17	ethylbenzene	601-023-00-4	202-849-4	100-41-4		<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<LOD
18	xylene	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]		<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
19	pH			PH		8.91	pH		8.91	pH	8.91 pH		
20	naphthalene	601-052-00-2	202-049-5	91-20-3		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
21	acenaphthylene		205-917-1	208-96-8		<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<LOD
22	acenaphthene		201-469-6	83-32-9		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
23	fluorene		201-695-5	86-73-7		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
24	phenanthrene		201-581-5	85-01-8		<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<LOD
25	anthracene		204-371-1	120-12-7		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
26	fluoranthene		205-912-4	206-44-0		<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<LOD
27	pyrene		204-927-3	129-00-0		<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<LOD
28	benzo[a]anthracene	601-033-00-9	200-280-6	56-55-3		<0.06	mg/kg		<0.06	mg/kg	<0.000006 %		<LOD
29	chrysene	601-048-00-0	205-923-4	218-01-9		<0.02	mg/kg		<0.02	mg/kg	<0.000002 %		<LOD
30	benzo[b]fluoranthene	601-034-00-4	205-911-9	205-99-2		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
31	benzo[k]fluoranthene	601-036-00-5	205-916-6	207-08-9		<0.02	mg/kg		<0.02	mg/kg	<0.000002 %		<LOD
32	benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5	50-32-8		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
33	indeno[123-cd]pyrene		205-893-2	193-39-5		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
34	dibenz[a,h]anthracene	601-041-00-2	200-181-8	53-70-3		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
35	benzo[ghi]perylene		205-883-8	191-24-2		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
36	polychlorobiphenyls; PCB	602-039-00-4	215-648-1	1336-36-3		<0.035	mg/kg		<0.035	mg/kg	<0.0000035 %		<LOD
37	barium { barium oxide }		215-127-9	1304-28-5		81	mg/kg	1.117	80.67	mg/kg	0.00807 %	✓	
38	coronene		205-881-7	191-07-1		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
39	benzo[j]fluoranthene	601-035-00-X	205-910-3	205-82-3		<1	mg/kg		<1	mg/kg	<0.0001 %		<LOD
										Total:	0.079 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
CLP: Note 1	Only the metal concentration has been used for classification

Classification of sample: TP102-28/06/2019-0.20-1.00m

Non Hazardous Waste
Classified as **17 05 04**
in the List of Waste

Sample details

Sample Name:
TP102-28/06/2019-0.20-1.00m
Moisture content:
11.2%
(wet weight correction)

LoW Code:
Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 11.2% Wet Weight Moisture Correction applied (MC)

#	Determinand	CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
1	antimony { antimony trioxide }	051-005-00-X	215-175-0	1309-64-4		1	mg/kg	1.197	1.063	mg/kg	0.000106 %	✓	
2	arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		14.2	mg/kg	1.32	16.649	mg/kg	0.00166 %	✓	
3	cadmium { cadmium oxide }	048-002-00-0	215-146-2	1306-19-0		0.6	mg/kg	1.142	0.609	mg/kg	0.0000609 %	✓	
4	chromium in chromium(III) compounds { chromium(III) oxide }		215-160-9	1308-38-9		64.5	mg/kg	1.462	83.712	mg/kg	0.00837 %	✓	
5	chromium in chromium(VI) compounds { chromium(VI) oxide }	024-001-00-0	215-607-8	1333-82-0		<0.3	mg/kg	1.923	<0.577	mg/kg	<0.0000577 %		<LOD
6	copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		21	mg/kg	1.126	20.996	mg/kg	0.0021 %	✓	
7	lead { lead chromate }	082-004-00-2	231-846-0	7758-97-6	1	53	mg/kg	1.56	73.411	mg/kg	0.00471 %	✓	
8	mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		<0.1	mg/kg	1.353	<0.135	mg/kg	<0.0000135 %		<LOD
9	molybdenum { molybdenum(VI) oxide }	042-001-00-9	215-204-7	1313-27-5		2.9	mg/kg	1.5	3.863	mg/kg	0.000386 %	✓	
10	nickel { nickel chromate }	028-035-00-7	238-766-5	14721-18-7		32.2	mg/kg	2.976	85.102	mg/kg	0.00851 %	✓	
11	selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }	034-002-00-8				1	mg/kg	2.554	2.268	mg/kg	0.000227 %	✓	
12	zinc { zinc chromate }	024-007-00-3				103	mg/kg	2.774	253.735	mg/kg	0.0254 %	✓	
13	TPH (C6 to C40) petroleum group			TPH		<52	mg/kg		<52	mg/kg	<0.0052 %		<LOD
14	tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane	603-181-00-X	216-653-1	1634-04-4		<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<LOD

#	Determinand	CLP index number	EC Number	CAS Number	CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
15	benzene	601-020-00-8	200-753-7	71-43-2		<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD
16	toluene	601-021-00-3	203-625-9	108-88-3		<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD
17	ethylbenzene	601-023-00-4	202-849-4	100-41-4		<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD
18	xylene	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]		<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
19	pH			PH		9.72 pH		9.72 pH	9.72 pH		
20	naphthalene	601-052-00-2	202-049-5	91-20-3		<0.04 mg/kg		<0.04 mg/kg	<0.000004 %		<LOD
21	acenaphthylene		205-917-1	208-96-8		<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
22	acenaphthene		201-469-6	83-32-9		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
23	fluorene		201-695-5	86-73-7		<0.04 mg/kg		<0.04 mg/kg	<0.000004 %		<LOD
24	phenanthrene		201-581-5	85-01-8		<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
25	anthracene		204-371-1	120-12-7		<0.04 mg/kg		<0.04 mg/kg	<0.000004 %		<LOD
26	fluoranthene		205-912-4	206-44-0		<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
27	pyrene		204-927-3	129-00-0		<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
28	benzo[a]anthracene	601-033-00-9	200-280-6	56-55-3		<0.06 mg/kg		<0.06 mg/kg	<0.000006 %		<LOD
29	chrysene	601-048-00-0	205-923-4	218-01-9		<0.02 mg/kg		<0.02 mg/kg	<0.000002 %		<LOD
30	benzo[b]fluoranthene	601-034-00-4	205-911-9	205-99-2		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
31	benzo[k]fluoranthene	601-036-00-5	205-916-6	207-08-9		<0.02 mg/kg		<0.02 mg/kg	<0.000002 %		<LOD
32	benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5	50-32-8		<0.04 mg/kg		<0.04 mg/kg	<0.000004 %		<LOD
33	indeno[123-cd]pyrene		205-893-2	193-39-5		<0.04 mg/kg		<0.04 mg/kg	<0.000004 %		<LOD
34	dibenz[a,h]anthracene	601-041-00-2	200-181-8	53-70-3		<0.04 mg/kg		<0.04 mg/kg	<0.000004 %		<LOD
35	benzo[ghi]perylene		205-883-8	191-24-2		<0.04 mg/kg		<0.04 mg/kg	<0.000004 %		<LOD
36	polychlorobiphenyls; PCB	602-039-00-4	215-648-1	1336-36-3		<0.035 mg/kg		<0.035 mg/kg	<0.0000035 %		<LOD
37	barium { barium oxide }		215-127-9	1304-28-5		57 mg/kg	1.117	56.513 mg/kg	0.00565 %	✓	
38	coronene		205-881-7	191-07-1		<0.04 mg/kg		<0.04 mg/kg	<0.000004 %		<LOD
39	benzo[j]fluoranthene	601-035-00-X	205-910-3	205-82-3		<1 mg/kg		<1 mg/kg	<0.0001 %		<LOD
								Total:	0.0626 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
CLP: Note 1	Only the metal concentration has been used for classification

Classification of sample: TP102-28/06/2019-1.00-2.00m

Non Hazardous Waste
Classified as **17 05 04**
in the List of Waste

Sample details

Sample Name:		LoW Code:	
TP102-28/06/2019-1.00-2.00m		Chapter:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Moisture content:		Entry:	17 05 04 (Soil and stones other than those mentioned in 17 05 03)
12.5% (wet weight correction)			

Hazard properties

None identified

Determinands

Moisture content: 12.5% Wet Weight Moisture Correction applied (MC)

#		Determinand / CLP index number / EC Number / CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
1		antimony { antimony trioxide } 051-005-00-X / 215-175-0 / 1309-64-4		1	mg/kg	1.197	1.047	mg/kg	0.000105 %	✓	
2		arsenic { arsenic trioxide } 033-003-00-0 / 215-481-4 / 1327-53-3		13.4	mg/kg	1.32	15.481	mg/kg	0.00155 %	✓	
3		cadmium { cadmium oxide } 048-002-00-0 / 215-146-2 / 1306-19-0		1.5	mg/kg	1.142	1.499	mg/kg	0.00015 %	✓	
4		chromium in chromium(III) compounds { chromium(III) oxide } 215-160-9 / 1308-38-9		44.1	mg/kg	1.462	56.398	mg/kg	0.00564 %	✓	
5		chromium in chromium(VI) compounds { chromium(VI) oxide } 024-001-00-0 / 215-607-8 / 1333-82-0		<0.3	mg/kg	1.923	<0.577	mg/kg	<0.0000577 %		<LOD
6		copper { dicopper oxide; copper (I) oxide } 029-002-00-X / 215-270-7 / 1317-39-1		25	mg/kg	1.126	24.629	mg/kg	0.00246 %	✓	
7		lead { lead chromate } 082-004-00-2 / 231-846-0 / 7758-97-6	1	30	mg/kg	1.56	40.945	mg/kg	0.00263 %	✓	
8		mercury { mercury dichloride } 080-010-00-X / 231-299-8 / 7487-94-7		<0.1	mg/kg	1.353	<0.135	mg/kg	<0.0000135 %		<LOD
9		molybdenum { molybdenum(VI) oxide } 042-001-00-9 / 215-204-7 / 1313-27-5		3.2	mg/kg	1.5	4.201	mg/kg	0.00042 %	✓	
10		nickel { nickel chromate } 028-035-00-7 / 238-766-5 / 14721-18-7		36.6	mg/kg	2.976	95.315	mg/kg	0.00953 %	✓	
11		selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex } 034-002-00-8		2	mg/kg	2.554	4.469	mg/kg	0.000447 %	✓	
12		zinc { zinc chromate } 024-007-00-3		116	mg/kg	2.774	281.576	mg/kg	0.0282 %	✓	
13		TPH (C6 to C40) petroleum group TPH		<52	mg/kg		<52	mg/kg	<0.0052 %		<LOD
14		tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane 603-181-00-X / 216-653-1 / 1634-04-4		<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<LOD

#	Determinand	CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
15	benzene	601-020-00-8	200-753-7	71-43-2		<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<LOD
16	toluene	601-021-00-3	203-625-9	108-88-3		<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<LOD
17	ethylbenzene	601-023-00-4	202-849-4	100-41-4		<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<LOD
18	xylene	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]		<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
19	pH			PH		8.91	pH		8.91	pH	8.91 pH		
20	naphthalene	601-052-00-2	202-049-5	91-20-3		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
21	acenaphthylene		205-917-1	208-96-8		<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<LOD
22	acenaphthene		201-469-6	83-32-9		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
23	fluorene		201-695-5	86-73-7		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
24	phenanthrene		201-581-5	85-01-8		<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<LOD
25	anthracene		204-371-1	120-12-7		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
26	fluoranthene		205-912-4	206-44-0		<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<LOD
27	pyrene		204-927-3	129-00-0		<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<LOD
28	benzo[a]anthracene	601-033-00-9	200-280-6	56-55-3		<0.06	mg/kg		<0.06	mg/kg	<0.000006 %		<LOD
29	chrysene	601-048-00-0	205-923-4	218-01-9		<0.02	mg/kg		<0.02	mg/kg	<0.000002 %		<LOD
30	benzo[b]fluoranthene	601-034-00-4	205-911-9	205-99-2		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
31	benzo[k]fluoranthene	601-036-00-5	205-916-6	207-08-9		<0.02	mg/kg		<0.02	mg/kg	<0.000002 %		<LOD
32	benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5	50-32-8		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
33	indeno[123-cd]pyrene		205-893-2	193-39-5		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
34	dibenz[a,h]anthracene	601-041-00-2	200-181-8	53-70-3		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
35	benzo[ghi]perylene		205-883-8	191-24-2		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
36	polychlorobiphenyls; PCB	602-039-00-4	215-648-1	1336-36-3		<0.035	mg/kg		<0.035	mg/kg	<0.0000035 %		<LOD
37	barium { barium oxide }		215-127-9	1304-28-5		47	mg/kg	1.117	45.916	mg/kg	0.00459 %	✓	
38	coronene		205-881-7	191-07-1		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
39	benzo[j]fluoranthene	601-035-00-X	205-910-3	205-82-3		<1	mg/kg		<1	mg/kg	<0.0001 %		<LOD
										Total:	0.0611 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
●	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
CLP: Note 1	Only the metal concentration has been used for classification

Appendix A: Classifier defined and non CLP determinands

chromium(III) oxide (EC Number: 215-160-9, CAS Number: 1308-38-9)

Conversion factor: 1.462
Description/Comments: Data from C&L Inventory Database
Data source: http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database
Data source date: 17 Jul 2015
Hazard Statements: Aquatic Chronic 1 H410 , Aquatic Acute 1 H400 , Repr. 1B H360FD , Skin Sens. 1 H317 , Resp. Sens. 1 H334 , Skin Irrit. 2 H315 , STOT SE 3 H335 , Eye Irrit. 2 H319 , Acute Tox. 4 H302 , Acute Tox. 4 H332

TPH (C6 to C40) petroleum group (CAS Number: TPH)

Description/Comments: Hazard statements taken from WM3 1st Edition 2015; Risk phrases: WM2 3rd Edition 2013
Data source: WM3 1st Edition 2015
Data source date: 25 May 2015
Hazard Statements: Aquatic Chronic 2 H411 , Repr. 2 H361d , Carc. 1B H350 , Muta. 1B H340 , STOT RE 2 H373 , Asp. Tox. 1 H304 , Flam. Liq. 3 H226

ethylbenzene (EC Number: 202-849-4, CAS Number: 100-41-4)

CLP index number: 601-023-00-4
Description/Comments:
Data source: Commission Regulation (EU) No 605/2014 – 6th Adaptation to Technical Progress for Regulation (EC) No 1272/2008. (ATP6)
Additional Hazard Statement(s): Carc. 2 H351
Reason for additional Hazards Statement(s)/Risk Phrase(s):
03 Jun 2015 - Carc. 2 H351 hazard statement sourced from: IARC Group 2B (77) 2000

pH (CAS Number: PH)

Description/Comments: Appendix C4
Data source: WM3 1st Edition 2015
Data source date: 25 May 2015
Hazard Statements: None.

acenaphthylene (EC Number: 205-917-1, CAS Number: 208-96-8)

Description/Comments: Data from C&L Inventory Database
Data source: http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database
Data source date: 17 Jul 2015
Hazard Statements: Skin Irrit. 2 H315 , STOT SE 3 H335 , Eye Irrit. 2 H319 , Acute Tox. 1 H310 , Acute Tox. 1 H330 , Acute Tox. 4 H302

acenaphthene (EC Number: 201-469-6, CAS Number: 83-32-9)

Description/Comments: Data from C&L Inventory Database
Data source: http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database
Data source date: 17 Jul 2015
Hazard Statements: Aquatic Chronic 2 H411 , Aquatic Chronic 1 H410 , Aquatic Acute 1 H400 , Skin Irrit. 2 H315 , STOT SE 3 H335 , Eye Irrit. 2 H319

fluorene (EC Number: 201-695-5, CAS Number: 86-73-7)

Description/Comments: Data from C&L Inventory Database
Data source: http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database
Data source date: 06 Aug 2015
Hazard Statements: Aquatic Chronic 1 H410 , Aquatic Acute 1 H400

phenanthrene (EC Number: 201-581-5, CAS Number: 85-01-8)

Description/Comments: Data from C&L Inventory Database
Data source: http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database
Data source date: 06 Aug 2015
Hazard Statements: Skin Irrit. 2 H315 , Aquatic Chronic 1 H410 , Aquatic Acute 1 H400 , Skin Sens. 1 H317 , Carc. 2 H351 , STOT SE 3 H335 , Eye Irrit. 2 H319 , Acute Tox. 4 H302

anthracene (EC Number: 204-371-1, CAS Number: 120-12-7)

Description/Comments: Data from C&L Inventory Database
Data source: http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database
Data source date: 17 Jul 2015
Hazard Statements: Aquatic Chronic 1 H410 , Aquatic Acute 1 H400 , Skin Sens. 1 H317 , Skin Irrit. 2 H315 , STOT SE 3 H335 , Eye Irrit. 2 H319

fluoranthene (EC Number: 205-912-4, CAS Number: 206-44-0)

Description/Comments: Data from C&L Inventory Database
Data source: http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database
Data source date: 21 Aug 2015
Hazard Statements: Aquatic Chronic 1 H410 , Aquatic Acute 1 H400 , Acute Tox. 4 H302

pyrene (EC Number: 204-927-3, CAS Number: 129-00-0)

Description/Comments: Data from C&L Inventory Database; SDS Sigma Aldrich 2014
Data source: http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database
Data source date: 21 Aug 2015
Hazard Statements: Aquatic Chronic 1 H410 , Aquatic Acute 1 H400 , STOT SE 3 H335 , Eye Irrit. 2 H319 , Skin Irrit. 2 H315

indeno[123-cd]pyrene (EC Number: 205-893-2, CAS Number: 193-39-5)

Description/Comments: Data from C&L Inventory Database
Data source: http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database
Data source date: 06 Aug 2015
Hazard Statements: Carc. 2 H351

benzo[ghi]perylene (EC Number: 205-883-8, CAS Number: 191-24-2)

Description/Comments: Data from C&L Inventory Database; SDS Sigma Aldrich 28/02/2015
Data source: http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database
Data source date: 23 Jul 2015
Hazard Statements: Aquatic Chronic 1 H410 , Aquatic Acute 1 H400

polychlorobiphenyls; PCB (EC Number: 215-648-1, CAS Number: 1336-36-3)

CLP index number: 602-039-00-4
Description/Comments: Worst Case: IARC considers PCB Group 1; Carcinogenic to humans; POP specific threshold from ATP1 (Regulation 756/2010/EU) to POPs Regulation (Regulation 850/2004/EC). Where applicable, the calculation method laid down in European standards EN 12766-1 and EN 12766-2 shall be applied.
Data source: Regulation 1272/2008/EC - Classification, labelling and packaging of substances and mixtures. (CLP)
Additional Hazard Statement(s): Carc. 1A H350
Reason for additional Hazards Statement(s)/Risk Phrase(s):
29 Sep 2015 - Carc. 1A H350 hazard statement sourced from: IARC Group 1 (23, Sup 7, 100C) 2012

barium oxide (EC Number: 215-127-9, CAS Number: 1304-28-5)

Conversion factor: 1.117
Description/Comments: Data from C&L Inventory Database; No entries in Registered Substances Database, IARC or Pesticide Properties Database
Data source:
http://clp-inventory.echa.europa.eu/SummaryOfClassAndLabelling.aspx?SubstanceID=88825&HarmOnly=no?fc=true&lang=en
Data source date: 02 Jun 2014
Hazard Statements: Skin Irrit. 2 H315 , STOT SE 3 H335 , Eye Irrit. 2 H319 , Skin Corr. 1A H314 , Acute Tox. 3 H301 , Acute Tox. 4 H302 , Acute Tox. 4 H332

coronene (EC Number: 205-881-7, CAS Number: 191-07-1)

Description/Comments: Data from C&L Inventory Database; no entries in Registered Substances or Pesticides Properties databases; SDS: Sigma Aldrich, 1907/2006 compliant, dated 2012 - no entries; IARC – Group 3, not carcinogenic.
Data source:
http://clp-inventory.echa.europa.eu/SummaryOfClassAndLabelling.aspx?SubstanceID=17010&HarmOnly=no?fc=true&lang=en
Data source date: 16 Jun 2014
Hazard Statements: STOT SE 2 H371

Appendix B: Rationale for selection of metal species

antimony {antimony trioxide}

Worst case CLP species based on hazard statements/molecular weight and low solubility. Industrial sources include: flame retardants in electrical apparatus, textiles and coatings (edit as required)

arsenic {arsenic trioxide}

Reasonable case CLP species based on hazard statements/molecular weight and most common (stable) oxide of arsenic. Industrial sources include: smelting; main precursor to other arsenic compounds (edit as required)

cadmium {cadmium oxide}

Reasonable case CLP species based on hazard statements/molecular weight, very low solubility in water. Industrial sources include: electroplating baths, electrodes for storage batteries, catalysts, ceramic glazes, phosphors, pigments and nematocides. (edit as required) Worst case compounds in CLP: cadmium sulphate, chloride, fluoride & iodide not expected as either very soluble and/or compound's industrial usage not related to site history (edit as required)

chromium in chromium(III) compounds {chromium(III) oxide}

Reasonable case species based on hazard statements/molecular weight. Industrial sources include: tanning, pigment in paint, inks and glass (edit as required)

chromium in chromium(VI) compounds {chromium(VI) oxide}

Worst case CLP species based on hazard statements/molecular weight. Industrial sources include: production stainless steel, electroplating, wood preservation, anti-corrosion agents or coatings, pigments (edit as required)

copper {dicopper oxide; copper (I) oxide}

Reasonable case CLP species based on hazard statements/molecular weight and insolubility in water. Industrial sources include: oxidised copper metal, brake pads, pigments, antifouling paints, fungicide. (edit as required) Worse case copper sulphate is very soluble and likely to have been leached away if ever present and/or not enough soluble sulphate detected. (edit as required)

lead {lead chromate}

Worst case CLP species based on hazard statements/molecular weight (edit as required)

mercury {mercury dichloride}

Worst case CLP species based on hazard statements/molecular weight (edit as required)

molybdenum {molybdenum(VI) oxide}

Worst case CLP species based on hazard statements/molecular weight (edit as required)

nickel {nickel chromate}

Worst case CLP species based on hazard statements/molecular weight (edit as required)

selenium {selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex}

Harmonised group entry used as most reasonable case. Pigment cadmium sulphoselenide not likely to be present in this soil. No evidence for the other CLP entries: sodium selenite, nickel II selenite and nickel selenide, to be present in this soil. (edit as required)

zinc {zinc chromate}

Worst case CLP species based on hazard statements/molecular weight (edit as required)

barium {barium oxide}

Cr VI not detected

Appendix C: Version

HazWasteOnline Classification Engine: WM3 1st Edition v1.1, May 2018
HazWasteOnline Classification Engine Version: 2019.218.3917.7954 (06 Aug 2019)
HazWasteOnline Database: 2019.218.3917.7954 (06 Aug 2019)

This classification utilises the following guidance and legislation:
WM3 v1.1 - Waste Classification - 1st Edition v1.1 - May 2018
CLP Regulation - Regulation 1272/2008/EC of 16 December 2008
1st ATP - Regulation 790/2009/EC of 10 August 2009
2nd ATP - Regulation 286/2011/EC of 10 March 2011
3rd ATP - Regulation 618/2012/EU of 10 July 2012
4th ATP - Regulation 487/2013/EU of 8 May 2013
Correction to 1st ATP - Regulation 758/2013/EU of 7 August 2013
5th ATP - Regulation 944/2013/EU of 2 October 2013
6th ATP - Regulation 605/2014/EU of 5 June 2014
WFD Annex III replacement - Regulation 1357/2014/EU of 18 December 2014
Revised List of Wastes 2014 - Decision 2014/955/EU of 18 December 2014
7th ATP - Regulation 2015/1221/EU of 24 July 2015
8th ATP - Regulation (EU) 2016/918 of 19 May 2016
9th ATP - Regulation (EU) 2016/1179 of 19 July 2016
10th ATP - Regulation (EU) 2017/776 of 4 May 2017
HP14 amendment - Regulation (EU) 2017/997 of 8 June 2017
13th ATP - Regulation (EU) 2018/1480 of 4 October 2018
POPs Regulation 2004 - Regulation 850/2004/EC of 29 April 2004
1st ATP to POPs Regulation - Regulation 756/2010/EU of 24 August 2010
2nd ATP to POPs Regulation - Regulation 757/2010/EU of 24 August 2010

GROUND INVESTIGATIONS IRELAND

HazWasteOnline™

Waste Classification Report

S67JK-LUCRX-WLTBL

Job name

Sandyford Central

Description/Comments

Project

8408-01-19

Site

Sandyford Central

Related Documents

#	Name	Description
1	Sandyford Central.HWOL	.hwol file used to create the Job

Waste Stream Template

Example waste stream template for contaminated soils

Classified by

Name:
Barry Sexton
Date:
28 Mar 2019 08:07 GMT
Telephone:
00353876119640

Company:
Ground Investigations Ireland
Catherinestown House,
Hazelhatch Road, Newcastle
Co. Dublin

Report

Created by: Barry Sexton
Created date: 28 Mar 2019 08:07 GMT

Job summary

#	Sample Name	Depth [m]	Classification Result	Hazard properties	Page
1	TP01-19/02/2019-0.60-1.60m		Non Hazardous		3
2	TP06-20/02/2019-0.80-1.00m		Non Hazardous		6
3	TP02-20/02/2019-0.60-1.00m		Non Hazardous		9
4	TP06-20/02/2019-1.00-2.00m		Non Hazardous		12
5	TP02-20/02/2019-1.00-2.10m		Non Hazardous		15
6	TP06-20/02/2019-2.00-2.40m		Non Hazardous		18
7	TP03-19/02/2019-0.00-1.00m		Non Hazardous		21
8	TP03-19/02/2019-1.00-2.00m		Non Hazardous		24
9	TP03-19/02/2019-2.00-3.10m		Non Hazardous		27
10	TP04-19/02/2019-0.45-0.90m		Non Hazardous		30
11	TP04-19/02/2019-0.90-2.00m		Non Hazardous		33

Classification of sample: TP01-19/02/2019-0.60-1.60m

Non Hazardous Waste
Classified as **17 05 04**
in the List of Waste

Sample details

Sample Name:		LoW Code:	
TP01-19/02/2019-0.60-1.60m		Chapter:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Moisture content:			
10.8% (wet weight correction)		Entry:	17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 10.8% Wet Weight Moisture Correction applied (MC)

#	Determinand	CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
1	antimony { antimony trioxide }	051-005-00-X	215-175-0	1309-64-4		2	mg/kg	1.197	2.136	mg/kg	0.000214 %	✓	
2	arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		11.6	mg/kg	1.32	13.662	mg/kg	0.00137 %	✓	
3	cadmium { cadmium oxide }	048-002-00-0	215-146-2	1306-19-0		1.9	mg/kg	1.142	1.936	mg/kg	0.000194 %	✓	
4	chromium in chromium(III) compounds { chromium(III) oxide }		215-160-9	1308-38-9		27.3	mg/kg	1.462	35.591	mg/kg	0.00356 %	✓	
5	chromium in chromium(VI) compounds { chromium(VI) oxide }	024-001-00-0	215-607-8	1333-82-0		<0.3	mg/kg	1.923	<0.577	mg/kg	<0.0000577 %		<LOD
6	copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		27	mg/kg	1.126	27.116	mg/kg	0.00271 %	✓	
7	lead { lead chromate }	082-004-00-2	231-846-0	7758-97-6	1	47	mg/kg	1.56	65.394	mg/kg	0.00419 %	✓	
8	mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		<0.1	mg/kg	1.353	<0.135	mg/kg	<0.0000135 %		<LOD
9	molybdenum { molybdenum(VI) oxide }	042-001-00-9	215-204-7	1313-27-5		2.1	mg/kg	1.5	2.81	mg/kg	0.000281 %	✓	
10	nickel { nickel chromate }	028-035-00-7	238-766-5	14721-18-7		41	mg/kg	2.976	108.848	mg/kg	0.0109 %	✓	
11	selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }	034-002-00-8				<1	mg/kg	2.554	<2.554	mg/kg	<0.000255 %		<LOD
12	zinc { zinc chromate }	024-007-00-3				100	mg/kg	2.774	247.454	mg/kg	0.0247 %	✓	
13	TPH (C6 to C40) petroleum group			TPH		<52	mg/kg		<52	mg/kg	<0.0052 %		<LOD
14	tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane	603-181-00-X	216-653-1	1634-04-4		<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<LOD

#	Determinand	CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
15	benzene	601-020-00-8	200-753-7	71-43-2		<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<LOD
16	toluene	601-021-00-3	203-625-9	108-88-3		<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<LOD
17	ethylbenzene	601-023-00-4	202-849-4	100-41-4		<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<LOD
18	xylene	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]		<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
19	pH			PH		8.67	pH		8.67	pH	8.67 pH		
20	naphthalene	601-052-00-2	202-049-5	91-20-3		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
21	acenaphthylene		205-917-1	208-96-8		<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<LOD
22	acenaphthene		201-469-6	83-32-9		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
23	fluorene		201-695-5	86-73-7		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
24	phenanthrene		201-581-5	85-01-8		<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<LOD
25	anthracene		204-371-1	120-12-7		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
26	fluoranthene		205-912-4	206-44-0		<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<LOD
27	pyrene		204-927-3	129-00-0		<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<LOD
28	benzo[a]anthracene	601-033-00-9	200-280-6	56-55-3		<0.06	mg/kg		<0.06	mg/kg	<0.000006 %		<LOD
29	chrysene	601-048-00-0	205-923-4	218-01-9		<0.02	mg/kg		<0.02	mg/kg	<0.000002 %		<LOD
30	benzo[b]fluoranthene	601-034-00-4	205-911-9	205-99-2		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
31	benzo[k]fluoranthene	601-036-00-5	205-916-6	207-08-9		<0.02	mg/kg		<0.02	mg/kg	<0.000002 %		<LOD
32	benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5	50-32-8		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
33	indeno[123-cd]pyrene		205-893-2	193-39-5		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
34	dibenz[a,h]anthracene	601-041-00-2	200-181-8	53-70-3		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
35	benzo[ghi]perylene		205-883-8	191-24-2		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
36	polychlorobiphenyls; PCB	602-039-00-4	215-648-1	1336-36-3		<0.035	mg/kg		<0.035	mg/kg	<0.0000035 %		<LOD
37	barium { barium oxide }		215-127-9	1304-28-5		66	mg/kg	1.117	65.731	mg/kg	0.00657 %	✓	
38	coronene		205-881-7	191-07-1		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
39	benzo[j]fluoranthene	601-035-00-X	205-910-3	205-82-3		<1	mg/kg		<1	mg/kg	<0.0001 %		<LOD
										Total:	0.0604 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
CLP: Note 1	Only the metal concentration has been used for classification

Classification of sample: TP06-20/02/2019-0.80-1.00m

Non Hazardous Waste
Classified as **17 05 04**
in the List of Waste

Sample details

Sample Name:		LoW Code:	
TP06-20/02/2019-0.80-1.00m		Chapter:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Moisture content:			
20.1% (wet weight correction)		Entry:	17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 20.1% Wet Weight Moisture Correction applied (MC)

#	Determinand	CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
1	antimony { antimony trioxide }	051-005-00-X	215-175-0	1309-64-4		3	mg/kg	1.197	2.869	mg/kg	0.000287 %	✓	
2	arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		24.5	mg/kg	1.32	25.846	mg/kg	0.00258 %	✓	
3	cadmium { cadmium oxide }	048-002-00-0	215-146-2	1306-19-0		1.8	mg/kg	1.142	1.643	mg/kg	0.000164 %	✓	
4	chromium in chromium(III) compounds { chromium(III) oxide }		215-160-9	1308-38-9		46.4	mg/kg	1.462	54.185	mg/kg	0.00542 %	✓	
5	chromium in chromium(VI) compounds { chromium(VI) oxide }	024-001-00-0	215-607-8	1333-82-0		<0.3	mg/kg	1.923	<0.577	mg/kg	<0.0000577 %		<LOD
6	copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		37	mg/kg	1.126	33.285	mg/kg	0.00333 %	✓	
7	lead { lead chromate }	082-004-00-2	231-846-0	7758-97-6	1	34	mg/kg	1.56	42.374	mg/kg	0.00272 %	✓	
8	mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		<0.1	mg/kg	1.353	<0.135	mg/kg	<0.0000135 %		<LOD
9	molybdenum { molybdenum(VI) oxide }	042-001-00-9	215-204-7	1313-27-5		4.8	mg/kg	1.5	5.754	mg/kg	0.000575 %	✓	
10	nickel { nickel chromate }	028-035-00-7	238-766-5	14721-18-7		57	mg/kg	2.976	135.548	mg/kg	0.0136 %	✓	
11	selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }	034-002-00-8				2	mg/kg	2.554	4.081	mg/kg	0.000408 %	✓	
12	zinc { zinc chromate }	024-007-00-3				146	mg/kg	2.774	323.615	mg/kg	0.0324 %	✓	
13	TPH (C6 to C40) petroleum group			TPH		<52	mg/kg		<52	mg/kg	<0.0052 %		<LOD
14	tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane	603-181-00-X	216-653-1	1634-04-4		<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<LOD

#	Determinand	CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
15	benzene	601-020-00-8	200-753-7	71-43-2		<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<LOD
16	toluene	601-021-00-3	203-625-9	108-88-3		<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<LOD
17	ethylbenzene	601-023-00-4	202-849-4	100-41-4		<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<LOD
18	xylene	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]		<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
19	pH			PH		8.59	pH		8.59	pH	8.59 pH		
20	naphthalene	601-052-00-2	202-049-5	91-20-3		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
21	acenaphthylene		205-917-1	208-96-8		<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<LOD
22	acenaphthene		201-469-6	83-32-9		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
23	fluorene		201-695-5	86-73-7		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
24	phenanthrene		201-581-5	85-01-8		<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<LOD
25	anthracene		204-371-1	120-12-7		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
26	fluoranthene		205-912-4	206-44-0		<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<LOD
27	pyrene		204-927-3	129-00-0		<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<LOD
28	benzo[a]anthracene	601-033-00-9	200-280-6	56-55-3		<0.06	mg/kg		<0.06	mg/kg	<0.000006 %		<LOD
29	chrysene	601-048-00-0	205-923-4	218-01-9		<0.02	mg/kg		<0.02	mg/kg	<0.000002 %		<LOD
30	benzo[b]fluoranthene	601-034-00-4	205-911-9	205-99-2		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
31	benzo[k]fluoranthene	601-036-00-5	205-916-6	207-08-9		<0.02	mg/kg		<0.02	mg/kg	<0.000002 %		<LOD
32	benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5	50-32-8		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
33	indeno[123-cd]pyrene		205-893-2	193-39-5		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
34	dibenz[a,h]anthracene	601-041-00-2	200-181-8	53-70-3		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
35	benzo[ghi]perylene		205-883-8	191-24-2		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
36	polychlorobiphenyls; PCB	602-039-00-4	215-648-1	1336-36-3		<0.035	mg/kg		<0.035	mg/kg	<0.0000035 %		<LOD
37	barium { barium oxide }		215-127-9	1304-28-5		312	mg/kg	1.117	278.332	mg/kg	0.0278 %	✓	
38	coronene		205-881-7	191-07-1		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
39	benzo[j]fluoranthene	601-035-00-X	205-910-3	205-82-3		<1	mg/kg		<1	mg/kg	<0.0001 %		<LOD
										Total:	0.0947 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
●	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
CLP: Note 1	Only the metal concentration has been used for classification

Classification of sample: TP02-20/02/2019-0.60-1.00m

Non Hazardous Waste
Classified as **17 05 04**
in the List of Waste

Sample details

Sample Name:		LoW Code:	
TP02-20/02/2019-0.60-1.00m		Chapter:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Moisture content:			
12.7% (wet weight correction)		Entry:	17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 12.7% Wet Weight Moisture Correction applied (MC)

#	Determinand	CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
1	antimony { antimony trioxide }	051-005-00-X	215-175-0	1309-64-4		2	mg/kg	1.197	2.09	mg/kg	0.000209 %	✓	
2	arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		16.1	mg/kg	1.32	18.558	mg/kg	0.00186 %	✓	
3	cadmium { cadmium oxide }	048-002-00-0	215-146-2	1306-19-0		0.8	mg/kg	1.142	0.798	mg/kg	0.0000798 %	✓	
4	chromium in chromium(III) compounds { chromium(III) oxide }		215-160-9	1308-38-9		30.5	mg/kg	1.462	38.916	mg/kg	0.00389 %	✓	
5	chromium in chromium(VI) compounds { chromium(VI) oxide }	024-001-00-0	215-607-8	1333-82-0		<0.3	mg/kg	1.923	<0.577	mg/kg	<0.0000577 %		<LOD
6	copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		16	mg/kg	1.126	15.726	mg/kg	0.00157 %	✓	
7	lead { lead chromate }	082-004-00-2	231-846-0	7758-97-6	1	16	mg/kg	1.56	21.787	mg/kg	0.0014 %	✓	
8	mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		<0.1	mg/kg	1.353	<0.135	mg/kg	<0.0000135 %		<LOD
9	molybdenum { molybdenum(VI) oxide }	042-001-00-9	215-204-7	1313-27-5		2	mg/kg	1.5	2.619	mg/kg	0.000262 %	✓	
10	nickel { nickel chromate }	028-035-00-7	238-766-5	14721-18-7		29.3	mg/kg	2.976	76.13	mg/kg	0.00761 %	✓	
11	selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }	034-002-00-8				<1	mg/kg	2.554	<2.554	mg/kg	<0.000255 %		<LOD
12	zinc { zinc chromate }	024-007-00-3				75	mg/kg	2.774	181.637	mg/kg	0.0182 %	✓	
13	TPH (C6 to C40) petroleum group			TPH		<52	mg/kg		<52	mg/kg	<0.0052 %		<LOD
14	tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane	603-181-00-X	216-653-1	1634-04-4		<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<LOD

#	Determinand	CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
15	benzene	601-020-00-8	200-753-7	71-43-2		<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<LOD
16	toluene	601-021-00-3	203-625-9	108-88-3		<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<LOD
17	ethylbenzene	601-023-00-4	202-849-4	100-41-4		<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<LOD
18	xylene	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]		<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
19	pH			PH		8.56	pH		8.56	pH	8.56 pH		
20	naphthalene	601-052-00-2	202-049-5	91-20-3		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
21	acenaphthylene		205-917-1	208-96-8		<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<LOD
22	acenaphthene		201-469-6	83-32-9		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
23	fluorene		201-695-5	86-73-7		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
24	phenanthrene		201-581-5	85-01-8		<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<LOD
25	anthracene		204-371-1	120-12-7		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
26	fluoranthene		205-912-4	206-44-0		<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<LOD
27	pyrene		204-927-3	129-00-0		<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<LOD
28	benzo[a]anthracene	601-033-00-9	200-280-6	56-55-3		<0.06	mg/kg		<0.06	mg/kg	<0.000006 %		<LOD
29	chrysene	601-048-00-0	205-923-4	218-01-9		<0.02	mg/kg		<0.02	mg/kg	<0.000002 %		<LOD
30	benzo[b]fluoranthene	601-034-00-4	205-911-9	205-99-2		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
31	benzo[k]fluoranthene	601-036-00-5	205-916-6	207-08-9		<0.02	mg/kg		<0.02	mg/kg	<0.000002 %		<LOD
32	benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5	50-32-8		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
33	indeno[123-cd]pyrene		205-893-2	193-39-5		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
34	dibenz[a,h]anthracene	601-041-00-2	200-181-8	53-70-3		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
35	benzo[ghi]perylene		205-883-8	191-24-2		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
36	polychlorobiphenyls; PCB	602-039-00-4	215-648-1	1336-36-3		<0.035	mg/kg		<0.035	mg/kg	<0.0000035 %		<LOD
37	barium { barium oxide }		215-127-9	1304-28-5		50	mg/kg	1.117	48.735	mg/kg	0.00487 %	✓	
38	coronene		205-881-7	191-07-1		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
39	benzo[j]fluoranthene	601-035-00-X	205-910-3	205-82-3		<1	mg/kg		<1	mg/kg	<0.0001 %		<LOD
										Total:	0.0456 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
CLP: Note 1	Only the metal concentration has been used for classification

Classification of sample: TP06-20/02/2019-1.00-2.00m

Non Hazardous Waste
Classified as **17 05 04**
in the List of Waste

Sample details

Sample Name:
TP06-20/02/2019-1.00-2.00m
Moisture content:
8.6%
(wet weight correction)

LoW Code:
Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 8.6% Wet Weight Moisture Correction applied (MC)

#	Determinand	CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
1	antimony { antimony trioxide }	051-005-00-X	215-175-0	1309-64-4		2	mg/kg	1.197	2.188	mg/kg	0.000219 %	✓	
2	arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		8.1	mg/kg	1.32	9.775	mg/kg	0.000977 %	✓	
3	cadmium { cadmium oxide }	048-002-00-0	215-146-2	1306-19-0		2	mg/kg	1.142	2.088	mg/kg	0.000209 %	✓	
4	chromium in chromium(III) compounds { chromium(III) oxide }		215-160-9	1308-38-9		42.1	mg/kg	1.462	56.24	mg/kg	0.00562 %	✓	
5	chromium in chromium(VI) compounds { chromium(VI) oxide }	024-001-00-0	215-607-8	1333-82-0		<0.3	mg/kg	1.923	<0.577	mg/kg	<0.0000577 %		<LOD
6	copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		28	mg/kg	1.126	28.814	mg/kg	0.00288 %	✓	
7	lead { lead chromate }	082-004-00-2	231-846-0	7758-97-6	1	17	mg/kg	1.56	24.236	mg/kg	0.00155 %	✓	
8	mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		<0.1	mg/kg	1.353	<0.135	mg/kg	<0.0000135 %		<LOD
9	molybdenum { molybdenum(VI) oxide }	042-001-00-9	215-204-7	1313-27-5		4.6	mg/kg	1.5	6.307	mg/kg	0.000631 %	✓	
10	nickel { nickel chromate }	028-035-00-7	238-766-5	14721-18-7		38.2	mg/kg	2.976	103.916	mg/kg	0.0104 %	✓	
11	selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }	034-002-00-8				3	mg/kg	2.554	7.002	mg/kg	0.0007 %	✓	
12	zinc { zinc chromate }	024-007-00-3				94	mg/kg	2.774	238.344	mg/kg	0.0238 %	✓	
13	TPH (C6 to C40) petroleum group			TPH		<52	mg/kg		<52	mg/kg	<0.0052 %		<LOD
14	tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane	603-181-00-X	216-653-1	1634-04-4		<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<LOD

#	Determinand	CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
15	benzene	601-020-00-8	200-753-7	71-43-2		<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<LOD
16	toluene	601-021-00-3	203-625-9	108-88-3		<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<LOD
17	ethylbenzene	601-023-00-4	202-849-4	100-41-4		<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<LOD
18	xylene	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]		<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
19	pH			PH		8.48	pH		8.48	pH	8.48 pH		
20	naphthalene	601-052-00-2	202-049-5	91-20-3		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
21	acenaphthylene		205-917-1	208-96-8		<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<LOD
22	acenaphthene		201-469-6	83-32-9		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
23	fluorene		201-695-5	86-73-7		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
24	phenanthrene		201-581-5	85-01-8		<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<LOD
25	anthracene		204-371-1	120-12-7		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
26	fluoranthene		205-912-4	206-44-0		<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<LOD
27	pyrene		204-927-3	129-00-0		<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<LOD
28	benzo[a]anthracene	601-033-00-9	200-280-6	56-55-3		<0.06	mg/kg		<0.06	mg/kg	<0.000006 %		<LOD
29	chrysene	601-048-00-0	205-923-4	218-01-9		<0.02	mg/kg		<0.02	mg/kg	<0.000002 %		<LOD
30	benzo[b]fluoranthene	601-034-00-4	205-911-9	205-99-2		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
31	benzo[k]fluoranthene	601-036-00-5	205-916-6	207-08-9		<0.02	mg/kg		<0.02	mg/kg	<0.000002 %		<LOD
32	benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5	50-32-8		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
33	indeno[123-cd]pyrene		205-893-2	193-39-5		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
34	dibenz[a,h]anthracene	601-041-00-2	200-181-8	53-70-3		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
35	benzo[ghi]perylene		205-883-8	191-24-2		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
36	polychlorobiphenyls; PCB	602-039-00-4	215-648-1	1336-36-3		<0.035	mg/kg		<0.035	mg/kg	<0.0000035 %		<LOD
37	barium { barium oxide }		215-127-9	1304-28-5		59	mg/kg	1.117	60.209	mg/kg	0.00602 %	✓	
38	coronene		205-881-7	191-07-1		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
39	benzo[j]fluoranthene	601-035-00-X	205-910-3	205-82-3		<1	mg/kg		<1	mg/kg	<0.0001 %		<LOD
										Total:	0.0585 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
CLP: Note 1	Only the metal concentration has been used for classification

Classification of sample: TP02-20/02/2019-1.00-2.10m

Non Hazardous Waste
Classified as **17 05 04**
in the List of Waste

Sample details

Sample Name:		LoW Code:	
TP02-20/02/2019-1.00-2.10m		Chapter:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Moisture content:			
7.9% (wet weight correction)		Entry:	17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 7.9% Wet Weight Moisture Correction applied (MC)

#	Determinand	CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
1	antimony { antimony trioxide }	051-005-00-X	215-175-0	1309-64-4		<1	mg/kg	1.197	<1.197	mg/kg	<0.00012 %		<LOD
2	arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		4.3	mg/kg	1.32	5.229	mg/kg	0.000523 %	✓	
3	cadmium { cadmium oxide }	048-002-00-0	215-146-2	1306-19-0		0.5	mg/kg	1.142	0.526	mg/kg	0.0000526 %	✓	
4	chromium in chromium(III) compounds { chromium(III) oxide }		215-160-9	1308-38-9		29.3	mg/kg	1.462	39.441	mg/kg	0.00394 %	✓	
5	chromium in chromium(VI) compounds { chromium(VI) oxide }	024-001-00-0	215-607-8	1333-82-0		<0.3	mg/kg	1.923	<0.577	mg/kg	<0.0000577 %		<LOD
6	copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		8	mg/kg	1.126	8.296	mg/kg	0.00083 %	✓	
7	lead { lead chromate }	082-004-00-2	231-846-0	7758-97-6	1	13	mg/kg	1.56	18.676	mg/kg	0.0012 %	✓	
8	mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		<0.1	mg/kg	1.353	<0.135	mg/kg	<0.0000135 %		<LOD
9	molybdenum { molybdenum(VI) oxide }	042-001-00-9	215-204-7	1313-27-5		1.9	mg/kg	1.5	2.625	mg/kg	0.000263 %	✓	
10	nickel { nickel chromate }	028-035-00-7	238-766-5	14721-18-7		14.4	mg/kg	2.976	39.472	mg/kg	0.00395 %	✓	
11	selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }	034-002-00-8				<1	mg/kg	2.554	<2.554	mg/kg	<0.000255 %		<LOD
12	zinc { zinc chromate }	024-007-00-3				55	mg/kg	2.774	140.524	mg/kg	0.0141 %	✓	
13	TPH (C6 to C40) petroleum group			TPH		<52	mg/kg		<52	mg/kg	<0.0052 %		<LOD
14	tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane	603-181-00-X	216-653-1	1634-04-4		<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<LOD

#	Determinand	CLP index number	EC Number	CAS Number	CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
15	benzene	601-020-00-8	200-753-7	71-43-2		<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD
16	toluene	601-021-00-3	203-625-9	108-88-3		<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD
17	ethylbenzene	601-023-00-4	202-849-4	100-41-4		<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD
18	xylene	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]		<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
19	pH			PH		8.8 pH		8.8 pH	8.8 pH		
20	naphthalene	601-052-00-2	202-049-5	91-20-3		<0.04 mg/kg		<0.04 mg/kg	<0.000004 %		<LOD
21	acenaphthylene		205-917-1	208-96-8		<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
22	acenaphthene		201-469-6	83-32-9		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
23	fluorene		201-695-5	86-73-7		<0.04 mg/kg		<0.04 mg/kg	<0.000004 %		<LOD
24	phenanthrene		201-581-5	85-01-8		<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
25	anthracene		204-371-1	120-12-7		<0.04 mg/kg		<0.04 mg/kg	<0.000004 %		<LOD
26	fluoranthene		205-912-4	206-44-0		<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
27	pyrene		204-927-3	129-00-0		<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
28	benzo[a]anthracene	601-033-00-9	200-280-6	56-55-3		<0.06 mg/kg		<0.06 mg/kg	<0.000006 %		<LOD
29	chrysene	601-048-00-0	205-923-4	218-01-9		<0.02 mg/kg		<0.02 mg/kg	<0.000002 %		<LOD
30	benzo[b]fluoranthene	601-034-00-4	205-911-9	205-99-2		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
31	benzo[k]fluoranthene	601-036-00-5	205-916-6	207-08-9		<0.02 mg/kg		<0.02 mg/kg	<0.000002 %		<LOD
32	benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5	50-32-8		<0.04 mg/kg		<0.04 mg/kg	<0.000004 %		<LOD
33	indeno[123-cd]pyrene		205-893-2	193-39-5		<0.04 mg/kg		<0.04 mg/kg	<0.000004 %		<LOD
34	dibenz[a,h]anthracene	601-041-00-2	200-181-8	53-70-3		<0.04 mg/kg		<0.04 mg/kg	<0.000004 %		<LOD
35	benzo[ghi]perylene		205-883-8	191-24-2		<0.04 mg/kg		<0.04 mg/kg	<0.000004 %		<LOD
36	polychlorobiphenyls; PCB	602-039-00-4	215-648-1	1336-36-3		<0.035 mg/kg		<0.035 mg/kg	<0.0000035 %		<LOD
37	barium { barium oxide }		215-127-9	1304-28-5		32 mg/kg	1.117	32.906 mg/kg	0.00329 %	✓	
38	coronene		205-881-7	191-07-1		<0.04 mg/kg		<0.04 mg/kg	<0.000004 %		<LOD
39	benzo[j]fluoranthene	601-035-00-X	205-910-3	205-82-3		<1 mg/kg		<1 mg/kg	<0.0001 %		<LOD
								Total:	0.0339 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
CLP: Note 1	Only the metal concentration has been used for classification

Classification of sample: TP06-20/02/2019-2.00-2.40m

Non Hazardous Waste
Classified as **17 05 04**
in the List of Waste

Sample details

Sample Name:		LoW Code:	
TP06-20/02/2019-2.00-2.40m		Chapter:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Moisture content:		Entry:	17 05 04 (Soil and stones other than those mentioned in 17 05 03)
9.5% (wet weight correction)			

Hazard properties

None identified

Determinands

Moisture content: 9.5% Wet Weight Moisture Correction applied (MC)

#		Determinand / CLP index number / EC Number / CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
1		antimony { antimony trioxide } 051-005-00-X / 215-175-0 / 1309-64-4		2	mg/kg	1.197	2.167	mg/kg	0.000217 %	✓	
2		arsenic { arsenic trioxide } 033-003-00-0 / 215-481-4 / 1327-53-3		13.1	mg/kg	1.32	15.653	mg/kg	0.00157 %	✓	
3		cadmium { cadmium oxide } 048-002-00-0 / 215-146-2 / 1306-19-0		1.5	mg/kg	1.142	1.551	mg/kg	0.000155 %	✓	
4		chromium in chromium(III) compounds { chromium(III) oxide } 215-160-9 / 1308-38-9		28.4	mg/kg	1.462	37.565	mg/kg	0.00376 %	✓	
5		chromium in chromium(VI) compounds { chromium(VI) oxide } 024-001-00-0 / 215-607-8 / 1333-82-0		<0.3	mg/kg	1.923	<0.577	mg/kg	<0.0000577 %		<LOD
6		copper { dicopper oxide; copper (I) oxide } 029-002-00-X / 215-270-7 / 1317-39-1		22	mg/kg	1.126	22.416	mg/kg	0.00224 %	✓	
7		lead { lead chromate } 082-004-00-2 / 231-846-0 / 7758-97-6	1	20	mg/kg	1.56	28.233	mg/kg	0.00181 %	✓	
8		mercury { mercury dichloride } 080-010-00-X / 231-299-8 / 7487-94-7		<0.1	mg/kg	1.353	<0.135	mg/kg	<0.0000135 %		<LOD
9		molybdenum { molybdenum(VI) oxide } 042-001-00-9 / 215-204-7 / 1313-27-5		3	mg/kg	1.5	4.073	mg/kg	0.000407 %	✓	
10		nickel { nickel chromate } 028-035-00-7 / 238-766-5 / 14721-18-7		35.9	mg/kg	2.976	96.697	mg/kg	0.00967 %	✓	
11		selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex } 034-002-00-8		2	mg/kg	2.554	4.622	mg/kg	0.000462 %	✓	
12		zinc { zinc chromate } 024-007-00-3		92	mg/kg	2.774	230.975	mg/kg	0.0231 %	✓	
13		TPH (C6 to C40) petroleum group TPH		<52	mg/kg		<52	mg/kg	<0.0052 %		<LOD
14		tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane 603-181-00-X / 216-653-1 / 1634-04-4		<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<LOD

#	Determinand	CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
15	benzene	601-020-00-8	200-753-7	71-43-2		<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<LOD
16	toluene	601-021-00-3	203-625-9	108-88-3		<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<LOD
17	ethylbenzene	601-023-00-4	202-849-4	100-41-4		<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<LOD
18	xylene	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]		<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
19	pH			PH		8.52	pH		8.52	pH	8.52 pH		
20	naphthalene	601-052-00-2	202-049-5	91-20-3		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
21	acenaphthylene		205-917-1	208-96-8		<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<LOD
22	acenaphthene		201-469-6	83-32-9		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
23	fluorene		201-695-5	86-73-7		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
24	phenanthrene		201-581-5	85-01-8		<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<LOD
25	anthracene		204-371-1	120-12-7		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
26	fluoranthene		205-912-4	206-44-0		<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<LOD
27	pyrene		204-927-3	129-00-0		<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<LOD
28	benzo[a]anthracene	601-033-00-9	200-280-6	56-55-3		<0.06	mg/kg		<0.06	mg/kg	<0.000006 %		<LOD
29	chrysene	601-048-00-0	205-923-4	218-01-9		<0.02	mg/kg		<0.02	mg/kg	<0.000002 %		<LOD
30	benzo[b]fluoranthene	601-034-00-4	205-911-9	205-99-2		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
31	benzo[k]fluoranthene	601-036-00-5	205-916-6	207-08-9		<0.02	mg/kg		<0.02	mg/kg	<0.000002 %		<LOD
32	benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5	50-32-8		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
33	indeno[123-cd]pyrene		205-893-2	193-39-5		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
34	dibenz[a,h]anthracene	601-041-00-2	200-181-8	53-70-3		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
35	benzo[ghi]perylene		205-883-8	191-24-2		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
36	polychlorobiphenyls; PCB	602-039-00-4	215-648-1	1336-36-3		<0.035	mg/kg		<0.035	mg/kg	<0.0000035 %		<LOD
37	barium { barium oxide }		215-127-9	1304-28-5		70	mg/kg	1.117	70.731	mg/kg	0.00707 %	✓	
38	coronene		205-881-7	191-07-1		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
39	benzo[j]fluoranthene	601-035-00-X	205-910-3	205-82-3		<1	mg/kg		<1	mg/kg	<0.0001 %		<LOD
										Total:	0.0559 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
●	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
CLP: Note 1	Only the metal concentration has been used for classification

Classification of sample: TP03-19/02/2019-0.00-1.00m

Non Hazardous Waste
Classified as **17 05 04**
in the List of Waste

Sample details

Sample Name:		LoW Code:	
TP03-19/02/2019-0.00-1.00m		Chapter:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Moisture content:		Entry:	17 05 04 (Soil and stones other than those mentioned in 17 05 03)
9.1% (wet weight correction)			

Hazard properties

None identified

Determinands

Moisture content: 9.1% Wet Weight Moisture Correction applied (MC)

#	Determinand	CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
1	antimony { antimony trioxide }	051-005-00-X	215-175-0	1309-64-4		<1	mg/kg	1.197	<1.197	mg/kg	<0.00012 %		<LOD
2	arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		9	mg/kg	1.32	10.802	mg/kg	0.00108 %	✓	
3	cadmium { cadmium oxide }	048-002-00-0	215-146-2	1306-19-0		0.8	mg/kg	1.142	0.831	mg/kg	0.0000831 %	✓	
4	chromium in chromium(III) compounds { chromium(III) oxide }		215-160-9	1308-38-9		29.5	mg/kg	1.462	39.192	mg/kg	0.00392 %	✓	
5	chromium in chromium(VI) compounds { chromium(VI) oxide }	024-001-00-0	215-607-8	1333-82-0		<0.3	mg/kg	1.923	<0.577	mg/kg	<0.0000577 %		<LOD
6	copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		13	mg/kg	1.126	13.305	mg/kg	0.00133 %	✓	
7	lead { lead chromate }	082-004-00-2	231-846-0	7758-97-6	1	20	mg/kg	1.56	28.357	mg/kg	0.00182 %	✓	
8	mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		<0.1	mg/kg	1.353	<0.135	mg/kg	<0.0000135 %		<LOD
9	molybdenum { molybdenum(VI) oxide }	042-001-00-9	215-204-7	1313-27-5		1.2	mg/kg	1.5	1.636	mg/kg	0.000164 %	✓	
10	nickel { nickel chromate }	028-035-00-7	238-766-5	14721-18-7		15.4	mg/kg	2.976	41.664	mg/kg	0.00417 %	✓	
11	selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }	034-002-00-8				<1	mg/kg	2.554	<2.554	mg/kg	<0.000255 %		<LOD
12	zinc { zinc chromate }	024-007-00-3				61	mg/kg	2.774	153.824	mg/kg	0.0154 %	✓	
13	TPH (C6 to C40) petroleum group			TPH		130	mg/kg		118.17	mg/kg	0.0118 %	✓	
14	tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane	603-181-00-X	216-653-1	1634-04-4		<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<LOD

#	Determinand	CLP index number	EC Number	CAS Number	CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
15	benzene	601-020-00-8	200-753-7	71-43-2		<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD
16	toluene	601-021-00-3	203-625-9	108-88-3		<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD
17	ethylbenzene	601-023-00-4	202-849-4	100-41-4		<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD
18	xylene	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]		<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
19	pH			PH		10.65 pH		10.65 pH	10.65 pH		
20	naphthalene	601-052-00-2	202-049-5	91-20-3		<0.04 mg/kg		<0.04 mg/kg	<0.000004 %		<LOD
21	acenaphthylene		205-917-1	208-96-8		<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
22	acenaphthene		201-469-6	83-32-9		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
23	fluorene		201-695-5	86-73-7		<0.04 mg/kg		<0.04 mg/kg	<0.000004 %		<LOD
24	phenanthrene		201-581-5	85-01-8		<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
25	anthracene		204-371-1	120-12-7		<0.04 mg/kg		<0.04 mg/kg	<0.000004 %		<LOD
26	fluoranthene		205-912-4	206-44-0		<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
27	pyrene		204-927-3	129-00-0		<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
28	benzo[a]anthracene	601-033-00-9	200-280-6	56-55-3		<0.06 mg/kg		<0.06 mg/kg	<0.000006 %		<LOD
29	chrysene	601-048-00-0	205-923-4	218-01-9		<0.02 mg/kg		<0.02 mg/kg	<0.000002 %		<LOD
30	benzo[b]fluoranthene	601-034-00-4	205-911-9	205-99-2		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
31	benzo[k]fluoranthene	601-036-00-5	205-916-6	207-08-9		<0.02 mg/kg		<0.02 mg/kg	<0.000002 %		<LOD
32	benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5	50-32-8		<0.04 mg/kg		<0.04 mg/kg	<0.000004 %		<LOD
33	indeno[123-cd]pyrene		205-893-2	193-39-5		<0.04 mg/kg		<0.04 mg/kg	<0.000004 %		<LOD
34	dibenz[a,h]anthracene	601-041-00-2	200-181-8	53-70-3		<0.04 mg/kg		<0.04 mg/kg	<0.000004 %		<LOD
35	benzo[ghi]perylene		205-883-8	191-24-2		<0.04 mg/kg		<0.04 mg/kg	<0.000004 %		<LOD
36	polychlorobiphenyls; PCB	602-039-00-4	215-648-1	1336-36-3		<0.035 mg/kg		<0.035 mg/kg	<0.0000035 %		<LOD
37	barium { barium oxide }		215-127-9	1304-28-5		43 mg/kg	1.117	43.641 mg/kg	0.00436 %	✓	
38	coronene		205-881-7	191-07-1		<0.04 mg/kg		<0.04 mg/kg	<0.000004 %		<LOD
39	benzo[j]fluoranthene	601-035-00-X	205-910-3	205-82-3		<1 mg/kg		<1 mg/kg	<0.0001 %		<LOD
								Total:	0.0447 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
CLP: Note 1	Only the metal concentration has been used for classification

Supplementary Hazardous Property Information

HP 3(i): Flammable "flammable liquid waste: liquid waste having a flash point below 60°C or waste gas oil, diesel and light heating oils having a flash point > 55°C and <= 75°C"

Force this Hazardous property to non hazardous because Solid waste without liquid phase

Hazard Statements hit:

Flam. Liq. 3; H226 "Flammable liquid and vapour."

Because of determinand:

TPH (C6 to C40) petroleum group: (conc.: 0.0118%)

Classification of sample: TP03-19/02/2019-1.00-2.00m

Non Hazardous Waste
Classified as **17 05 04**
in the List of Waste

Sample details

Sample Name:		LoW Code:	
TP03-19/02/2019-1.00-2.00m		Chapter:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Moisture content:			
10.7% (wet weight correction)		Entry:	17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 10.7% Wet Weight Moisture Correction applied (MC)

#	Determinand	CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
1	antimony { antimony trioxide }	051-005-00-X	215-175-0	1309-64-4		2	mg/kg	1.197	2.138	mg/kg	0.000214 %	✓	
2	arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		11.3	mg/kg	1.32	13.323	mg/kg	0.00133 %	✓	
3	cadmium { cadmium oxide }	048-002-00-0	215-146-2	1306-19-0		1.2	mg/kg	1.142	1.224	mg/kg	0.000122 %	✓	
4	chromium in chromium(III) compounds { chromium(III) oxide }		215-160-9	1308-38-9		53.1	mg/kg	1.462	69.304	mg/kg	0.00693 %	✓	
5	chromium in chromium(VI) compounds { chromium(VI) oxide }	024-001-00-0	215-607-8	1333-82-0		<0.3	mg/kg	1.923	<0.577	mg/kg	<0.0000577 %		<LOD
6	copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		22	mg/kg	1.126	22.119	mg/kg	0.00221 %	✓	
7	lead { lead chromate }	082-004-00-2	231-846-0	7758-97-6	1	22	mg/kg	1.56	30.644	mg/kg	0.00196 %	✓	
8	mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		<0.1	mg/kg	1.353	<0.135	mg/kg	<0.0000135 %		<LOD
9	molybdenum { molybdenum(VI) oxide }	042-001-00-9	215-204-7	1313-27-5		2.3	mg/kg	1.5	3.081	mg/kg	0.000308 %	✓	
10	nickel { nickel chromate }	028-035-00-7	238-766-5	14721-18-7		28.1	mg/kg	2.976	74.684	mg/kg	0.00747 %	✓	
11	selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }	034-002-00-8				1	mg/kg	2.554	2.28	mg/kg	0.000228 %	✓	
12	zinc { zinc chromate }	024-007-00-3				85	mg/kg	2.774	210.572	mg/kg	0.0211 %	✓	
13	TPH (C6 to C40) petroleum group			TPH		244	mg/kg		217.892	mg/kg	0.0218 %	✓	
14	tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane	603-181-00-X	216-653-1	1634-04-4		<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<LOD

#		Determinand	CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
15		benzene	601-020-00-8	200-753-7	71-43-2		<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<LOD
16		toluene	601-021-00-3	203-625-9	108-88-3		<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<LOD
17	●	ethylbenzene	601-023-00-4	202-849-4	100-41-4		<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<LOD
18		xylene	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]		<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
19	●	pH			PH		9.35	pH		9.35	pH	9.35 pH		
20		naphthalene	601-052-00-2	202-049-5	91-20-3		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
21	●	acenaphthylene		205-917-1	208-96-8		<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<LOD
22	●	acenaphthene		201-469-6	83-32-9		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
23	●	fluorene		201-695-5	86-73-7		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
24	●	phenanthrene		201-581-5	85-01-8		0.15	mg/kg		0.134	mg/kg	0.0000134 %	✓	
25	●	anthracene		204-371-1	120-12-7		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
26	●	fluoranthene		205-912-4	206-44-0		<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<LOD
27	●	pyrene		204-927-3	129-00-0		<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<LOD
28		benzo[a]anthracene	601-033-00-9	200-280-6	56-55-3		<0.06	mg/kg		<0.06	mg/kg	<0.000006 %		<LOD
29		chrysene	601-048-00-0	205-923-4	218-01-9		<0.02	mg/kg		<0.02	mg/kg	<0.000002 %		<LOD
30		benzo[b]fluoranthene	601-034-00-4	205-911-9	205-99-2		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
31		benzo[k]fluoranthene	601-036-00-5	205-916-6	207-08-9		<0.02	mg/kg		<0.02	mg/kg	<0.000002 %		<LOD
32		benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5	50-32-8		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
33	●	indeno[123-cd]pyrene		205-893-2	193-39-5		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
34		dibenz[a,h]anthracene	601-041-00-2	200-181-8	53-70-3		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
35	●	benzo[ghi]perylene		205-883-8	191-24-2		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
36	●	polychlorobiphenyls; PCB	602-039-00-4	215-648-1	1336-36-3		<0.035	mg/kg		<0.035	mg/kg	<0.0000035 %		<LOD
37		barium { ● barium oxide }		215-127-9	1304-28-5		59	mg/kg	1.117	58.825	mg/kg	0.00588 %	✓	
38	●	coronene		205-881-7	191-07-1		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
39		benzo[j]fluoranthene	601-035-00-X	205-910-3	205-82-3		<1	mg/kg		<1	mg/kg	<0.0001 %		<LOD
											Total:	0.0698 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
•	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
CLP: Note 1	Only the metal concentration has been used for classification

Supplementary Hazardous Property Information

HP 3(i): Flammable "flammable liquid waste: liquid waste having a flash point below 60°C or waste gas oil, diesel and light heating oils having a flash point > 55°C and <= 75°C"

Force this Hazardous property to non hazardous because Solid waste without liquid phase

Hazard Statements hit:

Flam. Liq. 3; H226 "Flammable liquid and vapour."

Because of determinand:

TPH (C6 to C40) petroleum group: (conc.: 0.0218%)

Classification of sample: TP03-19/02/2019-2.00-3.10m

Non Hazardous Waste
Classified as **17 05 04**
in the List of Waste

Sample details

Sample Name:		LoW Code:	
TP03-19/02/2019-2.00-3.10m		Chapter:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Moisture content:			
10.8% (wet weight correction)		Entry:	17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 10.8% Wet Weight Moisture Correction applied (MC)

#	Determinand CLP index number / EC Number / CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
1	antimony { antimony trioxide } 051-005-00-X / 215-175-0 / 1309-64-4		<1	mg/kg	1.197	<1.197	mg/kg	<0.00012 %		<LOD
2	arsenic { arsenic trioxide } 033-003-00-0 / 215-481-4 / 1327-53-3		9	mg/kg	1.32	10.6	mg/kg	0.00106 %	✓	
3	cadmium { cadmium oxide } 048-002-00-0 / 215-146-2 / 1306-19-0		0.4	mg/kg	1.142	0.408	mg/kg	0.0000408 %	✓	
4	chromium in chromium(III) compounds { chromium(III) oxide } 215-160-9 / 1308-38-9		29.3	mg/kg	1.462	38.199	mg/kg	0.00382 %	✓	
5	chromium in chromium(VI) compounds { chromium(VI) oxide } 024-001-00-0 / 215-607-8 / 1333-82-0		<0.3	mg/kg	1.923	<0.577	mg/kg	<0.0000577 %		<LOD
6	copper { dicopper oxide; copper (I) oxide } 029-002-00-X / 215-270-7 / 1317-39-1		12	mg/kg	1.126	12.052	mg/kg	0.00121 %	✓	
7	lead { lead chromate } 082-004-00-2 / 231-846-0 / 7758-97-6	1	17	mg/kg	1.56	23.653	mg/kg	0.00152 %	✓	
8	mercury { mercury dichloride } 080-010-00-X / 231-299-8 / 7487-94-7		<0.1	mg/kg	1.353	<0.135	mg/kg	<0.0000135 %		<LOD
9	molybdenum { molybdenum(VI) oxide } 042-001-00-9 / 215-204-7 / 1313-27-5		2.3	mg/kg	1.5	3.078	mg/kg	0.000308 %	✓	
10	nickel { nickel chromate } 028-035-00-7 / 238-766-5 / 14721-18-7		15.5	mg/kg	2.976	41.15	mg/kg	0.00411 %	✓	
11	selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex } 034-002-00-8		<1	mg/kg	2.554	<2.554	mg/kg	<0.000255 %		<LOD
12	zinc { zinc chromate } 024-007-00-3		66	mg/kg	2.774	163.32	mg/kg	0.0163 %	✓	
13	TPH (C6 to C40) petroleum group TPH		108	mg/kg		96.336	mg/kg	0.00963 %	✓	
14	tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane 603-181-00-X / 216-653-1 / 1634-04-4		<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<LOD

#	Determinand	CLP index number	EC Number	CAS Number	CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
15	benzene	601-020-00-8	200-753-7	71-43-2		<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD
16	toluene	601-021-00-3	203-625-9	108-88-3		<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD
17	ethylbenzene	601-023-00-4	202-849-4	100-41-4		<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD
18	xylene	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]		<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
19	pH			PH		10.74 pH		10.74 pH	10.74 pH		
20	naphthalene	601-052-00-2	202-049-5	91-20-3		<0.04 mg/kg		<0.04 mg/kg	<0.000004 %		<LOD
21	acenaphthylene		205-917-1	208-96-8		<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
22	acenaphthene		201-469-6	83-32-9		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
23	fluorene		201-695-5	86-73-7		<0.04 mg/kg		<0.04 mg/kg	<0.000004 %		<LOD
24	phenanthrene		201-581-5	85-01-8		<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
25	anthracene		204-371-1	120-12-7		<0.04 mg/kg		<0.04 mg/kg	<0.000004 %		<LOD
26	fluoranthene		205-912-4	206-44-0		<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
27	pyrene		204-927-3	129-00-0		<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
28	benzo[a]anthracene	601-033-00-9	200-280-6	56-55-3		<0.06 mg/kg		<0.06 mg/kg	<0.000006 %		<LOD
29	chrysene	601-048-00-0	205-923-4	218-01-9		<0.02 mg/kg		<0.02 mg/kg	<0.000002 %		<LOD
30	benzo[b]fluoranthene	601-034-00-4	205-911-9	205-99-2		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
31	benzo[k]fluoranthene	601-036-00-5	205-916-6	207-08-9		<0.02 mg/kg		<0.02 mg/kg	<0.000002 %		<LOD
32	benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5	50-32-8		<0.04 mg/kg		<0.04 mg/kg	<0.000004 %		<LOD
33	indeno[123-cd]pyrene		205-893-2	193-39-5		<0.04 mg/kg		<0.04 mg/kg	<0.000004 %		<LOD
34	dibenz[a,h]anthracene	601-041-00-2	200-181-8	53-70-3		<0.04 mg/kg		<0.04 mg/kg	<0.000004 %		<LOD
35	benzo[ghi]perylene		205-883-8	191-24-2		<0.04 mg/kg		<0.04 mg/kg	<0.000004 %		<LOD
36	polychlorobiphenyls; PCB	602-039-00-4	215-648-1	1336-36-3		<0.035 mg/kg		<0.035 mg/kg	<0.0000035 %		<LOD
37	barium { barium oxide }		215-127-9	1304-28-5		48 mg/kg	1.117	47.804 mg/kg	0.00478 %	✓	
38	coronene		205-881-7	191-07-1		<0.04 mg/kg		<0.04 mg/kg	<0.000004 %		<LOD
39	benzo[j]fluoranthene	601-035-00-X	205-910-3	205-82-3		<1 mg/kg		<1 mg/kg	<0.0001 %		<LOD
								Total:	0.0434 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
●	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
CLP: Note 1	Only the metal concentration has been used for classification

Supplementary Hazardous Property Information

HP 3(i): Flammable "flammable liquid waste: liquid waste having a flash point below 60°C or waste gas oil, diesel and light heating oils having a flash point > 55°C and <= 75°C"

Force this Hazardous property to non hazardous because Solid waste without liquid phase

Hazard Statements hit:

Flam. Liq. 3; H226 "Flammable liquid and vapour."

Because of determinand:

TPH (C6 to C40) petroleum group: (conc.: 0.00963%)

Classification of sample: TP04-19/02/2019-0.45-0.90m

Non Hazardous Waste
Classified as **17 05 04**
in the List of Waste

Sample details

Sample Name:		LoW Code:	
TP04-19/02/2019-0.45-0.90m		Chapter:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Moisture content:		Entry:	17 05 04 (Soil and stones other than those mentioned in 17 05 03)
9.2% (wet weight correction)			

Hazard properties

None identified

Determinands

Moisture content: 9.2% Wet Weight Moisture Correction applied (MC)

#	Determinand / CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
1	antimony { antimony trioxide } 051-005-00-X	215-175-0	1309-64-4		1	mg/kg	1.197	1.087	mg/kg	0.000109 %	✓	
2	arsenic { arsenic trioxide } 033-003-00-0	215-481-4	1327-53-3		20.1	mg/kg	1.32	24.097	mg/kg	0.00241 %	✓	
3	cadmium { cadmium oxide } 048-002-00-0	215-146-2	1306-19-0		0.3	mg/kg	1.142	0.311	mg/kg	0.0000311 %	✓	
4	chromium in chromium(III) compounds { chromium(III) oxide }	215-160-9	1308-38-9		54.8	mg/kg	1.462	72.725	mg/kg	0.00727 %	✓	
5	chromium in chromium(VI) compounds { chromium(VI) oxide } 024-001-00-0	215-607-8	1333-82-0		<0.3	mg/kg	1.923	<0.577	mg/kg	<0.0000577 %		<LOD
6	copper { dicopper oxide; copper (I) oxide } 029-002-00-X	215-270-7	1317-39-1		20	mg/kg	1.126	20.446	mg/kg	0.00204 %	✓	
7	lead { lead chromate } 082-004-00-2	231-846-0	7758-97-6	1	10	mg/kg	1.56	14.163	mg/kg	0.000908 %	✓	
8	mercury { mercury dichloride } 080-010-00-X	231-299-8	7487-94-7		<0.1	mg/kg	1.353	<0.135	mg/kg	<0.0000135 %		<LOD
9	molybdenum { molybdenum(VI) oxide } 042-001-00-9	215-204-7	1313-27-5		2.1	mg/kg	1.5	2.861	mg/kg	0.000286 %	✓	
10	nickel { nickel chromate } 028-035-00-7	238-766-5	14721-18-7		27.9	mg/kg	2.976	75.398	mg/kg	0.00754 %	✓	
11	selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex } 034-002-00-8				1	mg/kg	2.554	2.319	mg/kg	0.000232 %	✓	
12	zinc { zinc chromate } 024-007-00-3				97	mg/kg	2.774	244.336	mg/kg	0.0244 %	✓	
13	TPH (C6 to C40) petroleum group		TPH		<52	mg/kg		<52	mg/kg	<0.0052 %		<LOD
14	tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane 603-181-00-X	216-653-1	1634-04-4		<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<LOD

#	Determinand	CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
15	benzene	601-020-00-8	200-753-7	71-43-2		<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<LOD
16	toluene	601-021-00-3	203-625-9	108-88-3		<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<LOD
17	ethylbenzene	601-023-00-4	202-849-4	100-41-4		<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<LOD
18	xylene	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]		<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
19	pH			PH		8.97	pH		8.97	pH	8.97 pH		
20	naphthalene	601-052-00-2	202-049-5	91-20-3		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
21	acenaphthylene		205-917-1	208-96-8		<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<LOD
22	acenaphthene		201-469-6	83-32-9		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
23	fluorene		201-695-5	86-73-7		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
24	phenanthrene		201-581-5	85-01-8		<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<LOD
25	anthracene		204-371-1	120-12-7		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
26	fluoranthene		205-912-4	206-44-0		<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<LOD
27	pyrene		204-927-3	129-00-0		<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<LOD
28	benzo[a]anthracene	601-033-00-9	200-280-6	56-55-3		<0.06	mg/kg		<0.06	mg/kg	<0.000006 %		<LOD
29	chrysene	601-048-00-0	205-923-4	218-01-9		<0.02	mg/kg		<0.02	mg/kg	<0.000002 %		<LOD
30	benzo[b]fluoranthene	601-034-00-4	205-911-9	205-99-2		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
31	benzo[k]fluoranthene	601-036-00-5	205-916-6	207-08-9		<0.02	mg/kg		<0.02	mg/kg	<0.000002 %		<LOD
32	benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5	50-32-8		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
33	indeno[123-cd]pyrene		205-893-2	193-39-5		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
34	dibenz[a,h]anthracene	601-041-00-2	200-181-8	53-70-3		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
35	benzo[ghi]perylene		205-883-8	191-24-2		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
36	polychlorobiphenyls; PCB	602-039-00-4	215-648-1	1336-36-3		<0.035	mg/kg		<0.035	mg/kg	<0.0000035 %		<LOD
37	barium { barium oxide }		215-127-9	1304-28-5		99	mg/kg	1.117	100.365	mg/kg	0.01 %	✓	
38	coronene		205-881-7	191-07-1		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
39	benzo[j]fluoranthene	601-035-00-X	205-910-3	205-82-3		<1	mg/kg		<1	mg/kg	<0.0001 %		<LOD
										Total:	0.0607 %		

Key	
	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
CLP: Note 1	Only the metal concentration has been used for classification

Classification of sample: TP04-19/02/2019-0.90-2.00m

Non Hazardous Waste
Classified as **17 05 04**
in the List of Waste

Sample details

Sample Name:		LoW Code:	
TP04-19/02/2019-0.90-2.00m		Chapter:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Moisture content:			
9.4% (wet weight correction)		Entry:	17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 9.4% Wet Weight Moisture Correction applied (MC)

#		Determinand / CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
1		antimony { antimony trioxide } 051-005-00-X	215-175-0	1309-64-4		2	mg/kg	1.197	2.169	mg/kg	0.000217 %	✓	
2		arsenic { arsenic trioxide } 033-003-00-0	215-481-4	1327-53-3		10.1	mg/kg	1.32	12.082	mg/kg	0.00121 %	✓	
3		cadmium { cadmium oxide } 048-002-00-0	215-146-2	1306-19-0		2.3	mg/kg	1.142	2.38	mg/kg	0.000238 %	✓	
4		chromium in chromium(III) compounds { chromium(III) oxide }	215-160-9	1308-38-9		27.8	mg/kg	1.462	36.812	mg/kg	0.00368 %	✓	
5		chromium in chromium(VI) compounds { chromium(VI) oxide } 024-001-00-0	215-607-8	1333-82-0		<0.3	mg/kg	1.923	<0.577	mg/kg	<0.0000577 %		<LOD
6		copper { dicopper oxide; copper (I) oxide } 029-002-00-X	215-270-7	1317-39-1		32	mg/kg	1.126	32.642	mg/kg	0.00326 %	✓	
7		lead { lead chromate } 082-004-00-2	231-846-0	7758-97-6	1	18	mg/kg	1.56	25.437	mg/kg	0.00163 %	✓	
8		mercury { mercury dichloride } 080-010-00-X	231-299-8	7487-94-7		<0.1	mg/kg	1.353	<0.135	mg/kg	<0.0000135 %		<LOD
9		molybdenum { molybdenum(VI) oxide } 042-001-00-9	215-204-7	1313-27-5		4	mg/kg	1.5	5.437	mg/kg	0.000544 %	✓	
10		nickel { nickel chromate } 028-035-00-7	238-766-5	14721-18-7		40.9	mg/kg	2.976	110.287	mg/kg	0.011 %	✓	
11		selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex } 034-002-00-8				2	mg/kg	2.554	4.627	mg/kg	0.000463 %	✓	
12		zinc { zinc chromate } 024-007-00-3				109	mg/kg	2.774	273.958	mg/kg	0.0274 %	✓	
13		TPH (C6 to C40) petroleum group		TPH		<52	mg/kg		<52	mg/kg	<0.0052 %		<LOD
14		tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane 603-181-00-X	216-653-1	1634-04-4		<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<LOD

#		Determinand	CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
15		benzene	601-020-00-8	200-753-7	71-43-2		<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<LOD
16		toluene	601-021-00-3	203-625-9	108-88-3		<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<LOD
17	●	ethylbenzene	601-023-00-4	202-849-4	100-41-4		<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<LOD
18		xylene	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]		<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
19	●	pH			PH		8.74	pH		8.74	pH	8.74 pH		
20		naphthalene	601-052-00-2	202-049-5	91-20-3		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
21	●	acenaphthylene		205-917-1	208-96-8		<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<LOD
22	●	acenaphthene		201-469-6	83-32-9		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
23	●	fluorene		201-695-5	86-73-7		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
24	●	phenanthrene		201-581-5	85-01-8		<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<LOD
25	●	anthracene		204-371-1	120-12-7		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
26	●	fluoranthene		205-912-4	206-44-0		<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<LOD
27	●	pyrene		204-927-3	129-00-0		<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<LOD
28		benzo[a]anthracene	601-033-00-9	200-280-6	56-55-3		<0.06	mg/kg		<0.06	mg/kg	<0.000006 %		<LOD
29		chrysene	601-048-00-0	205-923-4	218-01-9		<0.02	mg/kg		<0.02	mg/kg	<0.000002 %		<LOD
30		benzo[b]fluoranthene	601-034-00-4	205-911-9	205-99-2		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
31		benzo[k]fluoranthene	601-036-00-5	205-916-6	207-08-9		<0.02	mg/kg		<0.02	mg/kg	<0.000002 %		<LOD
32		benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5	50-32-8		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
33	●	indeno[123-cd]pyrene		205-893-2	193-39-5		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
34		dibenz[a,h]anthracene	601-041-00-2	200-181-8	53-70-3		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
35	●	benzo[ghi]perylene		205-883-8	191-24-2		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
36	●	polychlorobiphenyls; PCB	602-039-00-4	215-648-1	1336-36-3		<0.035	mg/kg		<0.035	mg/kg	<0.0000035 %		<LOD
37		barium { ● barium oxide }		215-127-9	1304-28-5		91	mg/kg	1.117	92.051	mg/kg	0.00921 %	✓	
38	●	coronene		205-881-7	191-07-1		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
39		benzo[j]fluoranthene	601-035-00-X	205-910-3	205-82-3		<1	mg/kg		<1	mg/kg	<0.0001 %		<LOD
											Total:	0.0643 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
CLP: Note 1	Only the metal concentration has been used for classification

Classification of sample: TP05-19/02/2019-0.35-1.00m

Non Hazardous Waste
Classified as **17 05 04**
in the List of Waste

Sample details

Sample Name:		LoW Code:	
TP05-19/02/2019-0.35-1.00m		Chapter:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Moisture content:		Entry:	17 05 04 (Soil and stones other than those mentioned in 17 05 03)
10.2% (wet weight correction)			

Hazard properties

None identified

Determinands

Moisture content: 10.2% Wet Weight Moisture Correction applied (MC)

#	Determinand	CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
1	antimony { antimony trioxide }	051-005-00-X	215-175-0	1309-64-4		2	mg/kg	1.197	2.15	mg/kg	0.000215 %	✓	
2	arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		11	mg/kg	1.32	13.042	mg/kg	0.0013 %	✓	
3	cadmium { cadmium oxide }	048-002-00-0	215-146-2	1306-19-0		1.6	mg/kg	1.142	1.641	mg/kg	0.000164 %	✓	
4	chromium in chromium(III) compounds { chromium(III) oxide }		215-160-9	1308-38-9		74.3	mg/kg	1.462	97.517	mg/kg	0.00975 %	✓	
5	chromium in chromium(VI) compounds { chromium(VI) oxide }	024-001-00-0	215-607-8	1333-82-0		<0.3	mg/kg	1.923	<0.577	mg/kg	<0.0000577 %		<LOD
6	copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		18	mg/kg	1.126	18.199	mg/kg	0.00182 %	✓	
7	lead { lead chromate }	082-004-00-2	231-846-0	7758-97-6	1	22	mg/kg	1.56	30.816	mg/kg	0.00198 %	✓	
8	mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		<0.1	mg/kg	1.353	<0.135	mg/kg	<0.0000135 %		<LOD
9	molybdenum { molybdenum(VI) oxide }	042-001-00-9	215-204-7	1313-27-5		4.4	mg/kg	1.5	5.928	mg/kg	0.000593 %	✓	
10	nickel { nickel chromate }	028-035-00-7	238-766-5	14721-18-7		33.4	mg/kg	2.976	89.268	mg/kg	0.00893 %	✓	
11	selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }	034-002-00-8				<1	mg/kg	2.554	<2.554	mg/kg	<0.000255 %		<LOD
12	zinc { zinc chromate }	024-007-00-3				83	mg/kg	2.774	206.768	mg/kg	0.0207 %	✓	
13	TPH (C6 to C40) petroleum group			TPH		<52	mg/kg		<52	mg/kg	<0.0052 %		<LOD
14	tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane	603-181-00-X	216-653-1	1634-04-4		<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<LOD

#	Determinand	CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
15	benzene	601-020-00-8	200-753-7	71-43-2		<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<LOD
16	toluene	601-021-00-3	203-625-9	108-88-3		<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<LOD
17	ethylbenzene	601-023-00-4	202-849-4	100-41-4		<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<LOD
18	xylene	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]		<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
19	pH			PH		8.48	pH		8.48	pH	8.48 pH		
20	naphthalene	601-052-00-2	202-049-5	91-20-3		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
21	acenaphthylene		205-917-1	208-96-8		<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<LOD
22	acenaphthene		201-469-6	83-32-9		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
23	fluorene		201-695-5	86-73-7		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
24	phenanthrene		201-581-5	85-01-8		<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<LOD
25	anthracene		204-371-1	120-12-7		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
26	fluoranthene		205-912-4	206-44-0		<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<LOD
27	pyrene		204-927-3	129-00-0		<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<LOD
28	benzo[a]anthracene	601-033-00-9	200-280-6	56-55-3		<0.06	mg/kg		<0.06	mg/kg	<0.000006 %		<LOD
29	chrysene	601-048-00-0	205-923-4	218-01-9		<0.02	mg/kg		<0.02	mg/kg	<0.000002 %		<LOD
30	benzo[b]fluoranthene	601-034-00-4	205-911-9	205-99-2		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
31	benzo[k]fluoranthene	601-036-00-5	205-916-6	207-08-9		<0.02	mg/kg		<0.02	mg/kg	<0.000002 %		<LOD
32	benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5	50-32-8		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
33	indeno[123-cd]pyrene		205-893-2	193-39-5		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
34	dibenz[a,h]anthracene	601-041-00-2	200-181-8	53-70-3		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
35	benzo[ghi]perylene		205-883-8	191-24-2		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
36	polychlorobiphenyls; PCB	602-039-00-4	215-648-1	1336-36-3		<0.035	mg/kg		<0.035	mg/kg	<0.0000035 %		<LOD
37	barium { barium oxide }		215-127-9	1304-28-5		178	mg/kg	1.117	178.467	mg/kg	0.0178 %	✓	
38	coronene		205-881-7	191-07-1		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
39	benzo[j]fluoranthene	601-035-00-X	205-910-3	205-82-3		<1	mg/kg		<1	mg/kg	<0.0001 %		<LOD
										Total:	0.069 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
CLP: Note 1	Only the metal concentration has been used for classification

Classification of sample: TP05-19/02/2019-1.00-2.00m

Non Hazardous Waste
Classified as **17 05 04**
in the List of Waste

Sample details

Sample Name:
TP05-19/02/2019-1.00-2.00m
Moisture content:
12.3%
(wet weight correction)

LoW Code:
Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 12.3% Wet Weight Moisture Correction applied (MC)

#		Determinand (CLP index number / EC Number / CAS Number)	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
1		antimony { antimony trioxide } 051-005-00-X / 215-175-0 / 1309-64-4		2	mg/kg	1.197	2.1	mg/kg	0.00021 %	✓	
2		arsenic { arsenic trioxide } 033-003-00-0 / 215-481-4 / 1327-53-3		12.9	mg/kg	1.32	14.937	mg/kg	0.00149 %	✓	
3		cadmium { cadmium oxide } 048-002-00-0 / 215-146-2 / 1306-19-0		3.4	mg/kg	1.142	3.406	mg/kg	0.000341 %	✓	
4		chromium in chromium(III) compounds { chromium(III) oxide } 215-160-9 / 1308-38-9		26.7	mg/kg	1.462	34.224	mg/kg	0.00342 %	✓	
5		chromium in chromium(VI) compounds { chromium(VI) oxide } 024-001-00-0 / 215-607-8 / 1333-82-0		<0.3	mg/kg	1.923	<0.577	mg/kg	<0.0000577 %		<LOD
6		copper { dicopper oxide; copper (I) oxide } 029-002-00-X / 215-270-7 / 1317-39-1		30	mg/kg	1.126	29.622	mg/kg	0.00296 %	✓	
7		lead { lead chromate } 082-004-00-2 / 231-846-0 / 7758-97-6	1	20	mg/kg	1.56	27.359	mg/kg	0.00175 %	✓	
8		mercury { mercury dichloride } 080-010-00-X / 231-299-8 / 7487-94-7		<0.1	mg/kg	1.353	<0.135	mg/kg	<0.0000135 %		<LOD
9		molybdenum { molybdenum(VI) oxide } 042-001-00-9 / 215-204-7 / 1313-27-5		3.6	mg/kg	1.5	4.736	mg/kg	0.000474 %	✓	
10		nickel { nickel chromate } 028-035-00-7 / 238-766-5 / 14721-18-7		43.6	mg/kg	2.976	113.804	mg/kg	0.0114 %	✓	
11		selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex } 034-002-00-8		6	mg/kg	2.554	13.437	mg/kg	0.00134 %	✓	
12		zinc { zinc chromate } 024-007-00-3		126	mg/kg	2.774	306.549	mg/kg	0.0307 %	✓	
13		TPH (C6 to C40) petroleum group TPH		<52	mg/kg		<52	mg/kg	<0.0052 %		<LOD
14		tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane 603-181-00-X / 216-653-1 / 1634-04-4		<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<LOD

#	Determinand	CLP index number	EC Number	CAS Number	CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
15	benzene	601-020-00-8	200-753-7	71-43-2		<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD
16	toluene	601-021-00-3	203-625-9	108-88-3		<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD
17	ethylbenzene	601-023-00-4	202-849-4	100-41-4		<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD
18	xylene	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]		<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
19	pH			PH		8.68 pH		8.68 pH	8.68 pH		
20	naphthalene	601-052-00-2	202-049-5	91-20-3		<0.04 mg/kg		<0.04 mg/kg	<0.000004 %		<LOD
21	acenaphthylene		205-917-1	208-96-8		<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
22	acenaphthene		201-469-6	83-32-9		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
23	fluorene		201-695-5	86-73-7		<0.04 mg/kg		<0.04 mg/kg	<0.000004 %		<LOD
24	phenanthrene		201-581-5	85-01-8		<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
25	anthracene		204-371-1	120-12-7		<0.04 mg/kg		<0.04 mg/kg	<0.000004 %		<LOD
26	fluoranthene		205-912-4	206-44-0		<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
27	pyrene		204-927-3	129-00-0		<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
28	benzo[a]anthracene	601-033-00-9	200-280-6	56-55-3		<0.06 mg/kg		<0.06 mg/kg	<0.000006 %		<LOD
29	chrysene	601-048-00-0	205-923-4	218-01-9		<0.02 mg/kg		<0.02 mg/kg	<0.000002 %		<LOD
30	benzo[b]fluoranthene	601-034-00-4	205-911-9	205-99-2		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
31	benzo[k]fluoranthene	601-036-00-5	205-916-6	207-08-9		<0.02 mg/kg		<0.02 mg/kg	<0.000002 %		<LOD
32	benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5	50-32-8		<0.04 mg/kg		<0.04 mg/kg	<0.000004 %		<LOD
33	indeno[123-cd]pyrene		205-893-2	193-39-5		<0.04 mg/kg		<0.04 mg/kg	<0.000004 %		<LOD
34	dibenz[a,h]anthracene	601-041-00-2	200-181-8	53-70-3		<0.04 mg/kg		<0.04 mg/kg	<0.000004 %		<LOD
35	benzo[ghi]perylene		205-883-8	191-24-2		<0.04 mg/kg		<0.04 mg/kg	<0.000004 %		<LOD
36	polychlorobiphenyls; PCB	602-039-00-4	215-648-1	1336-36-3		<0.035 mg/kg		<0.035 mg/kg	<0.0000035 %		<LOD
37	barium { barium oxide }		215-127-9	1304-28-5		99 mg/kg	1.117	96.938 mg/kg	0.00969 %	✓	
38	coronene		205-881-7	191-07-1		<0.04 mg/kg		<0.04 mg/kg	<0.000004 %		<LOD
39	benzo[j]fluoranthene	601-035-00-X	205-910-3	205-82-3		<1 mg/kg		<1 mg/kg	<0.0001 %		<LOD
								Total:	0.0692 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
CLP: Note 1	Only the metal concentration has been used for classification

Classification of sample: TP05-19/02/2019-2.00-3.10m

Non Hazardous Waste
Classified as **17 05 04**
in the List of Waste

Sample details

Sample Name:		LoW Code:	
TP05-19/02/2019-2.00-3.10m		Chapter:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Moisture content:		Entry:	17 05 04 (Soil and stones other than those mentioned in 17 05 03)
8.8% (wet weight correction)			

Hazard properties

None identified

Determinands

Moisture content: 8.8% Wet Weight Moisture Correction applied (MC)

#	Determinand	CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
1	antimony { antimony trioxide }	051-005-00-X	215-175-0	1309-64-4		2	mg/kg	1.197	2.184	mg/kg	0.000218 %	✓	
2	arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		9.2	mg/kg	1.32	11.078	mg/kg	0.00111 %	✓	
3	cadmium { cadmium oxide }	048-002-00-0	215-146-2	1306-19-0		1.5	mg/kg	1.142	1.563	mg/kg	0.000156 %	✓	
4	chromium in chromium(III) compounds { chromium(III) oxide }		215-160-9	1308-38-9		43.1	mg/kg	1.462	57.45	mg/kg	0.00574 %	✓	
5	chromium in chromium(VI) compounds { chromium(VI) oxide }	024-001-00-0	215-607-8	1333-82-0		<0.3	mg/kg	1.923	<0.577	mg/kg	<0.0000577 %		<LOD
6	copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		26	mg/kg	1.126	26.697	mg/kg	0.00267 %	✓	
7	lead { lead chromate }	082-004-00-2	231-846-0	7758-97-6	1	19	mg/kg	1.56	27.028	mg/kg	0.00173 %	✓	
8	mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		<0.1	mg/kg	1.353	<0.135	mg/kg	<0.0000135 %		<LOD
9	molybdenum { molybdenum(VI) oxide }	042-001-00-9	215-204-7	1313-27-5		3.8	mg/kg	1.5	5.199	mg/kg	0.00052 %	✓	
10	nickel { nickel chromate }	028-035-00-7	238-766-5	14721-18-7		37	mg/kg	2.976	100.431	mg/kg	0.01 %	✓	
11	selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }	034-002-00-8				3	mg/kg	2.554	6.987	mg/kg	0.000699 %	✓	
12	zinc { zinc chromate }	024-007-00-3				85	mg/kg	2.774	215.052	mg/kg	0.0215 %	✓	
13	TPH (C6 to C40) petroleum group			TPH		<52	mg/kg		<52	mg/kg	<0.0052 %		<LOD
14	tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane	603-181-00-X	216-653-1	1634-04-4		<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<LOD

#		Determinand CLP index number / EC Number / CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
15		benzene 601-020-00-8 / 200-753-7 / 71-43-2		<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<LOD
16		toluene 601-021-00-3 / 203-625-9 / 108-88-3		<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<LOD
17	●	ethylbenzene 601-023-00-4 / 202-849-4 / 100-41-4		<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<LOD
18		xylene 601-022-00-9 / 202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4] / 95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]		<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
19	●	pH PH		8.43	pH		8.43	pH	8.43 pH		
20		naphthalene 601-052-00-2 / 202-049-5 / 91-20-3		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
21	●	acenaphthylene 205-917-1 / 208-96-8		<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<LOD
22	●	acenaphthene 201-469-6 / 83-32-9		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
23	●	fluorene 201-695-5 / 86-73-7		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
24	●	phenanthrene 201-581-5 / 85-01-8		<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<LOD
25	●	anthracene 204-371-1 / 120-12-7		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
26	●	fluoranthene 205-912-4 / 206-44-0		<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<LOD
27	●	pyrene 204-927-3 / 129-00-0		<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<LOD
28		benzo[a]anthracene 601-033-00-9 / 200-280-6 / 56-55-3		<0.06	mg/kg		<0.06	mg/kg	<0.000006 %		<LOD
29		chrysene 601-048-00-0 / 205-923-4 / 218-01-9		<0.02	mg/kg		<0.02	mg/kg	<0.000002 %		<LOD
30		benzo[b]fluoranthene 601-034-00-4 / 205-911-9 / 205-99-2		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
31		benzo[k]fluoranthene 601-036-00-5 / 205-916-6 / 207-08-9		<0.02	mg/kg		<0.02	mg/kg	<0.000002 %		<LOD
32		benzo[a]pyrene; benzo[def]chrysene 601-032-00-3 / 200-028-5 / 50-32-8		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
33	●	indeno[123-cd]pyrene 205-893-2 / 193-39-5		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
34		dibenz[a,h]anthracene 601-041-00-2 / 200-181-8 / 53-70-3		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
35	●	benzo[ghi]perylene 205-883-8 / 191-24-2		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
36	●	polychlorobiphenyls; PCB 602-039-00-4 / 215-648-1 / 1336-36-3		<0.035	mg/kg		<0.035	mg/kg	<0.0000035 %		<LOD
37		barium { ● barium oxide } 215-127-9 / 1304-28-5		71	mg/kg	1.117	72.296	mg/kg	0.00723 %	✓	
38	●	coronene 205-881-7 / 191-07-1		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
39		benzo[j]fluoranthene 601-035-00-X / 205-910-3 / 205-82-3		<1	mg/kg		<1	mg/kg	<0.0001 %		<LOD
								Total:	0.0571 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
•	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
CLP: Note 1	Only the metal concentration has been used for classification

Classification of sample: SA02-20/02/2019-0.50-1.00m

Non Hazardous Waste
Classified as **17 05 04**
in the List of Waste

Sample details

Sample Name:	LoW Code:		
SA02-20/02/2019-0.50-1.00m	Chapter:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)	
Moisture content:			
16.3% (wet weight correction)	Entry:	17 05 04 (Soil and stones other than those mentioned in 17 05 03)	

Hazard properties

None identified

Determinands

Moisture content: 16.3% Wet Weight Moisture Correction applied (MC)

#	Determinand / CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
1	antimony { antimony trioxide } 051-005-00-X	215-175-0	1309-64-4		3	mg/kg	1.197	3.006	mg/kg	0.000301 %	✓	
2	arsenic { arsenic trioxide } 033-003-00-0	215-481-4	1327-53-3		21.3	mg/kg	1.32	23.539	mg/kg	0.00235 %	✓	
3	cadmium { cadmium oxide } 048-002-00-0	215-146-2	1306-19-0		3.5	mg/kg	1.142	3.346	mg/kg	0.000335 %	✓	
4	chromium in chromium(III) compounds { chromium(III) oxide }	215-160-9	1308-38-9		53.2	mg/kg	1.462	65.081	mg/kg	0.00651 %	✓	
5	chromium in chromium(VI) compounds { chromium(VI) oxide } 024-001-00-0	215-607-8	1333-82-0		<0.3	mg/kg	1.923	<0.577	mg/kg	<0.0000577 %		<LOD
6	copper { dicopper oxide; copper (I) oxide } 029-002-00-X	215-270-7	1317-39-1		29	mg/kg	1.126	27.329	mg/kg	0.00273 %	✓	
7	lead { lead chromate } 082-004-00-2	231-846-0	7758-97-6	1	34	mg/kg	1.56	44.389	mg/kg	0.00285 %	✓	
8	mercury { mercury dichloride } 080-010-00-X	231-299-8	7487-94-7		<0.1	mg/kg	1.353	<0.135	mg/kg	<0.0000135 %		<LOD
9	molybdenum { molybdenum(VI) oxide } 042-001-00-9	215-204-7	1313-27-5		3.6	mg/kg	1.5	4.52	mg/kg	0.000452 %	✓	
10	nickel { nickel chromate } 028-035-00-7	238-766-5	14721-18-7		70.8	mg/kg	2.976	176.372	mg/kg	0.0176 %	✓	
11	selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex } 034-002-00-8				2	mg/kg	2.554	4.275	mg/kg	0.000427 %	✓	
12	zinc { zinc chromate } 024-007-00-3				164	mg/kg	2.774	380.802	mg/kg	0.0381 %	✓	
13	TPH (C6 to C40) petroleum group		TPH		<52	mg/kg		<52	mg/kg	<0.0052 %		<LOD
14	tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane 603-181-00-X	216-653-1	1634-04-4		<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<LOD

#	Determinand	CLP index number	EC Number	CAS Number	CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
15	benzene	601-020-00-8	200-753-7	71-43-2		<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD
16	toluene	601-021-00-3	203-625-9	108-88-3		<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD
17	ethylbenzene	601-023-00-4	202-849-4	100-41-4		<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD
18	xylene	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]		<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
19	pH			PH		8.28 pH		8.28 pH	8.28 pH		
20	naphthalene	601-052-00-2	202-049-5	91-20-3		<0.04 mg/kg		<0.04 mg/kg	<0.000004 %		<LOD
21	acenaphthylene		205-917-1	208-96-8		<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
22	acenaphthene		201-469-6	83-32-9		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
23	fluorene		201-695-5	86-73-7		<0.04 mg/kg		<0.04 mg/kg	<0.000004 %		<LOD
24	phenanthrene		201-581-5	85-01-8		<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
25	anthracene		204-371-1	120-12-7		<0.04 mg/kg		<0.04 mg/kg	<0.000004 %		<LOD
26	fluoranthene		205-912-4	206-44-0		<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
27	pyrene		204-927-3	129-00-0		<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
28	benzo[a]anthracene	601-033-00-9	200-280-6	56-55-3		<0.06 mg/kg		<0.06 mg/kg	<0.000006 %		<LOD
29	chrysene	601-048-00-0	205-923-4	218-01-9		<0.02 mg/kg		<0.02 mg/kg	<0.000002 %		<LOD
30	benzo[b]fluoranthene	601-034-00-4	205-911-9	205-99-2		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
31	benzo[k]fluoranthene	601-036-00-5	205-916-6	207-08-9		<0.02 mg/kg		<0.02 mg/kg	<0.000002 %		<LOD
32	benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5	50-32-8		<0.04 mg/kg		<0.04 mg/kg	<0.000004 %		<LOD
33	indeno[123-cd]pyrene		205-893-2	193-39-5		<0.04 mg/kg		<0.04 mg/kg	<0.000004 %		<LOD
34	dibenz[a,h]anthracene	601-041-00-2	200-181-8	53-70-3		<0.04 mg/kg		<0.04 mg/kg	<0.000004 %		<LOD
35	benzo[ghi]perylene		205-883-8	191-24-2		<0.04 mg/kg		<0.04 mg/kg	<0.000004 %		<LOD
36	polychlorobiphenyls; PCB	602-039-00-4	215-648-1	1336-36-3		<0.035 mg/kg		<0.035 mg/kg	<0.0000035 %		<LOD
37	barium { barium oxide }		215-127-9	1304-28-5		230 mg/kg	1.117	214.939 mg/kg	0.0215 %	✓	
38	coronene		205-881-7	191-07-1		<0.04 mg/kg		<0.04 mg/kg	<0.000004 %		<LOD
39	benzo[j]fluoranthene	601-035-00-X	205-910-3	205-82-3		<1 mg/kg		<1 mg/kg	<0.0001 %		<LOD
								Total:	0.0986 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
CLP: Note 1	Only the metal concentration has been used for classification

Classification of sample: SA02-20/02/2019-1.00-1.80m

Non Hazardous Waste
Classified as **17 05 04**
in the List of Waste

Sample details

Sample Name:
SA02-20/02/2019-1.00-1.80m
Moisture content:
10.9%
(wet weight correction)

LoW Code:
Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 10.9% Wet Weight Moisture Correction applied (MC)

#		Determinand CLP index number / EC Number / CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
1		antimony { antimony trioxide } 051-005-00-X / 215-175-0 / 1309-64-4		1	mg/kg	1.197	1.067	mg/kg	0.000107 %	✓	
2		arsenic { arsenic trioxide } 033-003-00-0 / 215-481-4 / 1327-53-3		4.6	mg/kg	1.32	5.411	mg/kg	0.000541 %	✓	
3		cadmium { cadmium oxide } 048-002-00-0 / 215-146-2 / 1306-19-0		1.6	mg/kg	1.142	1.629	mg/kg	0.000163 %	✓	
4		chromium in chromium(III) compounds { chromium(III) oxide } 215-160-9 / 1308-38-9		29	mg/kg	1.462	37.765	mg/kg	0.00378 %	✓	
5		chromium in chromium(VI) compounds { chromium(VI) oxide } 024-001-00-0 / 215-607-8 / 1333-82-0		<0.3	mg/kg	1.923	<0.577	mg/kg	<0.0000577 %		<LOD
6		copper { dicopper oxide; copper (I) oxide } 029-002-00-X / 215-270-7 / 1317-39-1		17	mg/kg	1.126	17.054	mg/kg	0.00171 %	✓	
7		lead { lead chromate } 082-004-00-2 / 231-846-0 / 7758-97-6	1	11	mg/kg	1.56	15.288	mg/kg	0.00098 %	✓	
8		mercury { mercury dichloride } 080-010-00-X / 231-299-8 / 7487-94-7		<0.1	mg/kg	1.353	<0.135	mg/kg	<0.0000135 %		<LOD
9		molybdenum { molybdenum(VI) oxide } 042-001-00-9 / 215-204-7 / 1313-27-5		2.2	mg/kg	1.5	2.941	mg/kg	0.000294 %	✓	
10		nickel { nickel chromate } 028-035-00-7 / 238-766-5 / 14721-18-7		20.4	mg/kg	2.976	54.098	mg/kg	0.00541 %	✓	
11		selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex } 034-002-00-8		<1	mg/kg	2.554	<2.554	mg/kg	<0.000255 %		<LOD
12		zinc { zinc chromate } 024-007-00-3		55	mg/kg	2.774	135.947	mg/kg	0.0136 %	✓	
13		TPH (C6 to C40) petroleum group TPH		<52	mg/kg		<52	mg/kg	<0.0052 %		<LOD
14		tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane 603-181-00-X / 216-653-1 / 1634-04-4		<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<LOD

#	Determinand	CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
15	benzene	601-020-00-8	200-753-7	71-43-2		<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<LOD
16	toluene	601-021-00-3	203-625-9	108-88-3		<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<LOD
17	ethylbenzene	601-023-00-4	202-849-4	100-41-4		<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<LOD
18	xylene	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]		<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
19	pH			PH		8.67	pH		8.67	pH	8.67 pH		
20	naphthalene	601-052-00-2	202-049-5	91-20-3		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
21	acenaphthylene		205-917-1	208-96-8		<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<LOD
22	acenaphthene		201-469-6	83-32-9		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
23	fluorene		201-695-5	86-73-7		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
24	phenanthrene		201-581-5	85-01-8		<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<LOD
25	anthracene		204-371-1	120-12-7		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
26	fluoranthene		205-912-4	206-44-0		<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<LOD
27	pyrene		204-927-3	129-00-0		<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<LOD
28	benzo[a]anthracene	601-033-00-9	200-280-6	56-55-3		<0.06	mg/kg		<0.06	mg/kg	<0.000006 %		<LOD
29	chrysene	601-048-00-0	205-923-4	218-01-9		<0.02	mg/kg		<0.02	mg/kg	<0.000002 %		<LOD
30	benzo[b]fluoranthene	601-034-00-4	205-911-9	205-99-2		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
31	benzo[k]fluoranthene	601-036-00-5	205-916-6	207-08-9		<0.02	mg/kg		<0.02	mg/kg	<0.000002 %		<LOD
32	benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5	50-32-8		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
33	indeno[123-cd]pyrene		205-893-2	193-39-5		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
34	dibenz[a,h]anthracene	601-041-00-2	200-181-8	53-70-3		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
35	benzo[ghi]perylene		205-883-8	191-24-2		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
36	polychlorobiphenyls; PCB	602-039-00-4	215-648-1	1336-36-3		<0.035	mg/kg		<0.035	mg/kg	<0.0000035 %		<LOD
37	barium { barium oxide }		215-127-9	1304-28-5		42	mg/kg	1.117	41.782	mg/kg	0.00418 %	✓	
38	coronene		205-881-7	191-07-1		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
39	benzo[j]fluoranthene	601-035-00-X	205-910-3	205-82-3		<1	mg/kg		<1	mg/kg	<0.0001 %		<LOD
										Total:	0.0364 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
CLP: Note 1	Only the metal concentration has been used for classification

Appendix A: Classifier defined and non CLP determinands

chromium(III) oxide (EC Number: 215-160-9, CAS Number: 1308-38-9)

Conversion factor: 1.462
Description/Comments: Data from C&L Inventory Database
Data source: http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database
Data source date: 17 Jul 2015
Hazard Statements: Aquatic Chronic 1 H410 , Aquatic Acute 1 H400 , Repr. 1B H360FD , Skin Sens. 1 H317 , Resp. Sens. 1 H334 , Skin Irrit. 2 H315 , STOT SE 3 H335 , Eye Irrit. 2 H319 , Acute Tox. 4 H302 , Acute Tox. 4 H332

TPH (C6 to C40) petroleum group (CAS Number: TPH)

Description/Comments: Hazard statements taken from WM3 1st Edition 2015; Risk phrases: WM2 3rd Edition 2013
Data source: WM3 1st Edition 2015
Data source date: 25 May 2015
Hazard Statements: Aquatic Chronic 2 H411 , Repr. 2 H361d , Carc. 1B H350 , Muta. 1B H340 , STOT RE 2 H373 , Asp. Tox. 1 H304 , Flam. Liq. 3 H226

ethylbenzene (EC Number: 202-849-4, CAS Number: 100-41-4)

CLP index number: 601-023-00-4
Description/Comments:
Data source: Commission Regulation (EU) No 605/2014 – 6th Adaptation to Technical Progress for Regulation (EC) No 1272/2008. (ATP6)
Additional Hazard Statement(s): Carc. 2 H351
Reason for additional Hazards Statement(s)/Risk Phrase(s):
03 Jun 2015 - Carc. 2 H351 hazard statement sourced from: IARC Group 2B (77) 2000

pH (CAS Number: PH)

Description/Comments: Appendix C4
Data source: WM3 1st Edition 2015
Data source date: 25 May 2015
Hazard Statements: None.

acenaphthylene (EC Number: 205-917-1, CAS Number: 208-96-8)

Description/Comments: Data from C&L Inventory Database
Data source: http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database
Data source date: 17 Jul 2015
Hazard Statements: Skin Irrit. 2 H315 , STOT SE 3 H335 , Eye Irrit. 2 H319 , Acute Tox. 1 H310 , Acute Tox. 1 H330 , Acute Tox. 4 H302

acenaphthene (EC Number: 201-469-6, CAS Number: 83-32-9)

Description/Comments: Data from C&L Inventory Database
Data source: http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database
Data source date: 17 Jul 2015
Hazard Statements: Aquatic Chronic 2 H411 , Aquatic Chronic 1 H410 , Aquatic Acute 1 H400 , Skin Irrit. 2 H315 , STOT SE 3 H335 , Eye Irrit. 2 H319

fluorene (EC Number: 201-695-5, CAS Number: 86-73-7)

Description/Comments: Data from C&L Inventory Database
Data source: http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database
Data source date: 06 Aug 2015
Hazard Statements: Aquatic Chronic 1 H410 , Aquatic Acute 1 H400

phenanthrene (EC Number: 201-581-5, CAS Number: 85-01-8)

Description/Comments: Data from C&L Inventory Database
Data source: http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database
Data source date: 06 Aug 2015
Hazard Statements: Skin Irrit. 2 H315 , Aquatic Chronic 1 H410 , Aquatic Acute 1 H400 , Skin Sens. 1 H317 , Carc. 2 H351 , STOT SE 3 H335 , Eye Irrit. 2 H319 , Acute Tox. 4 H302

anthracene (EC Number: 204-371-1, CAS Number: 120-12-7)

Description/Comments: Data from C&L Inventory Database
Data source: http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database
Data source date: 17 Jul 2015
Hazard Statements: Aquatic Chronic 1 H410 , Aquatic Acute 1 H400 , Skin Sens. 1 H317 , Skin Irrit. 2 H315 , STOT SE 3 H335 , Eye Irrit. 2 H319

fluoranthene (EC Number: 205-912-4, CAS Number: 206-44-0)

Description/Comments: Data from C&L Inventory Database
Data source: http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database
Data source date: 21 Aug 2015
Hazard Statements: Aquatic Chronic 1 H410 , Aquatic Acute 1 H400 , Acute Tox. 4 H302

pyrene (EC Number: 204-927-3, CAS Number: 129-00-0)

Description/Comments: Data from C&L Inventory Database; SDS Sigma Aldrich 2014
Data source: http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database
Data source date: 21 Aug 2015
Hazard Statements: Aquatic Chronic 1 H410 , Aquatic Acute 1 H400 , STOT SE 3 H335 , Eye Irrit. 2 H319 , Skin Irrit. 2 H315

indeno[123-cd]pyrene (EC Number: 205-893-2, CAS Number: 193-39-5)

Description/Comments: Data from C&L Inventory Database
Data source: http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database
Data source date: 06 Aug 2015
Hazard Statements: Carc. 2 H351

benzo[ghi]perylene (EC Number: 205-883-8, CAS Number: 191-24-2)

Description/Comments: Data from C&L Inventory Database; SDS Sigma Aldrich 28/02/2015
Data source: http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database
Data source date: 23 Jul 2015
Hazard Statements: Aquatic Chronic 1 H410 , Aquatic Acute 1 H400

polychlorobiphenyls; PCB (EC Number: 215-648-1, CAS Number: 1336-36-3)

CLP index number: 602-039-00-4
Description/Comments: Worst Case: IARC considers PCB Group 1; Carcinogenic to humans; POP specific threshold from ATP1 (Regulation 756/2010/EU) to POPs Regulation (Regulation 850/2004/EC). Where applicable, the calculation method laid down in European standards EN 12766-1 and EN 12766-2 shall be applied.
Data source: Regulation 1272/2008/EC - Classification, labelling and packaging of substances and mixtures. (CLP)
Additional Hazard Statement(s): Carc. 1A H350
Reason for additional Hazards Statement(s)/Risk Phrase(s):
29 Sep 2015 - Carc. 1A H350 hazard statement sourced from: IARC Group 1 (23, Sup 7, 100C) 2012

barium oxide (EC Number: 215-127-9, CAS Number: 1304-28-5)

Conversion factor: 1.117
Description/Comments: Data from C&L Inventory Database; No entries in Registered Substances Database, IARC or Pesticide Properties Database
Data source:
http://clp-inventory.echa.europa.eu/SummaryOfClassAndLabelling.aspx?SubstanceID=88825&HarmOnly=no?fc=true&lang=en
Data source date: 02 Jun 2014
Hazard Statements: Skin Irrit. 2 H315 , STOT SE 3 H335 , Eye Irrit. 2 H319 , Skin Corr. 1A H314 , Acute Tox. 3 H301 , Acute Tox. 4 H302 , Acute Tox. 4 H332

coronene (EC Number: 205-881-7, CAS Number: 191-07-1)

Description/Comments: Data from C&L Inventory Database; no entries in Registered Substances or Pesticides Properties databases; SDS: Sigma Aldrich, 1907/2006 compliant, dated 2012 - no entries; IARC – Group 3, not carcinogenic.
Data source:
http://clp-inventory.echa.europa.eu/SummaryOfClassAndLabelling.aspx?SubstanceID=17010&HarmOnly=no?fc=true&lang=en
Data source date: 16 Jun 2014
Hazard Statements: STOT SE 2 H371

Appendix B: Rationale for selection of metal species

antimony {antimony trioxide}

Worst case CLP species based on hazard statements/molecular weight and low solubility. Industrial sources include: flame retardants in electrical apparatus, textiles and coatings (edit as required)

arsenic {arsenic trioxide}

Reasonable case CLP species based on hazard statements/molecular weight and most common (stable) oxide of arsenic. Industrial sources include: smelting; main precursor to other arsenic compounds (edit as required)

cadmium {cadmium oxide}

Reasonable case CLP species based on hazard statements/molecular weight, very low solubility in water. Industrial sources include: electroplating baths, electrodes for storage batteries, catalysts, ceramic glazes, phosphors, pigments and nematocides. (edit as required) Worst case compounds in CLP: cadmium sulphate, chloride, fluoride & iodide not expected as either very soluble and/or compound's industrial usage not related to site history (edit as required)

chromium in chromium(III) compounds {chromium(III) oxide}

Reasonable case species based on hazard statements/molecular weight. Industrial sources include: tanning, pigment in paint, inks and glass (edit as required)

chromium in chromium(VI) compounds {chromium(VI) oxide}

Worst case CLP species based on hazard statements/molecular weight. Industrial sources include: production stainless steel, electroplating, wood preservation, anti-corrosion agents or coatings, pigments (edit as required)

copper {dicopper oxide; copper (I) oxide}

Reasonable case CLP species based on hazard statements/molecular weight and insolubility in water. Industrial sources include: oxidised copper metal, brake pads, pigments, antifouling paints, fungicide. (edit as required) Worse case copper sulphate is very soluble and likely to have been leached away if ever present and/or not enough soluble sulphate detected. (edit as required)

lead {lead chromate}

Worst case CLP species based on hazard statements/molecular weight (edit as required)

mercury {mercury dichloride}

Worst case CLP species based on hazard statements/molecular weight (edit as required)

molybdenum {molybdenum(VI) oxide}

Worst case CLP species based on hazard statements/molecular weight (edit as required)

nickel {nickel chromate}

Worst case CLP species based on hazard statements/molecular weight (edit as required)

selenium {selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex}

Harmonised group entry used as most reasonable case. Pigment cadmium sulphoselenide not likely to be present in this soil. No evidence for the other CLP entries: sodium selenite, nickel II selenite and nickel selenide, to be present in this soil. (edit as required)

zinc {zinc chromate}

Worst case CLP species based on hazard statements/molecular weight (edit as required)

barium {barium oxide}

Cr VI not detected

Appendix C: Version

HazWasteOnline Classification Engine: WM3 1st Edition v1.1, May 2018
HazWasteOnline Classification Engine Version: 2019.71.3826.7799 (14 Mar 2019)
HazWasteOnline Database: 2019.71.3826.7799 (14 Mar 2019)

This classification utilises the following guidance and legislation:
WM3 v1.1 - Waste Classification - 1st Edition v1.1 - May 2018
CLP Regulation - Regulation 1272/2008/EC of 16 December 2008
1st ATP - Regulation 790/2009/EC of 10 August 2009
2nd ATP - Regulation 286/2011/EC of 10 March 2011
3rd ATP - Regulation 618/2012/EU of 10 July 2012
4th ATP - Regulation 487/2013/EU of 8 May 2013
Correction to 1st ATP - Regulation 758/2013/EU of 7 August 2013
5th ATP - Regulation 944/2013/EU of 2 October 2013
6th ATP - Regulation 605/2014/EU of 5 June 2014
WFD Annex III replacement - Regulation 1357/2014/EU of 18 December 2014
Revised List of Wastes 2014 - Decision 2014/955/EU of 18 December 2014
7th ATP - Regulation 2015/1221/EU of 24 July 2015
8th ATP - Regulation (EU) 2016/918 of 19 May 2016
9th ATP - Regulation (EU) 2016/1179 of 19 July 2016
10th ATP - Regulation (EU) 2017/776 of 4 May 2017
HP14 amendment - Regulation (EU) 2017/997 of 8 June 2017
13th ATP - Regulation (EU) 2018/1480 of 4 October 2018
POPs Regulation 2004 - Regulation 850/2004/EC of 29 April 2004
1st ATP to POPs Regulation - Regulation 756/2010/EU of 24 August 2010
2nd ATP to POPs Regulation - Regulation 757/2010/EU of 24 August 2010

APPENDIX 6 – Waste Acceptance Criteria Data

WAC Data - Sandyford Central, February 2019

Sample ID	TP01	TP02	TP02	TP03	TP03	TP03	TP04	TP04	Inert	Stable Non-reactive	Hazardous	LOD LOR	Units
Sample Depth (m)	0.60-1.60	0.60-1.00	1.00-2.10	0.00-1.00	1.00-2.00	2.00-3.10	0.45-0.90	0.90-2.00					
Total Organic Carbon *	0.36	0.22	0.15	0.34	0.34	0.20	0.26	0.51	3	5	6	<0.02	%
Sum of BTEX	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	6	-	-	<0.025	mg/kg
Sum of 7 PCBs	<0.035	<0.035	<0.035	<0.035	<0.035	<0.035	<0.035	<0.035	1	-	-	<0.035	mg/kg
Mineral Oil	<30	<30	<30	130	164	74	<30	<30	500	-	-	<30	mg/kg
PAH Sum of 6	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	-	-	-	<0.22	mg/kg
PAH Sum of 17	<0.64	<0.64	<0.64	<0.64	<0.64	<0.64	<0.64	<0.64	100	-	-	<0.64	mg/kg
Arsenic	<0.025	<0.025	<0.025	0.044	0.035	0.051	0.040	<0.025	0.5	2	25	<0.025	mg/kg
Barium	0.05	0.06	0.08	0.04	0.10	0.07	<0.03	<0.03	20	100	300	<0.03	mg/kg
Cadmium	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.04	1	5	<0.005	mg/kg
Chromium	<0.015	<0.015	<0.015	<0.015	0.020	0.034	<0.015	<0.015	0.5	10	70	<0.015	mg/kg
Copper	<0.07	<0.07	<0.07	<0.07	<0.07	<0.07	<0.07	<0.07	2	50	100	<0.07	mg/kg
Mercury	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	0.01	0.2	2	<0.0001	mg/kg
Molybdenum	0.06	0.02	<0.02	<0.02	0.06	0.03	0.05	0.06	0.5	10	30	<0.02	mg/kg
Nickel	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.4	10	40	<0.02	mg/kg
Lead	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.5	10	50	<0.05	mg/kg
Antimony	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.06	0.7	5	<0.02	mg/kg
Selenium	<0.03	<0.03	<0.03	<0.03	0.06	<0.03	<0.03	0.69	0.1	0.5	7	<0.03	mg/kg
Zinc	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	4	50	200	<0.03	mg/kg
Total Dissolved Solids**	920	860	1000	1530	2199	1579	1060	720	4000	60000	100000	<350	mg/kg
Dissolved Organic Carbon	<20	<20	<20	<20	<20	<20	<20	30	500	800	1000	<20	mg/kg
Phenol	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	1	-	-	<0.1	mg/kg
Sulphate as SO4**	52	185	106	366	697	443	117	48	1000	20000	50000	<0.5	mg/kg
Chloride**	4	<3	<3	<3	5	<3	<3	3	800	15000	25000	<3	mg/kg
Asbestos	NAD	NAD	NAD	NAD	NAD	NAD	NAD	NAD	-	-	-	<0.001	%
Asbestos Type	NAD	NAD	NAD	NAD	NAD	NAD	NAD	NAD	-	-	-	-	%

NAD- no asbestos detected

* In the case of soils, a higher limit value maybe admitted by the competent authority, provided the DOC value of 500 mg/kg isachieved at L/S = 10 l/kg, either at the soil's own pH or at a pH value between 7,5 and 8,0

** The values for total dissolved solids (TDS) can be used alternatively to the values for sulphate and chloride

WAC Data - Sandyford Central, February 2019

Sample ID	TP05	TP05	TP05	TP06	TP06	TP06	SA02	SA02	Inert	Stable Non-reactive	Hazardous	LOD LOR	Units
Sample Depth (m)	**0.35-1.00**	**1.00-2.00**	**2.00-3.10**	**0.80-1.00**	**1.00-2.00**	**2.00-2.40**	**0.50-1.00**	**1.00-1.80**					
Total Organic Carbon *	0.33	0.75	0.60	0.40	0.66	0.44	0.31	0.43	3	5	6	<0.02	%
Sum of BTEX	<0.025	<0.025	<0.025	<0.025	<0.025 SV	<0.025	<0.025	<0.025	6	-	-	<0.025	mg/kg
Sum of 7 PCBs	<0.035	<0.035	<0.035	<0.035	<0.035	<0.035	<0.035	<0.035	1	-	-	<0.035	mg/kg
Mineral Oil	<30	<30	<30	<30	<30	<30	<30	<30	500	-	-	<30	mg/kg
PAH Sum of 6	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	-	-	-	<0.22	mg/kg
PAH Sum of 17	<0.64	<0.64	<0.64	<0.64	<0.64	<0.64	<0.64	<0.64	100	-	-	<0.64	mg/kg
Arsenic	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	0.5	2	25	<0.025	mg/kg
Barium	1.37	0.52	0.55	0.06	0.55	0.45	0.06	0.05	20	100	300	<0.03	mg/kg
Cadmium	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.04	1	5	<0.005	mg/kg
Chromium	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	0.5	10	70	<0.015	mg/kg
Copper	<0.07	<0.07	<0.07	<0.07	<0.07	<0.07	<0.07	<0.07	2	50	100	<0.07	mg/kg
Mercury	<0.0001	<0.0001	0.0008	<0.0001	0.0011	0.0006	<0.0001	<0.0001	0.01	0.2	2	<0.0001	mg/kg
Molybdenum	0.12	0.25	0.14	0.07	0.19	0.15	0.06	0.18	0.5	10	30	<0.02	mg/kg
Nickel	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.4	10	40	<0.02	mg/kg
Lead	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.5	10	50	<0.05	mg/kg
Antimony	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.06	0.7	5	<0.02	mg/kg
Selenium	<0.03	<0.03	0.24	<0.03	0.29	0.19	<0.03	<0.03	0.1	0.5	7	<0.03	mg/kg
Zinc	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	4	50	200	<0.03	mg/kg
Total Dissolved Solids**	1739	660	1299	580	1060	850	880	1480	4000	60000	100000	<350	mg/kg
Dissolved Organic Carbon	30	<20	<20	<20	<20	<20	<20	<20	500	800	1000	<20	mg/kg
Phenol	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	1	-	-	<0.1	mg/kg
Sulphate as SO4**	162	<5	231	12	264	184	18	32	1000	20000	50000	<0.5	mg/kg
Chloride**	<3	<3	85	<3	98	64	4	4	800	15000	25000	<3	mg/kg
Asbestos	NAD	NAD	NAD	NAD	NAD	NAD	NAD	NAD	-	-	-	<0.001	%
Asbestos Type	NAD	NAD	NAD	NAD	NAD	NAD	NAD	NAD	-	-	-	-	%

NAD- no asbestos detected

* In the case of soils, a higher limit value maybe admitted by the competent authority, provided the DOC value of 500 mg/kg isachieved at L/S = 10 l/kg, either at the soil's own pH or at a pH value between 7,5 and 8,0

** The values for total dissolved solids (TDS) can be used alternatively to the values for sulphate and chloride

WAC Data - Sandyford Central, June 2019

Sample ID	**TP101**	**TP101**	**TP101**	**TP102**	**TP102**	**Inert**	**Stable Non-reactive**	**Hazardous**	**LOD LOR**	**Units**
Sample Depth (m)	**0.20-1.00**	**1.00-2.00**	**2.00-3.10**	**0.20-1.00**	**1.00-2.00**					
Total Organic Carbon *	1.75	0.16	0.20	0.47	0.20	3	5	6	<0.02	%
Sum of BTEX	<0.025	<0.025	<0.025	<0.025	<0.025	6	-	-	<0.025	mg/kg
Sum of 7 PCBs	<0.035	<0.035	<0.035	<0.035	<0.035	1	-	-	<0.035	mg/kg
Mineral Oil	<30	<30	<30	<30	<30	500	-	-	<30	mg/kg
PAH Sum of 6	<0.22	<0.22	<0.22	<0.22	<0.22	-	-	-	<0.22	mg/kg
PAH Sum of 17	<0.64	<0.64	<0.64	<0.64	<0.64	100	-	-	<0.64	mg/kg
Arsenic	<0.025	<0.025	<0.025	0.082	<0.025	0.5	2	25	<0.025	mg/kg
Barium	0.15	<0.03	0.05	<0.03	0.06	20	100	300	<0.03	mg/kg
Cadmium	<0.005	<0.005	<0.005	<0.005	<0.005	0.04	1	5	<0.005	mg/kg
Chromium	<0.015	<0.015	<0.015	0.037	<0.015	0.5	10	70	<0.015	mg/kg
Copper	<0.07	<0.07	<0.07	<0.07	<0.07	2	50	100	<0.07	mg/kg
Mercury	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	0.01	0.2	2	<0.0001	mg/kg
Molybdenum	0.06	0.04	<0.02	0.09	0.07	0.5	10	30	<0.02	mg/kg
Nickel	<0.02	<0.02	<0.02	<0.02	<0.02	0.4	10	40	<0.02	mg/kg
Lead	<0.05	<0.05	<0.05	<0.05	<0.05	0.5	10	50	<0.05	mg/kg
Antimony	<0.02	<0.02	<0.02	<0.02	<0.02	0.06	0.7	5	<0.02	mg/kg
Selenium	<0.03	<0.03	<0.03	0.05	<0.03	0.1	0.5	7	<0.03	mg/kg
Zinc	0.04	<0.03	<0.03	<0.03	<0.03	4	50	200	<0.03	mg/kg
Total Dissolved Solids**	1260	430	1859	1080	480	4000	60000	100000	<350	mg/kg
Dissolved Organic Carbon	70	<20	<20	50	20	500	800	1000	<20	mg/kg
Phenol	<0.1	<0.1	<0.1	<0.1	<0.1	1	-	-	<0.1	mg/kg
Sulphate as SO4**	241	18	13	110	21	1000	20000	50000	<0.5	mg/kg
Chloride**	7	5	5	7	6	800	15000	25000	<3	mg/kg
Asbestos	NAD	NAD	NAD	NAD	NAD	-	-	-	<0.001	%
Asbestos Type	NAD	NAD	NAD	NAD	NAD	-	-	-	-	%

NAD- no asbestos detected

* In the case of soils, a higher limit value maybe admitted by the competent authority, provided the DOC value of 500 mg/kg isachieved at L/S = 10 l/kg, either at the soil's own pH or at a pH value between 7,5 and 8,0

** The values for total dissolved solids (TDS) can be used alternatively to the values for sulphate and chloride

Appendix 9.2

Waste Classification Report

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Ground Investigations Ireland

Sandyford Central

Waste Classification Report

DOCUMENT CONTROL SHEET

Project Title	Sandford Central
Engineer	OCSC
Client	Richmond Homes
Project No	8408-01-19
Document Title	Waste Classification Report

Rev.	Status	Author(s)	Reviewed By	Approved By	Office of Origin	Issue Date
A	Final	P Moloney	B Sexton	C Finnerty	Dublin	07 August 2019

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CONTENTS

LIST OF TABLES

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APPENDICES

1.0 Preamble

Ground Investigations Ireland Limited (GII) was appointed by O'Connor Sutton Cronin Consulting Engineers on behalf of Richmond Homes to carry out a Waste Classification assessment for a proposed development at Sandyford, Dublin 18. The site investigation works were completed between February and June 2019.

2.0 Purpose & Scope

GII understand that as part of the proposed development there will be an excavation to accommodate the construction of a basement. As such the material which may be excavated and removed from site needs to be assessed in terms of waste disposal outlets.

The purpose of the waste classification exercise was as follows.

- Classification, in terms of waste management and final disposal outlets, of material that may require disposal following excavation during the construction phase.

The scope of the work undertaken to facilitate the waste classification exercise included the following:

- Excavation of eight (8 No.) trial pits;
- Excavation of two (2 No.) infiltration test trial pits;
- Excavation of ten (10 No.) rotary core boreholes; and
- Collection of subsoil samples for chemical analysis.

3.0 Standards

The works were undertaken on a phased basis and in sequence, as is industry best practice, and were carried out with cognisance of the following:

- BS 10175:2011, Investigation of Potentially Contaminated Sites. Code of practice;
- Eurocode 7 Part 2: Ground Investigation and testing (ISEN 1997 – 2:2007); and
- BS 5930:2015, Code of Practice for ground investigations;

4.0 Limitations

GII has prepared this report for the sole use of Richmond Homes. No other warranty, express or implied, is made as to the professional advice included in this report or other services provided by GII.

The conclusions and recommendations contained in this report are based upon information provided by others and the assumption that all relevant information has been provided by those bodies from whom it has been requested. Information obtained from third parties has not been independently verified by GII, unless otherwise stated in this report.

This report has been prepared in line with best industry standards and within the project's budgetary and time constraints. The methodology adopted, and the sources of information used by GII in providing its services are outlined in this report.

All investigations were competed at the locations specified by the design engineer.

GII disclaim any undertaking or obligation to advise any person of any change in any matter affecting the Report, which may come or be brought to GII's attention after the date of the Report.

The conclusions presented in this report represent GII's best professional judgement based on review of site conditions observed during the site visit and the relevant information available at the time of writing. The opinions and conclusions presented are valid only to the extent that the information provided was accurate and complete.

It was not possible to collect a sample between 2m BGL and 3m BGL at TP-02 due to an obstruction, this has resulted in an interpolation of WAC status of the subsoils between 79mOD and 80mOD at TP-02.

The waste classification exercise is reflective of and applicable to the ground conditions on site at the time of the site investigation and sampling. Alterations to the ground conditions or any further excavations carried out on site since the site investigation phase are not reflected in this report and GII are not liable for any such alterations if they have occurred.

5.0 Site Location and Layout

The site is located on the junction of Saint Raphaela's Road and Blackthorn Drive in Sandyford, Dublin 18 (Figure 1). The site is located within the Sandyford Business Park. The site is bounded to the west, south and east by commercial buildings which form park of the Business Park. The site is bounded the north by Blackthorn Drive and the Luas Green Line and housing beyond that. The Stillorgan Reservoir is located to the north east of the site beyond Blackthorn Drive.

The site is an open yard in the northern and central section with an industrial/commercial building located in the southern section. The southern section is more elevated than the central and northern sections with a ramp located along the eastern boundary linking the areas.

6.0 Site History

GII reviewed the aerial photographs and historical maps maintained by the Ordnance Survey of Ireland (OSI) and the google imagery records. These included the 6-inch maps that were produced between 1829 and 1842, the 25-inch maps that were produced between 1888 and 1913 and the 6-inch Cassini Maps that were produced between the 1830's and 1930's. The site is undeveloped on all historical maps reviewed.

A review of the google earth aerial photograph record and the aerial photograph records held by the OSI indicates that the site had been undeveloped until at last 1995. The lands surrounding the site had been developed prior to 1995. The building in the stern section of the site is present on the aerial photos from at least the year 2000. From at least 2000 the southern norther and central sections of the site are occupied by a commercial building possibly a warehouse. This building is absent from the aerial record from 2008.

7.0 Subsurface Exploration

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.

7.1. Trial Pits

The trial pits were excavated using a JCB 3CX excavator at the locations shown in Figure 2 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.

7.1. Soakaway Testing

The soakaway testing was carried out in selected trial pits at the locations shown in Figure 2 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.

7.2. Rotary Boreholes

The rotary coring was carried out by a track mounted T44 Beretta rig at the locations shown on Figure 2 location plan in Appendix 1. The rotary boreholes were completed from the ground surface or alternatively, where noted on the individual borehole log, from the base of the cable percussion borehole where a temporary liner was installed to facilitate follow-on rotary coring.
The T44 Beretta is equipped with rubber tracks which allow for short travel on pavement surfaces avoiding any damage to the surface. The T44 Beretta utilises a triple tube core barrel system operated using a wireline drilling process. The outer barrel is rotated by the drill rods and at its lower end, carries the coring bit. The inner barrel is mounted on a swivel so that it does not rotate during the process. The third barrel or liner is placed within the second one to retain the core intact and to preserve as much as possible the fabric of the drilling stratum. The core is cut by the coring bit and passes to the inner liner. The core is brought up to the surface within the inner barrel on a small diameter wire rope or line attached to the "overshoot"

recovery tool which is then placed into a core box in order of recovery. A drilling fluid, typically air mist or water flush is passed from the surface through hollow drill rods to the drill bit, and is used to cool the drill bit. Temporary casing is used in some situations to support unstable ground or to seal off fissures or voids. It should be noted that the rotary coring can only achieve limited recovery in overburden, particularly granular or weakly cemented strata due to the flushing medium washing away the cohesive fraction during coring. The recovery achieved, where required is noted on the borehole logs and core photographs are provided to allow assessment of the core recovered. The rotary borehole logs are provided in Appendix 3 of this Report.

7.3. 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.

7.1. Groundwater/Gas Monitoring Installations

Groundwater and or Gas 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.

8.0 Ground Conditions

8.1. 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;

- Surfacing
- FILL/ Made Ground
- Cohesive Deposits
- Granite Bedrock

SURFACING: Tarmac or Reinforced Concrete was encountered in all the exploratory holes and was present to a maximum depth of 0.15 to 0.3m BGL. Tarmac surfacing was present typically to a depth of 0.05m to 0.24m BGL.

FILL/MADE GROUND: Fill deposits were encountered beneath the Surfacing and was present to a relatively consistent depth of between 0.6m and 0.9m BGL and was typically described as Brown or Grey sandy clayey angular to sub angular Gravel (Crushed Rock Fill). Made Ground Deposits were encountered in TP3 and TP5 to a depth of 3.1m and 0.9m BGL respectively. These deposits were described generally as *brown or grey slightly sandy very gravelly CLAY with some cobbles and boulders and contained occasional fragments of plastic, concrete, red brick, metal glass and plastic.* The full details of these deposits are recorded on the trial pit logs in Appendix 2.

COHESIVE DEPOSITS: Cohesive deposits were encountered beneath the Fill or Made Ground and were described typically as *firm or stiff brown, grey or dark grey 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 with the exception of TP5 where it was noted as Firm to a depth of 3.1m BGL above rock. These deposits had some, occasional or frequent cobble and boulder content where noted on the exploratory hole logs.

GRANITE BEDROCK: In trial pits TP1 and TP2 weathered rock was encountered which was digable with the JCB 3CX excavator to a depth of up to 0.8m below the top of the stratum. The trial pits were terminated upon encountering the more competent bedrock, in which further excavation became more difficult. This material was recovered typically as angular gravel and cobbles of Granite however there was some variability in the fracture spacing and the ease at which the excavator could progress. Some clay and sand were also present with the rock mass either from weathering or as infilling to fractures which were opened upon excavation.

The rotary core boreholes recovered Granite Bedrock in each of the boreholes at depths of 1.5m to 5.5m BGL. The depth to rock varies from 1.5m BGL (79.8m OD) in BH04 and BH06 in the central portion of the site and is deeper towards the north eastern portion of the site to a maximum depth of 4.7m BGL (75.6m OD) in BH10. The total core recovery is good in the granite bedrock, typically 100% with some of the uppermost runs dropping to 80 or 90%. The SCR and RQD both are relatively poor in the upper weathered zone, often recovered as non-intact, however both indices show an increase with depth in each of the boreholes. The strength of the stratum varies from Extremely weak to Very Strong as noted on the logs with some portions of the core recovered as non-intact. The weathering is noted on the core logs and is typically distinctly weathered to partially weathered with occasional zones of where the granite was unweathered.

8.2. Laboratory Testing

8.2.1.Waste Classification Analysis

In order to assess materials, which may be excavated from site, in terms of waste classification, the samples collected were analysed for a suite of parameters which allows for the assessment of the soils in terms of total pollutant content for classification of materials as *hazardous* or *non-hazardous* (RILTA Suite). The suite also allows for the assessment of the soils in terms of suitability for placement at licenced landfills (inert, stable non-reactive, hazardous etc.). The parameter list for the RILTA suite includes analysis of the solid samples for arsenic, barium, cadmium, chromium, copper, cyanide, lead, nickel, mercury, zinc, speciated aliphatic and aromatic petroleum hydrocarbons, pH, sulphate, sulphide, moisture content, soil organic matter and an asbestos screen.

The RILTA suite also includes those parameters specified in the EC Council Decision establishing criteria for the acceptance of waste at Landfills (Council Decision 2003/33/EC), which for the solid samples are pH, total organic carbon (TOC), speciated aliphatic and aromatic petroleum hydrocarbons, BTEX, phenol, polychlorinated biphenyls (PCB) and PAH.

As part of the RILTA suite a leachate is generated from the solid samples which is analysed for antimony, arsenic, barium, cadmium, chromium, copper, lead, mercury, molybdenum, nickel, selenium, zinc, chloride, fluoride, soluble sulphate, sulphide, phenols, dissolved organic carbon (DOC) and total dissolved solids (TDS). The full laboratory reports for all analysis are presented in Appendix 4.

9.0 Waste Classification

GII understand that any materials which may be excavated from site would meet the definition of waste under the Waste Framework Directive. This may not be the case at the time of excavation when all or some of the materials may have been declared a by-product in line with Article 27 of the European Communities (Waste Directive) Regulations 2011[1].

Excess soil and stone resulting from excavation works (the primary purpose of which is not the production of soil and stone) may be declared a by-product if all four by-product conditions are met.[2]

a) further use of the soil and stone is certain;

b) the soil and stone can be used directly without any further processing other than normal industrial practice;

c) the soil and stone is produced as an integral part of a production process; and

d) further use is lawful in that the soil and stone fulfils all relevant requirements for the specific use and will not lead to overall adverse environmental or human health impacts.

Due to the varying levels of anthropogenic materials encountered in the made ground there are potentially two sets of List of Waste (LoW) with a “mirror” entry LoW (formerly EWC) codes which may be applied to excavated materials to be removed from site.

[1] S.I. No. 126/2011 - European Communities (Waste Directive) Regulations 2011 (Article 27).
[2] As set out in Article 5 of the 2008 Waste Framework Directive and Article 27 of the Waste Directive Regulations 2011.

1. 17-05-03* (soil and stone containing dangerous substances, classified as hazardous) or 17-05-04 (soil and stone other than those mentioned in 17-05-03, not hazardous); or

2. 17-09-03* (other construction and demolition wastes (including mixed wastes) containing hazardous substances) or 17-09-04 (mixed construction and demolition wastes other than those mentioned in 17 09 01, 17 09 02 and 17 09 03).

Where waste is a mirror entry in the LoW, it can be classified via a process of analysis against standard criteria set out in in the Waste Framework Directive. The assessment process is described in detail in guidance published by the UK regulatory authorities (Guidance on the Classification and Assessment of Waste: Technical Guidance WM3, 2015). The assessment involves comparison of the concentration of various parameters against defined threshold values.

The specific LoW code which should be applied to the material at each SI location is summarised in Table 1 below.

GII use HazWasteOnline™, a web-based commercial waste classification software tool which assists in the classification of potentially hazardous materials. This tool was used to determine whether the materials on site are classified as hazardous or non-hazardous. The use of the online tool is accepted by the EPA (EPA 2014).

The conclusions presented in the report are based on GII's professional opinion. **It should be noted that the environmental regulator (in this case the EPA) and the waste acceptor (in this case a landfill operator) shall decide whether a waste is hazardous or non-hazardous and suitable for disposal at their facility.**

10.0 HazWasteOnLine™ Results

In total twenty-one (21 No.) samples were assessed using the HazWasteOnLine™ Tool. All samples were classified as non-hazardous. The complete HazWasteOnLine™ reports for all samples are included in Appendix 5.

Table 1 Waste Classification Summary

Sample I.D.	Sample Depth (m)	LoW Code	Hazardous/Non-Hazardous	Asbestos Type Detected
TP01	0.60-1.60	17 05 04	Non-Hazardous	NAD[3]
TP02	0.60-1.00	17 05 04	Non-Hazardous	NAD

[3] NAD – no asbestos detected.

Sample I.D.	Sample Depth (m)	LoW Code	Hazardous/Non-Hazardous	Asbestos Type Detected
TP02	1.00-2.10	17 05 04	Non-Hazardous	NAD
TP03	0.00-1.00	17 05 04	Non-Hazardous	NAD
TP03	1.00-2.00	17 05 04	Non-Hazardous	NAD
TP03	2.00-3.10	17 05 04	Non-Hazardous	NAD
TP04	0.45-0.90	17 05 04	Non-Hazardous	NAD
TP04	0.90-2.00	17 05 04	Non-Hazardous	NAD
TP05	0.35-1.00	17 05 04	Non-Hazardous	NAD
TP05	1.00-2.00	17 05 04	Non-Hazardous	NAD
TP05	2.00-3.10	17 05 04	Non-Hazardous	NAD
TP06	0.80-1.00	17 05 04	Non-Hazardous	NAD
TP06	1.00-2.00	17 05 04	Non-Hazardous	NAD
TP06	2.00-2.40	17 05 04	Non-Hazardous	NAD
SA02	0.50-1.00	17 05 04	Non-Hazardous	NAD
SA02	1.00-1.80	17 05 04	Non-Hazardous	NAD
TP-101	0.20-1.00	17 05 04	Non-Hazardous	NAD
TP-101	1.00-.00	17 05 04	Non-Hazardous	NAD
TP-101	2.00-3.10	17 05 04	Non-Hazardous	NAD
TP-102	0.2-1.00	17 05 04	Non-Hazardous	NAD
TP-102	1.00-2.00	17 05 04	Non-Hazardous	NAD

11.0 Landfill Waste Acceptance Criteria

Waste Acceptance Criteria (WAC) have been agreed by the EC (Council Decision 2003/33/EC) and **are only applicable to material if it is to be disposed as a waste at a landfill facility**. Each individual member state and licensed operators of a licence landfill may apply more stringent WAC. WAC limits and the associated laboratory analysis are not suitable for use in the determination of whether a waste is hazardous or non-hazardous.

The level of selenium detected at TP-05 between 2m and3.1m and TP-06 between 1m and 2.4m exceeded the inert WAC.

The level of Selenium detected at TP-04 between 0.9m and 2m exceeded the stable non-reactive WAC.

All other samples were within the inert WAC. The WAC data is presented in Appendix 6.

12.0 Hydrocarbon Impacted Soils

TPH was detected in the samples collected from TP-03 between ground level and 3.1m. The levels detected ranged for 130mg/kg between 0m and 1m, 244mg/kg between 1m and 2m and 108m/kg between 2m and 3m. The levels of TPH are not significant enough to classify the waste as hazardous nor are the levels of mineral oil detected enough to exceed the inert criteria. The laboratory interpretation of the source of the TP is degrade diesel and lubricating oil. There was no identifiable source of diesel on site during the investigation and as such the diesel may be related to previous site activities.

13.0 Asbestos

Asbestos was **not** detected in any of the samples analysed.

14.0 Conclusions & Recommendations

The recommendations given and opinions expressed in this report are based on the findings of the site investigation works and laboratory testing undertaken. Where any opinion is expressed on the classification of material between site investigations 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 findings at the site investigation locations.

14.1. Waste Classification

The sampled materials on site are considered to be non-hazardous. Final waste classification is at the discretion of the landfill operator.

14.2. Waste Acceptance Criteria

The classification of the materials to be removed from site in terms of waste acceptance criteria and acceptance at landfill is presented in Figures 3 to 7 and as tabulated in Appendix 6.

14.3. Asbestos

Asbestos was **not** detected on site.

14.4. Waste Transfer

Any firm engaged to transport waste material from site and the operator of any waste facility that may accept material excavated from this site, should be furnished with, at a minimum, copies of the **full unabridged** laboratory reports and HazWasteOnLine™ report for all samples presented in this report.

The LoW codes applied at the time of removal from site may be based on the observations made during the bulk excavation which may supersede the LoW codes applied in Table 1.

The made ground material which contains less than 2% anthropogenic material and which **meets** the inert WAC may be removed to an inert licensed facility under the LoW code 17 05 04. Where it contains more than 2% anthropogenic material the LoW code 17 09 04 may be applied.

The made ground material which contains less than 2% anthropogenic material and which **exceeds** the inert WAC may be removed to a non-hazardous licensed facility under the LoW code 17 05 04. Where it contains more than 2% anthropogenic material the LoW code 17 09 04 may be applied.

The natural ground material which meets the inert WAC may be removed to a soil recovery facility or inert landfill facility under the LoW code 17 09 04.

The natural ground material which exceeds the inert WAC may be removed to a non-hazardous licensed facility under the LoW code 17 05 04.

TPH has been detected in the natural occurring material at TP-03 as such these materials are not suitable for removal to a soil and stone recovery facility but may be removed to an inert landfill facility under the LoW code 17 09 04.

The waste classification presented in the report is based on GII's professional opinion. It should be noted that the environmental regulator (in this case the EPA) and the waste acceptor (in this case a landfill operator) shall decide whether a waste is hazardous or non-hazardous and suitable for disposal at their facility.

15.0 References

Official Journal of the European Communities 16.1.2003, L 11/27. *COUNCIL DECISION of 19 December 2002 establishing criteria and procedures for the acceptance of waste at landfills pursuant to Article 16 of and Annex II to Directive 1999/31/EC* (2003/33/EC)

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Environment Agency (2018). *Technical Guidance WM3 - Guidance on the classification and assessment of waste (1st Edition V1.1 May 2018) Technical Guidance WM3*. Available at:

https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/719394/Waste-classification-technical-guidance-WM3.pdf

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Environmental Protection Agency (EPA) (2015). *Waste Classification List of Waste & Determining if Waste is Hazardous or Non-hazardous.* Available at: https://www.epa.ie/pubs/reports/waste/stats/wasteclassification/EPA_Waste_Classification_2015_Web.pdf

Environmental Protection Agency (EPA) (2017). Draft Guidance Note on Soil Recovery Waste Acceptance Criteria. Available at:

http://www.epa.ie/pubs/consultation/soilrecoveryconsultation/

APPENDIX 1 – Figures

Site Location

Site Boundary

Client:

Richmond Homes

Project Code:

8408-01-19

Project Title:

Sandyford Central

Drawing Title:

Figure 1 Site Location

GROUND INVESTIGATIONS IRELAND

Ground Investigations Ireland Ltd.
Catherinstown House,
Hazelhatch Road,
Newcastle, Co. Dublin
www.gii.ie 01-6015175/5176

0 10 20 30 40 50 60 m

Drawn By:	Date:
BS	27/03/2019

GROUND INVESTIGATIONS IRELAND

Ground Investigations Ireland Ltd.
Catherinstown House,
Hazelhatch Road,
Newcastle, Co. Dublin
www.gii.ie 01-6015175/5176

Client:

Richmond Homes

0 10 20 30 40 m

Project Title:
Sandyford Central

Drawing Title: Figure 2
SI Locations

GII Project Reference:
8459-02-19

Drawn By:
BS

Date:
07/08/2019

Site Boundary
Infiltration Test
Trial Pit
Borehole

GROUND INVESTIGATIONS IRELAND

Ground Investigations Ireland Ltd.
Catherinstown House,
Hazelhatch Road,
Newcastle, Co. Dublin
www.gii.ie 01-6015175/5176

Client: Richmond Homes

0 10 20 30 40 m

Project Title: Sandyford Central

Drawing Title: Figure 3
WAC 81 - 82 mOD

GII Project Reference:
8459-02-19

Drawn By: BS

Date: 07/08/2019

Site Boundary
Infiltration Test
Trial Pit
WAC Inert

GROUND INVESTIGATIONS IRELAND

Ground Investigations Ireland Ltd.
Catherinstown House,
Hazelhatch Road,
Newcastle, Co. Dublin
www.gii.ie 01-6015175/5176

Client: Richmond Homes

Project Title: Sandyford Central

Drawing Title: Figure 4 WAC 80 - 81 mOD

GII Project Reference: 8459-02-19

Drawn By: BS

Date: 07/08/2019

GROUND INVESTIGATIONS IRELAND

Ground Investigations Ireland Ltd.
Catherinstown House,
Hazelhatch Road,
Newcastle, Co. Dublin
www.gii.ie 01-6015175/5176

Client:

Richmond Homes

0 10 20 30 40 m

Project Title:
Sandyford Central

Drawing Title: Figure 5
WAC 79-80 mOD

GII Project Reference:
8459-02-19

Drawn By:
BS

Date:
07/08/2019

Site Boundary
Infiltration Test
Trial Pit
WAC Inert
WAC Exceeds Stable Non Reactive
Likely to Meet Inert WAC

GROUND INVESTIGATIONS IRELAND Ground Investigations Ireland Ltd. Catherinstown House, Hazelhatch Road, Newcastle, Co. Dublin www.gii.ie 01-6015175/5176	**Client:** Richmond Homes	**Project Title:** Sandyford Central **Drawing Title: Figure 6** WAC 78-79 mOD **GII Project Reference:** 8459-02-19	Site Boundary Infiltration Test Trial Pit WAC Inert WAC Non Haz
	0 10 20 30 40 m	Drawn By: BS Date: 07/08/2019	

GROUND INVESTIGATIONS IRELAND

Ground Investigations Ireland Ltd.
Catherinstown House,
Hazelhatch Road,
Newcastle, Co. Dublin
www.gii.ie 01-6015175/5176

Client:

Richmond Homes

0 10 20 30 40 m

Project Title:
Sandyford Central

Drawing Title: Figure 7
WAC 77-78 mOD

GII Project Reference:
8459-02-19

Drawn By:
BS

Date:
07/08/2019

Site Boundary

Infiltration Test

Trial Pit

WAC Non Haz

APPENDIX 2 – Trial Pit

Ground Investigations Ireland Ltd www.gii.ie	Site Sandyford Central	Trial Pit Number SA01
Machine : 3CX JCB Method : Trial pit	Dimensions: 1.90m x 0.60m; Ground Level (mOD): 81.36; Client: Richmond Homes	Job Number 8408-01-19
	Location (dGPS): 719157.3 E 726841.5 N; Dates: 20/02/2019; Project Contractor: Ground investigations Ireland Ltd	Sheet 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
				81.21	(0.15) 0.15	Reinforced Concrete with DPM		
				80.86	(0.35) 0.50	MADE GROUND: Dark grey angular to sub-angular fine to coarse GRAVEL		
				79.96	(0.90) 1.40	Weathered Granite: Light brown slightly clayey sandy angular to sub-angular fine to coarse GRAVEL with angular to sub-angular cobbles		
						Obstruction due to gRANITE		
						Complete at 1.40m		

Plan

Remarks

No groundwater encountered
Trial pit stable
Trial pit backfilled on completion

Scale (approx)	Logged By	Figure No.
1:25	NM	8408-01-19.SA01

Ground Investigations Ireland Ltd
www.gii.ie

Machine : 3CX JCB **Method :** Trial pit	**Dimensions** 2.00m x 0.60m	**Ground Level (mOD)** 80.37	**Client** Richmond Homes	**Job Number** 8408-01-19
	Location (dGPS) 719271.9 E 726894.6 N	**Dates** 20/02/2019	**Project Contractor** Ground investigations Ireland Ltd	**Sheet** 1/1

Site: Sandyford Central

Trial Pit Number: SA02

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
					(0.22)	Reinforced Concrete		
				80.15	0.22	MADE GROUND: Dark grey slightly sandy slightly clayey angular to sub-angular fine to coarse GRAVEL		
					(0.28)			
0.50-1.00	EN			79.87	0.50	Soft to firm brown slightly sandy gravelly CLAY with rootlets		
					(0.30)			
				79.57	0.80	Firm brown slightly sandy gravelly CLAY		
1.00 1.00-1.80	B EN				(0.80)			
				78.77	1.60	Firm dark grey slightly sandy gravelly CLAY		
					(0.20)			
				78.57	1.80	Complete at 1.80m		

Plan

Remarks

No groundwater encountered
Trial pit stable
Trial pit backfilled on completion

Scale (approx)	Logged By	Figure No.
1:25	NM	8408-01-19.SA02

Ground Investigations Ireland Ltd www.gii.ie			Site: Sandyford Central	Trial Pit Number: TP01
Machine : 3CX JCB Method : Trial pit	Dimensions: 3.50m x 0.60m	Ground Level (mOD): 82.04	Client: Richmond Homes	Job Number: 8408-01-19
	Location (dGPS): 719234.4 E 726829.9 N	Dates: 19/02/2019	Project Contractor: Ground investigations Ireland Ltd	Sheet: 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
				81.86	(0.18) 0.18	Tarmacadam		
				81.44	(0.42) 0.60	MADE GROUND: Grey slightly sandy slightly clayey angular to sub-rounded fine to coarse GRAVEL		
0.60-1.60 0.80	EN B			80.44	(1.00) 1.60	Stiff brown mottled grey slightly sandy gravelly CLAY with some sub-angular to sub-rounded cobbles		
				80.24	(0.20) 1.80	Stiff light brown slightly sandy gravelly CLAY with some sub-angular to sub-rounded cobbles		
				79.74	(0.50) 2.30	Weathered Granite: Light brown sandy clayey angular to sub-angular fine to coarse GRAVEL with many angular to sub-angular cobbles		
						Obstruction due to Rock Complete at 2.30m		

Plan

Remarks

No groundwater encountered
Trial pit stable
Trial pit backfilled on completion

Scale (approx)	Logged By	Figure No.
1:25	NM	8408-01-19.TP01

Ground Investigations Ireland Ltd www.gii.ie			Site Sandyford Central	Trial Pit Number **TP02**
Machine : 3CX JCB **Method :** Trial pit	**Dimensions** 2.60m x. 0.60m	**Ground Level (mOD)** 81.39	**Client** Richmond Homes	**Job Number** 8408-01-19
	Location (dGPS) 719213.9 E 726862.5 N	**Dates** 19/02/2019-19/03/2019	**Project Contractor** Ground investigations Ireland Ltd	**Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
					(0.23)	Reinforced Concrete.		
				81.16	0.23	MADE GROUND: Dark grey slightly sandy slightly clayey fine to medium angular to sub-angular GRAVEL		
					(0.77)			
0.60-1.00	EN							
0.90	B							
				80.39	1.00	Firm brown sandy very gravelly CLAY with many angular to sub-angular cobbles and boulders		
1.00-2.10	EN				(0.30)			
				80.09	1.30	Weathered Granite: Light brown sandy clayey fine to coarse angular to sub-angular GRAVEL with many angular to sub-angular cobbles and boulders		
1.50	B							
					(0.80)			
				79.29	2.10	Obstruction due to Rock		
						Complete at 2.10m		

Plan

Remarks

No groundwater encountered
Trial pit stable
Trial pit backfilled on completion

Scale (approx)	Logged By	Figure No.
1:25	NM	8408-01-19.TP02

Ground Investigations Ireland Ltd www.gii.ie	Site Sandyford Central	Trial Pit Number TP03

Machine : 3CX JCB Method : Trial pit	Dimensions 3.10m x 0.60m	Ground Level (mOD) 81.40	Client Richmond Homes	Job Number 8408-01-19
	Location (dGPS) 719194.8 E 726911.2 N	Dates 19/02/2019	Project Contractor Ground investigations Ireland Ltd	Sheet 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.00-1.00	EN					MADE GROUND: Light brown grey slightly sand very gravelly CLAY with rebar, plastic, cloth and redbrick fragments with many some sub-angular to sub-rounded cobbles and boulders with grass rootlets.		
0.50	B				(1.00)			
1.00-2.00	EN			80.40	1.00	MADE GROUND: Brown grey slightly sandy very gravelly CLAY with many rebar, redbrick, cloth and plastic fragments with some sub-angular to sub-rounded boulders of tarmacadam and concrete.		
1.50	B				(1.40)			
2.00-3.10	EN							
2.50	B			79.00	2.40	MADE GROUND: Light brown slightly sandy very clayey angular to sub-rounded fine to coarse GRAVEL with many angular to sub-angular cobbles and boulders with old metal concrete fragments and plastic.		
					(0.70)			
				78.30	3.10	Obstruction due to Rock or Boulder Complete at 3.10m		

Plan

Remarks

No groundwater encountered
Trial pit stable
Trial pit backfilled on completion

Scale (approx)	Logged By	Figure No.
1:25	NM	8408-01-19.TP03

Ground Investigations Ireland Ltd www.gii.ie	Site: Sandyford Central	Trial Pit Number: TP04

Machine : 3CX JCB Method : Trial Pit	Dimensions: 4.00m x 1.00m	Ground Level (mOD): 81.14	Client: Richmond Homes	Job Number: 8408-01-19
	Location (dGPS): 719242.9 E 726864.2 N	Dates: 19/03/2019	Project Contractor: Ground investigations Ireland Ltd	Sheet: 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
				80.96	(0.18) 0.18	Tarmacadam		
				80.69	(0.27) 0.45	MADE GROUND: Grey slightly sandy slightly gravelly angular to sub-angular fine to medium GRAVEL.		
0.45-0.90 0.50	EN B			80.24	(0.45) 0.90	MADE GROUND: Grey/brown slightly sandy clayey angular to sub-angular fine to course GRAVEL with some sub-angular to sub-rounded cobbles.		
0.90-2.00 1.20	EN B			79.84	(0.40) 1.30	Stiff brown mottled grey slightly sandy gravelly CLAY		
1.50	B			79.34	(0.50) 1.80	Stiff dark grey slightly sandy gravelly CLAY with some sub-angular to sub-rounded cobbles.		
2.30	B			78.74	(0.60) 2.40	Stiff light brown slightly sandy very gravelly CLAY with many sub-angular to sub-rounded cobbles.		
						Obstruction due to Rock.		
						Complete at 2.40m		

Plan

Remarks

No groundwater encountered
Trial pit stable
Trial pit backfilled on completion

Scale (approx)	Logged By	Figure No.
1:25	NM	8408-01-19.TP04

Ground Investigations Ireland Ltd www.gii.ie	Site Sandyford Central	Trial Pit Number **TP05**

Machine : 3CX JCB **Method :** Trial Pit	**Dimensions** 3.50m x 0.60m	**Ground Level (mOD)** 80.14	**Client** Richmond Homes	**Job Number** 8408-01-19
	Location (dGPS) 719262.4 E 726902.8 N	**Dates** 19/02/2019	**Project Contractor** Ground investigations Ireland Ltd	**Sheet** 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
					(0.25)	Reinforced Concrete		
				79.89	0.25 (0.10)	MADE GROUND: Grey slightly sandy slightly gravelly angular to sub-angular fine to coarse GRAVEL		
0.35-1.20	EN			79.79	0.35	MADE GROUND: Grey slightly sandy very gravelly CLAY with rare wood fragments occasional cobbles and sandy lenses		
0.50	B				(0.65)			
				79.14	1.00	Firm grey slightly sandy slightly gravelly CLAY with some sub-angular to sub-rounded cobbles		
1.20-2.00	EN							
1.30	B				(1.10)			
2.00-2.20	EN							
				78.04	2.10	Firm grey slightly sandy slightly gravelly CLAY with many sub-angular to sub-rounded cobbles		
2.20	B				(1.00)			
				77.04	3.10	Obstruction due to boulder. Complete at 3.10m		

Plan

Remarks

No groundwater encountered
Trial pit stable
Trial pit backfilled on completion

Scale (approx)	Logged By	Figure No.
1:25	NM	8408-01-19.TP05

Ground Investigations Ireland Ltd www.gii.ie	Site: Sandyford Central	Trial Pit Number: TP06
Machine: 3CX JCB; Method:	Dimensions: 4.00m x 0.60m	Ground Level (mOD): 79.99
Client: Richmond Homes	Job Number: 8408-01-19	
Location (dGPS): 719242.6 E 726924.6 N	Dates: 01/03/2019	Project Contractor: Ground investigations Ireland Ltd
Sheet: 1/1		

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
					(0.28)	Reinforced Concrete		
				79.71	0.28 (0.17)	MADE GROUND: Brown grey slightly sandy slightly clayey angular to sub-angular fine to coarse GRAVEL		
				79.54	0.45 (0.35)	MADE GROUND: Brown slightly sandy clayey angular to sub-angular fine to coarse GRAVEL with many angular to sub-angular cobbles		
0.80-1.00 1.00 1.00-2.00	EN B EN			79.19	0.80 (0.40)	Firm brown slightly sandy gravelly CLAY with some sub-angular to sub-rounded cobbles		
1.50 2.00-2.40	B EN			78.79	1.20 (1.20)	Stiff dark grey slightly sandy slightly gravelly CLAY with some sub-angular to sub-rounded cobbles		
2.40	B			77.59	2.40	Obstruction due to Boulder		
						Complete at 2.40m		

Plan

Remarks

No groundwater encountered
Trial pit stable
Trial pit backfilled on completion

Scale (approx)	Logged By	Figure No.
1:25	NM	8408-01-19.TP06

Ground Investigations Ireland Ltd www.gii.ie	Site: Sandyford Central	Trial Pit Number: TP101
Machine : JCB 3CX; Method : Trial Pit	Dimensions: ; Ground Level (mOD): ; Client: Richmond Homes	Job Number: 8408-01-19
	Location: ; Dates: 28/06/2019; Project Contractor: Ground investigations Ireland Ltd	Sheet: 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
					0.05	MADE GROUND: Grey slightly sandy angular fine to coarse Gravel.		
0.20-1.00	EN					Firm brown slightly sandy slightly gravelly CLAY with rare sub-angular to sub-rounded cobbles.		
0.40	B				(0.80)			
					0.85	Brown gravelly clayey fine to coarse SAND.		
1.00-2.00	EN				(0.65)			
1.50	B				1.50	Stiff brown/reddish brown slightly sandy gravelly CLAY with frequent sub-rounded cobbles and rare boulders.		
2.00-3.10	EN				(1.00)			
					2.50	Stiff brown/reddish brown/black slightly sandy gravelly CLAY with occasional sub-angular to sub-rounded cobbles.		
2.50	B				(0.60)			
3.10	B				3.10	Obstruction: Presumed boulders of granite.		
						Complete at 3.10m		

Plan

Remarks

No Groundwater encountered.
Trial pit sidewalls spalling.
Trial pit backfilled on completion.

Scale (approx)	Logged By	Figure No.
1:25	Tmcl	8408-01-19.TP101

Ground Investigations Ireland Ltd www.gii.ie	Site Sandyford Central	Trial Pit Number **TP102**

Machine : JCB 3CX Method : Trial Pit	Dimensions	Ground Level (mOD)	Client Richmond Homes	Job Number 8408-01-19
	Location	Dates 28/06/2019	Project Contractor Ground investigations Ireland Ltd	Sheet 1/1

Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.00-1.00	B				(0.20)	TARMACADAM.		
0.20-1.00	EN				0.20 (0.40)	MADE GROUND: Brown sandy gravelly Clay with fragments of concrete and roots.		
1.00-2.00	EN				0.60 (0.70)	MADE GROUND: Grey/brown slightly sandy gravelly Clay with rare fragments of concrete and ash.		
1.80	B				1.30 (0.70)	Stiff brown/black slightly sandy gravelly CLAY with occasional boulders.		
					2.00	Obstruction: Boulders. Complete at 2.00m		

Plan

Remarks

No Groundwater encountered.
Trial pit sidewalls spalling.
Trial pit backfilled on completion.

Scale (approx)	Logged By	Figure No.
1:25	Tmcl	8408-01-19.TP102

APPENDIX 3 – Rotary Borehole Logs

Ground Investigations Ireland Ltd www.gii.ie	Site: Sandyford Central	Borehole Number: BH01

Machine : Beretta T46 Flush : water Core Dia : 68 mm Method : Rotary Cored	Casing Diameter: 100mm cased to 8.40m	Ground Level (mOD): 82.20	Client: Richmond Homes	Job Number: 8408-01-19
	Location: 719153.4 E 726805.3 N	Dates: 08/03/2019	Project Contractor: Ground investigations Ireland Ltd	Sheet: 1/1

Depth (m)	TCR	SCR	RQD	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description
0.00						82.10	0.10	Tarmacadam.
	42						(1.70)	Driller notes: Dark brown sandy gravelly CLAY. Returns of sub-rounded to sub-angular gravel.
						80.40	1.80 (0.60)	Driller notes: Boulder. Returns of granite boulder
2.40	92					79.80	2.40 (1.05)	Driller notes: Brown clay with rare cobbles Returns of stiff dark brown grey slightly sandy gravelly CLAY.
3.45						78.75	3.45 (1.15)	Weak to medium strong pinkish orange white coarsely crystalline GRANITE. Distinctly weathered. 3.45-4.60m - Two fracture sets. F1: very close to close spaced, 10-30 degrees, stepped rough, tight to open, stained brown, clay smearing. F2: closely spaced, 70-90 degrees, stepped rough, tight to open, stained brown, clay smearing.
3.90	100	19	0	12				
4.60	100	0	0	10		77.60	4.60 (2.30)	Weak pinkish white coarsely crystalline GRANITE. Distinctly weathered. 4.60-5.40m - Two fracture set. F1: very close spaced, 80-90 degrees, stepped rough, tight to open with some clay smearing. F2: Very close to close 10-30 degrees undulating smooth tight to open with staining. 5.40-6.50m - Predominately non intact. Indicating two fracture sets of 10-30 degrees and 60-80 degrees.
5.40	100	37	13	N.I				
6.50				11				
6.90	100	68	48			75.30	6.90 (1.50)	Strong white coarsely crystalline GRANITE. Partially weathered. 6.50-7.90m - Two fracture sets. F1: closely spaced, 10-30 degrees, stepped rough, tight to open with some clay smearing and quartz sand. F2: close to medium spaced, 50-70 degrees, stepped rough, tight to open with some clay smearing. 7.90-8.20m - Mostly non intact
7.40	100	50	35					
7.90				N.I				
8.40						73.80	8.40	Complete at 8.40m

Remarks
No groundwater encountered.
50mm slotted standpipe installed from 8.40m to 1.00m with pea gravel surround, plain pipe installed from 1.00m to ground level with bentonite seal and flush cover.
Borehole backfilled on completion.

Scale (approx)	Logged By
1:50	NM

Figure No. 8408-01-19.BH01

Ground Investigations Ireland Ltd www.gii.ie			Site: Sandyford Central	Borehole Number: BH02
Machine : Beretta T46 Flush : water Core Dia : 68 mm Method : Rotary Cored	Casing Diameter: 100mm cased to 10.60m	Ground Level (mOD): 82.45	Client: Richmond Homes	Job Number: 8408-01-19
	Location: 719228.8 E 726817.8 N	Dates: 26/02/2019	Project Contractor: Ground investigations Ireland Ltd	Sheet: 1/2

Depth (m)	TCR	SCR	RQD	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
0.00	21					82.30	(0.15) 0.15	Tarmacadam.			
								Driller notes: Dark grey slightly sandy gravelly CLAY. Returns of sub-rounded to sub-angular gravel and cobbles.			
1.50 1.50-1.55	16				25/50 SPT(C) 25*/50 50/0						
2.50 2.50-2.55	17				25/50 SPT(C) 25*/50 50/0		(5.35)				
4.00 4.00-4.05	13				25/50 SPT(C) 25*/50 50/0						
5.50 5.50-5.50	100	73	73	6	25/50 SPT(C) 25*/0 50/0	76.95	5.50	Medium strong to strong orangish white coarsely crystalline GRANITE partially weathered			
6.60	100	11	11				(2.60)	5.50-8.10m - Three fracture sets. F1: close to wide spaced, 0-20 degrees, stepped rough, tight to open, stained brown. F2: close to medium spaced, 70-80 degrees, planar smooth to rough, tight to open stained black. F3: wide spaced 80-90 degrees, planar smooth to rough, tight to open stained brown.			
8.10	100	93	65	6		74.35	8.10	Strong greyish white coarsely crystalline GRANITE unweathered to partially weathered.			
							(2.50)	8.10-10.60m - Two fracture sets. F1: close to medium spaced, 10-30 degrees, stepped rough, tight to open, stained brown with some clay smearing. F2: close to medium spaced, 70-80 degrees, planar rough, tight to open stained brown.			
9.60											

Remarks
No groundwater encountered.
50mm slotted standpipe installed from 10.00m to 1.00m with pea gravel surround, plain pipe installed from 1.00m to ground level with bentonite seal and flush cover.
Borehole backfilled on completion.

Scale (approx)	Logged By
1:50	NM

Figure No. 8408-01-19.BH02

Ground Investigations Ireland Ltd www.gii.ie	Site: Sandyford Central	Borehole Number: BH02

Machine : Beretta T46	Casing Diameter	Ground Level (mOD)	Client	Job Number
Flush : water	100mm cased to 10.60m	82.45	Richmond Homes	8408-01-19
Core Dia : 68 mm	Location	Dates	Project Contractor	Sheet
Method : Rotary Cored	719228.8 E 726817.8 N	26/02/2019	Ground investigations Ireland Ltd	2/2

Depth (m)	TCR	SCR	RQD	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
	100	62	62								
10.60						71.85	10.60	Complete at 10.60m			

Remarks	Scale (approx)	Logged By
	1:50	NM
	Figure No. 8408-01-19.BH02	

Ground Investigations Ireland Ltd
www.gii.ie

Machine : Beretta T46 **Flush :** water **Core Dia :** 68 mm **Method :** Rotary Cored	**Casing Diameter** 100mm cased to 8.00m	**Ground Level (mOD)** 81.37	**Site** Sandyford Central **Client** Richmond Homes	**Borehole Number** **BH03** **Job Number** 8408-01-19
	Location 719188.9 E 726824.6 N	**Dates** 26/02/2019	**Project Contractor** Ground investigations Ireland Ltd	**Sheet** 1/1

Depth (m)	TCR	SCR	RQD	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.00	18					81.14	(0.23) 0.23	Reinforced concrete.		
							(2.27)	Driller notes: Brown slightly sandy slightly gravelly CLAY with cobbles and boulders. Returns of gravel to boulder sized fragments.		
1.50 1.50-1.55	57				25/50 SPT(C) 25*/50 50/0					
2.20 2.20-2.20 2.50					25/50 SPT(C) 25*/0 50/0	78.87	2.50			
2.90	75	41	39	6			(1.30)	Weak to medium strong brownish white fine to coarse crystalline GRANITE with quartz veins distinctly weathered. 2.50-2.90m - One fracture sets. F1: very close to medium spaced, 10-30 degrees, stepped rough, tight to open, some clay smearing.		
				10				2.90-3.80m - Two fracture sets. F1: closely spaced, 10-30 degrees, stepped rough, tight to open. F2: Very closely spaced 60-80 degrees, undulating rough, open, stained brown.		
3.80	98	92	85			77.57	3.80	Strong to weak orangish grey white coarsely crystalline GRANITE. Partially weathered. 3.80-6.10m - Two fracture sets. F1: close to medium spaced, 10-30 degrees, stepped rough, tight to open, stained orangish brown. F2: widely spaced, 80 degrees, undulating rough, open, stained brown.		
4.80 5.00	100	100	100	4			(2.30)			
	93	77	73							
6.10				6		75.27	6.10 (0.40)	Weak to medium strong brownish white fine to coarse crystalline GRANITE with quartz veins distinctly weathered. 6.10-6.55m - One fracture set. F1:very closely spaced, 0-30 degrees, stepped rough, tight to open, quartz sand smearing.		
6.50 6.55 6.80	100	67	53	N.I		74.87	6.50	Weak to medium strong orangish white fine to coarse crystalline GRANITE. Partially weathered. 6.55-6.80m - Non Intact.		
				8			(1.50)	6.80-8.00m - Two fracture sets. F1: closely spaced, 10-20 degrees, stepped rough, tight to open, stained brown. F2: very close to medium spaced, 60-80 degrees, stepped rough, tight to open, stained brown.		
8.00						73.37	8.00	Complete at 8.00m		

Remarks
No groundwater encountered.
No standpipe installed.
Borehole backfilled on completion.

Scale (approx)	Logged By
1:50	NM

Figure No.
8408-01-19.BH03

Ground Investigations Ireland Ltd www.gii.ie			Site: Sandyford Central	Borehole Number: BH04
Machine : Beretta T46 Flush : water Core Dia : 68 mm Method : Rotary Cored	Casing Diameter: 100mm cased to 5.00m	Ground Level (mOD): 81.37	Client: Richmond Homes	Job Number: 8408-01-19
	Location: 719176.6 E 726849.9 N	Dates: 25/02/2019	Project Contractor: Ground investigations Ireland Ltd	Sheet: 1/1

Depth (m)	TCR	SCR	RQD	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.00	11					81.12	(0.25) 0.25	Reinforced concrete.		
							(1.25)	Driller notes: Dark grey slightly sandy gravelly CLAY with occasional sub-angular to sub-rounded cobbles. Returns of gravel sized fragments.		
1.50 1.50-1.55	100	34	20	N.I	25/50 SPT(C) 25*/50 50/0	79.87	1.50 (0.50)	Weak to medium strong orangish white coarsely crystalline GRANITE Distinctly weathered. 1.50-2.00m - Non Intact.		
2.00	100	87	73	7		79.37	2.00 (1.50)	Medium strong orangish grey white coarsely crystalline GRANITE. Partially weathered. 2.00-3.50m - Two fracture sets. F1: very close to medium spaced, 10-30 degrees, stepped rough, tight to open, clay smearing. F2: close to medium spaced, 60-80 degrees, stepped rough, tight to open, stained brown.		
3.50	100	98	92	6		77.87	3.50 (1.50)	Strong greyish white pink coarsely crystalline GRANITE with occasional quartz veins partially weathered. 3.50-5.00m - Two fracture sets. F1: very close to medium spaced, 10-30 degrees, stepped rough, tight to open, stained brown. F2: close to medium spaced, 50-70 degrees, stepped rough, tight to open, stained brown.		
5.00						76.37	5.00	Complete at 5.00m		

Remarks	Scale (approx)	Logged By
No groundwater encountered. No standpipe installed. Borehole backfilled on completion.	1:50	NM
	Figure No. 8408-01-19.BH04	

Ground Investigations Ireland Ltd www.gii.ie	Site: Sandyford Central	Borehole Number: BH05

Machine : Beretta T46 Flush : water Core Dia : 68 mm Method : Rotary Cored	Casing Diameter: 100mm cased to 7.00m	Ground Level (mOD): 81.23	Client: Richmond Homes	Job Number: 8408-01-19
	Location: 719194.7 E 726906.4 N	Dates: 28/02/2019	Project Contractor: Ground investigations Ireland Ltd	Sheet: 1/1

Depth (m)	TCR	SCR	RQD	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.00	50						(1.00)	Driller notes: Fill. Returns of angular gravel sized granite and quartz with angular cobbles of granite concrete and Mudstone.		
1.00 1.00-1.10	0				25/50 SPT(C) 25*/50 50/50	80.23	1.00 (1.50)	Returns of gravel to cobble sized fragments.		
2.50 2.50-2.50	100	20	20	8	25/50 SPT(C) 25*/0 50/0	78.73	2.50 (0.50)	Weak to medium strong orangish white coarsely crystalline GRANITE. Partially weathered. 2.50-3.00m - Two fracture sets. F1: closely spaced, 60-80 degrees, stepped rough, tight to open, stained brown. F2: close to medium spaced, 20-40 degrees, stepped rough, tight to open, stained brown.		
3.00	100	60	52	5		78.23	3.00 (1.50)	Strong orangish grey coarsely crystalline GRANITE. Partially weathered 3.00-6.00m - Three fracture sets. F1: close to medium spaced, 0-20 degrees, stepped rough, tight to open, stained brown, clay smearing. F2: close to medium spaced, 40-60 degrees, stepped rough, tight to open, stained brown with some quartz sand on fractures. F3: closely spaced, 70-80 degrees stepped rough, tight to open stained brown.		
4.50	94	55	55			76.73	4.50 (1.50)	Strong greyish whitish grey coarsely crystalline GRANITE with frequent quartz veins. Partially weathered		
6.00	100	100	100	3		75.23	6.00 (1.00)	Strong to very strong grey coarsely crystalline GRANITE. Partially weathered 6.00-7.00m - One fracture set. F1: close to medium spaced, 10-20 degrees, stepped rough, tight to open, stained brown.		
7.00						74.23	7.00	Complete at 7.00m		

Remarks
No groundwater encountered.
No standpipe installed.
Borehole backfilled on completion.

Scale (approx)	Logged By
1:50	NM

Figure No. 8408-01-19.BH05

Ground Investigations Ireland Ltd
www.gii.ie

Machine : Beretta T46 **Flush :** water **Core Dia :** 68 mm **Method :** Rotary Cored	**Casing Diameter** 100mm cased to 6.50m	**Ground Level (mOD)** 81.39	**Site** Sandyford Central **Client** Richmond Homes	**Borehole Number** BH06 **Job Number** 8408-01-19
	Location 719216 E 726863.8 N	**Dates** 26/02/2019	**Project Contractor** Ground investigations Ireland Ltd	**Sheet** 1/1

Depth (m)	TCR	SCR	RQD	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
0.00	34					81.15	(0.24) 0.24	Reinforced concrete.			
								Driller Notes: Dark grey slightly sandy gravelly CLAY with occasional cobbles.			
0.75 0.75-0.85	59				25/50 SPT(C) 25*/50 50/50		(1.26)				
1.50 1.50-1.60	30			N.I	25/50 SPT(C) 25*/50 50/50	79.89	1.50 (0.70)	Extremely weak to weak orangish white coarsely crystalline GRANITE. Distinctly weathered. 1.50-2.20m - Non intact.			
2.00 2.20	47	55	55	4		79.19	2.20	Medium strong to strong orangish pink grey coarsely crystalline GRANITE. Partially weathered to weathered. 2.20-2.70m - One fracture set. F1: closely spaced, 60-80 degrees, stepped rough, tight to open, some clay smearing.			
2.70 2.93				N.I				2.70-2.93m - Non intact.			
3.50	100	53	53	6			(4.30)	2.93-5.00m - Two fracture set. F1: closely spaced, 70-90 degrees, stepped rough, tight to open, stained dark brown. F2: Closely spaced 0-20 degrees, undulating rough, tight to open.			
5.00	100	65	45	10				5.00-6.50m - Two fracture sets. F1: close to medium spaced, 80-90 degrees undulating rough, tight to open, stained brown. F2: close to medium spaced, 40-50 degrees, planar smooth to rough, stained brown.			
6.50						74.89	6.50	Complete at 6.50m			

Remarks
No groundwater encountered.
50mm slotted standpipe installed from 6.50m to 1.00m with pea gravel surround, plain pipe installed from 1.00m to ground level with bentonite seal and flush cover.
Borehole backfilled on completion.

Scale (approx)	Logged By
1:50	NM

Figure No.
8408-01-19.BH06

Ground Investigations Ireland Ltd www.gii.ie	Site: Sandyford Central	Borehole Number: BH07

Machine : Beretta T46 Flush : water Core Dia : 68 mm Method : Rotary Cored	Casing Diameter: 100mm cased to 7.00m	Ground Level (mOD): 81.24	Client: Richmond Homes	Job Number: 8408-01-19
	Location: 719241.8 E 726862.5 N	Dates: 27/02/2019	Project Contractor: Ground investigations Ireland Ltd	Sheet: 1/1

Depth (m)	TCR	SCR	RQD	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.00	33						(0.24)	Tarmacadam.		
						81.00	0.24	Recovery consists of dark grey, slightly sandy slightly gravelly CLAY with occasional sub-angular to sub-rounded cobbles		
1.00 1.00-1.10	32				25/50 SPT(C) 25*/50 50/50		(1.76)			
2.00 2.00-2.00	100	30	30	N.I	25/50 SPT(C) 25*/0 50/0	79.24	2.00	Weak whitish grey coarsely crystalline GRANITE. Distinctly weathered.		
2.50							(0.90)	2.00-2.90m - Non intact.		
2.90	100	49	40	10		78.34	2.90	Medium strong to strong whitish grey orange coarsely crystalline GRANITE. Partially weathered. 2.90-4.20m - Two fracture sets. F1: close to medium spaced, 0-20 degrees, stepped rough, tight to open, stained brown and some clay smearing. F2: Close to medium spaced 30-50 degrees, undulating rough, tight to open		
							(0.80)			
						77.54	3.70	Extremely weak to weak greyish orange coarsely crystalline GRANITE. Distinctly to partially weathered		
4.00										
4.20	100	62	62	N.I			(2.00)	4.20-4.70m - Non intact.		
4.70										
5.00	100	78	69	8		75.54	5.70	Medium strong to strong pinkish white grey coarsely crystalline GRANITE. Partially weathered. 4.70-7.00m - Two fracture sets. F1: close to medium spaced, 10-30 degrees, stepped rough, tight to open, stained brown and some clay smearing. F2: closely spaced, 60-80 degrees, stepped rough, stained brown.		
							(1.30)			
6.50	100	86	56							
7.00						74.24	7.00	Complete at 7.00m		

Remarks
No groundwater encountered.
No standpipe installed.
Borehole backfilled on completion.

Scale (approx)	Logged By
1:50	NM

Figure No. 8408-01-19.BH07

Ground Investigations Ireland Ltd www.gii.ie	Site: Sandyford Central	Borehole Number: BH08

Machine : Beretta T46	Casing Diameter: 100mm cased to 10.00m	Ground Level (mOD): 81.40	Client: Richmond Homes	Job Number: 8408-01-19
Flush : water				
Core Dia : 68 mm	Location: 719235.4 E 726909.9 N	Dates: 27/02/2019	Project Contractor: Ground investigations Ireland Ltd	Sheet: 1/2
Method : Rotary Cored				

Depth (m)	TCR	SCR	RQD	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
0.00	36					81.10	(0.30) 0.30	Reinforced concrete.			
								Driller notes: Fill. Dark grey slightly clayey medium to coarse sub angular GRAVEL with occasional sub-angular cobbles.Returns of gravel to cobble sized fragments			
1.00	19										
2.20 2.20-2.30	26				25/50 SPT(C) 25*/50 50/50		(4.40)				
3.50 3.50-3.60	50	0	0		25/50 SPT(C) 25*/50 50/50						
4.50 4.50-4.60 4.70	100	30	0		25/50 SPT(C) 25*/50 50/50	76.70	4.70	Extremely weak to weak pinkish orange coarsely crystalline GRANITE. Distinctly weathered.			
5.00	96	57	40	10			(2.60)	4.70-7.30m - One fracture set. F1: very close to close spaced, 10-20 degrees, stepped rough, tight to open, stained brown and black with some clay smearing and quartz sand on fracture surfaces.			
6.50											
7.30	88	46	39			74.10	7.30	Extremely weak to medium strong pinkish orange coarsely crystalline GRANITE. Distinctly weathered.			
				N.I			(1.20)	7.30-9.30m - Non intact.			
8.00						72.90	8.50	Extremely weak to medium strong pinkish orange coarsely crystalline GRANITE. Distinctly weathered to de-structured			
	93	17	17				(0.80)				
9.30				4		72.10	9.30 (0.70)	Extremely weak to weak pink coarsely crystalline GRANITE. Distinctly weathered. 9.30-10.00m - Two fracture sets. F1: close to medium spaced, 10-20 degrees, stepped rough, tight to open, stained brown with some			
10.00											

Remarks
No groundwater encountered.
50mm slotted standpipe installed from 10.00m to 1.00m with pea gravel surround, plain pipe installed from 1.00m to ground level with bentonite seal and flush cover.
Borehole backfilled on completion.

Scale (approx)	Logged By
1:50	NM

Figure No. 8408-01-19.BH08

Ground Investigations Ireland Ltd www.gii.ie	Site Sandyford Central	Borehole Number **BH08**

Machine : Beretta T46 Flush : water Core Dia : 68 mm Method : Rotary Cored	Casing Diameter 100mm cased to 10.00m	Ground Level (mOD) 81.40	Client Richmond Homes	Job Number 8408-01-19
	Location 719235.4 E 726909.9 N	Dates 27/02/2019	Project Contractor Ground investigations Ireland Ltd	Sheet 2/2

Depth (m)	TCR	SCR	RQD	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
						71.40	10.00	clay smearing and quartz sand on fracture surfaces. F2: closely spaced, 80-90 degrees, stepped rough, tight to open with some clay smearing on fracture surfaces.			
								Complete at 10.00m			

Remarks	Scale (approx) 1:50	Logged By NM
	Figure No. 8408-01-19.BH08	

Ground Investigations Ireland Ltd
www.gii.ie

Site Sandyford Central					**Borehole Number** BH09
Machine : Beretta T46 **Flush :** water **Core Dia :** 68 mm **Method :** Rotary Cored	**Casing Diameter** 100mm cased to 7.50m	**Ground Level (mOD)** 80.15	**Client** Richmond Homes		**Job Number** 8408-01-19
	Location 719218.9 E 726934.1 N	**Dates** 28/02/2019	**Project Contractor** Ground investigations Ireland Ltd		**Sheet** 1/1

Depth (m)	TCR	SCR	RQD	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
0.00	45							Driller notes: Brown grey slightly sandy gravelly CLAY with occasional cobble sized fragments.Returns of gravel to cobble sized fragments.			
1.00 1.00-1.10	47				25/50 SPT(C) 25*/50 50/50		(2.80)				
2.20 2.20-2.30	67				25/50 SPT(C) 25*/50 50/50						
2.80	100	50	27	N.I		77.35	2.80	Weak to medium strong brownish white coarsely crystalline GRANITE. Distinctly weathered. 2.80-3.20m - Non intact.			
3.20				8			(1.50)	3.20-4.30m - Two fracture sets. F1: very close to closely spaced, 0-20 degrees, stepped rough, tight to open, stained brown. F2: medium to widely spaced, 45-55 degrees, stepped rough, tight to open, stained brown.			
4.30	100	63	43	N.I		75.85	4.30	Medium strong greyish white coarsely crystalline GRANITE. Weathered to partially weathered 4.30-4.50m - Non intact.			
4.50				8			(1.20)	4.30-5.50m - Two fracture sets. F1: very close to closely spaced, 0-30 degrees, stepped rough, tight to open, stained brown. F2: close to medium spaced, 70-80 degrees, stepped rough, tight to open, stained brown grey.			
5.50	100	97	91	5		74.65	5.50	Medium strong to strong whitish greyish pink coarse to fine crystalline GRANITE. Partially weathered			
							(2.00)	5.50-7.50m - One fracture set. F1: close to widely spaced, 50-70 degrees, stepped rough, tight to open, stained brown.			
7.00	80	40	20								
7.50						72.65	7.50	Complete at 7.50m			

Remarks
No groundwater encountered.
50mm slotted standpipe installed from 7.50m to 1.00m with pea gravel surround, plain pipe installed from 1.00m to ground level with bentonite seal and flush cover.
Borehole backfilled on completion.

Scale (approx)	Logged By
1:50	NM

Figure No. 8408-01-19.BH09

Ground Investigations Ireland Ltd www.gii.ie		**Site** Sandyford Central	**Borehole Number** BH10
Machine : Beretta T46 **Flush :** water **Core Dia :** 68 mm **Method :** Rotary Cored	**Casing Diameter** 100mm cased to 10.00m	**Ground Level (mOD)** 80.32	**Client** Richmond Homes	**Job Number** 8408-01-19
	Location 719273.8 E 726899.4 N	**Dates** 28/02/2019	**Project Contractor** Ground investigations Ireland Ltd	**Sheet** 1/1

Depth (m)	TCR	SCR	RQD	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
0.00	27					80.08	(0.24) 0.24	Tarmacadam.			
						79.84	(0.24) 0.48	Driller notes: Dark grey medium to coarse sub-angular to sub-rounded GRAVEL.			
1.00 1.00-1.10	17				25/50 SPT(C) 25*/50 50/50			Recovery consists of stiff brown slightly sandy slightly gravelly CLAY with sub-angular to sub-rounded cobbles.			
2.20 2.20-2.30	41				25/50 SPT(C) 25*/50 50/50		(4.22)				
3.70 3.70-3.80	50				25/50 SPT(C) 25*/50 50/50	75.62	4.70				
4.70 4.70-4.70	100	100	100		25/50 SPT(C) 25*/0 50/0	75.22	(0.40) 5.10	Weak to medium strong orangish coarsely crystalline GRANITE. Partially weathered.			
5.10	94	34	30	5		74.32	(0.90) 6.00	Weak to strong orangish greyish white coarsely crystalline GRANITE. Partially weathered 4.70-6.00m - Two fracture sets. F1: widely spaced, 60-70 degrees, stepped rough, tight to open, stained brown with quartz sand on fracture surfaces. F2: close to medium spaced, 20-30 degrees, stepped rough, tight to open, stained brown with clay smearing.			
6.00											
6.70	100	49	41	8		72.52	(1.80) 7.80	Extremely weak to weak orange coarsely crystalline GRANITE. Distinctly weathered. 6.00-7.80m - Two fracture sets. F1: close to medium spaced, 70-80 degrees, stepped rough, tight to open, stained brown with clay smearing. F2: close to medium spaced, 0-20 degrees, stepped rough, tight to open, stained brown with quartz sand on fracture surfaces.			
7.80											
8.20	100	88	77	7			(2.20)	Strong to very strong greyish white coarsely crystalline GRANITE. Partially weathered 7.80-10.00m - Two fracture sets. F1: close to medium spaced, 0-20 degrees, stepped rough, tight to open, stained brown with quartz sand on fracture surfaces. F2: widely spaced, 70-80 degrees, stepped rough, tight to open, stained brown with some clay smearing.			
9.70	100	100	100								
10.00						70.32	10.00				

Remarks
No groundwater encountered.
50mm slotted standpipe installed from 10.00m to 1.00m with pea gravel surround, plain pipe installed from 1.00m to ground level with bentonite seal and flush cover.
Borehole backfilled on completion.

Scale (approx)	Logged By
1:50	NM

Figure No. 8408-01-19.BH010

APPENDIX 4 – Laboratory Testing

Exova Jones Environmental

Registered Office: Exova Environmental UK Limited, 10 Lower Grosvenor Place, London, SW1W 0EN. Reg No. 11371415

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Ground Investigations Ireland
Catherinestown House
Hazelhatch Road
Newcastle
Co. Dublin
Ireland

Attention :	Conor Finnerty
Date :	21st March, 2019
Your reference :	8408.01.19
Our reference :	Test Report 19/3052 Batch 1
Location :	Sandyford Central
Date samples received :	25th February, 2019
Status :	Final report
Issue :	2

Sixteen samples were received for analysis on 25th February, 2019 of which sixteen 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:

Bruce Leslie
Project Co-ordinator

Exova Jones Environmental

Client Name: Ground Investigations Ireland
Reference: 8408.01.19
Location: Sandyford Central
Contact: Conor Finnerty
JE Job No.: 19/3052

Report : Solid

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

Please see attached notes for all abbreviations and acronyms

J E Sample No.	1-3	4-6	7-9	10-12	13-15	16-18	19-21	22-24	25-27	28-30	LOD/LOR	Units	Method No.
Sample ID	TP01	TP06	TP02	TP06	TP02	TP06	TP03	TP03	TP03	TP04			
Depth	0.60-1.60	0.80-1.00	0.60-1.00	1.00-2.00	1.00-2.10	2.00-2.40	0.00-1.00	1.00-2.00	2.00-3.10	0.45-0.90			
COC No / misc													
Containers	V J T	V J T	V J T	V J T	V J T	V J T	V J T	V J T	V J T	V J T			
Sample Date	19/02/2019	20/02/2019	20/02/2019	20/02/2019	20/02/2019	20/02/2019	19/02/2019	19/02/2019	19/02/2019	19/02/2019			
Sample Type	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil			
Batch Number	1	1	1	1	1	1	1	1	1	1			
Date of Receipt	25/02/2019	25/02/2019	25/02/2019	25/02/2019	25/02/2019	25/02/2019	25/02/2019	25/02/2019	25/02/2019	25/02/2019			
Antimony	2	3	2	2	<1	2	<1	2	<1	1	<1	mg/kg	TM30/PM15
Arsenic #	11.6	24.5	16.1	8.1	4.3	13.1	9.0	11.3	9.0	20.1	<0.5	mg/kg	TM30/PM15
Barium #	66	312	50	59	32	70	43	59	48	99	<1	mg/kg	TM30/PM15
Cadmium #	1.9	1.8	0.8	2.0	0.5	1.5	0.8	1.2	0.4	0.3	<0.1	mg/kg	TM30/PM15
Chromium #	27.3	46.4	30.5	42.1	29.3	28.4	29.5	53.1	29.3	54.8	<0.5	mg/kg	TM30/PM15
Copper #	27	37	16	28	8	22	13	22	12	20	<1	mg/kg	TM30/PM15
Lead #	47	34	16	17	13	20	20	22	17	10	<5	mg/kg	TM30/PM15
Mercury #	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	mg/kg	TM30/PM15
Molybdenum #	2.1	4.8	2.0	4.6	1.9	3.0	1.2	2.3	2.3	2.1	<0.1	mg/kg	TM30/PM15
Nickel #	41.0	57.0	29.3	38.2	14.4	35.9	15.4	28.1	15.5	27.9	<0.7	mg/kg	TM30/PM15
Selenium #	<1	2	<1	3	<1	2	<1	1	<1	1	<1	mg/kg	TM30/PM15
Zinc #	100	146	75	94	55	92	61	85	66	97	<5	mg/kg	TM30/PM15
PAH MS													
Naphthalene #	<0.04	<0.04	<0.04	<0.04	<0.04	<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	<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	<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	<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	<0.03	0.15	<0.03	<0.03	<0.03	mg/kg	TM4/PM8
Anthracene #	<0.04	<0.04	<0.04	<0.04	<0.04	<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	<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	<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	<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	<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	<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	<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	<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	<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	<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	<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	<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	<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	<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	<0.02	<0.02	<0.02	<0.02	<0.02	mg/kg	TM4/PM8
Benzo(j)fluoranthene	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	mg/kg	TM4/PM8
PAH Surrogate % Recovery	91	90	92	94	93	79	94	95	94	95	<0	%	TM4/PM8
Mineral Oil (C10-C40)	<30	<30	<30	<30	<30	<30	130	164	74	<30	<30	mg/kg	TM5/PM8/PM16

Please include all sections of this report if it is reproduced
All solid results are expressed on a dry weight basis unless stated otherwise.

Exova Jones Environmental

Client Name:	Ground Investigations Ireland	**Report :**	**Solid**
Reference:	8408.01.19		
Location:	Sandyford Central	**Solids:** V=60g VOC jar, J=250g glass jar, T=plastic tub	
Contact:	Conor Finnerty		
JE Job No.:	19/3052		

Please see attached notes for all abbreviations and acronyms

J E Sample No.	1-3	4-6	7-9	10-12	13-15	16-18	19-21	22-24	25-27	28-30			
Sample ID	TP01	TP06	TP02	TP06	TP02	TP06	TP03	TP03	TP03	TP04			
Depth	0.60-1.60	0.80-1.00	0.60-1.00	1.00-2.00	1.00-2.10	2.00-2.40	0.00-1.00	1.00-2.00	2.00-3.10	0.45-0.90			
COC No / misc													
Containers	V J T	V J T	V J T	V J T	V J T	V J T	V J T	V J T	V J T	V J T			
Sample Date	19/02/2019	20/02/2019	20/02/2019	20/02/2019	20/02/2019	20/02/2019	19/02/2019	19/02/2019	19/02/2019	19/02/2019			
Sample Type	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil			
Batch Number	1	1	1	1	1	1	1	1	1	1	LOD/LOR	Units	Method No.
Date of Receipt	25/02/2019	25/02/2019	25/02/2019	25/02/2019	25/02/2019	25/02/2019	25/02/2019	25/02/2019	25/02/2019	25/02/2019			
TPH CWG													
Aliphatics													
>C5-C6[#]	<0.1	<0.1	<0.1	<0.1[SV]	<0.1	<0.1[SV]	<0.1	<0.1[SV]	<0.1	<0.1	<0.1	mg/kg	TM36/PM12
>C6-C8[#]	<0.1	<0.1	<0.1	<0.1[SV]	<0.1	<0.1[SV]	<0.1	<0.1[SV]	<0.1	<0.1	<0.1	mg/kg	TM36/PM12
>C8-C10	<0.1	<0.1	<0.1	<0.1[SV]	<0.1	<0.1[SV]	<0.1	<0.1[SV]	<0.1	<0.1	<0.1	mg/kg	TM36/PM12
>C10-C12[#]	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	mg/kg	TM5/PM8/PM16
>C12-C16[#]	<4	<4	<4	<4	<4	<4	11	27	<4	<4	<4	mg/kg	TM5/PM8/PM16
>C16-C21[#]	<7	<7	<7	<7	<7	<7	37	78	15	<7	<7	mg/kg	TM5/PM8/PM16
>C21-C35[#]	<7	<7	<7	<7	<7	<7	72	59	59	<7	<7	mg/kg	TM5/PM8/PM16
>C35-C40	<7	<7	<7	<7	<7	<7	10	<7	<7	<7	<7	mg/kg	TM5/PM8/PM16
Total aliphatics C5-40	<26	<26	<26	<26	<26	<26	130	164	74	<26	<26	mg/kg	TM5/TM36/PM8/PM12/PM16
>C6-C10	<0.1	<0.1	<0.1	<0.1[SV]	<0.1	<0.1[SV]	<0.1	<0.1[SV]	<0.1	<0.1	<0.1	mg/kg	TM36/PM12
>C10-C25	<10	<10	<10	<10	<10	<10	66	133	33	<10	<10	mg/kg	TM5/PM8/PM16
>C25-C35	<10	<10	<10	<10	<10	<10	48	19	48	<10	<10	mg/kg	TM5/PM8/PM16
Aromatics													
>C5-EC7[#]	<0.1	<0.1	<0.1	<0.1[SV]	<0.1	<0.1[SV]	<0.1	<0.1[SV]	<0.1	<0.1	<0.1	mg/kg	TM36/PM12
>EC7-EC8[#]	<0.1	<0.1	<0.1	<0.1[SV]	<0.1	<0.1[SV]	<0.1	<0.1[SV]	<0.1	<0.1	<0.1	mg/kg	TM36/PM12
>EC8-EC10[#]	<0.1	<0.1	<0.1	<0.1[SV]	<0.1	<0.1[SV]	<0.1	<0.1[SV]	<0.1	<0.1	<0.1	mg/kg	TM36/PM12
>EC10-EC12[#]	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	4.6	<0.2[SV]	<0.2	<0.2	mg/kg	TM5/PM8/PM16
>EC12-EC16[#]	<4	<4	<4	<4	<4	<4	<4	15	<4	<4	<4	mg/kg	TM5/PM8/PM16
>EC16-EC21[#]	<7	<7	<7	<7	<7	<7	9	38	<7	<7	<7	mg/kg	TM5/PM8/PM16
>EC21-EC35[#]	<7	<7	<7	<7	<7	<7	<7	22	34	<7	<7	mg/kg	TM5/PM8/PM16
>EC35-EC40	<7	<7	<7	<7	<7	<7	<7	<7	<7	<7	<7	mg/kg	TM5/PM8/PM16
Total aromatics C5-40	<26	<26	<26	<26	<26	<26	<26	80	34	<26	<26	mg/kg	TM5/TM36/PM8/PM12/PM16
Total aliphatics and aromatics(C5-40)	<52	<52	<52	<52	<52	<52	130	244	108	<52	<52	mg/kg	TM5/TM36/PM8/PM12/PM16
>EC6-EC10[#]	<0.1	<0.1	<0.1	<0.1[SV]	<0.1	<0.1[SV]	<0.1	<0.1[SV]	<0.1	<0.1	<0.1	mg/kg	TM36/PM12
>EC10-EC25	<10	<10	<10	<10	<10	<10	11	59	<10	<10	<10	mg/kg	TM5/PM8/PM16
>EC25-EC35	<10	<10	<10	<10	<10	<10	<10	<10	31	<10	<10	mg/kg	TM5/PM8/PM16
MTBE[#]	<5	<5	<5	<5[SV]	<5	<5[SV]	<5	<5[SV]	<5	<5	<5	ug/kg	TM31/PM12
Benzene[#]	<5	<5	<5	<5[SV]	<5	<5[SV]	<5	<5[SV]	<5	<5	<5	ug/kg	TM31/PM12
Toluene[#]	<5	<5	<5	<5[SV]	<5	<5[SV]	<5	<5[SV]	<5	<5	<5	ug/kg	TM31/PM12
Ethylbenzene[#]	<5	<5	<5	<5[SV]	<5	<5[SV]	<5	<5[SV]	<5	<5	<5	ug/kg	TM31/PM12
m/p-Xylene[#]	<5	<5	<5	<5[SV]	<5	<5[SV]	<5	<5[SV]	<5	<5	<5	ug/kg	TM31/PM12
o-Xylene[#]	<5	<5	<5	<5[SV]	<5	<5[SV]	<5	<5[SV]	<5	<5	<5	ug/kg	TM31/PM12
PCB 28[#]	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	ug/kg	TM17/PM8
PCB 52[#]	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	ug/kg	TM17/PM8
PCB 101[#]	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	ug/kg	TM17/PM8
PCB 118[#]	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	ug/kg	TM17/PM8
PCB 138[#]	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	ug/kg	TM17/PM8
PCB 153[#]	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	ug/kg	TM17/PM8
PCB 180[#]	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	ug/kg	TM17/PM8
Total 7 PCBs[#]	<35	<35	<35	<35	<35	<35	<35	<35	<35	<35	<35	ug/kg	TM17/PM8

Exova Jones Environmental

Client Name: Ground Investigations Ireland
Reference: 8408.01.19
Location: Sandyford Central
Contact: Conor Finnerty
JE Job No.: 19/3052

Report : **Solid**

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

Please see attached notes for all abbreviations and acronyms

J E Sample No.	1-3	4-6	7-9	10-12	13-15	16-18	19-21	22-24	25-27	28-30	LOD/LOR	Units	Method No.
Sample ID	TP01	TP06	TP02	TP06	TP02	TP06	TP03	TP03	TP03	TP04			
Depth	0.60-1.60	0.80-1.00	0.60-1.00	1.00-2.00	1.00-2.10	2.00-2.40	0.00-1.00	1.00-2.00	2.00-3.10	0.45-0.90			
COC No / misc													
Containers	V J T	V J T	V J T	V J T	V J T	V J T	V J T	V J T	V J T	V J T			
Sample Date	19/02/2019	20/02/2019	20/02/2019	20/02/2019	20/02/2019	20/02/2019	19/02/2019	19/02/2019	19/02/2019	19/02/2019			
Sample Type	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil			
Batch Number	1	1	1	1	1	1	1	1	1	1			
Date of Receipt	25/02/2019	25/02/2019	25/02/2019	25/02/2019	25/02/2019	25/02/2019	25/02/2019	25/02/2019	25/02/2019	25/02/2019			
Natural Moisture Content	12.1	25.2	14.6	9.4	8.6	10.5	10.0	11.9	12.1	10.2	<0.1	%	PM4/PM0
Moisture Content (% Wet Weight)	10.8	20.1	12.7	8.6	7.9	9.5	9.1	10.7	10.8	9.2	<0.1	%	PM4/PM0
Hexavalent Chromium #	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	mg/kg	TM38/PM20
Sulphate as SO4 (2:1 Ext) #	0.0644	-	-	0.1273	0.0856	-	-	0.2123	-	0.3265	<0.0015	g/l	TM38/PM20
Chromium III	27.3	46.4	30.5	42.1	29.3	28.4	29.5	53.1	29.3	54.8	<0.5	mg/kg	NONE/NONE
Total Organic Carbon #	0.36	0.40	0.22	0.66	0.15	0.44	0.34	0.34	0.20	0.26	<0.02	%	TM21/PM24
Loss on Ignition #	2.2	3.2	1.8	1.3	1.1	1.7	1.4	1.6	2.0	1.6	<1.0	%	TM22/PM0
pH #	8.67	8.59	8.56	8.48	8.80	8.52	10.65	9.35	10.74	8.97	<0.01	pH units	TM73/PM11
Mass of raw test portion	0.1004	0.1055	0.1019	0.0984	0.1007	0.0999	0.1005	0.1029	0.0982	0.0996		kg	NONE/PM17
Mass of dried test portion	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09		kg	NONE/PM17

Exova Jones Environmental

Client Name:	Ground Investigations Ireland	**Report :**	**Solid**
Reference:	8408.01.19		
Location:	Sandyford Central	**Solids:** V=60g VOC jar, J=250g glass jar, T=plastic tub	
Contact:	Conor Finnerty		
JE Job No.:	19/3052		

Please see attached notes for all abbreviations and acronyms

J E Sample No.	31-33	34-36	37-39	40-42	43-45	46-48							
Sample ID	TP04	TP05	TP05	TP05	SA02	SA02							
Depth	0.90-2.00	0.35-1.00	1.00-2.00	2.00-3.10	0.50-1.00	1.00-1.80							
COC No / misc													
Containers	V J T	V J T	V J T	V J T	V J T	V J T							
Sample Date	19/02/2019	19/02/2019	19/02/2019	19/02/2019	20/02/2019	20/02/2019							
Sample Type	Soil	Soil	Soil	Soil	Soil	Soil							
Batch Number	1	1	1	1	1	1					LOD/LOR	Units	Method No.
Date of Receipt	25/02/2019	25/02/2019	25/02/2019	25/02/2019	25/02/2019	25/02/2019							
Antimony	2	2	2	2	3	1					<1	mg/kg	TM30/PM15
Arsenic #	10.1	11.0	12.9	9.2	21.3	4.6					<0.5	mg/kg	TM30/PM15
Barium #	91	178	99	71	230	42					<1	mg/kg	TM30/PM15
Cadmium #	2.3	1.6	3.4	1.5	3.5	1.6					<0.1	mg/kg	TM30/PM15
Chromium #	27.8	74.3	26.7	43.1	53.2	29.0					<0.5	mg/kg	TM30/PM15
Copper #	32	18	30	26	29	17					<1	mg/kg	TM30/PM15
Lead #	18	22	20	19	34	11					<5	mg/kg	TM30/PM15
Mercury #	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1					<0.1	mg/kg	TM30/PM15
Molybdenum #	4.0	4.4	3.6	3.8	3.6	2.2					<0.1	mg/kg	TM30/PM15
Nickel #	40.9	33.4	43.6	37.0	70.8	20.4					<0.7	mg/kg	TM30/PM15
Selenium #	2	<1	6	3	2	<1					<1	mg/kg	TM30/PM15
Zinc #	109	83	126	85	164	55					<5	mg/kg	TM30/PM15
PAH MS													
Naphthalene #	<0.04	<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					<0.03	mg/kg	TM4/PM8
Acenaphthene #	<0.05	<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					<0.04	mg/kg	TM4/PM8
Phenanthrene #	<0.03	<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					<0.04	mg/kg	TM4/PM8
Fluoranthene #	<0.03	<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					<0.03	mg/kg	TM4/PM8
Benzo(a)anthracene #	<0.06	<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					<0.02	mg/kg	TM4/PM8
Benzo(bk)fluoranthene #	<0.07	<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					<0.04	mg/kg	TM4/PM8
Indeno(123cd)pyrene #	<0.04	<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					<0.04	mg/kg	TM4/PM8
Benzo(ghi)perylene #	<0.04	<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					<0.04	mg/kg	TM4/PM8
PAH 6 Total #	<0.22	<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					<0.64	mg/kg	TM4/PM8
Benzo(b)fluoranthene	<0.05	<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					<0.02	mg/kg	TM4/PM8
Benzo(j)fluoranthene	<1	<1	<1	<1	<1	<1					<1	mg/kg	TM4/PM8
PAH Surrogate % Recovery	94	95	88	86	87	85					<0	%	TM4/PM8
Mineral Oil (C10-C40)	<30	<30	<30	<30	<30	<30					<30	mg/kg	TM5/PM8/PM16

Client Name: Ground Investigations Ireland
Reference: 8408.01.19
Location: Sandyford Central
Contact: Conor Finnerty
JE Job No.: 19/3052

Report : Solid

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

Please see attached notes for all abbreviations and acronyms

J E Sample No.	31-33	34-36	37-39	40-42	43-45	46-48					LOD/LOR	Units	Method No.
Sample ID	TP04	TP05	TP05	TP05	SA02	SA02							
Depth	0.90-2.00	0.35-1.00	1.00-2.00	2.00-3.10	0.50-1.00	1.00-1.80							
COC No / misc													
Containers	V J T	V J T	V J T	V J T	V J T	V J T							
Sample Date	19/02/2019	19/02/2019	19/02/2019	19/02/2019	20/02/2019	20/02/2019							
Sample Type	Soil	Soil	Soil	Soil	Soil	Soil							
Batch Number	1	1	1	1	1	1							
Date of Receipt	25/02/2019	25/02/2019	25/02/2019	25/02/2019	25/02/2019	25/02/2019							
TPH CWG													
Aliphatics													
>C5-C6 #	<0.1 SV	<0.1	<0.1 SV	<0.1 SV	<0.1	<0.1					<0.1	mg/kg	TM36/PM12
>C6-C8 #	<0.1 SV	<0.1	<0.1 SV	<0.1 SV	<0.1	<0.1					<0.1	mg/kg	TM36/PM12
>C8-C10	<0.1 SV	<0.1	<0.1 SV	<0.1 SV	<0.1	<0.1					<0.1	mg/kg	TM36/PM12
>C10-C12 #	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2					<0.2	mg/kg	TM5/PM8/PM16
>C12-C16 #	<4	<4	<4	<4	<4	<4					<4	mg/kg	TM5/PM8/PM16
>C16-C21 #	<7	<7	<7	<7	<7	<7					<7	mg/kg	TM5/PM8/PM16
>C21-C35 #	<7	<7	<7	<7	<7	<7					<7	mg/kg	TM5/PM8/PM16
>C35-C40	<7	<7	<7	<7	<7	<7					<7	mg/kg	TM5/PM8/PM16
Total aliphatics C5-40	<26	<26	<26	<26	<26	<26					<26	mg/kg	TM5/TM36/PM8/PM12/PM16
>C6-C10	<0.1 SV	<0.1	<0.1 SV	<0.1 SV	<0.1	<0.1					<0.1	mg/kg	TM36/PM12
>C10-C25	<10	<10	<10	<10	<10	<10					<10	mg/kg	TM5/PM8/PM16
>C25-C35	<10	<10	<10	<10	<10	<10					<10	mg/kg	TM5/PM8/PM16
Aromatics													
>C5-EC7 #	<0.1 SV	<0.1	<0.1 SV	<0.1 SV	<0.1	<0.1					<0.1	mg/kg	TM36/PM12
>EC7-EC8 #	<0.1 SV	<0.1	<0.1 SV	<0.1 SV	<0.1	<0.1					<0.1	mg/kg	TM36/PM12
>EC8-EC10 #	<0.1 SV	<0.1	<0.1 SV	<0.1 SV	<0.1	<0.1					<0.1	mg/kg	TM36/PM12
>EC10-EC12 #	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2					<0.2	mg/kg	TM5/PM8/PM16
>EC12-EC16 #	<4	<4	<4	<4	<4	<4					<4	mg/kg	TM5/PM8/PM16
>EC16-EC21 #	<7	<7	<7	<7	<7	<7					<7	mg/kg	TM5/PM8/PM16
>EC21-EC35 #	<7	<7	<7	<7	<7	<7					<7	mg/kg	TM5/PM8/PM16
>EC35-EC40	<7	<7	<7	<7	<7	<7					<7	mg/kg	TM5/PM8/PM16
Total aromatics C5-40	<26	<26	<26	<26	<26	<26					<26	mg/kg	TM5/TM36/PM8/PM12/PM16
Total aliphatics and aromatics(C5-40)	<52	<52	<52	<52	<52	<52					<52	mg/kg	TM5/TM36/PM8/PM12/PM16
>EC6-EC10 #	<0.1 SV	<0.1	<0.1 SV	<0.1 SV	<0.1	<0.1					<0.1	mg/kg	TM36/PM12
>EC10-EC25	<10	<10	<10	<10	<10	<10					<10	mg/kg	TM5/PM8/PM16
>EC25-EC35	<10	<10	<10	<10	<10	<10					<10	mg/kg	TM5/PM8/PM16
MTBE #	<5 SV	<5	<5 SV	<5 SV	<5	<5					<5	ug/kg	TM31/PM12
Benzene #	<5 SV	<5	<5 SV	<5 SV	<5	<5					<5	ug/kg	TM31/PM12
Toluene #	<5 SV	<5	<5 SV	<5 SV	<5	<5					<5	ug/kg	TM31/PM12
Ethylbenzene #	<5 SV	<5	<5 SV	<5 SV	<5	<5					<5	ug/kg	TM31/PM12
m/p-Xylene #	<5 SV	<5	<5 SV	<5 SV	<5	<5					<5	ug/kg	TM31/PM12
o-Xylene #	<5 SV	<5	<5 SV	<5 SV	<5	<5					<5	ug/kg	TM31/PM12
PCB 28 #	<5	<5	<5	<5	<5	<5					<5	ug/kg	TM17/PM8
PCB 52 #	<5	<5	<5	<5	<5	<5					<5	ug/kg	TM17/PM8
PCB 101 #	<5	<5	<5	<5	<5	<5					<5	ug/kg	TM17/PM8
PCB 118 #	<5	<5	<5	<5	<5	<5					<5	ug/kg	TM17/PM8
PCB 138 #	<5	<5	<5	<5	<5	<5					<5	ug/kg	TM17/PM8
PCB 153 #	<5	<5	<5	<5	<5	<5					<5	ug/kg	TM17/PM8
PCB 180 #	<5	<5	<5	<5	<5	<5					<5	ug/kg	TM17/PM8
Total 7 PCBs #	<35	<35	<35	<35	<35	<35					<35	ug/kg	TM17/PM8

Please include all sections of this report if it is reproduced
All solid results are expressed on a dry weight basis unless stated otherwise.

Exova Jones Environmental

Client Name: Ground Investigations Ireland
Reference: 8408.01.19
Location: Sandyford Central
Contact: Conor Finnerty
JE Job No.: 19/3052

Report : **Solid**

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

Please see attached notes for all abbreviations and acronyms

J E Sample No.	31-33	34-36	37-39	40-42	43-45	46-48							
Sample ID	TP04	TP05	TP05	TP05	SA02	SA02							
Depth	0.90-2.00	0.35-1.00	1.00-2.00	2.00-3.10	0.50-1.00	1.00-1.80							
COC No / misc													
Containers	V J T	V J T	V J T	V J T	V J T	V J T							
Sample Date	19/02/2019	19/02/2019	19/02/2019	19/02/2019	20/02/2019	20/02/2019							
Sample Type	Soil	Soil	Soil	Soil	Soil	Soil							
Batch Number	1	1	1	1	1	1					LOD/LOR	Units	Method No.
Date of Receipt	25/02/2019	25/02/2019	25/02/2019	25/02/2019	25/02/2019	25/02/2019							
Natural Moisture Content	10.4	11.4	14.0	9.7	19.5	12.2					<0.1	%	PM4/PM0
Moisture Content (% Wet Weight)	9.4	10.2	12.3	8.8	16.3	10.9					<0.1	%	PM4/PM0
Hexavalent Chromium #	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3					<0.3	mg/kg	TM38/PM20
Sulphate as SO4 (2:1 Ext) #	-	0.0412	-	-	-	-					<0.0015	g/l	TM38/PM20
Chromium III	27.8	74.3	26.7	43.1	53.2	29.0					<0.5	mg/kg	NONE/NONE
Total Organic Carbon #	0.51	0.33	0.75	0.60	0.31	0.43					<0.02	%	TM21/PM24
Loss on Ignition #	2.3	1.9	2.2	1.6	2.9	1.5					<1.0	%	TM22/PM0
pH #	8.74	8.48	8.68	8.43	8.28	8.67					<0.01	pH units	TM73/PM11
Mass of raw test portion	0.0993	0.1045	0.1012	0.1003	0.1053	0.1098						kg	NONE/PM17
Mass of dried test portion	0.09	0.09	0.09	0.09	0.09	0.09						kg	NONE/PM17

Client Name:	Ground Investigations Ireland	**Report :**	**CEN 10:1 1 Batch**
Reference:	8408.01.19		
Location:	Sandyford Central	**Solids:**	V=60g VOC jar, J=250g glass jar, T=plastic tub
Contact:	Conor Finnerty		
JE Job No.:	19/3052		

Please see attached notes for all abbreviations and acronyms

J E Sample No.	1-3	4-6	7-9	10-12	13-15	16-18	19-21	22-24	25-27	28-30			
Sample ID	TP01	TP06	TP02	TP06	TP02	TP06	TP03	TP03	TP03	TP04			
Depth	0.60-1.60	0.80-1.00	0.60-1.00	1.00-2.00	1.00-2.10	2.00-2.40	0.00-1.00	1.00-2.00	2.00-3.10	0.45-0.90			
COC No / misc													
Containers	V J T	V J T	V J T	V J T	V J T	V J T	V J T	V J T	V J T	V J T			
Sample Date	19/02/2019	20/02/2019	20/02/2019	20/02/2019	20/02/2019	20/02/2019	19/02/2019	19/02/2019	19/02/2019	19/02/2019			
Sample Type	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil			
Batch Number	1	1	1	1	1	1	1	1	1	1	LOD/LOR	Units	Method No.
Date of Receipt	25/02/2019	25/02/2019	25/02/2019	25/02/2019	25/02/2019	25/02/2019	25/02/2019	25/02/2019	25/02/2019	25/02/2019			
Dissolved Antimony #	<0.002	<0.002	<0.002	<0.002	<0.002	<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	<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	0.0044	0.0035	0.0051	0.0040	<0.0025	mg/l	TM30/PM17
Dissolved Arsenic (A10) #	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	0.044	0.035	0.051	0.040	<0.025	mg/kg	TM30/PM17
Dissolved Barium #	0.005	0.006	0.006	0.055	0.008	0.045	0.004	0.010	0.007	<0.003	<0.003	mg/l	TM30/PM17
Dissolved Barium (A10) #	0.05	0.06	0.06	0.55	0.08	0.45	0.04	0.10	0.07	<0.03	<0.03	mg/kg	TM30/PM17
Dissolved Cadmium #	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<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	<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	<0.0015	0.0020	0.0034	<0.0015	<0.0015	mg/l	TM30/PM17
Dissolved Chromium (A10) #	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	0.020	0.034	<0.015	<0.015	mg/kg	TM30/PM17
Dissolved Copper #	<0.007	<0.007	<0.007	<0.007	<0.007	<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	<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	<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	<0.05	<0.05	<0.05	<0.05	<0.05	mg/kg	TM30/PM17
Dissolved Molybdenum #	0.006	0.007	0.002	0.019	<0.002	0.015	<0.002	0.006	0.003	0.005	<0.002	mg/l	TM30/PM17
Dissolved Molybdenum (A10) #	0.06	0.07	0.02	0.19	<0.02	0.15	<0.02	0.06	0.03	0.05	<0.02	mg/kg	TM30/PM17
Dissolved Nickel #	<0.002	<0.002	<0.002	<0.002	<0.002	<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	<0.02	<0.02	<0.02	<0.02	<0.02	mg/kg	TM30/PM17
Dissolved Selenium #	<0.003	<0.003	<0.003	0.029	<0.003	0.019	<0.003	0.006	<0.003	<0.003	<0.003	mg/l	TM30/PM17
Dissolved Selenium (A10) #	<0.03	<0.03	<0.03	0.29	<0.03	0.19	<0.03	0.06	<0.03	<0.03	<0.03	mg/kg	TM30/PM17
Dissolved Zinc #	<0.003	<0.003	<0.003	0.003	<0.003	<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	<0.03	<0.03	<0.03	<0.03	<0.03	mg/kg	TM30/PM17
Mercury Dissolved by CVAF #	<0.00001	<0.00001	<0.00001	0.00011	<0.00001	0.00006	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	mg/l	TM61/PM0
Mercury Dissolved by CVAF #	<0.0001	<0.0001	<0.0001	0.0011	<0.0001	0.0006	<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	<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	<0.1	<0.1	<0.1	<0.1	<0.1	mg/kg	TM26/PM0
Fluoride	0.4	0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	mg/l	TM173/PM0
Fluoride	4	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	mg/kg	TM173/PM0
Sulphate as SO4 #	5.2	1.2	18.5	26.4	10.6	18.4	36.6	69.7	44.3	11.7	<0.5	mg/l	TM38/PM0
Sulphate as SO4 #	52	12	185	264	106	184	366	697	443	117	<5	mg/kg	TM38/PM0
Chloride #	0.4	0.3	<0.3	9.8	<0.3	6.4	<0.3	0.5	0.3	0.3	<0.3	mg/l	TM38/PM0
Chloride #	4	<3	<3	98	<3	64	<3	5	<3	<3	<3	mg/kg	TM38/PM0
Dissolved Organic Carbon	<2	<2	<2	<2	<2	<2	<2	<2	2	<2	<2	mg/l	TM60/PM0
Dissolved Organic Carbon	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	mg/kg	TM60/PM0
pH	7.49	7.89	8.20	8.00	8.25	8.08	10.58	10.71	10.98	8.57	<0.01	pH units	TM73/PM0
Total Dissolved Solids #	92	58	86	106	100	85	153	220	158	106	<35	mg/l	TM20/PM0
Total Dissolved Solids #	920	580	860	1060	1000	850	1530	2199	1579	1060	<350	mg/kg	TM20/PM0

Please include all sections of this report if it is reproduced
All solid results are expressed on a dry weight basis unless stated otherwise.

Exova Jones Environmental

Client Name:	Ground Investigations Ireland	**Report :**	**CEN 10:1 1 Batch**
Reference:	8408.01.19		
Location:	Sandyford Central	**Solids:**	V=60g VOC jar, J=250g glass jar, T=plastic tub
Contact:	Conor Finnerty		
JE Job No.:	19/3052		

Please see attached notes for all abbreviations and acronyms

J E Sample No.	31-33	34-36	37-39	40-42	43-45	46-48							
Sample ID	TP04	TP05	TP05	TP05	SA02	SA02							
Depth	0.90-2.00	0.35-1.00	1.00-2.00	2.00-3.10	0.50-1.00	1.00-1.80							
COC No / misc													
Containers	V J T	V J T	V J T	V J T	V J T	V J T							
Sample Date	19/02/2019	19/02/2019	19/02/2019	19/02/2019	20/02/2019	20/02/2019							
Sample Type	Soil	Soil	Soil	Soil	Soil	Soil							
Batch Number	1	1	1	1	1	1					LOD/LOR	Units	Method No.
Date of Receipt	25/02/2019	25/02/2019	25/02/2019	25/02/2019	25/02/2019	25/02/2019							
Dissolved Antimony #	<0.002	<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					<0.02	mg/kg	TM30/PM17
Dissolved Arsenic #	<0.0025	<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					<0.025	mg/kg	TM30/PM17
Dissolved Barium #	<0.003	0.137	0.052	0.055	0.006	0.005					<0.003	mg/l	TM30/PM17
Dissolved Barium (A10) #	<0.03	1.37	0.52	0.55	0.06	0.05					<0.03	mg/kg	TM30/PM17
Dissolved Cadmium #	<0.0005	<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					<0.005	mg/kg	TM30/PM17
Dissolved Chromium #	<0.0015	<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					<0.015	mg/kg	TM30/PM17
Dissolved Copper #	<0.007	<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					<0.07	mg/kg	TM30/PM17
Dissolved Lead #	<0.005	<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					<0.05	mg/kg	TM30/PM17
Dissolved Molybdenum #	0.006	0.012	0.025	0.014	0.006	0.018					<0.002	mg/l	TM30/PM17
Dissolved Molybdenum (A10) #	0.06	0.12	0.25	0.14	0.06	0.18					<0.02	mg/kg	TM30/PM17
Dissolved Nickel #	<0.002	<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					<0.02	mg/kg	TM30/PM17
Dissolved Selenium #	0.069	<0.003	<0.003	0.024	<0.003	<0.003					<0.003	mg/l	TM30/PM17
Dissolved Selenium (A10) #	0.69	<0.03	<0.03	0.24	<0.03	<0.03					<0.03	mg/kg	TM30/PM17
Dissolved Zinc #	<0.003	<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					<0.03	mg/kg	TM30/PM17
Mercury Dissolved by CVAF #	<0.00001	<0.00001	<0.00001	0.00008	<0.00001	<0.00001					<0.00001	mg/l	TM61/PM0
Mercury Dissolved by CVAF #	<0.0001	<0.0001	<0.0001	0.0008	<0.0001	<0.0001					<0.0001	mg/kg	TM61/PM0
Phenol	<0.01	<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					<0.1	mg/kg	TM26/PM0
Fluoride	<0.3	<0.3	0.3	<0.3	0.8	<0.3					<0.3	mg/l	TM173/PM0
Fluoride	<3	<3	<3	<3	8	<3					<3	mg/kg	TM173/PM0
Sulphate as SO4 #	4.8	16.2	0.5	23.1	1.8	3.2					<0.5	mg/l	TM38/PM0
Sulphate as SO4 #	48	162	<5	231	18	32					<5	mg/kg	TM38/PM0
Chloride #	0.3	<0.3	<0.3	8.5	0.4	0.4					<0.3	mg/l	TM38/PM0
Chloride #	3	<3	<3	85	4	4					<3	mg/kg	TM38/PM0
Dissolved Organic Carbon	3	3	2	<2	<2	<2					<2	mg/l	TM60/PM0
Dissolved Organic Carbon	30	30	<20	<20	<20	<20					<20	mg/kg	TM60/PM0
pH	8.34	8.23	8.20	7.56	8.02	8.17					<0.01	pH units	TM73/PM0
Total Dissolved Solids #	72	174	66	130	88	148					<35	mg/l	TM20/PM0
Total Dissolved Solids #	720	1739	660	1299	880	1480					<350	mg/kg	TM20/PM0

Client Name: Ground Investigations Ireland
Reference: 8408.01.19
Location: Sandyford Central
Contact: Conor Finnerty
JE Job No.: 19/3052

Report : EN12457_2

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

Please see attached notes for all abbreviations and acronyms

J E Sample No.	1-3	4-6	7-9	10-12	13-15	16-18	19-21	22-24	25-27	28-30	Inert	Stable Non-reactive	Hazardous	LOD LOR	Units	Method No.
Sample ID	TP01	TP06	TP02	TP06	TP02	TP06	TP03	TP03	TP03	TP04						
Depth	0.60-1.60	0.80-1.00	0.60-1.00	1.00-2.00	1.00-2.10	2.00-2.40	0.00-1.00	1.00-2.00	2.00-3.10	0.45-0.90						
COC No / misc																
Containers	V J T	V J T	V J T	V J T	V J T	V J T	V J T	V J T	V J T	V J T						
Sample Date	19/02/2019	20/02/2019	20/02/2019	20/02/2019	20/02/2019	20/02/2019	19/02/2019	19/02/2019	19/02/2019	19/02/2019						
Sample Type	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil						
Batch Number	1	1	1	1	1	1	1	1	1	1						
Date of Receipt	25/02/2019	25/02/2019	25/02/2019	25/02/2019	25/02/2019	25/02/2019	25/02/2019	25/02/2019	25/02/2019	25/02/2019						
Solid Waste Analysis																
Total Organic Carbon #	0.36	0.40	0.22	0.66	0.15	0.44	0.34	0.34	0.20	0.26	3	5	6	<0.02	%	TM21/PM24
Sum of BTEX	<0.025	<0.025	<0.025	<0.025 SV	<0.025	<0.025 SV	<0.025	<0.025 SV	<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	<0.035	<0.035	<0.035	<0.035	<0.035	1	-	-	<0.035	mg/kg	TM17/PM8
Mineral Oil	<30	<30	<30	<30	<30	<30	130	164	74	<30	500	-	-	<30	mg/kg	TM5/PM8/PM16
PAH Sum of 6 #	<0.22	<0.22	<0.22	<0.22	<0.22	<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	<0.64	<0.64	<0.64	<0.64	<0.64	100	-	-	<0.64	mg/kg	TM4/PM8
CEN 10:1 Leachate																
Arsenic #	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	0.044	0.035	0.051	0.040	0.5	2	25	<0.025	mg/kg	TM30/PM17
Barium #	0.05	0.06	0.06	0.55	0.08	0.45	0.04	0.10	0.07	<0.03	20	100	300	<0.03	mg/kg	TM30/PM17
Cadmium #	<0.005	<0.005	<0.005	<0.005	<0.005	<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	<0.015	<0.015	0.020	0.034	<0.015	0.5	10	70	<0.015	mg/kg	TM30/PM17
Copper #	<0.07	<0.07	<0.07	<0.07	<0.07	<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	0.0011	<0.0001	0.0006	<0.0001	<0.0001	<0.0001	<0.0001	0.01	0.2	2	<0.0001	mg/kg	TM61/PM0
Molybdenum #	0.06	0.07	0.02	0.19	<0.02	0.15	<0.02	0.06	0.03	0.05	0.5	10	30	<0.02	mg/kg	TM30/PM17
Nickel #	<0.02	<0.02	<0.02	<0.02	<0.02	<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	<0.05	<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	<0.02	<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	0.29	<0.03	0.19	<0.03	0.06	<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	<0.03	<0.03	<0.03	<0.03	<0.03	4	50	200	<0.03	mg/kg	TM30/PM17
Total Dissolved Solids #	920	580	860	1060	1000	850	1530	2199	1579	1060	4000	60000	100000	<350	mg/kg	TM20/PM0
Dissolved Organic Carbon	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	500	800	1000	<20	mg/kg	TM60/PM0
Mass of raw test portion	0.1004	0.1055	0.1019	0.0984	0.1007	0.0999	0.1005	0.1029	0.0982	0.0996	-	-	-		kg	NONE/PM17
Dry Matter Content Ratio	90.1	85.7	88.2	91.2	88.9	90.3	89.2	87.6	91.4	90.4	-	-	-	<0.1	%	NONE/PM4
Leachant Volume	0.89	0.885	0.888	0.891	0.889	0.89	0.889	0.887	0.891	0.89	-	-	-		l	NONE/PM17
Eluate Volume	0.7	0.85	0.7	0.69	0.85	0.64	0.8	0.8	0.8	0.8	-	-	-		l	NONE/PM17
pH #	8.67	8.59	8.56	8.48	8.80	8.52	10.65	9.35	10.74	8.97	-	-	-	<0.01	pH units	TM73/PM11
Phenol	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	1	-	-	<0.1	mg/kg	TM26/PM0
Fluoride	4	<3	<3	<3	<3	<3	<3	<3	<3	<3	-	-	-	<3	mg/kg	TM173/PM0
Sulphate as SO4 #	52	12	185	264	106	184	366	697	443	117	1000	20000	50000	<5	mg/kg	TM38/PM0
Chloride #	4	<3	<3	98	<3	64	<3	5	<3	<3	800	15000	25000	<3	mg/kg	TM38/PM0

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Exova Jones Environmental

Client Name:	Ground Investigations Ireland	**Report :**	**EN12457_2**
Reference:	8408.01.19		
Location:	Sandyford Central	**Solids:** V=60g VOC jar, J=250g glass jar, T=plastic tub	
Contact:	Conor Finnerty		
JE Job No.:	19/3052		

Please see attached notes for all abbreviations and acronyms

J E Sample No.	31-33	34-36	37-39	40-42	43-45	46-48				
Sample ID	TP04	TP05	TP05	TP05	SA02	SA02				
Depth	0.90-2.00	0.35-1.00	1.00-2.00	2.00-3.10	0.50-1.00	1.00-1.80				
COC No / misc										
Containers	V J T	V J T	V J T	V J T	V J T	V J T				
Sample Date	19/02/2019	19/02/2019	19/02/2019	19/02/2019	20/02/2019	20/02/2019				
Sample Type	Soil	Soil	Soil	Soil	Soil	Soil				
Batch Number	1	1	1	1	1	1				
Date of Receipt	25/02/2019	25/02/2019	25/02/2019	25/02/2019	25/02/2019	25/02/2019				

	31-33	34-36	37-39	40-42	43-45	46-48	Inert	Stable Non-reactive	Hazardous	LOD LOR	Units	Method No.
Solid Waste Analysis												
Total Organic Carbon #	0.51	0.33	0.75	0.60	0.31	0.43	3	5	6	<0.02	%	TM21/PM24
Sum of BTEX	<0.025[SV]	<0.025	<0.025[SV]	<0.025[SV]	<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	<0.035	1	-	-	<0.035	mg/kg	TM17/PM8
Mineral Oil	<30	<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	-	-	-	<0.22	mg/kg	TM4/PM8
PAH Sum of 17	<0.64	<0.64	<0.64	<0.64	<0.64	<0.64	100	-	-	<0.64	mg/kg	TM4/PM8
CEN 10:1 Leachate												
Arsenic #	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	0.5	2	25	<0.025	mg/kg	TM30/PM17
Barium #	<0.03	1.37	0.52	0.55	0.06	0.05	20	100	300	<0.03	mg/kg	TM30/PM17
Cadmium #	<0.005	<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	<0.015	0.5	10	70	<0.015	mg/kg	TM30/PM17
Copper #	<0.07	<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	0.0008	<0.0001	<0.0001	0.01	0.2	2	<0.0001	mg/kg	TM61/PM0
Molybdenum #	0.06	0.12	0.25	0.14	0.06	0.18	0.5	10	30	<0.02	mg/kg	TM30/PM17
Nickel #	<0.02	<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	<0.05	0.5	10	50	<0.05	mg/kg	TM30/PM17
Antimony #	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.06	0.7	5	<0.02	mg/kg	TM30/PM17
Selenium #	0.69	<0.03	<0.03	0.24	<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	<0.03	4	50	200	<0.03	mg/kg	TM30/PM17
Total Dissolved Solids #	720	1739	660	1299	880	1480	4000	60000	100000	<350	mg/kg	TM20/PM0
Dissolved Organic Carbon	30	30	<20	<20	<20	<20	500	800	1000	<20	mg/kg	TM60/PM0
Mass of raw test portion	0.0993	0.1045	0.1012	0.1003	0.1053	0.1098	-	-	-		kg	NONE/PM17
Dry Matter Content Ratio	90.8	86.1	89.4	89.4	85.9	81.6	-	-	-	<0.1	%	NONE/PM4
Leachant Volume	0.891	0.885	0.889	0.889	0.885	0.88	-	-	-		l	NONE/PM17
Eluate Volume	0.8	0.8	0.85	0.7	0.8	0.78	-	-	-		l	NONE/PM17
pH #	8.74	8.48	8.68	8.43	8.28	8.67	-	-	-	<0.01	pH units	TM73/PM11
Phenol	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	1	-	-	<0.1	mg/kg	TM26/PM0
Fluoride	<3	<3	<3	<3	8	<3	-	-	-	<3	mg/kg	TM173/PM0
Sulphate as SO4 #	48	162	<5	231	18	32	1000	20000	50000	<5	mg/kg	TM38/PM0
Chloride #	3	<3	<3	85	4	4	800	15000	25000	<3	mg/kg	TM38/PM0

Exova Jones Environmental

EPH Interpretation Report

Client Name: Ground Investigations Ireland
Reference: 8408.01.19
Location: Sandyford Central
Contact: Conor Finnerty

Matrix : Solid

J E Job No.	Batch	Sample ID	Depth	J E Sample No.	EPH Interpretation
19/3052	1	TP01	0.60-1.60	1-3	No interpretation possible
19/3052	1	TP06	0.80-1.00	4-6	No interpretation possible
19/3052	1	TP02	0.60-1.00	7-9	No interpretation possible
19/3052	1	TP06	1.00-2.00	10-12	No interpretation possible
19/3052	1	TP02	1.00-2.10	13-15	No interpretation possible
19/3052	1	TP06	2.00-2.40	16-18	No interpretation possible
19/3052	1	TP03	0.00-1.00	19-21	Lubricating oil & Possible degraded diesel
19/3052	1	TP03	1.00-2.00	22-24	Degraded diesel
19/3052	1	TP03	2.00-3.10	25-27	Lubricating oil & Possible trace of degraded diesel
19/3052	1	TP04	0.45-0.90	28-30	No interpretation possible
19/3052	1	TP04	0.90-2.00	31-33	No interpretation possible
19/3052	1	TP05	0.35-1.00	34-36	No interpretation possible
19/3052	1	TP05	1.00-2.00	37-39	No interpretation possible
19/3052	1	TP05	2.00-3.10	40-42	No interpretation possible
19/3052	1	SA02	0.50-1.00	43-45	No interpretation possible
19/3052	1	SA02	1.00-1.80	46-48	No interpretation possible

Client Name: Ground Investigations Ireland
Reference: 8408.01.19
Location: Sandyford Central
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
19/3052	1	TP01	0.60-1.60	2	28/02/2019	**General Description (Bulk Analysis)**	soil-stones
					28/02/2019	**Asbestos Fibres**	NAD
					28/02/2019	**Asbestos ACM**	NAD
					28/02/2019	**Asbestos Type**	NAD
					28/02/2019	**Asbestos Level Screen**	NAD
19/3052	1	TP06	0.80-1.00	5	28/02/2019	**General Description (Bulk Analysis)**	soil-stones
					28/02/2019	**Asbestos Fibres**	NAD
					28/02/2019	**Asbestos ACM**	NAD
					28/02/2019	**Asbestos Type**	NAD
					28/02/2019	**Asbestos Level Screen**	NAD
19/3052	1	TP02	0.60-1.00	8	28/02/2019	**General Description (Bulk Analysis)**	soil-stones
					28/02/2019	**Asbestos Fibres**	NAD
					28/02/2019	**Asbestos ACM**	NAD
					28/02/2019	**Asbestos Type**	NAD
					28/02/2019	**Asbestos Level Screen**	NAD
19/3052	1	TP06	1.00-2.00	11	28/02/2019	**General Description (Bulk Analysis)**	soils-tones
					28/02/2019	**Asbestos Fibres**	NAD
					28/02/2019	**Asbestos ACM**	NAD
					28/02/2019	**Asbestos Type**	NAD
					28/02/2019	**Asbestos Level Screen**	NAD
19/3052	1	TP02	1.00-2.10	14	28/02/2019	**General Description (Bulk Analysis)**	soil-stones
					28/02/2019	**Asbestos Fibres**	NAD
					28/02/2019	**Asbestos ACM**	NAD
					28/02/2019	**Asbestos Type**	NAD
					28/02/2019	**Asbestos Level Screen**	NAD
19/3052	1	TP06	2.00-2.40	17	28/02/2019	**General Description (Bulk Analysis)**	soil-stones
					28/02/2019	**Asbestos Fibres**	NAD
					28/02/2019	**Asbestos ACM**	NAD
					28/02/2019	**Asbestos Type**	NAD
					28/02/2019	**Asbestos Level Screen**	NAD
19/3052	1	TP03	0.00-1.00	20	28/02/2019	**General Description (Bulk Analysis)**	Soil/Stones
					28/02/2019	**Asbestos Fibres**	NAD
					28/02/2019	**Asbestos ACM**	NAD

Client Name: Ground Investigations Ireland
Reference: 8408.01.19
Location: Sandyford Central
Contact: Conor Finnerty

J E Job No.	Batch	Sample ID	Depth	J E Sample No.	Date Of Analysis	Analysis	Result
19/3052	1	TP03	0.00-1.00	20	28/02/2019	**Asbestos Type**	NAD
					28/02/2019	**Asbestos Level Screen**	NAD
19/3052	1	TP03	1.00-2.00	23	28/02/2019	**General Description (Bulk Analysis)**	Soil/Stones
					28/02/2019	**Asbestos Fibres**	NAD
					28/02/2019	**Asbestos ACM**	NAD
					28/02/2019	**Asbestos Type**	NAD
					28/02/2019	**Asbestos Level Screen**	NAD
19/3052	1	TP03	2.00-3.10	26	28/02/2019	**General Description (Bulk Analysis)**	Soil/Stones
					28/02/2019	**Asbestos Fibres**	NAD
					28/02/2019	**Asbestos ACM**	NAD
					28/02/2019	**Asbestos Type**	NAD
					28/02/2019	**Asbestos Level Screen**	NAD
19/3052	1	TP04	0.45-0.90	29	28/02/2019	**General Description (Bulk Analysis)**	soil/stones
					28/02/2019	**Asbestos Fibres**	NAD
					28/02/2019	**Asbestos ACM**	NAD
					28/02/2019	**Asbestos Type**	NAD
					28/02/2019	**Asbestos Level Screen**	NAD
19/3052	1	TP04	0.90-2.00	32	28/02/2019	**General Description (Bulk Analysis)**	soil.stones
					28/02/2019	**Asbestos Fibres**	NAD
					28/02/2019	**Asbestos ACM**	NAD
					28/02/2019	**Asbestos Type**	NAD
					28/02/2019	**Asbestos Level Screen**	NAD
19/3052	1	TP05	0.35-1.00	35	28/02/2019	**General Description (Bulk Analysis)**	soil.stones
					28/02/2019	**Asbestos Fibres**	NAD
					28/02/2019	**Asbestos ACM**	NAD
					28/02/2019	**Asbestos Type**	NAD
					28/02/2019	**Asbestos Level Screen**	NAD
19/3052	1	TP05	1.00-2.00	38	28/02/2019	**General Description (Bulk Analysis)**	soil/stones
					28/02/2019	**Asbestos Fibres**	NAD
					28/02/2019	**Asbestos ACM**	NAD
					28/02/2019	**Asbestos Type**	NAD
					28/02/2019	**Asbestos Level Screen**	NAD
19/3052	1	TP05	2.00-3.10	41	28/02/2019	**General Description (Bulk Analysis)**	soil/stones
					28/02/2019	**Asbestos Fibres**	NAD
					28/02/2019	**Asbestos ACM**	NAD
					28/02/2019	**Asbestos Type**	NAD
					28/02/2019	**Asbestos Level Screen**	NAD
19/3052	1	SA02	0.50-1.00	44	28/02/2019	**General Description (Bulk Analysis)**	soil.stones
					28/02/2019	**Asbestos Fibres**	NAD
					28/02/2019	**Asbestos ACM**	NAD
					28/02/2019	**Asbestos Type**	NAD
					28/02/2019	**Asbestos Level Screen**	NAD
19/3052	1	SA02	1.00-1.80	47	28/02/2019	**General Description (Bulk Analysis)**	soil.stones
					28/02/2019	**Asbestos Fibres**	NAD

Client Name: Ground Investigations Ireland
Reference: 8408.01.19
Location: Sandyford Central
Contact: Conor Finnerty

J E Job No.	Batch	Sample ID	Depth	J E Sample No.	Date Of Analysis	Analysis	Result
19/3052	1	SA02	1.00-1.80	47	28/02/2019	**Asbestos ACM**	NAD
					28/02/2019	**Asbestos Type**	NAD
					28/02/2019	**Asbestos Level Screen**	NAD

Client Name: Ground Investigations Ireland
Reference: 8408.01.19
Location: Sandyford Central
Contact: Conor Finnerty

J E Job No.	Batch	Sample ID	Depth	J E Sample No.	Analysis	Reason
No deviating sample report results for job 19/3052						

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.: 19/3052

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 overesitimate 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.

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.: 19/3052

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 spectrometic 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 amouns of acid or base needed to cover the pH range

Notes:

*If not suitable due to LOD, precision, etc., any other suitable method can be used, e.g. AFS, ICP-MS
**PCB-28, PCB-52, PCB-101, PCB-118, PCB-138, PCB-153 and PCB-180

***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.

JE Job No: 19/3052

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/SANAS)	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: 19/3052

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/SANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM22	Modified BS1377-3:1990 Gravimetric determination of Loss on Ignition by temperature controlled Muffle Furnace (35C-440C). On request modified ASTM D2974-00 LOI (105C-440C)	PM0	No preparation is required.	Yes		AD	Yes
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 BS 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 Methyltertbutylether, 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 Methyltertbutylether, 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

JE Job No: 19/3052

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/SANAS)	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		AD	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		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 BS 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.				

JE Job No: 19/3052

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/SANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
NONE	No Method Code	PM17	Modified method BS 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	
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	

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Ground Investigations Ireland
Catherinestown House
Hazelhatch Road
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Ireland

Attention :	Conor Finnerty
Date :	17th July, 2019
Your reference :	8408.01.19
Our reference :	Test Report 19/10728 Batch 1
Location :	Sandyford Central
Date samples received :	3rd July, 2019
Status :	Final report
Issue :	1

Five samples were received for analysis on 3rd July, 2019 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:

Bruce Leslie
Project Manager

Please include all sections of this report if it is reproduced

Element Materials Technology

Client Name: Ground Investigations Ireland
Reference: 8408.01.19
Location: Sandyford Central
Contact: Conor Finnerty
EMT Job No: 19/10728

Report : **Solid**

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

Please see attached notes for all abbreviations and acronyms

EMT Sample No.	1-3	4-6	7-9	10-12	13-15						LOD/LOR	Units	Method No.
Sample ID	TP101	TP101	TP101	TP102	TP102								
Depth	0.20-1.00	1.00-2.00	2.00-3.10	0.20-1.00	1.00-2.00								
COC No / misc													
Containers	V J T	V J T	V J T	V J T	V J T								
Sample Date	28/06/2019	28/06/2019	28/06/2019	28/06/2019	28/06/2019								
Sample Type	Soil	Soil	Soil	Soil	Soil								
Batch Number	1	1	1	1	1								
Date of Receipt	03/07/2019	03/07/2019	03/07/2019	03/07/2019	03/07/2019								
Antimony	2	1	2	1	1						<1	mg/kg	TM30/PM15
Arsenic #	27.6	8.8	20.4	14.2	13.4						<0.5	mg/kg	TM30/PM15
Barium #	203	65	81	57	47						<1	mg/kg	TM30/PM15
Cadmium #	3.3	0.7	1.1	0.6	1.5						<0.1	mg/kg	TM30/PM15
Chromium #	61.2	46.1	59.8	64.5	44.1						<0.5	mg/kg	TM30/PM15
Copper #	32	20	32	21	25						<1	mg/kg	TM30/PM15
Lead #	53	13	30	53	30						<5	mg/kg	TM30/PM15
Mercury #	<0.1	<0.1	<0.1	<0.1	<0.1						<0.1	mg/kg	TM30/PM15
Molybdenum #	3.3	1.9	2.3	2.9	3.2						<0.1	mg/kg	TM30/PM15
Nickel #	39.0	31.0	51.5	32.2	36.6						<0.7	mg/kg	TM30/PM15
Selenium #	2	<1	2	1	2						<1	mg/kg	TM30/PM15
Zinc #	170	66	140	103	116						<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	94	96	91	95	94						<0	%	TM4/PM8
Mineral Oil (C10-C40)	<30	<30	<30	<30	<30						<30	mg/kg	TM5/PM8/PM16

Client Name: Ground Investigations Ireland
Reference: 8408.01.19
Location: Sandyford Central
Contact: Conor Finnerty
EMT Job No: 19/10728

Report : Solid

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

Please see attached notes for all abbreviations and acronyms

EMT Sample No.	1-3	4-6	7-9	10-12	13-15						LOD/LOR	Units	Method No.
Sample ID	TP101	TP101	TP101	TP102	TP102								
Depth	0.20-1.00	1.00-2.00	2.00-3.10	0.20-1.00	1.00-2.00								
COC No / misc													
Containers	V J T	V J T	V J T	V J T	V J T								
Sample Date	28/06/2019	28/06/2019	28/06/2019	28/06/2019	28/06/2019								
Sample Type	Soil	Soil	Soil	Soil	Soil								
Batch Number	1	1	1	1	1								
Date of Receipt	03/07/2019	03/07/2019	03/07/2019	03/07/2019	03/07/2019								
TPH CWG													
Aliphatics													
>C5-C6 #	<0.1	<0.1	<0.1 SV	<0.1	<0.1						<0.1	mg/kg	TM36/PM12
>C6-C8 #	<0.1	<0.1	<0.1 SV	<0.1	<0.1						<0.1	mg/kg	TM36/PM12
>C8-C10	<0.1	<0.1	<0.1 SV	<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	TM5/PM8/PM16
>C12-C16 #	<4	<4	<4	<4	<4						<4	mg/kg	TM5/PM8/PM16
>C16-C21 #	<7	<7	<7	<7	<7						<7	mg/kg	TM5/PM8/PM16
>C21-C35 #	<7	<7	<7	<7	<7						<7	mg/kg	TM5/PM8/PM16
>C35-C40	<7	<7	<7	<7	<7						<7	mg/kg	TM5/PM8/PM16
Total aliphatics C5-40	<26	<26	<26	<26	<26						<26	mg/kg	TM5/TM36/PM8/PM12/PM16
>C6-C10	<0.1	<0.1	<0.1 SV	<0.1	<0.1						<0.1	mg/kg	TM36/PM12
>C10-C25	<10	<10	<10	<10	<10						<10	mg/kg	TM5/PM8/PM16
>C25-C35	<10	<10	<10	<10	<10						<10	mg/kg	TM5/PM8/PM16
Aromatics													
>C5-EC7 #	<0.1	<0.1	<0.1 SV	<0.1	<0.1						<0.1	mg/kg	TM36/PM12
>EC7-EC8 #	<0.1	<0.1	<0.1 SV	<0.1	<0.1						<0.1	mg/kg	TM36/PM12
>EC8-EC10 #	<0.1	<0.1	<0.1 SV	<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	TM5/PM8/PM16
>EC12-EC16 #	<4	<4	<4	<4	<4						<4	mg/kg	TM5/PM8/PM16
>EC16-EC21 #	<7	<7	<7	<7	<7						<7	mg/kg	TM5/PM8/PM16
>EC21-EC35 #	<7	<7	<7	<7	<7						<7	mg/kg	TM5/PM8/PM16
>EC35-EC40	<7	<7	<7	<7	<7						<7	mg/kg	TM5/PM8/PM16
Total aromatics C5-40	<26	<26	<26	<26	<26						<26	mg/kg	TM5/TM36/PM8/PM12/PM16
Total aliphatics and aromatics(C5-40)	<52	<52	<52	<52	<52						<52	mg/kg	TM5/TM36/PM8/PM12/PM16
>EC6-EC10 #	<0.1	<0.1	<0.1 SV	<0.1	<0.1						<0.1	mg/kg	TM36/PM12
>EC10-EC25	<10	<10	<10	<10	<10						<10	mg/kg	TM5/PM8/PM16
>EC25-EC35	<10	<10	<10	<10	<10						<10	mg/kg	TM5/PM8/PM16
MTBE #	<5	<5	<5 SV	<5	<5						<5	ug/kg	TM31/PM12
Benzene #	<5	<5	<5 SV	<5	<5						<5	ug/kg	TM31/PM12
Toluene #	<5	<5	<5 SV	<5	<5						<5	ug/kg	TM31/PM12
Ethylbenzene #	<5	<5	<5 SV	<5	<5						<5	ug/kg	TM31/PM12
m/p-Xylene #	<5	<5	<5 SV	<5	<5						<5	ug/kg	TM31/PM12
o-Xylene #	<5	<5	<5 SV	<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

Please include all sections of this report if it is reproduced
All solid results are expressed on a dry weight basis unless stated otherwise.

Element Materials Technology

Client Name: Ground Investigations Ireland
Reference: 8408.01.19
Location: Sandyford Central
Contact: Conor Finnerty
EMT Job No: 19/10728

Report : **Solid**

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

Please see attached notes for all abbreviations and acronyms

EMT Sample No.	1-3	4-6	7-9	10-12	13-15								
Sample ID	TP101	TP101	TP101	TP102	TP102								
Depth	0.20-1.00	1.00-2.00	2.00-3.10	0.20-1.00	1.00-2.00								
COC No / misc													
Containers	V J T	V J T	V J T	V J T	V J T								
Sample Date	28/06/2019	28/06/2019	28/06/2019	28/06/2019	28/06/2019								
Sample Type	Soil	Soil	Soil	Soil	Soil								
Batch Number	1	1	1	1	1						LOD/LOR	Units	Method No.
Date of Receipt	03/07/2019	03/07/2019	03/07/2019	03/07/2019	03/07/2019								
Natural Moisture Content	30.4	9.8	12.1	12.6	14.3						<0.1	%	PM4/PM0
Moisture Content (% Wet Weight)	23.3	8.9	10.8	11.2	12.5						<0.1	%	PM4/PM0
Hexavalent Chromium #	<0.3	<0.3	<0.3	<0.3	<0.3						<0.3	mg/kg	TM38/PM20
Chromium III	61.2	46.1	59.8	64.5	44.1						<0.5	mg/kg	NONE/NONE
Total Organic Carbon #	1.75	0.16	0.20	0.47	0.20						<0.02	%	TM21/PM24
Loss on Ignition #	6.8	1.8	1.9	2.5	1.7						<1.0	%	TM22/PM0
pH #	8.19	8.88	8.91	9.72	8.91						<0.01	pH units	TM73/PM11
Mass of raw test portion	0.1104	0.0979	0.0982	0.1008	0.1038							kg	NONE/PM17
Mass of dried test portion	0.09	0.09	0.09	0.09	0.09							kg	NONE/PM17

Element Materials Technology

Client Name: Ground Investigations Ireland
Reference: 8408.01.19
Location: Sandyford Central
Contact: Conor Finnerty
EMT Job No: 19/10728

Report : **CEN 10:1 1 Batch**

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

Please see attached notes for all abbreviations and acronyms

EMT Sample No.	1-3	4-6	7-9	10-12	13-15			
Sample ID	TP101	TP101	TP101	TP102	TP102			
Depth	0.20-1.00	1.00-2.00	2.00-3.10	0.20-1.00	1.00-2.00			
COC No / misc								
Containers	V J T	V J T	V J T	V J T	V J T			
Sample Date	28/06/2019	28/06/2019	28/06/2019	28/06/2019	28/06/2019			
Sample Type	Soil	Soil	Soil	Soil	Soil			
Batch Number	1	1	1	1	1	LOD/LOR	Units	Method No.
Date of Receipt	03/07/2019	03/07/2019	03/07/2019	03/07/2019	03/07/2019			
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	0.0082	<0.0025	<0.0025	mg/l	TM30/PM17
Dissolved Arsenic (A10) #	<0.025	<0.025	<0.025	0.082	<0.025	<0.025	mg/kg	TM30/PM17
Dissolved Barium #	0.015	<0.003	0.005	<0.003	0.006	<0.003	mg/l	TM30/PM17
Dissolved Barium (A10) #	0.15	<0.03	0.05	<0.03	0.06	<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	0.0037	<0.0015	<0.0015	mg/l	TM30/PM17
Dissolved Chromium (A10) #	<0.015	<0.015	<0.015	0.037	<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 #	0.006	0.004	0.002	0.009	0.007	<0.002	mg/l	TM30/PM17
Dissolved Molybdenum (A10) #	0.06	0.04	<0.02	0.09	0.07	<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	0.005	<0.003	<0.003	mg/l	TM30/PM17
Dissolved Selenium (A10) #	<0.03	<0.03	<0.03	0.05	<0.03	<0.03	mg/kg	TM30/PM17
Dissolved Zinc #	0.004	<0.003	<0.003	<0.003	<0.003	<0.003	mg/l	TM30/PM17
Dissolved Zinc (A10) #	0.04	<0.03	<0.03	<0.03	<0.03	<0.03	mg/kg	TM30/PM17
Mercury Dissolved by CVAF #	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	mg/l	TM61/PM0
Mercury Dissolved by CVAF #	<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	0.3	<0.3	<0.3	<0.3	<0.3	<0.3	mg/l	TM173/PM0
Fluoride	<3	<3	<3	<3	<3	<3	mg/kg	TM173/PM0
Sulphate as SO4 #	24.1	1.8	1.3	11.0	2.1	<0.5	mg/l	TM38/PM0
Sulphate as SO4 #	241	18	13	110	21	<5	mg/kg	TM38/PM0
Chloride #	0.7	0.5	0.5	0.7	0.6	<0.3	mg/l	TM38/PM0
Chloride #	7	5	5	7	6	<3	mg/kg	TM38/PM0
Dissolved Organic Carbon	7	<2	2	5	2	<2	mg/l	TM60/PM0
Dissolved Organic Carbon	70	<20	<20	50	20	<20	mg/kg	TM60/PM0
pH	7.76	7.87	7.66	9.88	8.05	<0.01	pH units	TM73/PM0
Total Dissolved Solids #	126	43	186	108	48	<35	mg/l	TM20/PM0
Total Dissolved Solids #	1260	430	1859	1080	480	<350	mg/kg	TM20/PM0

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Element Materials Technology

Client Name: Ground Investigations Ireland
Reference: 8408.01.19
Location: Sandyford Central
Contact: Conor Finnerty
EMT Job No: 19/10728

Report : **EN12457_2**

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

Please see attached notes for all abbreviations and acronyms

EMT Sample No.	1-3	4-6	7-9	10-12	13-15	Inert	Stable Non-reactive	Hazardous	LOD LOR	Units	Method No.
Sample ID	TP101	TP101	TP101	TP102	TP102						
Depth	0.20-1.00	1.00-2.00	2.00-3.10	0.20-1.00	1.00-2.00						
COC No / misc											
Containers	V J T	V J T	V J T	V J T	V J T						
Sample Date	28/06/2019	28/06/2019	28/06/2019	28/06/2019	28/06/2019						
Sample Type	Soil	Soil	Soil	Soil	Soil						
Batch Number	1	1	1	1	1						
Date of Receipt	03/07/2019	03/07/2019	03/07/2019	03/07/2019	03/07/2019						
Solid Waste Analysis											
Total Organic Carbon #	1.75	0.16	0.20	0.47	0.20	3	5	6	<0.02	%	TM21/PM24
Sum of BTEX	<0.025	<0.025	<0.025[SV]	<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
CEN 10:1 Leachate											
Arsenic #	<0.025	<0.025	<0.025	0.082	<0.025	0.5	2	25	<0.025	mg/kg	TM30/PM17
Barium #	0.15	<0.03	0.05	<0.03	0.06	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	0.037	<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 #	0.06	0.04	<0.02	0.09	0.07	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	0.05	<0.03	0.1	0.5	7	<0.03	mg/kg	TM30/PM17
Zinc #	0.04	<0.03	<0.03	<0.03	<0.03	4	50	200	<0.03	mg/kg	TM30/PM17
Total Dissolved Solids #	1260	430	1859	1080	480	4000	60000	100000	<350	mg/kg	TM20/PM0
Dissolved Organic Carbon	70	<20	<20	50	20	500	800	1000	<20	mg/kg	TM60/PM0
Mass of raw test portion	0.1104	0.0979	0.0982	0.1008	0.1038	-	-	-		kg	NONE/PM17
Dry Matter Content Ratio	81.3	91.7	91.3	89.4	86.3	-	-	-	<0.1	%	NONE/PM4
Leachant Volume	0.879	0.892	0.891	0.889	0.886	-	-	-		l	NONE/PM17
Eluate Volume	0.7	0.65	0.57	0.78	0.85	-	-	-		l	NONE/PM17
pH #	8.19	8.88	8.91	9.72	8.91	-	-	-	<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	<3	<3	<3	<3	<3	-	-	-	<3	mg/kg	TM173/PM0
Sulphate as SO4 #	241	18	13	110	21	1000	20000	50000	<5	mg/kg	TM38/PM0
Chloride #	7	5	5	7	6	800	15000	25000	<3	mg/kg	TM38/PM0

Please include all sections of this report if it is reproduced
All solid results are expressed on a dry weight basis unless stated otherwise.

Client Name: Ground Investigations Ireland

Reference: 8408.01.19

Location: Sandyford Central

Contact: Conor Finnerty

Matrix : Solid

EMT Job No.	Batch	Sample ID	Depth	EMT Sample No.	EPH Interpretation
19/10728	1	TP101	0.20-1.00	1-3	No interpretation possible
19/10728	1	TP101	1.00-2.00	4-6	No interpretation possible
19/10728	1	TP101	2.00-3.10	7-9	No interpretation possible
19/10728	1	TP102	0.20-1.00	10-12	No interpretation possible
19/10728	1	TP102	1.00-2.00	13-15	No interpretation possible

Client Name: Ground Investigations Ireland
Reference: 8408.01.19
Location: Sandyford Central
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 Element Materials Technology consultant, Element Materials Technology cannot be responsible for inaccurate or unrepresentative sampling.

Signed on behalf of Element Materials Technology:

Ryan Butterworth
Asbestos Team Leader

EMT Job No.	Batch	Sample ID	Depth	EMT Sample No.	Date Of Analysis	Analysis	Result
19/10728	1	TP101	0.20-1.00	2	05/07/2019	**General Description (Bulk Analysis)**	soil-stones
					05/07/2019	**Asbestos Fibres**	NAD
					05/07/2019	**Asbestos ACM**	NAD
					05/07/2019	**Asbestos Type**	NAD
					05/07/2019	**Asbestos Level Screen**	NAD
19/10728	1	TP101	1.00-2.00	5	05/07/2019	**General Description (Bulk Analysis)**	soil-stones
					05/07/2019	**Asbestos Fibres**	NAD
					05/07/2019	**Asbestos ACM**	NAD
					05/07/2019	**Asbestos Type**	NAD
					05/07/2019	**Asbestos Level Screen**	NAD
19/10728	1	TP101	2.00-3.10	8	05/07/2019	**General Description (Bulk Analysis)**	soil-stones
					05/07/2019	**Asbestos Fibres**	NAD
					05/07/2019	**Asbestos ACM**	NAD
					05/07/2019	**Asbestos Type**	NAD
					05/07/2019	**Asbestos Level Screen**	NAD
19/10728	1	TP102	0.20-1.00	11	04/07/2019	**General Description (Bulk Analysis)**	soil/stones
					04/07/2019	**Asbestos Fibres**	NAD
					04/07/2019	**Asbestos ACM**	NAD
					04/07/2019	**Asbestos Type**	NAD
					04/07/2019	**Asbestos Level Screen**	NAD
19/10728	1	TP102	1.00-2.00	14	04/07/2019	**General Description (Bulk Analysis)**	soil/stones
					04/07/2019	**Asbestos Fibres**	NAD
					04/07/2019	**Asbestos ACM**	NAD
					04/07/2019	**Asbestos Type**	NAD
					04/07/2019	**Asbestos Level Screen**	NAD

Client Name: Ground Investigations Ireland
Reference: 8408.01.19
Location: Sandyford Central
Contact: Conor Finnerty

EMT Job No.	Batch	Sample ID	Depth	EMT Sample No.	Analysis	Reason
No deviating sample report results for job 19/10728						

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

EMT Job No.: 19/10728

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. Limits of detection for analyses carried out on as received samples are not moisture content corrected. 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.

Sufficient amount of sample must be received to carry out the testing specified. Where an insufficient amount of sample has been received the testing may not meet the requirements of our accredited methods, as such accreditation may be removed.

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 overesitimate 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

All samples should be submitted to the laboratory in suitable containers with sufficient ice packs to sustain an appropriate temperature for the requested analysis. The temperature of sample receipt is recorded on the confirmation schedules in order that the client can make an informed decision as to whether testing should still be undertaken.

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.

Measurement Uncertainty

Measurement uncertainty defines the range of values that could reasonably be attributed to the measured quantity. This range of values has not been included within the reported results. Uncertainty expressed as a percentage can be provided upon request.

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 Element Materials Technology 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)

EMT Job No: 19/10728

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 spectrometic methods after distillation)* (BY HPLC - EMT)
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 amouns of acid or base needed to cover the pH range

Notes:

*If not suitable due to LOD, precision, etc., any other suitable method can be used, e.g. AFS, ICP-MS
**PCB-28, PCB-52, PCB-101, PCB-118, PCB-138, PCB-153 and PCB-180

***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.

EMT Job No: 19/10728

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/SANAS)	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 8015B method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) within the range C8-C40 by GCFID. For waters the solvent extracts dissolved phase plus a sheen if present.	PM16	Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE.			AR	
TM5	Modified 8015B method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) within the range C8-C40 by GCFID. For waters the solvent extracts dissolved phase plus a sheen if present.	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 8015B method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) within the range C8-C40 by GCFID. For waters the solvent extracts dissolved phase plus a sheen if present.	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

EMT Job No: 19/10728

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/SANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM22	Modified BS1377-3:1990 Gravimetric determination of Loss on Ignition by temperature controlled Muffle Furnace (35C-440C). On request modified ASTM D2974-00 LOI (105C-440C)	PM0	No preparation is required.	Yes		AD	Yes
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 BS 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 Methyltertbutylether, 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 Methyltertbutylether, 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

EMT Job No: 19/10728

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/SANAS)	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			AD	Yes
NONE	No Method Code	PM17	Modified method BS 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 BS 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	

EMT Job No: 19/10728

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/SANAS)	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	

APPENDIX 5 – HazWasteOnLine^{TM} Report

HazWasteOnline™

Waste Classification Report

LQEG2-25QRS-Z8VBT

Job name

Sandyford Central Phase 2

Description/Comments

Project

8408-01-19

Site

Sandyford Central

Related Documents

#	Name	Description
1	Sandyford Central Phase 2.hwol	.hwol file used to create the Job

Waste Stream Template

Example waste stream template for contaminated soils

Classified by

Name:
Barry Sexton
Date:
07 Aug 2019 09:23 GMT
Telephone:
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Report

Created by: Barry Sexton
Created date: 07 Aug 2019 09:23 GMT

Job summary

#	Sample Name	Depth [m]	Classification Result	Hazard properties	Page
1	TP101-28/06/2019-0.20-1.00m		Non Hazardous		2
2	TP101-28/06/2019-1.00-2.00m		Non Hazardous		5
3	TP101-28/06/2019-2.00-3.10m		Non Hazardous		8
4	TP102-28/06/2019-0.20-1.00m		Non Hazardous		11
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Classification of sample: TP101-28/06/2019-0.20-1.00m

Non Hazardous Waste
Classified as **17 05 04**
in the List of Waste

Sample details

Sample Name:		LoW Code:	
TP101-28/06/2019-0.20-1.00m		Chapter:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Moisture content:		Entry:	17 05 04 (Soil and stones other than those mentioned in 17 05 03)
23.3% (wet weight correction)			

Hazard properties

None identified

Determinands

Moisture content: 23.3% Wet Weight Moisture Correction applied (MC)

#	Determinand	CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
1	antimony { antimony trioxide }	051-005-00-X	215-175-0	1309-64-4		2	mg/kg	1.197	1.836	mg/kg	0.000184 %	✓	
2	arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		27.6	mg/kg	1.32	27.95	mg/kg	0.0028 %	✓	
3	cadmium { cadmium oxide }	048-002-00-0	215-146-2	1306-19-0		3.3	mg/kg	1.142	2.891	mg/kg	0.000289 %	✓	
4	chromium in chromium(III) compounds { chromium(III) oxide }		215-160-9	1308-38-9		61.2	mg/kg	1.462	68.606	mg/kg	0.00686 %	✓	
5	chromium in chromium(VI) compounds { chromium(VI) oxide }	024-001-00-0	215-607-8	1333-82-0		<0.3	mg/kg	1.923	<0.577	mg/kg	<0.0000577 %		<LOD
6	copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		32	mg/kg	1.126	27.634	mg/kg	0.00276 %	✓	
7	lead { lead chromate }	082-004-00-2	231-846-0	7758-97-6	1	53	mg/kg	1.56	63.408	mg/kg	0.00407 %	✓	
8	mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		<0.1	mg/kg	1.353	<0.135	mg/kg	<0.0000135 %		<LOD
9	molybdenum { molybdenum(VI) oxide }	042-001-00-9	215-204-7	1313-27-5		3.3	mg/kg	1.5	3.797	mg/kg	0.00038 %	✓	
10	nickel { nickel chromate }	028-035-00-7	238-766-5	14721-18-7		39	mg/kg	2.976	89.029	mg/kg	0.0089 %	✓	
11	selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }	034-002-00-8				2	mg/kg	2.554	3.917	mg/kg	0.000392 %	✓	
12	zinc { zinc chromate }	024-007-00-3				170	mg/kg	2.774	361.721	mg/kg	0.0362 %	✓	
13	TPH (C6 to C40) petroleum group			TPH		<52	mg/kg		<52	mg/kg	<0.0052 %		<LOD
14	tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane	603-181-00-X	216-653-1	1634-04-4		<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<LOD

#	Determinand	CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
15	benzene	601-020-00-8	200-753-7	71-43-2		<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<LOD
16	toluene	601-021-00-3	203-625-9	108-88-3		<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<LOD
17	ethylbenzene	601-023-00-4	202-849-4	100-41-4		<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<LOD
18	xylene	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]		<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
19	pH			PH		8.19	pH		8.19	pH	8.19 pH		
20	naphthalene	601-052-00-2	202-049-5	91-20-3		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
21	acenaphthylene		205-917-1	208-96-8		<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<LOD
22	acenaphthene		201-469-6	83-32-9		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
23	fluorene		201-695-5	86-73-7		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
24	phenanthrene		201-581-5	85-01-8		<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<LOD
25	anthracene		204-371-1	120-12-7		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
26	fluoranthene		205-912-4	206-44-0		<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<LOD
27	pyrene		204-927-3	129-00-0		<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<LOD
28	benzo[a]anthracene	601-033-00-9	200-280-6	56-55-3		<0.06	mg/kg		<0.06	mg/kg	<0.000006 %		<LOD
29	chrysene	601-048-00-0	205-923-4	218-01-9		<0.02	mg/kg		<0.02	mg/kg	<0.000002 %		<LOD
30	benzo[b]fluoranthene	601-034-00-4	205-911-9	205-99-2		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
31	benzo[k]fluoranthene	601-036-00-5	205-916-6	207-08-9		<0.02	mg/kg		<0.02	mg/kg	<0.000002 %		<LOD
32	benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5	50-32-8		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
33	indeno[123-cd]pyrene		205-893-2	193-39-5		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
34	dibenz[a,h]anthracene	601-041-00-2	200-181-8	53-70-3		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
35	benzo[ghi]perylene		205-883-8	191-24-2		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
36	polychlorobiphenyls; PCB	602-039-00-4	215-648-1	1336-36-3		<0.035	mg/kg		<0.035	mg/kg	<0.0000035 %		<LOD
37	barium { barium oxide }		215-127-9	1304-28-5		203	mg/kg	1.117	173.841	mg/kg	0.0174 %	✓	
38	coronene		205-881-7	191-07-1		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
39	benzo[j]fluoranthene	601-035-00-X	205-910-3	205-82-3		<1	mg/kg		<1	mg/kg	<0.0001 %		<LOD
										Total:	0.0856 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
CLP: Note 1	Only the metal concentration has been used for classification

Classification of sample: TP101-28/06/2019-1.00-2.00m

Non Hazardous Waste
Classified as **17 05 04**
in the List of Waste

Sample details

Sample Name:		LoW Code:	
TP101-28/06/2019-1.00-2.00m		Chapter:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Moisture content:			
8.9% (wet weight correction)		Entry:	17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 8.9% Wet Weight Moisture Correction applied (MC)

#	Determinand	CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
1	antimony { antimony trioxide }	051-005-00-X	215-175-0	1309-64-4		1	mg/kg	1.197	1.091	mg/kg	0.000109 %	✓	
2	arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		8.8	mg/kg	1.32	10.585	mg/kg	0.00106 %	✓	
3	cadmium { cadmium oxide }	048-002-00-0	215-146-2	1306-19-0		0.7	mg/kg	1.142	0.728	mg/kg	0.0000728 %	✓	
4	chromium in chromium(III) compounds { chromium(III) oxide }		215-160-9	1308-38-9		46.1	mg/kg	1.462	61.381	mg/kg	0.00614 %	✓	
5	chromium in chromium(VI) compounds { chromium(VI) oxide }	024-001-00-0	215-607-8	1333-82-0		<0.3	mg/kg	1.923	<0.577	mg/kg	<0.0000577 %		<LOD
6	copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		20	mg/kg	1.126	20.514	mg/kg	0.00205 %	✓	
7	lead { lead chromate }	082-004-00-2	231-846-0	7758-97-6	1	13	mg/kg	1.56	18.473	mg/kg	0.00118 %	✓	
8	mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		<0.1	mg/kg	1.353	<0.135	mg/kg	<0.0000135 %		<LOD
9	molybdenum { molybdenum(VI) oxide }	042-001-00-9	215-204-7	1313-27-5		1.9	mg/kg	1.5	2.597	mg/kg	0.00026 %	✓	
10	nickel { nickel chromate }	028-035-00-7	238-766-5	14721-18-7		31	mg/kg	2.976	84.053	mg/kg	0.00841 %	✓	
11	selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }	034-002-00-8				<1	mg/kg	2.554	<2.554	mg/kg	<0.000255 %		<LOD
12	zinc { zinc chromate }	024-007-00-3				66	mg/kg	2.774	166.798	mg/kg	0.0167 %	✓	
13	TPH (C6 to C40) petroleum group			TPH		<52	mg/kg		<52	mg/kg	<0.0052 %		<LOD
14	tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane	603-181-00-X	216-653-1	1634-04-4		<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<LOD

#		Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
		CLP index number	EC Number	CAS Number									
15		benzene 601-020-00-8	200-753-7	71-43-2		<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<LOD
16		toluene 601-021-00-3	203-625-9	108-88-3		<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<LOD
17	●	ethylbenzene 601-023-00-4	202-849-4	100-41-4		<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<LOD
18		xylene 601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]		<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
19	●	pH		PH		8.88	pH		8.88	pH	8.88 pH		
20		naphthalene 601-052-00-2	202-049-5	91-20-3		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
21	●	acenaphthylene	205-917-1	208-96-8		<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<LOD
22	●	acenaphthene	201-469-6	83-32-9		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
23	●	fluorene	201-695-5	86-73-7		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
24	●	phenanthrene	201-581-5	85-01-8		<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<LOD
25	●	anthracene	204-371-1	120-12-7		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
26	●	fluoranthene	205-912-4	206-44-0		<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<LOD
27	●	pyrene	204-927-3	129-00-0		<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<LOD
28		benzo[a]anthracene 601-033-00-9	200-280-6	56-55-3		<0.06	mg/kg		<0.06	mg/kg	<0.000006 %		<LOD
29		chrysene 601-048-00-0	205-923-4	218-01-9		<0.02	mg/kg		<0.02	mg/kg	<0.000002 %		<LOD
30		benzo[b]fluoranthene 601-034-00-4	205-911-9	205-99-2		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
31		benzo[k]fluoranthene 601-036-00-5	205-916-6	207-08-9		<0.02	mg/kg		<0.02	mg/kg	<0.000002 %		<LOD
32		benzo[a]pyrene; benzo[def]chrysene 601-032-00-3	200-028-5	50-32-8		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
33	●	indeno[123-cd]pyrene	205-893-2	193-39-5		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
34		dibenz[a,h]anthracene 601-041-00-2	200-181-8	53-70-3		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
35	●	benzo[ghi]perylene	205-883-8	191-24-2		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
36	●	polychlorobiphenyls; PCB 602-039-00-4	215-648-1	1336-36-3		<0.035	mg/kg		<0.035	mg/kg	<0.0000035 %		<LOD
37		barium { ● barium oxide }	215-127-9	1304-28-5		65	mg/kg	1.117	66.114	mg/kg	0.00661 %	✓	
38	●	coronene	205-881-7	191-07-1		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
39		benzo[j]fluoranthene 601-035-00-X	205-910-3	205-82-3		<1	mg/kg		<1	mg/kg	<0.0001 %		<LOD
										Total:	0.0483 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
CLP: Note 1	Only the metal concentration has been used for classification

Classification of sample: TP101-28/06/2019-2.00-3.10m

Non Hazardous Waste
Classified as **17 05 04**
in the List of Waste

Sample details

Sample Name:
TP101-28/06/2019-2.00-3.10m
Moisture content:
10.8%
(wet weight correction)

LoW Code:
Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 10.8% Wet Weight Moisture Correction applied (MC)

#	Determinand	CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
1	antimony { antimony trioxide }	051-005-00-X	215-175-0	1309-64-4		2	mg/kg	1.197	2.136	mg/kg	0.000214 %	✓	
2	arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		20.4	mg/kg	1.32	24.026	mg/kg	0.0024 %	✓	
3	cadmium { cadmium oxide }	048-002-00-0	215-146-2	1306-19-0		1.1	mg/kg	1.142	1.121	mg/kg	0.000112 %	✓	
4	chromium in chromium(III) compounds { chromium(III) oxide }		215-160-9	1308-38-9		59.8	mg/kg	1.462	77.962	mg/kg	0.0078 %	✓	
5	chromium in chromium(VI) compounds { chromium(VI) oxide }	024-001-00-0	215-607-8	1333-82-0		<0.3	mg/kg	1.923	<0.577	mg/kg	<0.0000577 %		<LOD
6	copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		32	mg/kg	1.126	32.137	mg/kg	0.00321 %	✓	
7	lead { lead chromate }	082-004-00-2	231-846-0	7758-97-6	1	30	mg/kg	1.56	41.741	mg/kg	0.00268 %	✓	
8	mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		<0.1	mg/kg	1.353	<0.135	mg/kg	<0.0000135 %		<LOD
9	molybdenum { molybdenum(VI) oxide }	042-001-00-9	215-204-7	1313-27-5		2.3	mg/kg	1.5	3.078	mg/kg	0.000308 %	✓	
10	nickel { nickel chromate }	028-035-00-7	238-766-5	14721-18-7		51.5	mg/kg	2.976	136.724	mg/kg	0.0137 %	✓	
11	selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }	034-002-00-8				2	mg/kg	2.554	4.556	mg/kg	0.000456 %	✓	
12	zinc { zinc chromate }	024-007-00-3				140	mg/kg	2.774	346.435	mg/kg	0.0346 %	✓	
13	TPH (C6 to C40) petroleum group			TPH		<52	mg/kg		<52	mg/kg	<0.0052 %		<LOD
14	tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane	603-181-00-X	216-653-1	1634-04-4		<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<LOD

#	Determinand	CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
15	benzene	601-020-00-8	200-753-7	71-43-2		<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<LOD
16	toluene	601-021-00-3	203-625-9	108-88-3		<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<LOD
17	ethylbenzene	601-023-00-4	202-849-4	100-41-4		<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<LOD
18	xylene	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]		<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
19	pH			PH		8.91	pH		8.91	pH	8.91 pH		
20	naphthalene	601-052-00-2	202-049-5	91-20-3		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
21	acenaphthylene		205-917-1	208-96-8		<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<LOD
22	acenaphthene		201-469-6	83-32-9		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
23	fluorene		201-695-5	86-73-7		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
24	phenanthrene		201-581-5	85-01-8		<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<LOD
25	anthracene		204-371-1	120-12-7		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
26	fluoranthene		205-912-4	206-44-0		<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<LOD
27	pyrene		204-927-3	129-00-0		<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<LOD
28	benzo[a]anthracene	601-033-00-9	200-280-6	56-55-3		<0.06	mg/kg		<0.06	mg/kg	<0.000006 %		<LOD
29	chrysene	601-048-00-0	205-923-4	218-01-9		<0.02	mg/kg		<0.02	mg/kg	<0.000002 %		<LOD
30	benzo[b]fluoranthene	601-034-00-4	205-911-9	205-99-2		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
31	benzo[k]fluoranthene	601-036-00-5	205-916-6	207-08-9		<0.02	mg/kg		<0.02	mg/kg	<0.000002 %		<LOD
32	benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5	50-32-8		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
33	indeno[123-cd]pyrene		205-893-2	193-39-5		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
34	dibenz[a,h]anthracene	601-041-00-2	200-181-8	53-70-3		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
35	benzo[ghi]perylene		205-883-8	191-24-2		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
36	polychlorobiphenyls; PCB	602-039-00-4	215-648-1	1336-36-3		<0.035	mg/kg		<0.035	mg/kg	<0.0000035 %		<LOD
37	barium { barium oxide }		215-127-9	1304-28-5		81	mg/kg	1.117	80.67	mg/kg	0.00807 %	✓	
38	coronene		205-881-7	191-07-1		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
39	benzo[j]fluoranthene	601-035-00-X	205-910-3	205-82-3		<1	mg/kg		<1	mg/kg	<0.0001 %		<LOD
										Total:	0.079 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
CLP: Note 1	Only the metal concentration has been used for classification

Classification of sample: TP102-28/06/2019-0.20-1.00m

Non Hazardous Waste
Classified as **17 05 04**
in the List of Waste

Sample details

Sample Name:		LoW Code:	
TP102-28/06/2019-0.20-1.00m		Chapter:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Moisture content:			
11.2% (wet weight correction)		Entry:	17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 11.2% Wet Weight Moisture Correction applied (MC)

#	Determinand	CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
1	antimony { antimony trioxide }	051-005-00-X	215-175-0	1309-64-4		1	mg/kg	1.197	1.063	mg/kg	0.000106 %	✓	
2	arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		14.2	mg/kg	1.32	16.649	mg/kg	0.00166 %	✓	
3	cadmium { cadmium oxide }	048-002-00-0	215-146-2	1306-19-0		0.6	mg/kg	1.142	0.609	mg/kg	0.0000609 %	✓	
4	chromium in chromium(III) compounds { chromium(III) oxide }		215-160-9	1308-38-9		64.5	mg/kg	1.462	83.712	mg/kg	0.00837 %	✓	
5	chromium in chromium(VI) compounds { chromium(VI) oxide }	024-001-00-0	215-607-8	1333-82-0		<0.3	mg/kg	1.923	<0.577	mg/kg	<0.0000577 %		<LOD
6	copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		21	mg/kg	1.126	20.996	mg/kg	0.0021 %	✓	
7	lead { lead chromate }	082-004-00-2	231-846-0	7758-97-6	1	53	mg/kg	1.56	73.411	mg/kg	0.00471 %	✓	
8	mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		<0.1	mg/kg	1.353	<0.135	mg/kg	<0.0000135 %		<LOD
9	molybdenum { molybdenum(VI) oxide }	042-001-00-9	215-204-7	1313-27-5		2.9	mg/kg	1.5	3.863	mg/kg	0.000386 %	✓	
10	nickel { nickel chromate }	028-035-00-7	238-766-5	14721-18-7		32.2	mg/kg	2.976	85.102	mg/kg	0.00851 %	✓	
11	selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }	034-002-00-8				1	mg/kg	2.554	2.268	mg/kg	0.000227 %	✓	
12	zinc { zinc chromate }	024-007-00-3				103	mg/kg	2.774	253.735	mg/kg	0.0254 %	✓	
13	TPH (C6 to C40) petroleum group			TPH		<52	mg/kg		<52	mg/kg	<0.0052 %		<LOD
14	tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane	603-181-00-X	216-653-1	1634-04-4		<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<LOD

#	Determinand	CLP index number	EC Number	CAS Number	CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
15	benzene	601-020-00-8	200-753-7	71-43-2		<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD
16	toluene	601-021-00-3	203-625-9	108-88-3		<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD
17	ethylbenzene	601-023-00-4	202-849-4	100-41-4		<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD
18	xylene	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]		<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
19	pH			PH		9.72 pH		9.72 pH	9.72 pH		
20	naphthalene	601-052-00-2	202-049-5	91-20-3		<0.04 mg/kg		<0.04 mg/kg	<0.000004 %		<LOD
21	acenaphthylene		205-917-1	208-96-8		<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
22	acenaphthene		201-469-6	83-32-9		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
23	fluorene		201-695-5	86-73-7		<0.04 mg/kg		<0.04 mg/kg	<0.000004 %		<LOD
24	phenanthrene		201-581-5	85-01-8		<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
25	anthracene		204-371-1	120-12-7		<0.04 mg/kg		<0.04 mg/kg	<0.000004 %		<LOD
26	fluoranthene		205-912-4	206-44-0		<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
27	pyrene		204-927-3	129-00-0		<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
28	benzo[a]anthracene	601-033-00-9	200-280-6	56-55-3		<0.06 mg/kg		<0.06 mg/kg	<0.000006 %		<LOD
29	chrysene	601-048-00-0	205-923-4	218-01-9		<0.02 mg/kg		<0.02 mg/kg	<0.000002 %		<LOD
30	benzo[b]fluoranthene	601-034-00-4	205-911-9	205-99-2		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
31	benzo[k]fluoranthene	601-036-00-5	205-916-6	207-08-9		<0.02 mg/kg		<0.02 mg/kg	<0.000002 %		<LOD
32	benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5	50-32-8		<0.04 mg/kg		<0.04 mg/kg	<0.000004 %		<LOD
33	indeno[123-cd]pyrene		205-893-2	193-39-5		<0.04 mg/kg		<0.04 mg/kg	<0.000004 %		<LOD
34	dibenz[a,h]anthracene	601-041-00-2	200-181-8	53-70-3		<0.04 mg/kg		<0.04 mg/kg	<0.000004 %		<LOD
35	benzo[ghi]perylene		205-883-8	191-24-2		<0.04 mg/kg		<0.04 mg/kg	<0.000004 %		<LOD
36	polychlorobiphenyls; PCB	602-039-00-4	215-648-1	1336-36-3		<0.035 mg/kg		<0.035 mg/kg	<0.0000035 %		<LOD
37	barium { barium oxide }		215-127-9	1304-28-5		57 mg/kg	1.117	56.513 mg/kg	0.00565 %	✓	
38	coronene		205-881-7	191-07-1		<0.04 mg/kg		<0.04 mg/kg	<0.000004 %		<LOD
39	benzo[j]fluoranthene	601-035-00-X	205-910-3	205-82-3		<1 mg/kg		<1 mg/kg	<0.0001 %		<LOD
								Total:	0.0626 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
CLP: Note 1	Only the metal concentration has been used for classification

Classification of sample: TP102-28/06/2019-1.00-2.00m

Non Hazardous Waste
Classified as **17 05 04**
in the List of Waste

Sample details

Sample Name:		LoW Code:	
TP102-28/06/2019-1.00-2.00m		Chapter:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Moisture content:			
12.5% (wet weight correction)		Entry:	17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 12.5% Wet Weight Moisture Correction applied (MC)

#	Determinand	CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
1	antimony { antimony trioxide }	051-005-00-X	215-175-0	1309-64-4		1	mg/kg	1.197	1.047	mg/kg	0.000105 %	✓	
2	arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		13.4	mg/kg	1.32	15.481	mg/kg	0.00155 %	✓	
3	cadmium { cadmium oxide }	048-002-00-0	215-146-2	1306-19-0		1.5	mg/kg	1.142	1.499	mg/kg	0.00015 %	✓	
4	chromium in chromium(III) compounds { chromium(III) oxide }		215-160-9	1308-38-9		44.1	mg/kg	1.462	56.398	mg/kg	0.00564 %	✓	
5	chromium in chromium(VI) compounds { chromium(VI) oxide }	024-001-00-0	215-607-8	1333-82-0		<0.3	mg/kg	1.923	<0.577	mg/kg	<0.0000577 %		<LOD
6	copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		25	mg/kg	1.126	24.629	mg/kg	0.00246 %	✓	
7	lead { lead chromate }	082-004-00-2	231-846-0	7758-97-6	1	30	mg/kg	1.56	40.945	mg/kg	0.00263 %	✓	
8	mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		<0.1	mg/kg	1.353	<0.135	mg/kg	<0.0000135 %		<LOD
9	molybdenum { molybdenum(VI) oxide }	042-001-00-9	215-204-7	1313-27-5		3.2	mg/kg	1.5	4.201	mg/kg	0.00042 %	✓	
10	nickel { nickel chromate }	028-035-00-7	238-766-5	14721-18-7		36.6	mg/kg	2.976	95.315	mg/kg	0.00953 %	✓	
11	selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }	034-002-00-8				2	mg/kg	2.554	4.469	mg/kg	0.000447 %	✓	
12	zinc { zinc chromate }	024-007-00-3				116	mg/kg	2.774	281.576	mg/kg	0.0282 %	✓	
13	TPH (C6 to C40) petroleum group			TPH		<52	mg/kg		<52	mg/kg	<0.0052 %		<LOD
14	tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane	603-181-00-X	216-653-1	1634-04-4		<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<LOD

#		Determinand: CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
15		benzene				<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<LOD
		601-020-00-8	200-753-7	71-43-2									
16		toluene				<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<LOD
		601-021-00-3	203-625-9	108-88-3									
17	●	ethylbenzene				<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<LOD
		601-023-00-4	202-849-4	100-41-4									
18		xylene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
		601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]									
19	●	pH				8.91	pH		8.91	pH	8.91 pH		
				PH									
20		naphthalene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
		601-052-00-2	202-049-5	91-20-3									
21	●	acenaphthylene				<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<LOD
			205-917-1	208-96-8									
22	●	acenaphthene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
			201-469-6	83-32-9									
23	●	fluorene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
			201-695-5	86-73-7									
24	●	phenanthrene				<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<LOD
			201-581-5	85-01-8									
25	●	anthracene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
			204-371-1	120-12-7									
26	●	fluoranthene				<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<LOD
			205-912-4	206-44-0									
27	●	pyrene				<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<LOD
			204-927-3	129-00-0									
28		benzo[a]anthracene				<0.06	mg/kg		<0.06	mg/kg	<0.000006 %		<LOD
		601-033-00-9	200-280-6	56-55-3									
29		chrysene				<0.02	mg/kg		<0.02	mg/kg	<0.000002 %		<LOD
		601-048-00-0	205-923-4	218-01-9									
30		benzo[b]fluoranthene				<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
		601-034-00-4	205-911-9	205-99-2									
31		benzo[k]fluoranthene				<0.02	mg/kg		<0.02	mg/kg	<0.000002 %		<LOD
		601-036-00-5	205-916-6	207-08-9									
32		benzo[a]pyrene; benzo[def]chrysene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
		601-032-00-3	200-028-5	50-32-8									
33	●	indeno[123-cd]pyrene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
			205-893-2	193-39-5									
34		dibenz[a,h]anthracene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
		601-041-00-2	200-181-8	53-70-3									
35	●	benzo[ghi]perylene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
			205-883-8	191-24-2									
36	●	polychlorobiphenyls; PCB				<0.035	mg/kg		<0.035	mg/kg	<0.0000035 %		<LOD
		602-039-00-4	215-648-1	1336-36-3									
37		barium { ● barium oxide }				47	mg/kg	1.117	45.916	mg/kg	0.00459 %	✓	
			215-127-9	1304-28-5									
38	●	coronene				<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
			205-881-7	191-07-1									
39		benzo[j]fluoranthene				<1	mg/kg		<1	mg/kg	<0.0001 %		<LOD
		601-035-00-X	205-910-3	205-82-3									
										Total:	0.0611 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
CLP: Note 1	Only the metal concentration has been used for classification

Appendix A: Classifier defined and non CLP determinands

chromium(III) oxide (EC Number: 215-160-9, CAS Number: 1308-38-9)

Conversion factor: 1.462
Description/Comments: Data from C&L Inventory Database
Data source: http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database
Data source date: 17 Jul 2015
Hazard Statements: Aquatic Chronic 1 H410 , Aquatic Acute 1 H400 , Repr. 1B H360FD , Skin Sens. 1 H317 , Resp. Sens. 1 H334 , Skin Irrit. 2 H315 , STOT SE 3 H335 , Eye Irrit. 2 H319 , Acute Tox. 4 H302 , Acute Tox. 4 H332

TPH (C6 to C40) petroleum group (CAS Number: TPH)

Description/Comments: Hazard statements taken from WM3 1st Edition 2015; Risk phrases: WM2 3rd Edition 2013
Data source: WM3 1st Edition 2015
Data source date: 25 May 2015
Hazard Statements: Aquatic Chronic 2 H411 , Repr. 2 H361d , Carc. 1B H350 , Muta. 1B H340 , STOT RE 2 H373 , Asp. Tox. 1 H304 , Flam. Liq. 3 H226

ethylbenzene (EC Number: 202-849-4, CAS Number: 100-41-4)

CLP index number: 601-023-00-4
Description/Comments:
Data source: Commission Regulation (EU) No 605/2014 – 6th Adaptation to Technical Progress for Regulation (EC) No 1272/2008. (ATP6)
Additional Hazard Statement(s): Carc. 2 H351
Reason for additional Hazards Statement(s)/Risk Phrase(s):
03 Jun 2015 - Carc. 2 H351 hazard statement sourced from: IARC Group 2B (77) 2000

pH (CAS Number: PH)

Description/Comments: Appendix C4
Data source: WM3 1st Edition 2015
Data source date: 25 May 2015
Hazard Statements: None.

acenaphthylene (EC Number: 205-917-1, CAS Number: 208-96-8)

Description/Comments: Data from C&L Inventory Database
Data source: http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database
Data source date: 17 Jul 2015
Hazard Statements: Skin Irrit. 2 H315 , STOT SE 3 H335 , Eye Irrit. 2 H319 , Acute Tox. 1 H310 , Acute Tox. 1 H330 , Acute Tox. 4 H302

acenaphthene (EC Number: 201-469-6, CAS Number: 83-32-9)

Description/Comments: Data from C&L Inventory Database
Data source: http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database
Data source date: 17 Jul 2015
Hazard Statements: Aquatic Chronic 2 H411 , Aquatic Chronic 1 H410 , Aquatic Acute 1 H400 , Skin Irrit. 2 H315 , STOT SE 3 H335 , Eye Irrit. 2 H319

fluorene (EC Number: 201-695-5, CAS Number: 86-73-7)

Description/Comments: Data from C&L Inventory Database
Data source: http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database
Data source date: 06 Aug 2015
Hazard Statements: Aquatic Chronic 1 H410 , Aquatic Acute 1 H400

phenanthrene (EC Number: 201-581-5, CAS Number: 85-01-8)

Description/Comments: Data from C&L Inventory Database
Data source: http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database
Data source date: 06 Aug 2015
Hazard Statements: Skin Irrit. 2 H315 , Aquatic Chronic 1 H410 , Aquatic Acute 1 H400 , Skin Sens. 1 H317 , Carc. 2 H351 , STOT SE 3 H335 , Eye Irrit. 2 H319 , Acute Tox. 4 H302

anthracene (EC Number: 204-371-1, CAS Number: 120-12-7)

Description/Comments: Data from C&L Inventory Database
Data source: http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database
Data source date: 17 Jul 2015
Hazard Statements: Aquatic Chronic 1 H410 , Aquatic Acute 1 H400 , Skin Sens. 1 H317 , Skin Irrit. 2 H315 , STOT SE 3 H335 , Eye Irrit. 2 H319

fluoranthene (EC Number: 205-912-4, CAS Number: 206-44-0)

Description/Comments: Data from C&L Inventory Database
Data source: http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database
Data source date: 21 Aug 2015
Hazard Statements: Aquatic Chronic 1 H410 , Aquatic Acute 1 H400 , Acute Tox. 4 H302

pyrene (EC Number: 204-927-3, CAS Number: 129-00-0)

Description/Comments: Data from C&L Inventory Database; SDS Sigma Aldrich 2014
Data source: http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database
Data source date: 21 Aug 2015
Hazard Statements: Aquatic Chronic 1 H410 , Aquatic Acute 1 H400 , STOT SE 3 H335 , Eye Irrit. 2 H319 , Skin Irrit. 2 H315

indeno[123-cd]pyrene (EC Number: 205-893-2, CAS Number: 193-39-5)

Description/Comments: Data from C&L Inventory Database
Data source: http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database
Data source date: 06 Aug 2015
Hazard Statements: Carc. 2 H351

benzo[ghi]perylene (EC Number: 205-883-8, CAS Number: 191-24-2)

Description/Comments: Data from C&L Inventory Database; SDS Sigma Aldrich 28/02/2015
Data source: http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database
Data source date: 23 Jul 2015
Hazard Statements: Aquatic Chronic 1 H410 , Aquatic Acute 1 H400

polychlorobiphenyls; PCB (EC Number: 215-648-1, CAS Number: 1336-36-3)

CLP index number: 602-039-00-4
Description/Comments: Worst Case: IARC considers PCB Group 1; Carcinogenic to humans; POP specific threshold from ATP1 (Regulation 756/2010/EU) to POPs Regulation (Regulation 850/2004/EC). Where applicable, the calculation method laid down in European standards EN 12766-1 and EN 12766-2 shall be applied.
Data source: Regulation 1272/2008/EC - Classification, labelling and packaging of substances and mixtures. (CLP)
Additional Hazard Statement(s): Carc. 1A H350
Reason for additional Hazards Statement(s)/Risk Phrase(s):
29 Sep 2015 - Carc. 1A H350 hazard statement sourced from: IARC Group 1 (23, Sup 7, 100C) 2012

barium oxide (EC Number: 215-127-9, CAS Number: 1304-28-5)

Conversion factor: 1.117
Description/Comments: Data from C&L Inventory Database; No entries in Registered Substances Database, IARC or Pesticide Properties Database
Data source:
http://clp-inventory.echa.europa.eu/SummaryOfClassAndLabelling.aspx?SubstanceID=88825&HarmOnly=no?fc=true&lang=en
Data source date: 02 Jun 2014
Hazard Statements: Skin Irrit. 2 H315 , STOT SE 3 H335 , Eye Irrit. 2 H319 , Skin Corr. 1A H314 , Acute Tox. 3 H301 , Acute Tox. 4 H302 , Acute Tox. 4 H332

coronene (EC Number: 205-881-7, CAS Number: 191-07-1)

Description/Comments: Data from C&L Inventory Database; no entries in Registered Substances or Pesticides Properties databases; SDS: Sigma Aldrich, 1907/2006 compliant, dated 2012 - no entries; IARC – Group 3, not carcinogenic.
Data source:
http://clp-inventory.echa.europa.eu/SummaryOfClassAndLabelling.aspx?SubstanceID=17010&HarmOnly=no?fc=true&lang=en
Data source date: 16 Jun 2014
Hazard Statements: STOT SE 2 H371

Appendix B: Rationale for selection of metal species

antimony {antimony trioxide}

Worst case CLP species based on hazard statements/molecular weight and low solubility. Industrial sources include: flame retardants in electrical apparatus, textiles and coatings (edit as required)

arsenic {arsenic trioxide}

Reasonable case CLP species based on hazard statements/molecular weight and most common (stable) oxide of arsenic. Industrial sources include: smelting; main precursor to other arsenic compounds (edit as required)

cadmium {cadmium oxide}

Reasonable case CLP species based on hazard statements/molecular weight, very low solubility in water. Industrial sources include: electroplating baths, electrodes for storage batteries, catalysts, ceramic glazes, phosphors, pigments and nematocides. (edit as required) Worst case compounds in CLP: cadmium sulphate, chloride, fluoride & iodide not expected as either very soluble and/or compound's industrial usage not related to site history (edit as required)

chromium in chromium(III) compounds {chromium(III) oxide}

Reasonable case species based on hazard statements/molecular weight. Industrial sources include: tanning, pigment in paint, inks and glass (edit as required)

chromium in chromium(VI) compounds {chromium(VI) oxide}

Worst case CLP species based on hazard statements/molecular weight. Industrial sources include: production stainless steel, electroplating, wood preservation, anti-corrosion agents or coatings, pigments (edit as required)

copper {dicopper oxide; copper (I) oxide}

Reasonable case CLP species based on hazard statements/molecular weight and insolubility in water. Industrial sources include: oxidised copper metal, brake pads, pigments, antifouling paints, fungicide. (edit as required) Worse case copper sulphate is very soluble and likely to have been leached away if ever present and/or not enough soluble sulphate detected. (edit as required)

lead {lead chromate}

Worst case CLP species based on hazard statements/molecular weight (edit as required)

mercury {mercury dichloride}

Worst case CLP species based on hazard statements/molecular weight (edit as required)

molybdenum {molybdenum(VI) oxide}

Worst case CLP species based on hazard statements/molecular weight (edit as required)

nickel {nickel chromate}

Worst case CLP species based on hazard statements/molecular weight (edit as required)

selenium {selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex}

Harmonised group entry used as most reasonable case. Pigment cadmium sulphoselenide not likely to be present in this soil. No evidence for the other CLP entries: sodium selenite, nickel II selenite and nickel selenide, to be present in this soil. (edit as required)

zinc {zinc chromate}

Worst case CLP species based on hazard statements/molecular weight (edit as required)

barium {barium oxide}

Cr VI not detected

Appendix C: Version

HazWasteOnline Classification Engine: WM3 1st Edition v1.1, May 2018
HazWasteOnline Classification Engine Version: 2019.218.3917.7954 (06 Aug 2019)
HazWasteOnline Database: 2019.218.3917.7954 (06 Aug 2019)

This classification utilises the following guidance and legislation:
WM3 v1.1 - Waste Classification - 1st Edition v1.1 - May 2018
CLP Regulation - Regulation 1272/2008/EC of 16 December 2008
1st ATP - Regulation 790/2009/EC of 10 August 2009
2nd ATP - Regulation 286/2011/EC of 10 March 2011
3rd ATP - Regulation 618/2012/EU of 10 July 2012
4th ATP - Regulation 487/2013/EU of 8 May 2013
Correction to 1st ATP - Regulation 758/2013/EU of 7 August 2013
5th ATP - Regulation 944/2013/EU of 2 October 2013
6th ATP - Regulation 605/2014/EU of 5 June 2014
WFD Annex III replacement - Regulation 1357/2014/EU of 18 December 2014
Revised List of Wastes 2014 - Decision 2014/955/EU of 18 December 2014
7th ATP - Regulation 2015/1221/EU of 24 July 2015
8th ATP - Regulation (EU) 2016/918 of 19 May 2016
9th ATP - Regulation (EU) 2016/1179 of 19 July 2016
10th ATP - Regulation (EU) 2017/776 of 4 May 2017
HP14 amendment - Regulation (EU) 2017/997 of 8 June 2017
13th ATP - Regulation (EU) 2018/1480 of 4 October 2018
POPs Regulation 2004 - Regulation 850/2004/EC of 29 April 2004
1st ATP to POPs Regulation - Regulation 756/2010/EU of 24 August 2010
2nd ATP to POPs Regulation - Regulation 757/2010/EU of 24 August 2010

HazWasteOnline™

Waste Classification Report

S67JK-LUCRX-WLTBL

Job name

Sandyford Central

Description/Comments

Project

8408-01-19

Site

Sandyford Central

Related Documents

#	Name	Description
1	Sandyford Central.HWOL	.hwol file used to create the Job

Waste Stream Template

Example waste stream template for contaminated soils

Classified by

Name:
Barry Sexton
Date:
28 Mar 2019 08:07 GMT
Telephone:
00353876119640

Company:
Ground Investigations Ireland
Catherinestown House,
Hazelhatch Road, Newcastle
Co. Dublin

Report

Created by: Barry Sexton
Created date: 28 Mar 2019 08:07 GMT

Job summary

#	Sample Name	Depth [m]	Classification Result	Hazard properties	Page
1	TP01-19/02/2019-0.60-1.60m		Non Hazardous		3
2	TP06-20/02/2019-0.80-1.00m		Non Hazardous		6
3	TP02-20/02/2019-0.60-1.00m		Non Hazardous		9
4	TP06-20/02/2019-1.00-2.00m		Non Hazardous		12
5	TP02-20/02/2019-1.00-2.10m		Non Hazardous		15
6	TP06-20/02/2019-2.00-2.40m		Non Hazardous		18
7	TP03-19/02/2019-0.00-1.00m		Non Hazardous		21
8	TP03-19/02/2019-1.00-2.00m		Non Hazardous		24
9	TP03-19/02/2019-2.00-3.10m		Non Hazardous		27
10	TP04-19/02/2019-0.45-0.90m		Non Hazardous		30
11	TP04-19/02/2019-0.90-2.00m		Non Hazardous		33

Classification of sample: TP01-19/02/2019-0.60-1.60m

Non Hazardous Waste
Classified as **17 05 04**
in the List of Waste

Sample details

Sample Name:		LoW Code:	
TP01-19/02/2019-0.60-1.60m		Chapter:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Moisture content:			
10.8% (wet weight correction)		Entry:	17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 10.8% Wet Weight Moisture Correction applied (MC)

#	Determinand CLP index number / EC Number / CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
1	antimony { antimony trioxide } 051-005-00-X / 215-175-0 / 1309-64-4		2	mg/kg	1.197	2.136	mg/kg	0.000214 %	✓	
2	arsenic { arsenic trioxide } 033-003-00-0 / 215-481-4 / 1327-53-3		11.6	mg/kg	1.32	13.662	mg/kg	0.00137 %	✓	
3	cadmium { cadmium oxide } 048-002-00-0 / 215-146-2 / 1306-19-0		1.9	mg/kg	1.142	1.936	mg/kg	0.000194 %	✓	
4	chromium in chromium(III) compounds { chromium(III) oxide } 215-160-9 / 1308-38-9		27.3	mg/kg	1.462	35.591	mg/kg	0.00356 %	✓	
5	chromium in chromium(VI) compounds { chromium(VI) oxide } 024-001-00-0 / 215-607-8 / 1333-82-0		<0.3	mg/kg	1.923	<0.577	mg/kg	<0.0000577 %		<LOD
6	copper { dicopper oxide; copper (I) oxide } 029-002-00-X / 215-270-7 / 1317-39-1		27	mg/kg	1.126	27.116	mg/kg	0.00271 %	✓	
7	lead { lead chromate } 082-004-00-2 / 231-846-0 / 7758-97-6	1	47	mg/kg	1.56	65.394	mg/kg	0.00419 %	✓	
8	mercury { mercury dichloride } 080-010-00-X / 231-299-8 / 7487-94-7		<0.1	mg/kg	1.353	<0.135	mg/kg	<0.0000135 %		<LOD
9	molybdenum { molybdenum(VI) oxide } 042-001-00-9 / 215-204-7 / 1313-27-5		2.1	mg/kg	1.5	2.81	mg/kg	0.000281 %	✓	
10	nickel { nickel chromate } 028-035-00-7 / 238-766-5 / 14721-18-7		41	mg/kg	2.976	108.848	mg/kg	0.0109 %	✓	
11	selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex } 034-002-00-8		<1	mg/kg	2.554	<2.554	mg/kg	<0.000255 %		<LOD
12	zinc { zinc chromate } 024-007-00-3		100	mg/kg	2.774	247.454	mg/kg	0.0247 %	✓	
13	TPH (C6 to C40) petroleum group TPH		<52	mg/kg		<52	mg/kg	<0.0052 %		<LOD
14	tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane 603-181-00-X / 216-653-1 / 1634-04-4		<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<LOD

#	Determinand	CLP index number	EC Number	CAS Number	CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
15	benzene	601-020-00-8	200-753-7	71-43-2		<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD
16	toluene	601-021-00-3	203-625-9	108-88-3		<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD
17	ethylbenzene	601-023-00-4	202-849-4	100-41-4		<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD
18	xylene	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]		<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
19	pH			PH		8.67 pH		8.67 pH	8.67 pH		
20	naphthalene	601-052-00-2	202-049-5	91-20-3		<0.04 mg/kg		<0.04 mg/kg	<0.000004 %		<LOD
21	acenaphthylene		205-917-1	208-96-8		<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
22	acenaphthene		201-469-6	83-32-9		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
23	fluorene		201-695-5	86-73-7		<0.04 mg/kg		<0.04 mg/kg	<0.000004 %		<LOD
24	phenanthrene		201-581-5	85-01-8		<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
25	anthracene		204-371-1	120-12-7		<0.04 mg/kg		<0.04 mg/kg	<0.000004 %		<LOD
26	fluoranthene		205-912-4	206-44-0		<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
27	pyrene		204-927-3	129-00-0		<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
28	benzo[a]anthracene	601-033-00-9	200-280-6	56-55-3		<0.06 mg/kg		<0.06 mg/kg	<0.000006 %		<LOD
29	chrysene	601-048-00-0	205-923-4	218-01-9		<0.02 mg/kg		<0.02 mg/kg	<0.000002 %		<LOD
30	benzo[b]fluoranthene	601-034-00-4	205-911-9	205-99-2		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
31	benzo[k]fluoranthene	601-036-00-5	205-916-6	207-08-9		<0.02 mg/kg		<0.02 mg/kg	<0.000002 %		<LOD
32	benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5	50-32-8		<0.04 mg/kg		<0.04 mg/kg	<0.000004 %		<LOD
33	indeno[123-cd]pyrene		205-893-2	193-39-5		<0.04 mg/kg		<0.04 mg/kg	<0.000004 %		<LOD
34	dibenz[a,h]anthracene	601-041-00-2	200-181-8	53-70-3		<0.04 mg/kg		<0.04 mg/kg	<0.000004 %		<LOD
35	benzo[ghi]perylene		205-883-8	191-24-2		<0.04 mg/kg		<0.04 mg/kg	<0.000004 %		<LOD
36	polychlorobiphenyls; PCB	602-039-00-4	215-648-1	1336-36-3		<0.035 mg/kg		<0.035 mg/kg	<0.0000035 %		<LOD
37	barium { barium oxide }		215-127-9	1304-28-5		66 mg/kg	1.117	65.731 mg/kg	0.00657 %	✓	
38	coronene		205-881-7	191-07-1		<0.04 mg/kg		<0.04 mg/kg	<0.000004 %		<LOD
39	benzo[j]fluoranthene	601-035-00-X	205-910-3	205-82-3		<1 mg/kg		<1 mg/kg	<0.0001 %		<LOD
								Total:	0.0604 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
CLP: Note 1	Only the metal concentration has been used for classification

Classification of sample: TP06-20/02/2019-0.80-1.00m

Non Hazardous Waste
Classified as **17 05 04**
in the List of Waste

Sample details

Sample Name:		LoW Code:	
TP06-20/02/2019-0.80-1.00m		Chapter:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Moisture content:			
20.1% (wet weight correction)		Entry:	17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 20.1% Wet Weight Moisture Correction applied (MC)

#		Determinand / CLP index number / EC Number / CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
1		antimony { antimony trioxide } 051-005-00-X / 215-175-0 / 1309-64-4		3	mg/kg	1.197	2.869	mg/kg	0.000287 %	✓	
2		arsenic { arsenic trioxide } 033-003-00-0 / 215-481-4 / 1327-53-3		24.5	mg/kg	1.32	25.846	mg/kg	0.00258 %	✓	
3		cadmium { cadmium oxide } 048-002-00-0 / 215-146-2 / 1306-19-0		1.8	mg/kg	1.142	1.643	mg/kg	0.000164 %	✓	
4		chromium in chromium(III) compounds { chromium(III) oxide } 215-160-9 / 1308-38-9		46.4	mg/kg	1.462	54.185	mg/kg	0.00542 %	✓	
5		chromium in chromium(VI) compounds { chromium(VI) oxide } 024-001-00-0 / 215-607-8 / 1333-82-0		<0.3	mg/kg	1.923	<0.577	mg/kg	<0.0000577 %		<LOD
6		copper { dicopper oxide; copper (I) oxide } 029-002-00-X / 215-270-7 / 1317-39-1		37	mg/kg	1.126	33.285	mg/kg	0.00333 %	✓	
7		lead { lead chromate } 082-004-00-2 / 231-846-0 / 7758-97-6	1	34	mg/kg	1.56	42.374	mg/kg	0.00272 %	✓	
8		mercury { mercury dichloride } 080-010-00-X / 231-299-8 / 7487-94-7		<0.1	mg/kg	1.353	<0.135	mg/kg	<0.0000135 %		<LOD
9		molybdenum { molybdenum(VI) oxide } 042-001-00-9 / 215-204-7 / 1313-27-5		4.8	mg/kg	1.5	5.754	mg/kg	0.000575 %	✓	
10		nickel { nickel chromate } 028-035-00-7 / 238-766-5 / 14721-18-7		57	mg/kg	2.976	135.548	mg/kg	0.0136 %	✓	
11		selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex } 034-002-00-8		2	mg/kg	2.554	4.081	mg/kg	0.000408 %	✓	
12		zinc { zinc chromate } 024-007-00-3		146	mg/kg	2.774	323.615	mg/kg	0.0324 %	✓	
13		TPH (C6 to C40) petroleum group TPH		<52	mg/kg		<52	mg/kg	<0.0052 %		<LOD
14		tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane 603-181-00-X / 216-653-1 / 1634-04-4		<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<LOD

#		Determinand	CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
15		benzene	601-020-00-8	200-753-7	71-43-2		<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<LOD
16		toluene	601-021-00-3	203-625-9	108-88-3		<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<LOD
17		ethylbenzene	601-023-00-4	202-849-4	100-41-4		<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<LOD
18		xylene	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]		<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
19		pH			PH		8.59	pH		8.59	pH	8.59 pH		
20		naphthalene	601-052-00-2	202-049-5	91-20-3		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
21		acenaphthylene		205-917-1	208-96-8		<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<LOD
22		acenaphthene		201-469-6	83-32-9		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
23		fluorene		201-695-5	86-73-7		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
24		phenanthrene		201-581-5	85-01-8		<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<LOD
25		anthracene		204-371-1	120-12-7		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
26		fluoranthene		205-912-4	206-44-0		<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<LOD
27		pyrene		204-927-3	129-00-0		<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<LOD
28		benzo[a]anthracene	601-033-00-9	200-280-6	56-55-3		<0.06	mg/kg		<0.06	mg/kg	<0.000006 %		<LOD
29		chrysene	601-048-00-0	205-923-4	218-01-9		<0.02	mg/kg		<0.02	mg/kg	<0.000002 %		<LOD
30		benzo[b]fluoranthene	601-034-00-4	205-911-9	205-99-2		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
31		benzo[k]fluoranthene	601-036-00-5	205-916-6	207-08-9		<0.02	mg/kg		<0.02	mg/kg	<0.000002 %		<LOD
32		benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5	50-32-8		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
33		indeno[123-cd]pyrene		205-893-2	193-39-5		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
34		dibenz[a,h]anthracene	601-041-00-2	200-181-8	53-70-3		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
35		benzo[ghi]perylene		205-883-8	191-24-2		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
36		polychlorobiphenyls; PCB	602-039-00-4	215-648-1	1336-36-3		<0.035	mg/kg		<0.035	mg/kg	<0.0000035 %		<LOD
37		barium { barium oxide }		215-127-9	1304-28-5		312	mg/kg	1.117	278.332	mg/kg	0.0278 %	✓	
38		coronene		205-881-7	191-07-1		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
39		benzo[j]fluoranthene	601-035-00-X	205-910-3	205-82-3		<1	mg/kg		<1	mg/kg	<0.0001 %		<LOD
											Total:	0.0947 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
•	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
CLP: Note 1	Only the metal concentration has been used for classification

Classification of sample: TP02-20/02/2019-0.60-1.00m

Non Hazardous Waste
Classified as **17 05 04**
in the List of Waste

Sample details

Sample Name: **TP02-20/02/2019-0.60-1.00m**	LoW Code:		
	Chapter:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)	
Moisture content: **12.7%** (wet weight correction)	Entry:	17 05 04 (Soil and stones other than those mentioned in 17 05 03)	

Hazard properties

None identified

Determinands

Moisture content: 12.7% Wet Weight Moisture Correction applied (MC)

#	Determinand	CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
1	antimony { antimony trioxide }	051-005-00-X	215-175-0	1309-64-4		2	mg/kg	1.197	2.09	mg/kg	0.000209 %	✓	
2	arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		16.1	mg/kg	1.32	18.558	mg/kg	0.00186 %	✓	
3	cadmium { cadmium oxide }	048-002-00-0	215-146-2	1306-19-0		0.8	mg/kg	1.142	0.798	mg/kg	0.0000798 %	✓	
4	chromium in chromium(III) compounds { chromium(III) oxide }		215-160-9	1308-38-9		30.5	mg/kg	1.462	38.916	mg/kg	0.00389 %	✓	
5	chromium in chromium(VI) compounds { chromium(VI) oxide }	024-001-00-0	215-607-8	1333-82-0		<0.3	mg/kg	1.923	<0.577	mg/kg	<0.0000577 %		<LOD
6	copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		16	mg/kg	1.126	15.726	mg/kg	0.00157 %	✓	
7	lead { lead chromate }	082-004-00-2	231-846-0	7758-97-6	1	16	mg/kg	1.56	21.787	mg/kg	0.0014 %	✓	
8	mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		<0.1	mg/kg	1.353	<0.135	mg/kg	<0.0000135 %		<LOD
9	molybdenum { molybdenum(VI) oxide }	042-001-00-9	215-204-7	1313-27-5		2	mg/kg	1.5	2.619	mg/kg	0.000262 %	✓	
10	nickel { nickel chromate }	028-035-00-7	238-766-5	14721-18-7		29.3	mg/kg	2.976	76.13	mg/kg	0.00761 %	✓	
11	selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }	034-002-00-8				<1	mg/kg	2.554	<2.554	mg/kg	<0.000255 %		<LOD
12	zinc { zinc chromate }	024-007-00-3				75	mg/kg	2.774	181.637	mg/kg	0.0182 %	✓	
13	TPH (C6 to C40) petroleum group			TPH		<52	mg/kg		<52	mg/kg	<0.0052 %		<LOD
14	tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane	603-181-00-X	216-653-1	1634-04-4		<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<LOD

#	Determinand	CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
15	benzene	601-020-00-8	200-753-7	71-43-2		<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<LOD
16	toluene	601-021-00-3	203-625-9	108-88-3		<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<LOD
17	ethylbenzene	601-023-00-4	202-849-4	100-41-4		<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<LOD
18	xylene	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]		<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
19	pH			PH		8.56	pH		8.56	pH	8.56 pH		
20	naphthalene	601-052-00-2	202-049-5	91-20-3		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
21	acenaphthylene		205-917-1	208-96-8		<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<LOD
22	acenaphthene		201-469-6	83-32-9		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
23	fluorene		201-695-5	86-73-7		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
24	phenanthrene		201-581-5	85-01-8		<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<LOD
25	anthracene		204-371-1	120-12-7		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
26	fluoranthene		205-912-4	206-44-0		<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<LOD
27	pyrene		204-927-3	129-00-0		<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<LOD
28	benzo[a]anthracene	601-033-00-9	200-280-6	56-55-3		<0.06	mg/kg		<0.06	mg/kg	<0.000006 %		<LOD
29	chrysene	601-048-00-0	205-923-4	218-01-9		<0.02	mg/kg		<0.02	mg/kg	<0.000002 %		<LOD
30	benzo[b]fluoranthene	601-034-00-4	205-911-9	205-99-2		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
31	benzo[k]fluoranthene	601-036-00-5	205-916-6	207-08-9		<0.02	mg/kg		<0.02	mg/kg	<0.000002 %		<LOD
32	benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5	50-32-8		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
33	indeno[123-cd]pyrene		205-893-2	193-39-5		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
34	dibenz[a,h]anthracene	601-041-00-2	200-181-8	53-70-3		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
35	benzo[ghi]perylene		205-883-8	191-24-2		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
36	polychlorobiphenyls; PCB	602-039-00-4	215-648-1	1336-36-3		<0.035	mg/kg		<0.035	mg/kg	<0.0000035 %		<LOD
37	barium { barium oxide }		215-127-9	1304-28-5		50	mg/kg	1.117	48.735	mg/kg	0.00487 %	✓	
38	coronene		205-881-7	191-07-1		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
39	benzo[j]fluoranthene	601-035-00-X	205-910-3	205-82-3		<1	mg/kg		<1	mg/kg	<0.0001 %		<LOD
										Total:	0.0456 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
CLP: Note 1	Only the metal concentration has been used for classification

Classification of sample: TP06-20/02/2019-1.00-2.00m

Non Hazardous Waste
Classified as **17 05 04**
in the List of Waste

Sample details

Sample Name:		LoW Code:	
TP06-20/02/2019-1.00-2.00m		Chapter:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Moisture content:			
8.6% (wet weight correction)		Entry:	17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 8.6% Wet Weight Moisture Correction applied (MC)

#		Determinand / CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
1		antimony { antimony trioxide } 051-005-00-X	215-175-0	1309-64-4		2	mg/kg	1.197	2.188	mg/kg	0.000219 %	✓	
2		arsenic { arsenic trioxide } 033-003-00-0	215-481-4	1327-53-3		8.1	mg/kg	1.32	9.775	mg/kg	0.000977 %	✓	
3		cadmium { cadmium oxide } 048-002-00-0	215-146-2	1306-19-0		2	mg/kg	1.142	2.088	mg/kg	0.000209 %	✓	
4		chromium in chromium(III) compounds { chromium(III) oxide }	215-160-9	1308-38-9		42.1	mg/kg	1.462	56.24	mg/kg	0.00562 %	✓	
5		chromium in chromium(VI) compounds { chromium(VI) oxide } 024-001-00-0	215-607-8	1333-82-0		<0.3	mg/kg	1.923	<0.577	mg/kg	<0.0000577 %		**<LOD**
6		copper { dicopper oxide; copper (I) oxide } 029-002-00-X	215-270-7	1317-39-1		28	mg/kg	1.126	28.814	mg/kg	0.00288 %	✓	
7		lead { lead chromate } 082-004-00-2	231-846-0	7758-97-6	1	17	mg/kg	1.56	24.236	mg/kg	0.00155 %	✓	
8		mercury { mercury dichloride } 080-010-00-X	231-299-8	7487-94-7		<0.1	mg/kg	1.353	<0.135	mg/kg	<0.0000135 %		**<LOD**
9		molybdenum { molybdenum(VI) oxide } 042-001-00-9	215-204-7	1313-27-5		4.6	mg/kg	1.5	6.307	mg/kg	0.000631 %	✓	
10		nickel { nickel chromate } 028-035-00-7	238-766-5	14721-18-7		38.2	mg/kg	2.976	103.916	mg/kg	0.0104 %	✓	
11		selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex } 034-002-00-8				3	mg/kg	2.554	7.002	mg/kg	0.0007 %	✓	
12		zinc { zinc chromate } 024-007-00-3				94	mg/kg	2.774	238.344	mg/kg	0.0238 %	✓	
13		TPH (C6 to C40) petroleum group		TPH		<52	mg/kg		<52	mg/kg	<0.0052 %		**<LOD**
14		tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane 603-181-00-X	216-653-1	1634-04-4		<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		**<LOD**

#	Determinand	CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
15	benzene	601-020-00-8	200-753-7	71-43-2		<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<LOD
16	toluene	601-021-00-3	203-625-9	108-88-3		<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<LOD
17	ethylbenzene	601-023-00-4	202-849-4	100-41-4		<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<LOD
18	xylene	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]		<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
19	pH			PH		8.48	pH		8.48	pH	8.48 pH		
20	naphthalene	601-052-00-2	202-049-5	91-20-3		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
21	acenaphthylene		205-917-1	208-96-8		<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<LOD
22	acenaphthene		201-469-6	83-32-9		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
23	fluorene		201-695-5	86-73-7		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
24	phenanthrene		201-581-5	85-01-8		<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<LOD
25	anthracene		204-371-1	120-12-7		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
26	fluoranthene		205-912-4	206-44-0		<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<LOD
27	pyrene		204-927-3	129-00-0		<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<LOD
28	benzo[a]anthracene	601-033-00-9	200-280-6	56-55-3		<0.06	mg/kg		<0.06	mg/kg	<0.000006 %		<LOD
29	chrysene	601-048-00-0	205-923-4	218-01-9		<0.02	mg/kg		<0.02	mg/kg	<0.000002 %		<LOD
30	benzo[b]fluoranthene	601-034-00-4	205-911-9	205-99-2		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
31	benzo[k]fluoranthene	601-036-00-5	205-916-6	207-08-9		<0.02	mg/kg		<0.02	mg/kg	<0.000002 %		<LOD
32	benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5	50-32-8		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
33	indeno[123-cd]pyrene		205-893-2	193-39-5		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
34	dibenz[a,h]anthracene	601-041-00-2	200-181-8	53-70-3		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
35	benzo[ghi]perylene		205-883-8	191-24-2		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
36	polychlorobiphenyls; PCB	602-039-00-4	215-648-1	1336-36-3		<0.035	mg/kg		<0.035	mg/kg	<0.0000035 %		<LOD
37	barium { barium oxide }		215-127-9	1304-28-5		59	mg/kg	1.117	60.209	mg/kg	0.00602 %	✓	
38	coronene		205-881-7	191-07-1		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
39	benzo[j]fluoranthene	601-035-00-X	205-910-3	205-82-3		<1	mg/kg		<1	mg/kg	<0.0001 %		<LOD
										Total:	0.0585 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
•	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
CLP: Note 1	Only the metal concentration has been used for classification

Classification of sample: TP02-20/02/2019-1.00-2.10m

Non Hazardous Waste
Classified as **17 05 04**
in the List of Waste

Sample details

Sample Name:
TP02-20/02/2019-1.00-2.10m
Moisture content:
7.9%
(wet weight correction)

LoW Code:
Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 7.9% Wet Weight Moisture Correction applied (MC)

#	Determinand / CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
1	antimony { antimony trioxide } 051-005-00-X	215-175-0	1309-64-4		<1	mg/kg	1.197	<1.197	mg/kg	<0.00012 %		<LOD
2	arsenic { arsenic trioxide } 033-003-00-0	215-481-4	1327-53-3		4.3	mg/kg	1.32	5.229	mg/kg	0.000523 %	✓	
3	cadmium { cadmium oxide } 048-002-00-0	215-146-2	1306-19-0		0.5	mg/kg	1.142	0.526	mg/kg	0.0000526 %	✓	
4	chromium in chromium(III) compounds { chromium(III) oxide }	215-160-9	1308-38-9		29.3	mg/kg	1.462	39.441	mg/kg	0.00394 %	✓	
5	chromium in chromium(VI) compounds { chromium(VI) oxide } 024-001-00-0	215-607-8	1333-82-0		<0.3	mg/kg	1.923	<0.577	mg/kg	<0.0000577 %		<LOD
6	copper { dicopper oxide; copper (I) oxide } 029-002-00-X	215-270-7	1317-39-1		8	mg/kg	1.126	8.296	mg/kg	0.00083 %	✓	
7	lead { lead chromate } 082-004-00-2	231-846-0	7758-97-6	1	13	mg/kg	1.56	18.676	mg/kg	0.0012 %	✓	
8	mercury { mercury dichloride } 080-010-00-X	231-299-8	7487-94-7		<0.1	mg/kg	1.353	<0.135	mg/kg	<0.0000135 %		<LOD
9	molybdenum { molybdenum(VI) oxide } 042-001-00-9	215-204-7	1313-27-5		1.9	mg/kg	1.5	2.625	mg/kg	0.000263 %	✓	
10	nickel { nickel chromate } 028-035-00-7	238-766-5	14721-18-7		14.4	mg/kg	2.976	39.472	mg/kg	0.00395 %	✓	
11	selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex } 034-002-00-8				<1	mg/kg	2.554	<2.554	mg/kg	<0.000255 %		<LOD
12	zinc { zinc chromate } 024-007-00-3				55	mg/kg	2.774	140.524	mg/kg	0.0141 %	✓	
13	TPH (C6 to C40) petroleum group		TPH		<52	mg/kg		<52	mg/kg	<0.0052 %		<LOD
14	tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane 603-181-00-X	216-653-1	1634-04-4		<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<LOD

#	Determinand	CLP index number	EC Number	CAS Number	CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
15	benzene	601-020-00-8	200-753-7	71-43-2		<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD
16	toluene	601-021-00-3	203-625-9	108-88-3		<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD
17	ethylbenzene	601-023-00-4	202-849-4	100-41-4		<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD
18	xylene	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]		<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
19	pH			PH		8.8 pH		8.8 pH	8.8 pH		
20	naphthalene	601-052-00-2	202-049-5	91-20-3		<0.04 mg/kg		<0.04 mg/kg	<0.000004 %		<LOD
21	acenaphthylene		205-917-1	208-96-8		<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
22	acenaphthene		201-469-6	83-32-9		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
23	fluorene		201-695-5	86-73-7		<0.04 mg/kg		<0.04 mg/kg	<0.000004 %		<LOD
24	phenanthrene		201-581-5	85-01-8		<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
25	anthracene		204-371-1	120-12-7		<0.04 mg/kg		<0.04 mg/kg	<0.000004 %		<LOD
26	fluoranthene		205-912-4	206-44-0		<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
27	pyrene		204-927-3	129-00-0		<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
28	benzo[a]anthracene	601-033-00-9	200-280-6	56-55-3		<0.06 mg/kg		<0.06 mg/kg	<0.000006 %		<LOD
29	chrysene	601-048-00-0	205-923-4	218-01-9		<0.02 mg/kg		<0.02 mg/kg	<0.000002 %		<LOD
30	benzo[b]fluoranthene	601-034-00-4	205-911-9	205-99-2		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
31	benzo[k]fluoranthene	601-036-00-5	205-916-6	207-08-9		<0.02 mg/kg		<0.02 mg/kg	<0.000002 %		<LOD
32	benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5	50-32-8		<0.04 mg/kg		<0.04 mg/kg	<0.000004 %		<LOD
33	indeno[123-cd]pyrene		205-893-2	193-39-5		<0.04 mg/kg		<0.04 mg/kg	<0.000004 %		<LOD
34	dibenz[a,h]anthracene	601-041-00-2	200-181-8	53-70-3		<0.04 mg/kg		<0.04 mg/kg	<0.000004 %		<LOD
35	benzo[ghi]perylene		205-883-8	191-24-2		<0.04 mg/kg		<0.04 mg/kg	<0.000004 %		<LOD
36	polychlorobiphenyls; PCB	602-039-00-4	215-648-1	1336-36-3		<0.035 mg/kg		<0.035 mg/kg	<0.0000035 %		<LOD
37	barium { barium oxide }		215-127-9	1304-28-5		32 mg/kg	1.117	32.906 mg/kg	0.00329 %	✓	
38	coronene		205-881-7	191-07-1		<0.04 mg/kg		<0.04 mg/kg	<0.000004 %		<LOD
39	benzo[j]fluoranthene	601-035-00-X	205-910-3	205-82-3		<1 mg/kg		<1 mg/kg	<0.0001 %		<LOD
								Total:	0.0339 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
CLP: Note 1	Only the metal concentration has been used for classification

Classification of sample: TP06-20/02/2019-2.00-2.40m

Non Hazardous Waste
Classified as **17 05 04**
in the List of Waste

Sample details

Sample Name:		LoW Code:	
TP06-20/02/2019-2.00-2.40m		Chapter:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Moisture content:			
9.5% (wet weight correction)		Entry:	17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 9.5% Wet Weight Moisture Correction applied (MC)

#		Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
		CLP index number	EC Number	CAS Number									
1		antimony { antimony trioxide }				2	mg/kg	1.197	2.167	mg/kg	0.000217 %	✓	
		051-005-00-X	215-175-0	1309-64-4									
2		arsenic { arsenic trioxide }				13.1	mg/kg	1.32	15.653	mg/kg	0.00157 %	✓	
		033-003-00-0	215-481-4	1327-53-3									
3		cadmium { cadmium oxide }				1.5	mg/kg	1.142	1.551	mg/kg	0.000155 %	✓	
		048-002-00-0	215-146-2	1306-19-0									
4		chromium in chromium(III) compounds { chromium(III) oxide }				28.4	mg/kg	1.462	37.565	mg/kg	0.00376 %	✓	
			215-160-9	1308-38-9									
5		chromium in chromium(VI) compounds { chromium(VI) oxide }				<0.3	mg/kg	1.923	<0.577	mg/kg	<0.0000577 %		<LOD
		024-001-00-0	215-607-8	1333-82-0									
6		copper { dicopper oxide; copper (I) oxide }				22	mg/kg	1.126	22.416	mg/kg	0.00224 %	✓	
		029-002-00-X	215-270-7	1317-39-1									
7		lead { lead chromate }			1	20	mg/kg	1.56	28.233	mg/kg	0.00181 %	✓	
		082-004-00-2	231-846-0	7758-97-6									
8		mercury { mercury dichloride }				<0.1	mg/kg	1.353	<0.135	mg/kg	<0.0000135 %		<LOD
		080-010-00-X	231-299-8	7487-94-7									
9		molybdenum { molybdenum(VI) oxide }				3	mg/kg	1.5	4.073	mg/kg	0.000407 %	✓	
		042-001-00-9	215-204-7	1313-27-5									
10		nickel { nickel chromate }				35.9	mg/kg	2.976	96.697	mg/kg	0.00967 %	✓	
		028-035-00-7	238-766-5	14721-18-7									
11		selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }				2	mg/kg	2.554	4.622	mg/kg	0.000462 %	✓	
		034-002-00-8											
12		zinc { zinc chromate }				92	mg/kg	2.774	230.975	mg/kg	0.0231 %	✓	
		024-007-00-3											
13		TPH (C6 to C40) petroleum group				<52	mg/kg		<52	mg/kg	<0.0052 %		<LOD
				TPH									
14		tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane				<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<LOD
		603-181-00-X	216-653-1	1634-04-4									

#	Determinand	CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
15	benzene	601-020-00-8	200-753-7	71-43-2		<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<LOD
16	toluene	601-021-00-3	203-625-9	108-88-3		<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<LOD
17	ethylbenzene	601-023-00-4	202-849-4	100-41-4		<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<LOD
18	xylene	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]		<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
19	pH			PH		8.52	pH		8.52	pH	8.52 pH		
20	naphthalene	601-052-00-2	202-049-5	91-20-3		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
21	acenaphthylene		205-917-1	208-96-8		<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<LOD
22	acenaphthene		201-469-6	83-32-9		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
23	fluorene		201-695-5	86-73-7		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
24	phenanthrene		201-581-5	85-01-8		<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<LOD
25	anthracene		204-371-1	120-12-7		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
26	fluoranthene		205-912-4	206-44-0		<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<LOD
27	pyrene		204-927-3	129-00-0		<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<LOD
28	benzo[a]anthracene	601-033-00-9	200-280-6	56-55-3		<0.06	mg/kg		<0.06	mg/kg	<0.000006 %		<LOD
29	chrysene	601-048-00-0	205-923-4	218-01-9		<0.02	mg/kg		<0.02	mg/kg	<0.000002 %		<LOD
30	benzo[b]fluoranthene	601-034-00-4	205-911-9	205-99-2		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
31	benzo[k]fluoranthene	601-036-00-5	205-916-6	207-08-9		<0.02	mg/kg		<0.02	mg/kg	<0.000002 %		<LOD
32	benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5	50-32-8		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
33	indeno[123-cd]pyrene		205-893-2	193-39-5		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
34	dibenz[a,h]anthracene	601-041-00-2	200-181-8	53-70-3		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
35	benzo[ghi]perylene		205-883-8	191-24-2		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
36	polychlorobiphenyls; PCB	602-039-00-4	215-648-1	1336-36-3		<0.035	mg/kg		<0.035	mg/kg	<0.0000035 %		<LOD
37	barium { barium oxide }		215-127-9	1304-28-5		70	mg/kg	1.117	70.731	mg/kg	0.00707 %	✓	
38	coronene		205-881-7	191-07-1		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
39	benzo[j]fluoranthene	601-035-00-X	205-910-3	205-82-3		<1	mg/kg		<1	mg/kg	<0.0001 %		<LOD
										Total:	0.0559 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
•	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
CLP: Note 1	Only the metal concentration has been used for classification

Classification of sample: TP03-19/02/2019-0.00-1.00m

Non Hazardous Waste
Classified as **17 05 04**
in the List of Waste

Sample details

Sample Name:		LoW Code:	
TP03-19/02/2019-0.00-1.00m		Chapter:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Moisture content:		Entry:	17 05 04 (Soil and stones other than those mentioned in 17 05 03)
9.1% (wet weight correction)			

Hazard properties

None identified

Determinands

Moisture content: 9.1% Wet Weight Moisture Correction applied (MC)

#	Determinand	CLP index number	EC Number	CAS Number	CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
1	antimony { antimony trioxide }	051-005-00-X	215-175-0	1309-64-4		<1 mg/kg	1.197	<1.197 mg/kg	<0.00012 %		<LOD
2	arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		9 mg/kg	1.32	10.802 mg/kg	0.00108 %	✓	
3	cadmium { cadmium oxide }	048-002-00-0	215-146-2	1306-19-0		0.8 mg/kg	1.142	0.831 mg/kg	0.0000831 %	✓	
4	chromium in chromium(III) compounds { chromium(III) oxide }		215-160-9	1308-38-9		29.5 mg/kg	1.462	39.192 mg/kg	0.00392 %	✓	
5	chromium in chromium(VI) compounds { chromium(VI) oxide }	024-001-00-0	215-607-8	1333-82-0		<0.3 mg/kg	1.923	<0.577 mg/kg	<0.0000577 %		<LOD
6	copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		13 mg/kg	1.126	13.305 mg/kg	0.00133 %	✓	
7	lead { lead chromate }	082-004-00-2	231-846-0	7758-97-6	1	20 mg/kg	1.56	28.357 mg/kg	0.00182 %	✓	
8	mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		<0.1 mg/kg	1.353	<0.135 mg/kg	<0.0000135 %		<LOD
9	molybdenum { molybdenum(VI) oxide }	042-001-00-9	215-204-7	1313-27-5		1.2 mg/kg	1.5	1.636 mg/kg	0.000164 %	✓	
10	nickel { nickel chromate }	028-035-00-7	238-766-5	14721-18-7		15.4 mg/kg	2.976	41.664 mg/kg	0.00417 %	✓	
11	selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }	034-002-00-8				<1 mg/kg	2.554	<2.554 mg/kg	<0.000255 %		<LOD
12	zinc { zinc chromate }	024-007-00-3				61 mg/kg	2.774	153.824 mg/kg	0.0154 %	✓	
13	TPH (C6 to C40) petroleum group			TPH		130 mg/kg		118.17 mg/kg	0.0118 %	✓	
14	tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane	603-181-00-X	216-653-1	1634-04-4		<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD

#		Determinand	CLP index number	EC Number	CAS Number	CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
15		benzene	601-020-00-8	200-753-7	71-43-2		<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD
16		toluene	601-021-00-3	203-625-9	108-88-3		<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD
17		ethylbenzene	601-023-00-4	202-849-4	100-41-4		<0.005 mg/kg		<0.005 mg/kg	<0.0000005 %		<LOD
18		xylene	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]		<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
19		pH			PH		10.65 pH		10.65 pH	10.65 pH		
20		naphthalene	601-052-00-2	202-049-5	91-20-3		<0.04 mg/kg		<0.04 mg/kg	<0.000004 %		<LOD
21		acenaphthylene		205-917-1	208-96-8		<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
22		acenaphthene		201-469-6	83-32-9		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
23		fluorene		201-695-5	86-73-7		<0.04 mg/kg		<0.04 mg/kg	<0.000004 %		<LOD
24		phenanthrene		201-581-5	85-01-8		<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
25		anthracene		204-371-1	120-12-7		<0.04 mg/kg		<0.04 mg/kg	<0.000004 %		<LOD
26		fluoranthene		205-912-4	206-44-0		<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
27		pyrene		204-927-3	129-00-0		<0.03 mg/kg		<0.03 mg/kg	<0.000003 %		<LOD
28		benzo[a]anthracene	601-033-00-9	200-280-6	56-55-3		<0.06 mg/kg		<0.06 mg/kg	<0.000006 %		<LOD
29		chrysene	601-048-00-0	205-923-4	218-01-9		<0.02 mg/kg		<0.02 mg/kg	<0.000002 %		<LOD
30		benzo[b]fluoranthene	601-034-00-4	205-911-9	205-99-2		<0.05 mg/kg		<0.05 mg/kg	<0.000005 %		<LOD
31		benzo[k]fluoranthene	601-036-00-5	205-916-6	207-08-9		<0.02 mg/kg		<0.02 mg/kg	<0.000002 %		<LOD
32		benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5	50-32-8		<0.04 mg/kg		<0.04 mg/kg	<0.000004 %		<LOD
33		indeno[123-cd]pyrene		205-893-2	193-39-5		<0.04 mg/kg		<0.04 mg/kg	<0.000004 %		<LOD
34		dibenz[a,h]anthracene	601-041-00-2	200-181-8	53-70-3		<0.04 mg/kg		<0.04 mg/kg	<0.000004 %		<LOD
35		benzo[ghi]perylene		205-883-8	191-24-2		<0.04 mg/kg		<0.04 mg/kg	<0.000004 %		<LOD
36		polychlorobiphenyls; PCB	602-039-00-4	215-648-1	1336-36-3		<0.035 mg/kg		<0.035 mg/kg	<0.0000035 %		<LOD
37		barium { barium oxide }		215-127-9	1304-28-5		43 mg/kg	1.117	43.641 mg/kg	0.00436 %	✓	
38		coronene		205-881-7	191-07-1		<0.04 mg/kg		<0.04 mg/kg	<0.000004 %		<LOD
39		benzo[j]fluoranthene	601-035-00-X	205-910-3	205-82-3		<1 mg/kg		<1 mg/kg	<0.0001 %		<LOD
									Total:	0.0447 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
CLP: Note 1	Only the metal concentration has been used for classification

Supplementary Hazardous Property Information

HP 3(i): Flammable "flammable liquid waste: liquid waste having a flash point below 60°C or waste gas oil, diesel and light heating oils having a flash point > 55°C and <= 75°C"

Force this Hazardous property to non hazardous because Solid waste without liquid phase

Hazard Statements hit:

Flam. Liq. 3; H226 "Flammable liquid and vapour."

Because of determinand:

TPH (C6 to C40) petroleum group: (conc.: 0.0118%)

Classification of sample: TP03-19/02/2019-1.00-2.00m

Non Hazardous Waste
Classified as **17 05 04**
in the List of Waste

Sample details

Sample Name:		LoW Code:	
TP03-19/02/2019-1.00-2.00m		Chapter:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Moisture content:			
10.7% (wet weight correction)		Entry:	17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 10.7% Wet Weight Moisture Correction applied (MC)

#	Determinand	CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
1	antimony { antimony trioxide }	051-005-00-X	215-175-0	1309-64-4		2	mg/kg	1.197	2.138	mg/kg	0.000214 %	✓	
2	arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		11.3	mg/kg	1.32	13.323	mg/kg	0.00133 %	✓	
3	cadmium { cadmium oxide }	048-002-00-0	215-146-2	1306-19-0		1.2	mg/kg	1.142	1.224	mg/kg	0.000122 %	✓	
4	chromium in chromium(III) compounds { chromium(III) oxide }		215-160-9	1308-38-9		53.1	mg/kg	1.462	69.304	mg/kg	0.00693 %	✓	
5	chromium in chromium(VI) compounds { chromium(VI) oxide }	024-001-00-0	215-607-8	1333-82-0		<0.3	mg/kg	1.923	<0.577	mg/kg	<0.0000577 %		<LOD
6	copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		22	mg/kg	1.126	22.119	mg/kg	0.00221 %	✓	
7	lead { lead chromate }	082-004-00-2	231-846-0	7758-97-6	1	22	mg/kg	1.56	30.644	mg/kg	0.00196 %	✓	
8	mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		<0.1	mg/kg	1.353	<0.135	mg/kg	<0.0000135 %		<LOD
9	molybdenum { molybdenum(VI) oxide }	042-001-00-9	215-204-7	1313-27-5		2.3	mg/kg	1.5	3.081	mg/kg	0.000308 %	✓	
10	nickel { nickel chromate }	028-035-00-7	238-766-5	14721-18-7		28.1	mg/kg	2.976	74.684	mg/kg	0.00747 %	✓	
11	selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }	034-002-00-8				1	mg/kg	2.554	2.28	mg/kg	0.000228 %	✓	
12	zinc { zinc chromate }	024-007-00-3				85	mg/kg	2.774	210.572	mg/kg	0.0211 %	✓	
13	TPH (C6 to C40) petroleum group			TPH		244	mg/kg		217.892	mg/kg	0.0218 %	✓	
14	tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane	603-181-00-X	216-653-1	1634-04-4		<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<LOD

#	Determinand	CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
15	benzene	601-020-00-8	200-753-7	71-43-2		<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<LOD
16	toluene	601-021-00-3	203-625-9	108-88-3		<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<LOD
17	ethylbenzene	601-023-00-4	202-849-4	100-41-4		<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<LOD
18	xylene	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]		<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
19	pH			PH		9.35	pH		9.35	pH	9.35 pH		
20	naphthalene	601-052-00-2	202-049-5	91-20-3		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
21	acenaphthylene		205-917-1	208-96-8		<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<LOD
22	acenaphthene		201-469-6	83-32-9		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
23	fluorene		201-695-5	86-73-7		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
24	phenanthrene		201-581-5	85-01-8		0.15	mg/kg		0.134	mg/kg	0.0000134 %	✓	
25	anthracene		204-371-1	120-12-7		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
26	fluoranthene		205-912-4	206-44-0		<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<LOD
27	pyrene		204-927-3	129-00-0		<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<LOD
28	benzo[a]anthracene	601-033-00-9	200-280-6	56-55-3		<0.06	mg/kg		<0.06	mg/kg	<0.000006 %		<LOD
29	chrysene	601-048-00-0	205-923-4	218-01-9		<0.02	mg/kg		<0.02	mg/kg	<0.000002 %		<LOD
30	benzo[b]fluoranthene	601-034-00-4	205-911-9	205-99-2		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
31	benzo[k]fluoranthene	601-036-00-5	205-916-6	207-08-9		<0.02	mg/kg		<0.02	mg/kg	<0.000002 %		<LOD
32	benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5	50-32-8		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
33	indeno[123-cd]pyrene		205-893-2	193-39-5		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
34	dibenz[a,h]anthracene	601-041-00-2	200-181-8	53-70-3		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
35	benzo[ghi]perylene		205-883-8	191-24-2		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
36	polychlorobiphenyls; PCB	602-039-00-4	215-648-1	1336-36-3		<0.035	mg/kg		<0.035	mg/kg	<0.0000035 %		<LOD
37	barium { barium oxide }		215-127-9	1304-28-5		59	mg/kg	1.117	58.825	mg/kg	0.00588 %	✓	
38	coronene		205-881-7	191-07-1		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
39	benzo[j]fluoranthene	601-035-00-X	205-910-3	205-82-3		<1	mg/kg		<1	mg/kg	<0.0001 %		<LOD
										Total:	0.0698 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
•	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
CLP: Note 1	Only the metal concentration has been used for classification

Supplementary Hazardous Property Information

HP 3(i): Flammable "flammable liquid waste: liquid waste having a flash point below 60°C or waste gas oil, diesel and light heating oils having a flash point > 55°C and <= 75°C"

Force this Hazardous property to non hazardous because Solid waste without liquid phase

Hazard Statements hit:

Flam. Liq. 3; H226 "Flammable liquid and vapour."

Because of determinand:

TPH (C6 to C40) petroleum group: (conc.: 0.0218%)

GROUND INVESTIGATIONS IRELAND

Classification of sample: TP03-19/02/2019-2.00-3.10m

Non Hazardous Waste
Classified as **17 05 04**
in the List of Waste

Sample details

Sample Name:
TP03-19/02/2019-2.00-3.10m
Moisture content:
10.8%
(wet weight correction)

LoW Code:
Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 10.8% Wet Weight Moisture Correction applied (MC)

#	Determinand	CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
1	antimony { antimony trioxide }	051-005-00-X	215-175-0	1309-64-4		<1	mg/kg	1.197	<1.197	mg/kg	<0.00012 %		<LOD
2	arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		9	mg/kg	1.32	10.6	mg/kg	0.00106 %	✓	
3	cadmium { cadmium oxide }	048-002-00-0	215-146-2	1306-19-0		0.4	mg/kg	1.142	0.408	mg/kg	0.0000408 %	✓	
4	chromium in chromium(III) compounds { chromium(III) oxide }		215-160-9	1308-38-9		29.3	mg/kg	1.462	38.199	mg/kg	0.00382 %	✓	
5	chromium in chromium(VI) compounds { chromium(VI) oxide }	024-001-00-0	215-607-8	1333-82-0		<0.3	mg/kg	1.923	<0.577	mg/kg	<0.0000577 %		<LOD
6	copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		12	mg/kg	1.126	12.052	mg/kg	0.00121 %	✓	
7	lead { lead chromate }	082-004-00-2	231-846-0	7758-97-6	1	17	mg/kg	1.56	23.653	mg/kg	0.00152 %	✓	
8	mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		<0.1	mg/kg	1.353	<0.135	mg/kg	<0.0000135 %		<LOD
9	molybdenum { molybdenum(VI) oxide }	042-001-00-9	215-204-7	1313-27-5		2.3	mg/kg	1.5	3.078	mg/kg	0.000308 %	✓	
10	nickel { nickel chromate }	028-035-00-7	238-766-5	14721-18-7		15.5	mg/kg	2.976	41.15	mg/kg	0.00411 %	✓	
11	selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }	034-002-00-8				<1	mg/kg	2.554	<2.554	mg/kg	<0.000255 %		<LOD
12	zinc { zinc chromate }	024-007-00-3				66	mg/kg	2.774	163.32	mg/kg	0.0163 %	✓	
13	TPH (C6 to C40) petroleum group			TPH		108	mg/kg		96.336	mg/kg	0.00963 %	✓	
14	tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane	603-181-00-X	216-653-1	1634-04-4		<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<LOD

#	Determinand	CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
15	benzene	601-020-00-8	200-753-7	71-43-2		<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<LOD
16	toluene	601-021-00-3	203-625-9	108-88-3		<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<LOD
17	ethylbenzene	601-023-00-4	202-849-4	100-41-4		<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<LOD
18	xylene	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]		<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
19	pH			PH		10.74	pH		10.74	pH	10.74 pH		
20	naphthalene	601-052-00-2	202-049-5	91-20-3		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
21	acenaphthylene		205-917-1	208-96-8		<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<LOD
22	acenaphthene		201-469-6	83-32-9		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
23	fluorene		201-695-5	86-73-7		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
24	phenanthrene		201-581-5	85-01-8		<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<LOD
25	anthracene		204-371-1	120-12-7		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
26	fluoranthene		205-912-4	206-44-0		<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<LOD
27	pyrene		204-927-3	129-00-0		<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<LOD
28	benzo[a]anthracene	601-033-00-9	200-280-6	56-55-3		<0.06	mg/kg		<0.06	mg/kg	<0.000006 %		<LOD
29	chrysene	601-048-00-0	205-923-4	218-01-9		<0.02	mg/kg		<0.02	mg/kg	<0.000002 %		<LOD
30	benzo[b]fluoranthene	601-034-00-4	205-911-9	205-99-2		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
31	benzo[k]fluoranthene	601-036-00-5	205-916-6	207-08-9		<0.02	mg/kg		<0.02	mg/kg	<0.000002 %		<LOD
32	benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5	50-32-8		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
33	indeno[123-cd]pyrene		205-893-2	193-39-5		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
34	dibenz[a,h]anthracene	601-041-00-2	200-181-8	53-70-3		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
35	benzo[ghi]perylene		205-883-8	191-24-2		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
36	polychlorobiphenyls; PCB	602-039-00-4	215-648-1	1336-36-3		<0.035	mg/kg		<0.035	mg/kg	<0.0000035 %		<LOD
37	barium { barium oxide }		215-127-9	1304-28-5		48	mg/kg	1.117	47.804	mg/kg	0.00478 %	✓	
38	coronene		205-881-7	191-07-1		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
39	benzo[j]fluoranthene	601-035-00-X	205-910-3	205-82-3		<1	mg/kg		<1	mg/kg	<0.0001 %		<LOD
										Total:	0.0434 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
●	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
CLP: Note 1	Only the metal concentration has been used for classification

Supplementary Hazardous Property Information

HP 3(i): Flammable "flammable liquid waste: liquid waste having a flash point below 60°C or waste gas oil, diesel and light heating oils having a flash point > 55°C and <= 75°C"

Force this Hazardous property to non hazardous because Solid waste without liquid phase

Hazard Statements hit:

Flam. Liq. 3; H226 "Flammable liquid and vapour."

Because of determinand:

TPH (C6 to C40) petroleum group: (conc.: 0.00963%)

Classification of sample: TP04-19/02/2019-0.45-0.90m

Non Hazardous Waste
Classified as **17 05 04**
in the List of Waste

Sample details

Sample Name:		LoW Code:	
TP04-19/02/2019-0.45-0.90m		Chapter:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Moisture content:		Entry:	17 05 04 (Soil and stones other than those mentioned in 17 05 03)
9.2% (wet weight correction)			

Hazard properties

None identified

Determinands

Moisture content: 9.2% Wet Weight Moisture Correction applied (MC)

#		Determinand / CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
1		antimony { antimony trioxide } 051-005-00-X	215-175-0	1309-64-4		1	mg/kg	1.197	1.087	mg/kg	0.000109 %	✓	
2		arsenic { arsenic trioxide } 033-003-00-0	215-481-4	1327-53-3		20.1	mg/kg	1.32	24.097	mg/kg	0.00241 %	✓	
3		cadmium { cadmium oxide } 048-002-00-0	215-146-2	1306-19-0		0.3	mg/kg	1.142	0.311	mg/kg	0.0000311 %	✓	
4		chromium in chromium(III) compounds { chromium(III) oxide }	215-160-9	1308-38-9		54.8	mg/kg	1.462	72.725	mg/kg	0.00727 %	✓	
5		chromium in chromium(VI) compounds { chromium(VI) oxide } 024-001-00-0	215-607-8	1333-82-0		<0.3	mg/kg	1.923	<0.577	mg/kg	<0.0000577 %		<LOD
6		copper { dicopper oxide; copper (I) oxide } 029-002-00-X	215-270-7	1317-39-1		20	mg/kg	1.126	20.446	mg/kg	0.00204 %	✓	
7		lead { lead chromate } 082-004-00-2	231-846-0	7758-97-6	1	10	mg/kg	1.56	14.163	mg/kg	0.000908 %	✓	
8		mercury { mercury dichloride } 080-010-00-X	231-299-8	7487-94-7		<0.1	mg/kg	1.353	<0.135	mg/kg	<0.0000135 %		<LOD
9		molybdenum { molybdenum(VI) oxide } 042-001-00-9	215-204-7	1313-27-5		2.1	mg/kg	1.5	2.861	mg/kg	0.000286 %	✓	
10		nickel { nickel chromate } 028-035-00-7	238-766-5	14721-18-7		27.9	mg/kg	2.976	75.398	mg/kg	0.00754 %	✓	
11		selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex } 034-002-00-8				1	mg/kg	2.554	2.319	mg/kg	0.000232 %	✓	
12		zinc { zinc chromate } 024-007-00-3				97	mg/kg	2.774	244.336	mg/kg	0.0244 %	✓	
13		TPH (C6 to C40) petroleum group		TPH		<52	mg/kg		<52	mg/kg	<0.0052 %		<LOD
14		tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane 603-181-00-X	216-653-1	1634-04-4		<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<LOD

#	Determinand	CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
15	benzene	601-020-00-8	200-753-7	71-43-2		<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<LOD
16	toluene	601-021-00-3	203-625-9	108-88-3		<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<LOD
17	ethylbenzene	601-023-00-4	202-849-4	100-41-4		<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<LOD
18	xylene	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]		<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
19	pH			PH		8.97	pH		8.97	pH	8.97 pH		
20	naphthalene	601-052-00-2	202-049-5	91-20-3		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
21	acenaphthylene		205-917-1	208-96-8		<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<LOD
22	acenaphthene		201-469-6	83-32-9		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
23	fluorene		201-695-5	86-73-7		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
24	phenanthrene		201-581-5	85-01-8		<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<LOD
25	anthracene		204-371-1	120-12-7		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
26	fluoranthene		205-912-4	206-44-0		<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<LOD
27	pyrene		204-927-3	129-00-0		<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<LOD
28	benzo[a]anthracene	601-033-00-9	200-280-6	56-55-3		<0.06	mg/kg		<0.06	mg/kg	<0.000006 %		<LOD
29	chrysene	601-048-00-0	205-923-4	218-01-9		<0.02	mg/kg		<0.02	mg/kg	<0.000002 %		<LOD
30	benzo[b]fluoranthene	601-034-00-4	205-911-9	205-99-2		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
31	benzo[k]fluoranthene	601-036-00-5	205-916-6	207-08-9		<0.02	mg/kg		<0.02	mg/kg	<0.000002 %		<LOD
32	benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5	50-32-8		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
33	indeno[123-cd]pyrene		205-893-2	193-39-5		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
34	dibenz[a,h]anthracene	601-041-00-2	200-181-8	53-70-3		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
35	benzo[ghi]perylene		205-883-8	191-24-2		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
36	polychlorobiphenyls; PCB	602-039-00-4	215-648-1	1336-36-3		<0.035	mg/kg		<0.035	mg/kg	<0.0000035 %		<LOD
37	barium { barium oxide }		215-127-9	1304-28-5		99	mg/kg	1.117	100.365	mg/kg	0.01 %	✓	
38	coronene		205-881-7	191-07-1		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
39	benzo[j]fluoranthene	601-035-00-X	205-910-3	205-82-3		<1	mg/kg		<1	mg/kg	<0.0001 %		<LOD
										Total:	0.0607 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
•	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
CLP: Note 1	Only the metal concentration has been used for classification

GROUND INVESTIGATIONS IRELAND

Classification of sample: TP04-19/02/2019-0.90-2.00m

Non Hazardous Waste
Classified as **17 05 04**
in the List of Waste

Sample details

Sample Name:		LoW Code:	
TP04-19/02/2019-0.90-2.00m		Chapter:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Moisture content:			
9.4% (wet weight correction)		Entry:	17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 9.4% Wet Weight Moisture Correction applied (MC)

#	Determinand / CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
1	antimony { antimony trioxide } 051-005-00-X	215-175-0	1309-64-4		2	mg/kg	1.197	2.169	mg/kg	0.000217 %	✓	
2	arsenic { arsenic trioxide } 033-003-00-0	215-481-4	1327-53-3		10.1	mg/kg	1.32	12.082	mg/kg	0.00121 %	✓	
3	cadmium { cadmium oxide } 048-002-00-0	215-146-2	1306-19-0		2.3	mg/kg	1.142	2.38	mg/kg	0.000238 %	✓	
4	chromium in chromium(III) compounds { chromium(III) oxide }	215-160-9	1308-38-9		27.8	mg/kg	1.462	36.812	mg/kg	0.00368 %	✓	
5	chromium in chromium(VI) compounds { chromium(VI) oxide } 024-001-00-0	215-607-8	1333-82-0		<0.3	mg/kg	1.923	<0.577	mg/kg	<0.0000577 %		<LOD
6	copper { dicopper oxide; copper (I) oxide } 029-002-00-X	215-270-7	1317-39-1		32	mg/kg	1.126	32.642	mg/kg	0.00326 %	✓	
7	lead { lead chromate } 082-004-00-2	231-846-0	7758-97-6	1	18	mg/kg	1.56	25.437	mg/kg	0.00163 %	✓	
8	mercury { mercury dichloride } 080-010-00-X	231-299-8	7487-94-7		<0.1	mg/kg	1.353	<0.135	mg/kg	<0.0000135 %		<LOD
9	molybdenum { molybdenum(VI) oxide } 042-001-00-9	215-204-7	1313-27-5		4	mg/kg	1.5	5.437	mg/kg	0.000544 %	✓	
10	nickel { nickel chromate } 028-035-00-7	238-766-5	14721-18-7		40.9	mg/kg	2.976	110.287	mg/kg	0.011 %	✓	
11	selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex } 034-002-00-8				2	mg/kg	2.554	4.627	mg/kg	0.000463 %	✓	
12	zinc { zinc chromate } 024-007-00-3				109	mg/kg	2.774	273.958	mg/kg	0.0274 %	✓	
13	TPH (C6 to C40) petroleum group		TPH		<52	mg/kg		<52	mg/kg	<0.0052 %		<LOD
14	tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane 603-181-00-X	216-653-1	1634-04-4		<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<LOD

#	Determinand	CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
15	benzene	601-020-00-8	200-753-7	71-43-2		<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<LOD
16	toluene	601-021-00-3	203-625-9	108-88-3		<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<LOD
17	ethylbenzene	601-023-00-4	202-849-4	100-41-4		<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<LOD
18	xylene	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]		<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
19	pH			PH		8.74	pH		8.74	pH	8.74 pH		
20	naphthalene	601-052-00-2	202-049-5	91-20-3		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
21	acenaphthylene		205-917-1	208-96-8		<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<LOD
22	acenaphthene		201-469-6	83-32-9		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
23	fluorene		201-695-5	86-73-7		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
24	phenanthrene		201-581-5	85-01-8		<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<LOD
25	anthracene		204-371-1	120-12-7		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
26	fluoranthene		205-912-4	206-44-0		<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<LOD
27	pyrene		204-927-3	129-00-0		<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<LOD
28	benzo[a]anthracene	601-033-00-9	200-280-6	56-55-3		<0.06	mg/kg		<0.06	mg/kg	<0.000006 %		<LOD
29	chrysene	601-048-00-0	205-923-4	218-01-9		<0.02	mg/kg		<0.02	mg/kg	<0.000002 %		<LOD
30	benzo[b]fluoranthene	601-034-00-4	205-911-9	205-99-2		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
31	benzo[k]fluoranthene	601-036-00-5	205-916-6	207-08-9		<0.02	mg/kg		<0.02	mg/kg	<0.000002 %		<LOD
32	benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5	50-32-8		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
33	indeno[123-cd]pyrene		205-893-2	193-39-5		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
34	dibenz[a,h]anthracene	601-041-00-2	200-181-8	53-70-3		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
35	benzo[ghi]perylene		205-883-8	191-24-2		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
36	polychlorobiphenyls; PCB	602-039-00-4	215-648-1	1336-36-3		<0.035	mg/kg		<0.035	mg/kg	<0.0000035 %		<LOD
37	barium { barium oxide }		215-127-9	1304-28-5		91	mg/kg	1.117	92.051	mg/kg	0.00921 %	✓	
38	coronene		205-881-7	191-07-1		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
39	benzo[j]fluoranthene	601-035-00-X	205-910-3	205-82-3		<1	mg/kg		<1	mg/kg	<0.0001 %		<LOD
										Total:	0.0643 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
CLP: Note 1	Only the metal concentration has been used for classification

Classification of sample: TP05-19/02/2019-0.35-1.00m

Non Hazardous Waste
Classified as **17 05 04**
in the List of Waste

Sample details

Sample Name:	LoW Code:		
TP05-19/02/2019-0.35-1.00m	Chapter:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)	
Moisture content:	Entry:	17 05 04 (Soil and stones other than those mentioned in 17 05 03)	
10.2% (wet weight correction)			

Hazard properties

None identified

Determinands

Moisture content: 10.2% Wet Weight Moisture Correction applied (MC)

#	Determinand	CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
1	antimony { antimony trioxide }	051-005-00-X	215-175-0	1309-64-4		2	mg/kg	1.197	2.15	mg/kg	0.000215 %	✓	
2	arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		11	mg/kg	1.32	13.042	mg/kg	0.0013 %	✓	
3	cadmium { cadmium oxide }	048-002-00-0	215-146-2	1306-19-0		1.6	mg/kg	1.142	1.641	mg/kg	0.000164 %	✓	
4	chromium in chromium(III) compounds { chromium(III) oxide }		215-160-9	1308-38-9		74.3	mg/kg	1.462	97.517	mg/kg	0.00975 %	✓	
5	chromium in chromium(VI) compounds { chromium(VI) oxide }	024-001-00-0	215-607-8	1333-82-0		<0.3	mg/kg	1.923	<0.577	mg/kg	<0.0000577 %		<LOD
6	copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		18	mg/kg	1.126	18.199	mg/kg	0.00182 %	✓	
7	lead { lead chromate }	082-004-00-2	231-846-0	7758-97-6	1	22	mg/kg	1.56	30.816	mg/kg	0.00198 %	✓	
8	mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		<0.1	mg/kg	1.353	<0.135	mg/kg	<0.0000135 %		<LOD
9	molybdenum { molybdenum(VI) oxide }	042-001-00-9	215-204-7	1313-27-5		4.4	mg/kg	1.5	5.928	mg/kg	0.000593 %	✓	
10	nickel { nickel chromate }	028-035-00-7	238-766-5	14721-18-7		33.4	mg/kg	2.976	89.268	mg/kg	0.00893 %	✓	
11	selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }	034-002-00-8				<1	mg/kg	2.554	<2.554	mg/kg	<0.000255 %		<LOD
12	zinc { zinc chromate }	024-007-00-3				83	mg/kg	2.774	206.768	mg/kg	0.0207 %	✓	
13	TPH (C6 to C40) petroleum group			TPH		<52	mg/kg		<52	mg/kg	<0.0052 %		<LOD
14	tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane	603-181-00-X	216-653-1	1634-04-4		<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<LOD

#	Determinand	CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
15	benzene	601-020-00-8	200-753-7	71-43-2		<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<LOD
16	toluene	601-021-00-3	203-625-9	108-88-3		<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<LOD
17	ethylbenzene	601-023-00-4	202-849-4	100-41-4		<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<LOD
18	xylene	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]		<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
19	pH			PH		8.48	pH		8.48	pH	8.48 pH		
20	naphthalene	601-052-00-2	202-049-5	91-20-3		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
21	acenaphthylene		205-917-1	208-96-8		<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<LOD
22	acenaphthene		201-469-6	83-32-9		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
23	fluorene		201-695-5	86-73-7		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
24	phenanthrene		201-581-5	85-01-8		<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<LOD
25	anthracene		204-371-1	120-12-7		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
26	fluoranthene		205-912-4	206-44-0		<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<LOD
27	pyrene		204-927-3	129-00-0		<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<LOD
28	benzo[a]anthracene	601-033-00-9	200-280-6	56-55-3		<0.06	mg/kg		<0.06	mg/kg	<0.000006 %		<LOD
29	chrysene	601-048-00-0	205-923-4	218-01-9		<0.02	mg/kg		<0.02	mg/kg	<0.000002 %		<LOD
30	benzo[b]fluoranthene	601-034-00-4	205-911-9	205-99-2		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
31	benzo[k]fluoranthene	601-036-00-5	205-916-6	207-08-9		<0.02	mg/kg		<0.02	mg/kg	<0.000002 %		<LOD
32	benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5	50-32-8		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
33	indeno[123-cd]pyrene		205-893-2	193-39-5		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
34	dibenz[a,h]anthracene	601-041-00-2	200-181-8	53-70-3		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
35	benzo[ghi]perylene		205-883-8	191-24-2		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
36	polychlorobiphenyls; PCB	602-039-00-4	215-648-1	1336-36-3		<0.035	mg/kg		<0.035	mg/kg	<0.0000035 %		<LOD
37	barium { barium oxide }		215-127-9	1304-28-5		178	mg/kg	1.117	178.467	mg/kg	0.0178 %	✓	
38	coronene		205-881-7	191-07-1		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
39	benzo[j]fluoranthene	601-035-00-X	205-910-3	205-82-3		<1	mg/kg		<1	mg/kg	<0.0001 %		<LOD
										Total:	0.069 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
CLP: Note 1	Only the metal concentration has been used for classification

GROUND INVESTIGATIONS IRELAND

HazWasteOnline™
Report created by Barry Sexton on 28 Mar 2019

Classification of sample: TP05-19/02/2019-1.00-2.00m

Non Hazardous Waste
Classified as **17 05 04**
in the List of Waste

Sample details

Sample Name:
TP05-19/02/2019-1.00-2.00m
Moisture content:
12.3%
(wet weight correction)

LoW Code:
Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 12.3% Wet Weight Moisture Correction applied (MC)

#		Determinand CLP index number / EC Number / CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
1		antimony { antimony trioxide } 051-005-00-X / 215-175-0 / 1309-64-4		2	mg/kg	1.197	2.1	mg/kg	0.00021 %	✓	
2		arsenic { arsenic trioxide } 033-003-00-0 / 215-481-4 / 1327-53-3		12.9	mg/kg	1.32	14.937	mg/kg	0.00149 %	✓	
3		cadmium { cadmium oxide } 048-002-00-0 / 215-146-2 / 1306-19-0		3.4	mg/kg	1.142	3.406	mg/kg	0.000341 %	✓	
4		chromium in chromium(III) compounds { chromium(III) oxide } 215-160-9 / 1308-38-9		26.7	mg/kg	1.462	34.224	mg/kg	0.00342 %	✓	
5		chromium in chromium(VI) compounds { chromium(VI) oxide } 024-001-00-0 / 215-607-8 / 1333-82-0		<0.3	mg/kg	1.923	<0.577	mg/kg	<0.0000577 %		<LOD
6		copper { dicopper oxide; copper (I) oxide } 029-002-00-X / 215-270-7 / 1317-39-1		30	mg/kg	1.126	29.622	mg/kg	0.00296 %	✓	
7		lead { lead chromate } 082-004-00-2 / 231-846-0 / 7758-97-6	1	20	mg/kg	1.56	27.359	mg/kg	0.00175 %	✓	
8		mercury { mercury dichloride } 080-010-00-X / 231-299-8 / 7487-94-7		<0.1	mg/kg	1.353	<0.135	mg/kg	<0.0000135 %		<LOD
9		molybdenum { molybdenum(VI) oxide } 042-001-00-9 / 215-204-7 / 1313-27-5		3.6	mg/kg	1.5	4.736	mg/kg	0.000474 %	✓	
10		nickel { nickel chromate } 028-035-00-7 / 238-766-5 / 14721-18-7		43.6	mg/kg	2.976	113.804	mg/kg	0.0114 %	✓	
11		selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex } 034-002-00-8		6	mg/kg	2.554	13.437	mg/kg	0.00134 %	✓	
12		zinc { zinc chromate } 024-007-00-3		126	mg/kg	2.774	306.549	mg/kg	0.0307 %	✓	
13		TPH (C6 to C40) petroleum group TPH		<52	mg/kg		<52	mg/kg	<0.0052 %		<LOD
14		tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane 603-181-00-X / 216-653-1 / 1634-04-4		<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<LOD

#	Determinand	CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
15	benzene	601-020-00-8	200-753-7	71-43-2		<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<LOD
16	toluene	601-021-00-3	203-625-9	108-88-3		<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<LOD
17	ethylbenzene	601-023-00-4	202-849-4	100-41-4		<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<LOD
18	xylene	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]		<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
19	pH			PH		8.68	pH		8.68	pH	8.68 pH		
20	naphthalene	601-052-00-2	202-049-5	91-20-3		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
21	acenaphthylene		205-917-1	208-96-8		<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<LOD
22	acenaphthene		201-469-6	83-32-9		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
23	fluorene		201-695-5	86-73-7		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
24	phenanthrene		201-581-5	85-01-8		<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<LOD
25	anthracene		204-371-1	120-12-7		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
26	fluoranthene		205-912-4	206-44-0		<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<LOD
27	pyrene		204-927-3	129-00-0		<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<LOD
28	benzo[a]anthracene	601-033-00-9	200-280-6	56-55-3		<0.06	mg/kg		<0.06	mg/kg	<0.000006 %		<LOD
29	chrysene	601-048-00-0	205-923-4	218-01-9		<0.02	mg/kg		<0.02	mg/kg	<0.000002 %		<LOD
30	benzo[b]fluoranthene	601-034-00-4	205-911-9	205-99-2		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
31	benzo[k]fluoranthene	601-036-00-5	205-916-6	207-08-9		<0.02	mg/kg		<0.02	mg/kg	<0.000002 %		<LOD
32	benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5	50-32-8		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
33	indeno[123-cd]pyrene		205-893-2	193-39-5		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
34	dibenz[a,h]anthracene	601-041-00-2	200-181-8	53-70-3		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
35	benzo[ghi]perylene		205-883-8	191-24-2		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
36	polychlorobiphenyls; PCB	602-039-00-4	215-648-1	1336-36-3		<0.035	mg/kg		<0.035	mg/kg	<0.0000035 %		<LOD
37	barium { barium oxide }		215-127-9	1304-28-5		99	mg/kg	1.117	96.938	mg/kg	0.00969 %	✓	
38	coronene		205-881-7	191-07-1		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
39	benzo[j]fluoranthene	601-035-00-X	205-910-3	205-82-3		<1	mg/kg		<1	mg/kg	<0.0001 %		<LOD
										Total:	0.0692 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
CLP: Note 1	Only the metal concentration has been used for classification

Classification of sample: TP05-19/02/2019-2.00-3.10m

Non Hazardous Waste
Classified as **17 05 04**
in the List of Waste

Sample details

Sample Name:
TP05-19/02/2019-2.00-3.10m
Moisture content:
8.8%
(wet weight correction)

LoW Code:
Chapter: 17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Entry: 17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 8.8% Wet Weight Moisture Correction applied (MC)

#		Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
		CLP index number	EC Number	CAS Number									
1		antimony { antimony trioxide }				2	mg/kg	1.197	2.184	mg/kg	0.000218 %	✓	
		051-005-00-X	215-175-0	1309-64-4									
2		arsenic { arsenic trioxide }				9.2	mg/kg	1.32	11.078	mg/kg	0.00111 %	✓	
		033-003-00-0	215-481-4	1327-53-3									
3		cadmium { cadmium oxide }				1.5	mg/kg	1.142	1.563	mg/kg	0.000156 %	✓	
		048-002-00-0	215-146-2	1306-19-0									
4		chromium in chromium(III) compounds { chromium(III) oxide }				43.1	mg/kg	1.462	57.45	mg/kg	0.00574 %	✓	
			215-160-9	1308-38-9									
5		chromium in chromium(VI) compounds { chromium(VI) oxide }				<0.3	mg/kg	1.923	<0.577	mg/kg	<0.0000577 %		<LOD
		024-001-00-0	215-607-8	1333-82-0									
6		copper { dicopper oxide; copper (I) oxide }				26	mg/kg	1.126	26.697	mg/kg	0.00267 %	✓	
		029-002-00-X	215-270-7	1317-39-1									
7		lead { lead chromate }			1	19	mg/kg	1.56	27.028	mg/kg	0.00173 %	✓	
		082-004-00-2	231-846-0	7758-97-6									
8		mercury { mercury dichloride }				<0.1	mg/kg	1.353	<0.135	mg/kg	<0.0000135 %		<LOD
		080-010-00-X	231-299-8	7487-94-7									
9		molybdenum { molybdenum(VI) oxide }				3.8	mg/kg	1.5	5.199	mg/kg	0.00052 %	✓	
		042-001-00-9	215-204-7	1313-27-5									
10		nickel { nickel chromate }				37	mg/kg	2.976	100.431	mg/kg	0.01 %	✓	
		028-035-00-7	238-766-5	14721-18-7									
11		selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }				3	mg/kg	2.554	6.987	mg/kg	0.000699 %	✓	
		034-002-00-8											
12		zinc { zinc chromate }				85	mg/kg	2.774	215.052	mg/kg	0.0215 %	✓	
		024-007-00-3											
13		TPH (C6 to C40) petroleum group				<52	mg/kg		<52	mg/kg	<0.0052 %		<LOD
				TPH									
14		tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane				<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<LOD
		603-181-00-X	216-653-1	1634-04-4									

#	Determinand	CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
15	benzene	601-020-00-8	200-753-7	71-43-2		<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<LOD
16	toluene	601-021-00-3	203-625-9	108-88-3		<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<LOD
17	ethylbenzene	601-023-00-4	202-849-4	100-41-4		<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<LOD
18	xylene	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]		<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
19	pH			PH		8.43	pH		8.43	pH	8.43 pH		
20	naphthalene	601-052-00-2	202-049-5	91-20-3		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
21	acenaphthylene		205-917-1	208-96-8		<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<LOD
22	acenaphthene		201-469-6	83-32-9		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
23	fluorene		201-695-5	86-73-7		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
24	phenanthrene		201-581-5	85-01-8		<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<LOD
25	anthracene		204-371-1	120-12-7		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
26	fluoranthene		205-912-4	206-44-0		<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<LOD
27	pyrene		204-927-3	129-00-0		<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<LOD
28	benzo[a]anthracene	601-033-00-9	200-280-6	56-55-3		<0.06	mg/kg		<0.06	mg/kg	<0.000006 %		<LOD
29	chrysene	601-048-00-0	205-923-4	218-01-9		<0.02	mg/kg		<0.02	mg/kg	<0.000002 %		<LOD
30	benzo[b]fluoranthene	601-034-00-4	205-911-9	205-99-2		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
31	benzo[k]fluoranthene	601-036-00-5	205-916-6	207-08-9		<0.02	mg/kg		<0.02	mg/kg	<0.000002 %		<LOD
32	benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5	50-32-8		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
33	indeno[123-cd]pyrene		205-893-2	193-39-5		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
34	dibenz[a,h]anthracene	601-041-00-2	200-181-8	53-70-3		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
35	benzo[ghi]perylene		205-883-8	191-24-2		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
36	polychlorobiphenyls; PCB	602-039-00-4	215-648-1	1336-36-3		<0.035	mg/kg		<0.035	mg/kg	<0.0000035 %		<LOD
37	barium { barium oxide }		215-127-9	1304-28-5		71	mg/kg	1.117	72.296	mg/kg	0.00723 %	✓	
38	coronene		205-881-7	191-07-1		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
39	benzo[j]fluoranthene	601-035-00-X	205-910-3	205-82-3		<1	mg/kg		<1	mg/kg	<0.0001 %		<LOD
										Total:	0.0571 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
●	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
CLP: Note 1	Only the metal concentration has been used for classification

Classification of sample: SA02-20/02/2019-0.50-1.00m

Non Hazardous Waste
Classified as **17 05 04**
in the List of Waste

Sample details

Sample Name:		LoW Code:	
SA02-20/02/2019-0.50-1.00m		Chapter:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Moisture content:			
16.3% (wet weight correction)		Entry:	17 05 04 (Soil and stones other than those mentioned in 17 05 03)

Hazard properties

None identified

Determinands

Moisture content: 16.3% Wet Weight Moisture Correction applied (MC)

#	Determinand	CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
1	antimony { antimony trioxide }	051-005-00-X	215-175-0	1309-64-4		3	mg/kg	1.197	3.006	mg/kg	0.000301 %	✓	
2	arsenic { arsenic trioxide }	033-003-00-0	215-481-4	1327-53-3		21.3	mg/kg	1.32	23.539	mg/kg	0.00235 %	✓	
3	cadmium { cadmium oxide }	048-002-00-0	215-146-2	1306-19-0		3.5	mg/kg	1.142	3.346	mg/kg	0.000335 %	✓	
4	chromium in chromium(III) compounds { chromium(III) oxide }		215-160-9	1308-38-9		53.2	mg/kg	1.462	65.081	mg/kg	0.00651 %	✓	
5	chromium in chromium(VI) compounds { chromium(VI) oxide }	024-001-00-0	215-607-8	1333-82-0		<0.3	mg/kg	1.923	<0.577	mg/kg	<0.0000577 %		<LOD
6	copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		29	mg/kg	1.126	27.329	mg/kg	0.00273 %	✓	
7	lead { lead chromate }	082-004-00-2	231-846-0	7758-97-6	1	34	mg/kg	1.56	44.389	mg/kg	0.00285 %	✓	
8	mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		<0.1	mg/kg	1.353	<0.135	mg/kg	<0.0000135 %		<LOD
9	molybdenum { molybdenum(VI) oxide }	042-001-00-9	215-204-7	1313-27-5		3.6	mg/kg	1.5	4.52	mg/kg	0.000452 %	✓	
10	nickel { nickel chromate }	028-035-00-7	238-766-5	14721-18-7		70.8	mg/kg	2.976	176.372	mg/kg	0.0176 %	✓	
11	selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }	034-002-00-8				2	mg/kg	2.554	4.275	mg/kg	0.000427 %	✓	
12	zinc { zinc chromate }	024-007-00-3				164	mg/kg	2.774	380.802	mg/kg	0.0381 %	✓	
13	TPH (C6 to C40) petroleum group			TPH		<52	mg/kg		<52	mg/kg	<0.0052 %		<LOD
14	tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane	603-181-00-X	216-653-1	1634-04-4		<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<LOD

#	Determinand	CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
15	benzene	601-020-00-8	200-753-7	71-43-2		<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<LOD
16	toluene	601-021-00-3	203-625-9	108-88-3		<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<LOD
17	ethylbenzene	601-023-00-4	202-849-4	100-41-4		<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<LOD
18	xylene	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]		<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
19	pH			PH		8.28	pH		8.28	pH	8.28 pH		
20	naphthalene	601-052-00-2	202-049-5	91-20-3		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
21	acenaphthylene		205-917-1	208-96-8		<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<LOD
22	acenaphthene		201-469-6	83-32-9		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
23	fluorene		201-695-5	86-73-7		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
24	phenanthrene		201-581-5	85-01-8		<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<LOD
25	anthracene		204-371-1	120-12-7		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
26	fluoranthene		205-912-4	206-44-0		<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<LOD
27	pyrene		204-927-3	129-00-0		<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<LOD
28	benzo[a]anthracene	601-033-00-9	200-280-6	56-55-3		<0.06	mg/kg		<0.06	mg/kg	<0.000006 %		<LOD
29	chrysene	601-048-00-0	205-923-4	218-01-9		<0.02	mg/kg		<0.02	mg/kg	<0.000002 %		<LOD
30	benzo[b]fluoranthene	601-034-00-4	205-911-9	205-99-2		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
31	benzo[k]fluoranthene	601-036-00-5	205-916-6	207-08-9		<0.02	mg/kg		<0.02	mg/kg	<0.000002 %		<LOD
32	benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5	50-32-8		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
33	indeno[123-cd]pyrene		205-893-2	193-39-5		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
34	dibenz[a,h]anthracene	601-041-00-2	200-181-8	53-70-3		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
35	benzo[ghi]perylene		205-883-8	191-24-2		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
36	polychlorobiphenyls; PCB	602-039-00-4	215-648-1	1336-36-3		<0.035	mg/kg		<0.035	mg/kg	<0.0000035 %		<LOD
37	barium { barium oxide }		215-127-9	1304-28-5		230	mg/kg	1.117	214.939	mg/kg	0.0215 %	✓	
38	coronene		205-881-7	191-07-1		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
39	benzo[j]fluoranthene	601-035-00-X	205-910-3	205-82-3		<1	mg/kg		<1	mg/kg	<0.0001 %		<LOD
										Total:	0.0986 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
CLP: Note 1	Only the metal concentration has been used for classification

Classification of sample: SA02-20/02/2019-1.00-1.80m

Non Hazardous Waste
Classified as **17 05 04**
in the List of Waste

Sample details

Sample Name:	LoW Code:	
SA02-20/02/2019-1.00-1.80m	Chapter:	17: Construction and Demolition Wastes (including excavated soil from contaminated sites)
Moisture content:	Entry:	17 05 04 (Soil and stones other than those mentioned in 17 05 03)
10.9% (wet weight correction)		

Hazard properties

None identified

Determinands

Moisture content: 10.9% Wet Weight Moisture Correction applied (MC)

#	Determinand / CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
1	antimony { antimony trioxide } 051-005-00-X	215-175-0	1309-64-4		1	mg/kg	1.197	1.067	mg/kg	0.000107 %	✓	
2	arsenic { arsenic trioxide } 033-003-00-0	215-481-4	1327-53-3		4.6	mg/kg	1.32	5.411	mg/kg	0.000541 %	✓	
3	cadmium { cadmium oxide } 048-002-00-0	215-146-2	1306-19-0		1.6	mg/kg	1.142	1.629	mg/kg	0.000163 %	✓	
4	chromium in chromium(III) compounds { chromium(III) oxide }	215-160-9	1308-38-9		29	mg/kg	1.462	37.765	mg/kg	0.00378 %	✓	
5	chromium in chromium(VI) compounds { chromium(VI) oxide } 024-001-00-0	215-607-8	1333-82-0		<0.3	mg/kg	1.923	<0.577	mg/kg	<0.0000577 %		<LOD
6	copper { dicopper oxide; copper (I) oxide } 029-002-00-X	215-270-7	1317-39-1		17	mg/kg	1.126	17.054	mg/kg	0.00171 %	✓	
7	lead { lead chromate } 082-004-00-2	231-846-0	7758-97-6	1	11	mg/kg	1.56	15.288	mg/kg	0.00098 %	✓	
8	mercury { mercury dichloride } 080-010-00-X	231-299-8	7487-94-7		<0.1	mg/kg	1.353	<0.135	mg/kg	<0.0000135 %		<LOD
9	molybdenum { molybdenum(VI) oxide } 042-001-00-9	215-204-7	1313-27-5		2.2	mg/kg	1.5	2.941	mg/kg	0.000294 %	✓	
10	nickel { nickel chromate } 028-035-00-7	238-766-5	14721-18-7		20.4	mg/kg	2.976	54.098	mg/kg	0.00541 %	✓	
11	selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex } 034-002-00-8				<1	mg/kg	2.554	<2.554	mg/kg	<0.000255 %		<LOD
12	zinc { zinc chromate } 024-007-00-3				55	mg/kg	2.774	135.947	mg/kg	0.0136 %	✓	
13	TPH (C6 to C40) petroleum group		TPH		<52	mg/kg		<52	mg/kg	<0.0052 %		<LOD
14	tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane 603-181-00-X	216-653-1	1634-04-4		<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<LOD

#	Determinand	CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
15	benzene	601-020-00-8	200-753-7	71-43-2		<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<LOD
16	toluene	601-021-00-3	203-625-9	108-88-3		<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<LOD
17	ethylbenzene	601-023-00-4	202-849-4	100-41-4		<0.005	mg/kg		<0.005	mg/kg	<0.0000005 %		<LOD
18	xylene	601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]		<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
19	pH			PH		8.67	pH		8.67	pH	8.67 pH		
20	naphthalene	601-052-00-2	202-049-5	91-20-3		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
21	acenaphthylene		205-917-1	208-96-8		<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<LOD
22	acenaphthene		201-469-6	83-32-9		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
23	fluorene		201-695-5	86-73-7		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
24	phenanthrene		201-581-5	85-01-8		<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<LOD
25	anthracene		204-371-1	120-12-7		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
26	fluoranthene		205-912-4	206-44-0		<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<LOD
27	pyrene		204-927-3	129-00-0		<0.03	mg/kg		<0.03	mg/kg	<0.000003 %		<LOD
28	benzo[a]anthracene	601-033-00-9	200-280-6	56-55-3		<0.06	mg/kg		<0.06	mg/kg	<0.000006 %		<LOD
29	chrysene	601-048-00-0	205-923-4	218-01-9		<0.02	mg/kg		<0.02	mg/kg	<0.000002 %		<LOD
30	benzo[b]fluoranthene	601-034-00-4	205-911-9	205-99-2		<0.05	mg/kg		<0.05	mg/kg	<0.000005 %		<LOD
31	benzo[k]fluoranthene	601-036-00-5	205-916-6	207-08-9		<0.02	mg/kg		<0.02	mg/kg	<0.000002 %		<LOD
32	benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5	50-32-8		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
33	indeno[123-cd]pyrene		205-893-2	193-39-5		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
34	dibenz[a,h]anthracene	601-041-00-2	200-181-8	53-70-3		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
35	benzo[ghi]perylene		205-883-8	191-24-2		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
36	polychlorobiphenyls; PCB	602-039-00-4	215-648-1	1336-36-3		<0.035	mg/kg		<0.035	mg/kg	<0.0000035 %		<LOD
37	barium { barium oxide }		215-127-9	1304-28-5		42	mg/kg	1.117	41.782	mg/kg	0.00418 %	✓	
38	coronene		205-881-7	191-07-1		<0.04	mg/kg		<0.04	mg/kg	<0.000004 %		<LOD
39	benzo[j]fluoranthene	601-035-00-X	205-910-3	205-82-3		<1	mg/kg		<1	mg/kg	<0.0001 %		<LOD
										Total:	0.0364 %		

Key

	User supplied data
	Determinand values ignored for classification, see column 'Conc. Not Used' for reason
	Determinand defined or amended by HazWasteOnline (see Appendix A)
	Speciated Deteminand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
CLP: Note 1	Only the metal concentration has been used for classification

Appendix A: Classifier defined and non CLP determinands

chromium(III) oxide (EC Number: 215-160-9, CAS Number: 1308-38-9)

Conversion factor: 1.462
Description/Comments: Data from C&L Inventory Database
Data source: http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database
Data source date: 17 Jul 2015
Hazard Statements: Aquatic Chronic 1 H410 , Aquatic Acute 1 H400 , Repr. 1B H360FD , Skin Sens. 1 H317 , Resp. Sens. 1 H334 , Skin Irrit. 2 H315 , STOT SE 3 H335 , Eye Irrit. 2 H319 , Acute Tox. 4 H302 , Acute Tox. 4 H332

TPH (C6 to C40) petroleum group (CAS Number: TPH)

Description/Comments: Hazard statements taken from WM3 1st Edition 2015; Risk phrases: WM2 3rd Edition 2013
Data source: WM3 1st Edition 2015
Data source date: 25 May 2015
Hazard Statements: Aquatic Chronic 2 H411 , Repr. 2 H361d , Carc. 1B H350 , Muta. 1B H340 , STOT RE 2 H373 , Asp. Tox. 1 H304 , Flam. Liq. 3 H226

ethylbenzene (EC Number: 202-849-4, CAS Number: 100-41-4)

CLP index number: 601-023-00-4
Description/Comments:
Data source: Commission Regulation (EU) No 605/2014 – 6th Adaptation to Technical Progress for Regulation (EC) No 1272/2008. (ATP6)
Additional Hazard Statement(s): Carc. 2 H351
Reason for additional Hazards Statement(s)/Risk Phrase(s):
03 Jun 2015 - Carc. 2 H351 hazard statement sourced from: IARC Group 2B (77) 2000

pH (CAS Number: PH)

Description/Comments: Appendix C4
Data source: WM3 1st Edition 2015
Data source date: 25 May 2015
Hazard Statements: None.

acenaphthylene (EC Number: 205-917-1, CAS Number: 208-96-8)

Description/Comments: Data from C&L Inventory Database
Data source: http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database
Data source date: 17 Jul 2015
Hazard Statements: Skin Irrit. 2 H315 , STOT SE 3 H335 , Eye Irrit. 2 H319 , Acute Tox. 1 H310 , Acute Tox. 1 H330 , Acute Tox. 4 H302

acenaphthene (EC Number: 201-469-6, CAS Number: 83-32-9)

Description/Comments: Data from C&L Inventory Database
Data source: http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database
Data source date: 17 Jul 2015
Hazard Statements: Aquatic Chronic 2 H411 , Aquatic Chronic 1 H410 , Aquatic Acute 1 H400 , Skin Irrit. 2 H315 , STOT SE 3 H335 , Eye Irrit. 2 H319

fluorene (EC Number: 201-695-5, CAS Number: 86-73-7)

Description/Comments: Data from C&L Inventory Database
Data source: http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database
Data source date: 06 Aug 2015
Hazard Statements: Aquatic Chronic 1 H410 , Aquatic Acute 1 H400

phenanthrene (EC Number: 201-581-5, CAS Number: 85-01-8)

Description/Comments: Data from C&L Inventory Database
Data source: http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database
Data source date: 06 Aug 2015
Hazard Statements: Skin Irrit. 2 H315 , Aquatic Chronic 1 H410 , Aquatic Acute 1 H400 , Skin Sens. 1 H317 , Carc. 2 H351 , STOT SE 3 H335 , Eye Irrit. 2 H319 , Acute Tox. 4 H302

anthracene (EC Number: 204-371-1, CAS Number: 120-12-7)

Description/Comments: Data from C&L Inventory Database
Data source: http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database
Data source date: 17 Jul 2015
Hazard Statements: Aquatic Chronic 1 H410 , Aquatic Acute 1 H400 , Skin Sens. 1 H317 , Skin Irrit. 2 H315 , STOT SE 3 H335 , Eye Irrit. 2 H319

fluoranthene (EC Number: 205-912-4, CAS Number: 206-44-0)

Description/Comments: Data from C&L Inventory Database
Data source: http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database
Data source date: 21 Aug 2015
Hazard Statements: Aquatic Chronic 1 H410 , Aquatic Acute 1 H400 , Acute Tox. 4 H302

pyrene (EC Number: 204-927-3, CAS Number: 129-00-0)

Description/Comments: Data from C&L Inventory Database; SDS Sigma Aldrich 2014
Data source: http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database
Data source date: 21 Aug 2015
Hazard Statements: Aquatic Chronic 1 H410 , Aquatic Acute 1 H400 , STOT SE 3 H335 , Eye Irrit. 2 H319 , Skin Irrit. 2 H315

indeno[123-cd]pyrene (EC Number: 205-893-2, CAS Number: 193-39-5)

Description/Comments: Data from C&L Inventory Database
Data source: http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database
Data source date: 06 Aug 2015
Hazard Statements: Carc. 2 H351

benzo[ghi]perylene (EC Number: 205-883-8, CAS Number: 191-24-2)

Description/Comments: Data from C&L Inventory Database; SDS Sigma Aldrich 28/02/2015
Data source: http://echa.europa.eu/web/guest/information-on-chemicals/cl-inventory-database
Data source date: 23 Jul 2015
Hazard Statements: Aquatic Chronic 1 H410 , Aquatic Acute 1 H400

polychlorobiphenyls; PCB (EC Number: 215-648-1, CAS Number: 1336-36-3)

CLP index number: 602-039-00-4
Description/Comments: Worst Case: IARC considers PCB Group 1; Carcinogenic to humans; POP specific threshold from ATP1 (Regulation 756/2010/EU) to POPs Regulation (Regulation 850/2004/EC). Where applicable, the calculation method laid down in European standards EN 12766-1 and EN 12766-2 shall be applied.
Data source: Regulation 1272/2008/EC - Classification, labelling and packaging of substances and mixtures. (CLP)
Additional Hazard Statement(s): Carc. 1A H350
Reason for additional Hazards Statement(s)/Risk Phrase(s):
29 Sep 2015 - Carc. 1A H350 hazard statement sourced from: IARC Group 1 (23, Sup 7, 100C) 2012

barium oxide (EC Number: 215-127-9, CAS Number: 1304-28-5)

Conversion factor: 1.117
Description/Comments: Data from C&L Inventory Database; No entries in Registered Substances Database, IARC or Pesticide Properties Database
Data source:
http://clp-inventory.echa.europa.eu/SummaryOfClassAndLabelling.aspx?SubstanceID=88825&HarmOnly=no?fc=true&lang=en
Data source date: 02 Jun 2014
Hazard Statements: Skin Irrit. 2 H315 , STOT SE 3 H335 , Eye Irrit. 2 H319 , Skin Corr. 1A H314 , Acute Tox. 3 H301 , Acute Tox. 4 H302 , Acute Tox. 4 H332

coronene (EC Number: 205-881-7, CAS Number: 191-07-1)

Description/Comments: Data from C&L Inventory Database; no entries in Registered Substances or Pesticides Properties databases; SDS: Sigma Aldrich, 1907/2006 compliant, dated 2012 - no entries; IARC – Group 3, not carcinogenic.
Data source:
http://clp-inventory.echa.europa.eu/SummaryOfClassAndLabelling.aspx?SubstanceID=17010&HarmOnly=no?fc=true&lang=en
Data source date: 16 Jun 2014
Hazard Statements: STOT SE 2 H371

Appendix B: Rationale for selection of metal species

antimony {antimony trioxide}

Worst case CLP species based on hazard statements/molecular weight and low solubility. Industrial sources include: flame retardants in electrical apparatus, textiles and coatings (edit as required)

arsenic {arsenic trioxide}

Reasonable case CLP species based on hazard statements/molecular weight and most common (stable) oxide of arsenic. Industrial sources include: smelting; main precursor to other arsenic compounds (edit as required)

cadmium {cadmium oxide}

Reasonable case CLP species based on hazard statements/molecular weight, very low solubility in water. Industrial sources include: electroplating baths, electrodes for storage batteries, catalysts, ceramic glazes, phosphors, pigments and nematocides. (edit as required) Worst case compounds in CLP: cadmium sulphate, chloride, fluoride & iodide not expected as either very soluble and/or compound's industrial usage not related to site history (edit as required)

chromium in chromium(III) compounds {chromium(III) oxide}

Reasonable case species based on hazard statements/molecular weight. Industrial sources include: tanning, pigment in paint, inks and glass (edit as required)

chromium in chromium(VI) compounds {chromium(VI) oxide}

Worst case CLP species based on hazard statements/molecular weight. Industrial sources include: production stainless steel, electroplating, wood preservation, anti-corrosion agents or coatings, pigments (edit as required)

copper {dicopper oxide; copper (I) oxide}

Reasonable case CLP species based on hazard statements/molecular weight and insolubility in water. Industrial sources include: oxidised copper metal, brake pads, pigments, antifouling paints, fungicide. (edit as required) Worse case copper sulphate is very soluble and likely to have been leached away if ever present and/or not enough soluble sulphate detected. (edit as required)

lead {lead chromate}

Worst case CLP species based on hazard statements/molecular weight (edit as required)

mercury {mercury dichloride}

Worst case CLP species based on hazard statements/molecular weight (edit as required)

molybdenum {molybdenum(VI) oxide}

Worst case CLP species based on hazard statements/molecular weight (edit as required)

nickel {nickel chromate}

Worst case CLP species based on hazard statements/molecular weight (edit as required)

selenium {selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex}

Harmonised group entry used as most reasonable case. Pigment cadmium sulphoselenide not likely to be present in this soil. No evidence for the other CLP entries: sodium selenite, nickel II selenite and nickel selenide, to be present in this soil. (edit as required)

zinc {zinc chromate}

Worst case CLP species based on hazard statements/molecular weight (edit as required)

barium {barium oxide}

Cr VI not detected

Appendix C: Version

HazWasteOnline Classification Engine: WM3 1st Edition v1.1, May 2018
HazWasteOnline Classification Engine Version: 2019.71.3826.7799 (14 Mar 2019)
HazWasteOnline Database: 2019.71.3826.7799 (14 Mar 2019)

This classification utilises the following guidance and legislation:
WM3 v1.1 - Waste Classification - 1st Edition v1.1 - May 2018
CLP Regulation - Regulation 1272/2008/EC of 16 December 2008
1st ATP - Regulation 790/2009/EC of 10 August 2009
2nd ATP - Regulation 286/2011/EC of 10 March 2011
3rd ATP - Regulation 618/2012/EU of 10 July 2012
4th ATP - Regulation 487/2013/EU of 8 May 2013
Correction to 1st ATP - Regulation 758/2013/EU of 7 August 2013
5th ATP - Regulation 944/2013/EU of 2 October 2013
6th ATP - Regulation 605/2014/EU of 5 June 2014
WFD Annex III replacement - Regulation 1357/2014/EU of 18 December 2014
Revised List of Wastes 2014 - Decision 2014/955/EU of 18 December 2014
7th ATP - Regulation 2015/1221/EU of 24 July 2015
8th ATP - Regulation (EU) 2016/918 of 19 May 2016
9th ATP - Regulation (EU) 2016/1179 of 19 July 2016
10th ATP - Regulation (EU) 2017/776 of 4 May 2017
HP14 amendment - Regulation (EU) 2017/997 of 8 June 2017
13th ATP - Regulation (EU) 2018/1480 of 4 October 2018
POPs Regulation 2004 - Regulation 850/2004/EC of 29 April 2004
1st ATP to POPs Regulation - Regulation 756/2010/EU of 24 August 2010
2nd ATP to POPs Regulation - Regulation 757/2010/EU of 24 August 2010

APPENDIX 6 – Waste Acceptance Criteria Data

WAC Data - Sandyford Central, February 2019

Sample ID	TP01	TP02	TP02	TP03	TP03	TP03	TP04	TP04	Inert	Stable Non-reactive	Hazardous	LOD LOR	Units
Sample Depth (m)	**0.60-1.60**	**0.60-1.00**	**1.00-2.10**	**0.00-1.00**	**1.00-2.00**	**2.00-3.10**	**0.45-0.90**	**0.90-2.00**					
Total Organic Carbon *	0.36	0.22	0.15	0.34	0.34	0.20	0.26	0.51	3	5	6	<0.02	%
Sum of BTEX	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	6	-	-	<0.025	mg/kg
Sum of 7 PCBs	<0.035	<0.035	<0.035	<0.035	<0.035	<0.035	<0.035	<0.035	1	-	-	<0.035	mg/kg
Mineral Oil	<30	<30	<30	130	164	74	<30	<30	500	-	-	<30	mg/kg
PAH Sum of 6	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	-	-	-	<0.22	mg/kg
PAH Sum of 17	<0.64	<0.64	<0.64	<0.64	<0.64	<0.64	<0.64	<0.64	100	-	-	<0.64	mg/kg
Arsenic	<0.025	<0.025	<0.025	0.044	0.035	0.051	0.040	<0.025	0.5	2	25	<0.025	mg/kg
Barium	0.05	0.06	0.08	0.04	0.10	0.07	<0.03	<0.03	20	100	300	<0.03	mg/kg
Cadmium	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.04	1	5	<0.005	mg/kg
Chromium	<0.015	<0.015	<0.015	<0.015	0.020	0.034	<0.015	<0.015	0.5	10	70	<0.015	mg/kg
Copper	<0.07	<0.07	<0.07	<0.07	<0.07	<0.07	<0.07	<0.07	2	50	100	<0.07	mg/kg
Mercury	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	0.01	0.2	2	<0.0001	mg/kg
Molybdenum	0.06	0.02	<0.02	<0.02	0.06	0.03	0.05	0.06	0.5	10	30	<0.02	mg/kg
Nickel	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.4	10	40	<0.02	mg/kg
Lead	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.5	10	50	<0.05	mg/kg
Antimony	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.06	0.7	5	<0.02	mg/kg
Selenium	<0.03	<0.03	<0.03	<0.03	0.06	<0.03	<0.03	0.69	0.1	0.5	7	<0.03	mg/kg
Zinc	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	4	50	200	<0.03	mg/kg
Total Dissolved Solids**	920	860	1000	1530	2199	1579	1060	720	4000	60000	100000	<350	mg/kg
Dissolved Organic Carbon	<20	<20	<20	<20	<20	<20	<20	30	500	800	1000	<20	mg/kg
Phenol	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	1	-	-	<0.1	mg/kg
Sulphate as SO4**	52	185	106	366	697	443	117	48	1000	20000	50000	<0.5	mg/kg
Chloride**	4	<3	<3	<3	5	<3	<3	3	800	15000	25000	<3	mg/kg
Asbestos	NAD	NAD	NAD	NAD	NAD	NAD	NAD	NAD	-	-	-	<0.001	%
Asbestos Type	NAD	NAD	NAD	NAD	NAD	NAD	NAD	NAD	-	-	-	-	%

NAD- no asbestos detected

* In the case of soils, a higher limit value maybe admitted by the competent authority, provided the DOC value of 500 mg/kg isachieved at L/S = 10 l/kg, either at the soil's own pH or at a pH value between 7,5 and 8,0

** The values for total dissolved solids (TDS) can be used alternatively to the values for sulphate and chloride

WAC Data - Sandyford Central, February 2019

Sample ID	TP05	TP05	TP05	TP06	TP06	TP06	SA02	SA02	Inert	Stable Non-reactive	Hazardous	LOD LOR	Units
Sample Depth (m)	**0.35-1.00**	**1.00-2.00**	**2.00-3.10**	**0.80-1.00**	**1.00-2.00**	**2.00-2.40**	**0.50-1.00**	**1.00-1.80**					
Total Organic Carbon *	0.33	0.75	0.60	0.40	0.66	0.44	0.31	0.43	3	5	6	<0.02	%
Sum of BTEX	<0.025	<0.025	<0.025	<0.025	<0.025[SV]	<0.025	<0.025	<0.025	6	-	-	<0.025	mg/kg
Sum of 7 PCBs	<0.035	<0.035	<0.035	<0.035	<0.035	<0.035	<0.035	<0.035	1	-	-	<0.035	mg/kg
Mineral Oil	<30	<30	<30	<30	<30	<30	<30	<30	500	-	-	<30	mg/kg
PAH Sum of 6	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	-	-	-	<0.22	mg/kg
PAH Sum of 17	<0.64	<0.64	<0.64	<0.64	<0.64	<0.64	<0.64	<0.64	100	-	-	<0.64	mg/kg
Arsenic	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	0.5	2	25	<0.025	mg/kg
Barium	1.37	0.52	0.55	0.06	0.55	0.45	0.06	0.05	20	100	300	<0.03	mg/kg
Cadmium	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.04	1	5	<0.005	mg/kg
Chromium	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	0.5	10	70	<0.015	mg/kg
Copper	<0.07	<0.07	<0.07	<0.07	<0.07	<0.07	<0.07	<0.07	2	50	100	<0.07	mg/kg
Mercury	<0.0001	<0.0001	0.0008	<0.0001	0.0011	0.0006	<0.0001	<0.0001	0.01	0.2	2	<0.0001	mg/kg
Molybdenum	0.12	0.25	0.14	0.07	0.19	0.15	0.06	0.18	0.5	10	30	<0.02	mg/kg
Nickel	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.4	10	40	<0.02	mg/kg
Lead	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.5	10	50	<0.05	mg/kg
Antimony	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.06	0.7	5	<0.02	mg/kg
Selenium	<0.03	<0.03	0.24	<0.03	0.29	0.19	<0.03	<0.03	0.1	0.5	7	<0.03	mg/kg
Zinc	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	4	50	200	<0.03	mg/kg
Total Dissolved Solids**	1739	660	1299	580	1060	850	880	1480	4000	60000	100000	<350	mg/kg
Dissolved Organic Carbon	30	<20	<20	<20	<20	<20	<20	<20	500	800	1000	<20	mg/kg
Phenol	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	1	-	-	<0.1	mg/kg
Sulphate as SO4**	162	<5	231	12	264	184	18	32	1000	20000	50000	<0.5	mg/kg
Chloride**	<3	<3	85	<3	98	64	4	4	800	15000	25000	<3	mg/kg
Asbestos	NAD	NAD	NAD	NAD	NAD	NAD	NAD	NAD	-	-	-	<0.001	%
Asbestos Type	NAD	NAD	NAD	NAD	NAD	NAD	NAD	NAD	-	-	-	-	%

NAD- no asbestos detected

* In the case of soils, a higher limit value maybe admitted by the competent authority, provided the DOC value of 500 mg/kg isachieved at L/S = 10 l/kg, either at the soil's own pH or at a pH value between 7,5 and 8,0

** The values for total dissolved solids (TDS) can be used alternatively to the values for sulphate and chloride

WAC Data - Sandyford Central, June 2019

Sample ID	TP101	TP101	TP101	TP102	TP102	Inert	Stable Non-reactive	Hazardous	LOD LOR	Units
Sample Depth (m)	**0.20-1.00**	**1.00-2.00**	**2.00-3.10**	**0.20-1.00**	**1.00-2.00**					
Total Organic Carbon *	1.75	0.16	0.20	0.47	0.20	3	5	6	<0.02	%
Sum of BTEX	<0.025	<0.025	<0.025	<0.025	<0.025	6	-	-	<0.025	mg/kg
Sum of 7 PCBs	<0.035	<0.035	<0.035	<0.035	<0.035	1	-	-	<0.035	mg/kg
Mineral Oil	<30	<30	<30	<30	<30	500	-	-	<30	mg/kg
PAH Sum of 6	<0.22	<0.22	<0.22	<0.22	<0.22	-	-	-	<0.22	mg/kg
PAH Sum of 17	<0.64	<0.64	<0.64	<0.64	<0.64	100	-	-	<0.64	mg/kg
Arsenic	<0.025	<0.025	<0.025	0.082	<0.025	0.5	2	25	<0.025	mg/kg
Barium	0.15	<0.03	0.05	<0.03	0.06	20	100	300	<0.03	mg/kg
Cadmium	<0.005	<0.005	<0.005	<0.005	<0.005	0.04	1	5	<0.005	mg/kg
Chromium	<0.015	<0.015	<0.015	0.037	<0.015	0.5	10	70	<0.015	mg/kg
Copper	<0.07	<0.07	<0.07	<0.07	<0.07	2	50	100	<0.07	mg/kg
Mercury	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	0.01	0.2	2	<0.0001	mg/kg
Molybdenum	0.06	0.04	<0.02	0.09	0.07	0.5	10	30	<0.02	mg/kg
Nickel	<0.02	<0.02	<0.02	<0.02	<0.02	0.4	10	40	<0.02	mg/kg
Lead	<0.05	<0.05	<0.05	<0.05	<0.05	0.5	10	50	<0.05	mg/kg
Antimony	<0.02	<0.02	<0.02	<0.02	<0.02	0.06	0.7	5	<0.02	mg/kg
Selenium	<0.03	<0.03	<0.03	0.05	<0.03	0.1	0.5	7	<0.03	mg/kg
Zinc	0.04	<0.03	<0.03	<0.03	<0.03	4	50	200	<0.03	mg/kg
Total Dissolved Solids**	1260	430	1859	1080	480	4000	60000	100000	<350	mg/kg
Dissolved Organic Carbon	70	<20	<20	50	20	500	800	1000	<20	mg/kg
Phenol	<0.1	<0.1	<0.1	<0.1	<0.1	1	-	-	<0.1	mg/kg
Sulphate as SO4**	241	18	13	110	21	1000	20000	50000	<0.5	mg/kg
Chloride**	7	5	5	7	6	800	15000	25000	<3	mg/kg
Asbestos	NAD	NAD	NAD	NAD	NAD	-	-	-	<0.001	%
Asbestos Type	NAD	NAD	NAD	NAD	NAD	-	-	-	-	%

NAD- no asbestos detected

* In the case of soils, a higher limit value maybe admitted by the competent authority, provided the DOC value of 500 mg/kg isachieved at L/S = 10 l/kg, either at the soil's own pH or at a pH value between 7,5 and 8,0

** The values for total dissolved solids (TDS) can be used alternatively to the values for sulphate and chloride

Appendix 10.1

Conceptual Site Model

APPENDIX 10.1 CONCEPTUAL SITE MODEL

Constraint		Impact Assessment							
Activity/ Source	**Construction Element**	**Impact Description**	**Quality**	**Significance**	**Extent**	**Likelih.**	**Duration**	**Mitigation**	**Residual Impact**
Earthworks	• Site Clearance • Basement Excavation • Basement Construction	Excavation of Natural Soils and Subsoil for basements, attenuation tanks, drainage etc.	Negative	Moderate	Local	Certain	Permanent	The minimum amount of space to construct the project has been designed for. Material will be reused on site where possible.	Moderate Negative
		Change of landuse from Brownfield to Residential	Neutral	Moderate	Local	Certain	Permanent	Change of landuse from playing field to residential will reduce amenity locally. The related development of the sports campus will offset this impact	Imperceptible
		Reuse of suitable material off site	Positive	Slight	Local (potentially a number of sites)	Likely	Long-term	Spoil generated on site is a resource and shall be re-used on site where possible. Where material must be exported offsite it will be reused where possible in line with relevant Waste and Planning Legislation. Art. 27 declarations will be made to the EPA where required to classify the material as a by-product where required.	Slight Positive
		Soil erosion causing airborne dust and/or nuisance dust on public roads and neighbouring properties	Negative	Slight	Local	Unlikely	Short-term	Dust suppression measures will be implemented to minimise dust generation during extended dry periods. Dust monitoring will be conducted through the excavation period. Vehicle wheel wash facilities will be installed at site exits and a road sweeping programme will be implemented	Imperceptible
		A degree of fill will be required during the works which will included imported fill and aggregates	Negative	Slight - Moderate	Local (potentially a number of quarry sites)	Likely	Long-term	Contract and Procurement Procedures will ensure that all aggregates and fill material required for the construction are sourced from reputable suppliers. Declarations of conformity/compliance certificates will be required to ensure all aggregates supplied meet the specified engineering specifications.	Imperceptible
Altering Groundwater/Surface water	• Basement Excavation • Basement Construction • Replacing open green areas with hard standing	Altering existing local groundwater regime	Neutral	Slight	Local	Unlikely	Long-term	The basement will be founded within the low permeability/impermeable boulder clay so there will no impact on shallow groundwater flows which are contained within the bedrock. The replacement of open green space (currently available for limited recharge) with hard standing (no recharge possible) will prevent a small amount of water reaching the aquifer. The relative site area is small. The site is adjacent to St. Anne's park. Therefore the combined impact will be imperceptible.	Imperceptible
Storage of potentially polluting materials	• Site Clearance • Basement Excavation • Installation of Retaining Walls • Basement Construction	Potential leak or spillage from construction related liquids on site	Negative	Significant	Local	Unlikely	Short-term	Good housekeeping on all project sites and proper handling, storage and disposal of any potentially polluting substances can prevent soil and/or water contamination. Designated and bunded storage areas will be maintained. Further details are included in the CMP	Imperceptible
Discharge to Groundwater	• Basement Excavation and Construction • General Construction	Potential contaminated run-off percolating to ground and the underlying aquifer	Negative	Significant	Local	Unlikely	Short-term	There will be no direct discharge to groundwater during construction. However indirect discharges to the underlying bedrock aquifer may occur and the aquifer vulnerability will increase, albeit not significantly given the thickness of Boulder Clay beneath the site, as the subsoil is removed from site. Protection of groundwater from potentially polluting substances will be dealt with through a number of measures including correct handling and storage of potentially polluting substances.	Imperceptible

Appendix 11.1

Ambient Air Quality Standards

Appendix 11.1 AMBIENT AIR QUALITY STANDARDS

National standards for ambient air pollutants in Ireland have generally ensued from Council Directives enacted in the EU (& previously the EC & EEC). The initial interest in ambient air pollution legislation in the EU dates from the early 1980s and was in response to the most serious pollutant problems at that time which was the issue of acid rain. As a result of this sulphur dioxide, and later nitrogen dioxide, were both the focus of EU legislation. Linked to the acid rain problem was urban smog associated with fuel burning for space heating purposes. Also apparent at this time were the problems caused by leaded petrol and EU legislation was introduced to deal with this problem in the early 1980s.

In recent years the EU has focused on defining a basis strategy across the EU in relation to ambient air quality. In 1996, a Framework Directive, Council Directive 96/62/EC, on ambient air quality assessment and management was enacted. The aims of the Directive are fourfold. Firstly, the Directive's aim is to establish objectives for ambient air quality designed to avoid harmful effects to health. Secondly, the Directive aims to assess ambient air quality on the basis of common methods and criteria throughout the EU. Additionally, it is aimed to make information on air quality available to the public via alert thresholds and fourthly, it aims to maintain air quality where it is good and improve it in other cases.

As part of these measures to improve air quality, the European Commission has adopted proposals for daughter legislation under Directive 96/62/EC. The first of these directives to be enacted, Council Directive 1999/30/EC, has been passed into Irish Law as S.I. No 271 of 2002 (Air Quality Standards Regulations 2002), and has set limit values which came into operation on 17th June 2002. The Air Quality Standards Regulations 2002 detail margins of tolerance, which are trigger levels for certain types of action in the period leading to the attainment date. The margin of tolerance varies from 60% for lead, to 30% for 24-hour limit value for PM_{10}, 40% for the hourly and annual limit value for NO_2 and 26% for hourly SO_2 limit values. The margin of tolerance commenced from June 2002, and started to reduce from 1 January 2003 and every 12 months thereafter by equal annual percentages to reach 0% by the attainment date. A second daughter directive, EU Council Directive 2000/69/EC, has published limit values for both carbon monoxide and benzene in ambient air. This has also been passed into Irish Law under the Air Quality Standards Regulations 2002.

The most recent EU Council Directive on ambient air quality was published on the 11/06/08 which has been transposed into Irish Law as S.I. 180 of 2011. Council Directive 2008/50/EC combines the previous Air Quality Framework Directive and its subsequent daughter directives. Provisions were also made for the inclusion of new ambient limit values relating to $PM_{2.5}$. The margins of tolerance specific to each pollutant were also slightly adjusted from previous directives. In regards to existing ambient air quality standards, it is not proposed to modify the standards but to strengthen existing provisions to ensure that non-compliances are removed. In addition, new ambient standards for $PM_{2.5}$ are included in Directive 2008/50/EC. The approach for $PM_{2.5}$ was to establish a target value of 25 μg/m^3, as an annual average (to be attained everywhere by 2010) and a limit value of 25 μg/m^3, as an annual average (to be attained everywhere by 2015), coupled with a target to reduce human exposure generally to $PM_{2.5}$ between 2010 and 2020. This exposure reduction target will range from 0% (for $PM_{2.5}$ concentrations of less than 8.5 μg/m^3 to 20% of the average exposure indicator (AEI) for concentrations of between 18 - 22 μg/m^3). Where the AEI is currently greater than 22 μg/m^3 all appropriate measures should be employed to reduce this level to 18 μg/m^3 by 2020. The AEI is based on measurements taken in urban background locations averaged over a three year period from 2008 - 2010 and again from 2018-2020. Additionally, an exposure concentration obligation of 20 μg/m^3 was set to be complied with by 2015 again based on the AEI.

Although the EU Air Quality Limit Values are the basis of legislation, other thresholds outlined by the EU Directives are used which are triggers for particular actions. The Alert Threshold is defined in Council Directive 96/62/EC as "a level beyond which there is a risk to human health from brief exposure and at which immediate steps shall be taken as laid down in Directive 96/62/EC". These steps include undertaking to ensure that the necessary steps are taken to inform the public (e.g. by means of radio, television and the press).

The Margin of Tolerance is defined in Council Directive 96/62/EC as a concentration which is higher than the limit value when legislation comes into force. It decreases to meet the limit value by the attainment date. The Upper Assessment Threshold is defined in Council Directive 96/62/EC as a concentration above which high quality measurement is mandatory. Data from measurement may be supplemented by information from other sources, including air quality modelling.

An annual average limit for both NO_X (NO and NO_2) is applicable for the protection of vegetation in highly rural areas away from major sources of NO_X such as large conurbations, factories and high road vehicle activity such as a dual carriageway or motorway. Annex VI of EU Directive 1999/30/EC identifies that monitoring to demonstrate compliance with the NO_X limit for the protection of vegetation should be carried out distances greater than:

- 5 km from the nearest motorway or dual carriageway
- 5 km from the nearest major industrial installation
- 20 km from a major urban conurbation

As a guideline, a monitoring station should be indicative of approximately 1000 km^2 of surrounding area.

Under the terms of EU Framework Directive on Ambient Air Quality (96/62/EC), geographical areas within member states have been classified in terms of zones. The zones have been defined in order to meet the criteria for air quality monitoring, assessment and management as described in the Framework Directive and Daughter Directives. Zone A is defined as Dublin and its environs, Zone B is defined as Cork City, Zone C is defined as 23 urban areas with a population greater than 15,000 and Zone D is defined as the remainder of the country. The Zones were defined based on among other things, population and existing ambient air quality.

EU Council Directive 96/62/EC on ambient air quality and assessment has been adopted into Irish Legislation (S.I. No. 33 of 1999). The act has designated the Environmental Protection Agency (EPA) as the competent authority responsible for the implementation of the Directive and for assessing ambient air quality in the State. Other commonly referenced ambient air quality standards include the World Health Organisation. The WHO guidelines differ from air quality standards in that they are primarily set to protect public health from the effects of air pollution. Air quality standards, however, are air quality guidelines recommended by governments, for which additional factors, such as socio-economic factors, may be considered.

Appendix 11.2

Transport Infrastructure Ireland Significance Criteria

APPENDIX 11.2 TRANSPORT INFRASTRUCTURE IRELAND SIGNIFICANCE CRITERIA

Magnitude of Change	Annual Mean NO_2 / PM_{10}	No. days with PM_{10} concentration > 50 µg/m³	Annual Mean $PM_{2.5}$
Large	Increase / decrease ≥4 µg/m³	Increase / decrease >4 days	Increase / decrease ≥2.5 µg/m³
Medium	Increase / decrease 2 - <4 µg/m³	Increase / decrease 3 or 4 days	Increase / decrease 1.25 - <2.5 µg/m³
Small	Increase / decrease 0.4 - <2 µg/m³	Increase / decrease 1 or 2 days	Increase / decrease 0.25 - <1.25 µg/m³
Imperceptible	Increase / decrease <0.4 µg/m³	Increase / decrease <1 day	Increase / decrease <0.25 µg/m³

Table 11.2.1: Definition of Impact Magnitude for Changes in Ambient Pollutant Concentrations.

Absolute Concentration in Relation to Objective/Limit Value	Change in Concentration Note 1		
	Small	Medium	Large
Increase with Scheme			
Above Objective/Limit Value With Scheme (≥40 µg/m³ of NO_2 or PM_{10}) (≥25 µg/m³ of $PM_{2.5}$)	Slight Adverse	Moderate Adverse	Substantial Adverse
Just Below Objective/Limit Value With Scheme (36 - <40 µg/m³ of NO_2 or PM_{10}) (22.5 - <25 µg/m³ of $PM_{2.5}$)	Slight Adverse	Moderate Adverse	Moderate Adverse
Below Objective/Limit Value With Scheme (30 - <36 µg/m³ of NO_2 or PM_{10}) (18.75 - <22.5 µg/m³ of $PM_{2.5}$)	Negligible	Slight Adverse	Slight Adverse
Well Below Objective/Limit Value With Scheme (<30 µg/m³ of NO_2 or PM_{10}) (<18.75 µg/m³ of $PM_{2.5}$)	Negligible	Negligible	Slight Adverse
Decrease with Scheme			
Above Objective/Limit Value With Scheme (≥40 µg/m³ of NO_2 or PM_{10}) (≥25 µg/m³ of $PM_{2.5}$)	Slight Beneficial	Moderate Beneficial	Substantial Beneficial
Just Below Objective/Limit Value With Scheme (36 - <40 µg/m³ of NO_2 or PM_{10}) (22.5 - <25 µg/m³ of $PM_{2.5}$)	Slight Beneficial	Moderate Beneficial	Moderate Beneficial
Below Objective/Limit Value With Scheme (30 - <36 µg/m³ of NO_2 or PM_{10}) (18.75 - <22.5 µg/m³ of $PM_{2.5}$)	Negligible	Slight Beneficial	Slight Beneficial
Well Below Objective/Limit Value With Scheme (<30 µg/m³ of NO_2 or PM_{10}) (<18.75 µg/m³ of $PM_{2.5}$)	Negligible	Negligible	Slight Beneficial

Note 1 Well Below Standard = <75% of limit value.

Table 11.2.2: Air Quality Impact Significance Criteria For Annual Mean NO_2 and PM_{10} and $PM_{2.5}$ Concentrations at a Receptor.

Absolute Concentration in Relation to Objective / Limit Value	Change in Concentration Note 1		
	Small	Medium	Large
Increase with Scheme			
Above Objective/Limit Value With Scheme (≥35 days)	Slight Adverse	Moderate Adverse	Substantial Adverse
Just Below Objective/Limit Value With Scheme (32 - <35 days)	Slight Adverse	Moderate Adverse	Moderate Adverse
Below Objective/Limit Value With Scheme (26 - <32 days)	Negligible	Slight Adverse	Slight Adverse
Well Below Objective/Limit Value With Scheme (<26 days)	Negligible	Negligible	Slight Adverse
Decrease with Scheme			
Above Objective/Limit Value With Scheme (≥35 days)	Slight Beneficial	Moderate Beneficial	Substantial Beneficial
Just Below Objective/Limit Value With Scheme (32 - <35 days)	Slight Beneficial	Moderate Beneficial	Moderate Beneficial
Below Objective/Limit Value With Scheme (26 - <32 days)	Negligible	Slight Beneficial	Slight Beneficial
Well Below Objective/Limit Value With Scheme (<26 days)	Negligible	Negligible	Slight Beneficial

Table 11.2.3: Air Quality Impact Significance Criteria For Changes to Number of Days with PM_{10} Concentration Greater than 50 µg/m^3 at a Receptor

Appendix 11.3

Dust Minimisation Plan

APPENDIX 11.3 DUST MINIMISATION PLAN

The objective of dust control at the site is to ensure that no significant nuisance occurs at nearby sensitive receptors. In order to develop a workable and transparent dust control strategy, the following management plan has been formulated by drawing on best practice guidance from Ireland, the UK (IAQM (2014), BRE (2003), The Scottish Office (1996), UK ODPM (2002)) and the USA (USEPA, 1997).

Site Management

The aim is to ensure good site management by avoiding dust becoming airborne at source. This will be done through good design and effective control strategies.

At the construction planning stage, the siting of activities and storage piles will take note of the location of sensitive receptors and prevailing wind directions in order to minimise the potential for significant dust nuisance (see Figure 11.1 for the windrose for Dublin Airport). As the prevailing wind is predominantly westerly to south-westerly, locating construction compounds and storage piles downwind of sensitive receptors will minimise the potential for dust nuisance to occur at sensitive receptors.

Good site management will include the ability to respond to adverse weather conditions by either restricting operations on-site or quickly implementing effective control measures before the potential for nuisance occurs. When rainfall is greater than 0.2mm/day, dust generation is generally suppressed (IAQM, 2014; UK ODPM, 2002). The potential for significant dust generation is also reliant on threshold wind speeds of greater than 10 m/s (19.4 knots) (at 7m above ground) to release loose material from storage piles and other exposed materials (USEPA, 1986). Particular care should be taken during periods of high winds (gales) as these are periods where the potential for significant dust emissions are highest. The prevailing meteorological conditions in the vicinity of the site are favourable in general for the suppression of dust for a significant period of the year. Nevertheless, there will be infrequent periods were care will be needed to ensure that dust nuisance does not occur. The following measures shall be taken in order to avoid dust nuisance occurring under unfavourable meteorological conditions:

- The Principal Contractor or equivalent must monitor the contractors' performance to ensure that the proposed mitigation measures are implemented and that dust impacts and nuisance are minimised;
- During working hours, dust control methods will be monitored as appropriate, depending on the prevailing meteorological conditions;
- The name and contact details of a person to contact regarding air quality and dust issues shall be displayed on the site boundary, this notice board should also include head/regional office contact details;
- It is recommended that community engagement be undertaken before works commence on site explaining the nature and duration of the works to local residents and businesses;
- A complaints register will be kept on site detailing all telephone calls and letters of complaint received in connection with dust nuisance or air quality concerns, together with details of any remedial actions carried out;
- It is the responsibility of the contractor at all times to demonstrate full compliance with the dust control conditions herein;
- At all times, the procedures put in place will be strictly monitored and assessed.

The dust minimisation measures shall be reviewed at regular intervals during the works to ensure the effectiveness of the procedures in place and to maintain the goal of minimisation of dust through the use of best practice and procedures. In the event of dust nuisance occurring outside the site boundary, site activities will be reviewed and satisfactory procedures implemented to rectify the problem. Specific dust control measures to be employed are described below.

Site Roads / Haulage Routes

Movement of construction trucks along site roads (particularly unpaved roads) can be a significant source of fugitive dust if control measures are not in place. The most effective means of suppressing dust emissions from unpaved roads is to apply speed restrictions. Studies show that these measures can have a control efficiency ranging from 25 to 80% (UK ODPM, 2002).

- A speed restriction of 20 km/hr will be applied as an effective control measure for dust for on-site vehicles using unpaved site roads;
- Access gates to the site shall be located at least 10m from sensitive receptors where possible;
- Bowsers or suitable watering equipment will be available during periods of dry weather throughout the construction period. Research has found that watering can reduce dust emissions by 50% (USEPA, 1997). Watering shall be conducted during sustained dry periods to ensure that unpaved areas are kept moist. The required application frequency will vary according to soil type, weather conditions and vehicular use;
- Any hard surface roads will be swept to remove mud and aggregate materials from their surface while any unsurfaced roads shall be restricted to essential site traffic only.

Land Clearing / Earth Moving

Land clearing / earth-moving works during periods of high winds and dry weather conditions can be a significant source of dust.

- During dry and windy periods, and when there is a likelihood of dust nuisance, watering shall be conducted to ensure moisture content of materials being moved is high enough to increase the stability of the soil and thus suppress dust;
- During periods of very high winds (gales), activities likely to generate significant dust emissions should be postponed until the gale has subsided.

Storage Piles

The location and moisture content of storage piles are important factors which determine their potential for dust emissions.

- Overburden material will be protected from exposure to wind by storing the material in sheltered regions of the site. Where possible storage piles should be located downwind of sensitive receptors;
- Regular watering will take place to ensure the moisture content is high enough to increase the stability of the soil and thus suppress dust. The regular watering of stockpiles has been found to have an 80% control efficiency (UK ODPM, 2002).
- Where feasible, hoarding will be erected around site boundaries to reduce visual impact. This will also have an added benefit of preventing larger particles from impacting on nearby sensitive receptors.

Site Traffic on Public Roads

Spillage and blow-off of debris, aggregates and fine material onto public roads should be reduced to a minimum by employing the following measures:

- Vehicles delivering or collecting material with potential for dust emissions shall be enclosed or covered with tarpaulin at all times to restrict the escape of dust;
- At the main site traffic exits, a wheel wash facility shall be installed if feasible. All trucks leaving the site must pass through the wheel wash. In addition, public roads outside the site shall be regularly inspected for cleanliness, as a minimum on a daily basis, and cleaned as necessary.

Summary of Dust Mitigation Measures

The pro-active control of fugitive dust will ensure that the prevention of significant emissions, rather than an inefficient attempt to control them once they have been released, will contribute towards the satisfactory performance of the contractor. The key features with respect to control of dust will be:

- The specification of a site policy on dust and the identification of the site management responsibilities for dust issues;
- The development of a documented system for managing site practices with regard to dust control;
- The development of a means by which the performance of the dust minimisation plan can be regularly monitored and assessed; and
- The specification of effective measures to deal with any complaints received.

Appendix 14.1

Traffic Survey Data

Site No. 1
Location Blackthorn Drive(N) / Birch Avenue / Blackthorn Drive(S) / Carmanhall Road
Date Thursday 11 April 2019

Time	A to D - Blackthorn Drive(N) to Carmanhall Road								Veh. Total	A to C - Blackthorn Drive(N) to Blackthorn Drive(S)								Veh. Total
	CAR	TAXI	LGV	OGV1	OGV2	PSV	M/C	P/C		CAR	TAXI	LGV	OGV1	OGV2	PSV	M/C	P/C	
7:00	8	0	1	0	0	0	0	0	9	12	1	0	0	0	3	0	0	16
7:15	10	0	1	0	0	0	0	0	11	18	0	2	0	0	1	0	0	21
7:30	13	1	2	0	0	0	1	0	17	30	0	3	0	1	1	1	0	36
7:45	29	0	1	0	0	0	0	0	30	32	2	1	0	0	1	0	2	38
8:00	26	1	0	0	0	0	0	3	30	42	2	4	0	0	2	0	1	51
8:15	22	1	3	1	0	0	1	1	29	39	1	1	1	0	1	0	0	43
8:30	29	0	0	0	0	0	0	1	30	39	1	1	1	0	1	1	1	45
8:45	42	0	0	0	0	0	0	0	42	31	0	3	1	0	0	0	3	38
9:00	33	2	3	2	0	0	0	4	44	46	1	3	1	0	3	0	1	55
9:15	29	1	1	0	0	0	0	0	31	38	3	2	0	0	2	0	0	45
9:30	28	0	2	0	0	0	0	0	30	17	1	3	0	1	3	0	0	25
9:45	22	2	3	0	0	0	1	1	29	25	0	3	1	0	1	0	0	30
Total	291	8	17	3	0	0	3	10	332	369	12	26	5	2	19	2	8	443

Peak Hour 8:00 to 9:00

8:00	26	1	0	0	0	0	0	3	30	42	2	4	0	0	2	0	1	51
8:15	22	1	3	1	0	0	1	1	29	39	1	1	1	0	1	0	0	43
8:30	29	0	0	0	0	0	0	1	30	39	1	1	1	0	1	1	1	45
8:45	42	0	0	0	0	0	0	0	42	31	0	3	1	0	0	0	3	38
Total	119	2	3	1	0	0	1	5	131	151	4	9	3	0	4	1	5	177

Date Thursday 11 April 2019

Time	A to D - Blackthorn Drive(N) to Carmanhall Road								Veh. Total	A to C - Blackthorn Drive(N) to Blackthorn Drive(S)								Veh. Total
	CAR	TAXI	LGV	OGV1	OGV2	PSV	M/C	P/C		CAR	TAXI	LGV	OGV1	OGV2	PSV	M/C	P/C	
16:00	19	1	1	0	0	0	0	0	21	57	1	6	2	0	2	0	0	68
16:15	22	1	1	0	0	0	0	0	24	46	0	6	0	0	0	0	0	52
16:30	24	0	1	0	0	0	0	0	25	45	0	4	1	0	0	0	2	52
16:45	15	0	3	0	0	0	0	1	19	38	2	4	0	0	0	0	2	46
17:00	20	0	0	0	0	0	0	0	20	29	1	3	0	0	3	0	1	37
17:15	18	0	1	0	0	0	1	1	21	44	2	3	0	0	1	0	1	51
17:30	16	0	0	0	0	0	1	0	17	52	1	4	1	0	1	0	1	60
17:45	17	1	0	0	0	0	1	0	19	53	2	1	0	0	1	1	1	59
18:00	20	0	1	0	0	0	0	1	22	52	0	2	0	0	1	2	2	59
18:15	24	2	1	0	0	0	0	1	28	49	0	3	0	0	1	0	3	56
18:30	12	2	1	0	0	0	0	0	15	59	4	0	0	0	2	0	0	65
18:45	15	1	0	0	0	0	0	0	16	60	2	1	0	1	1	1	2	68
Total	222	8	10	0	0	0	3	4	247	584	15	37	4	1	13	4	15	673

Peak Hour 17:00 to 18:00

17:00	20	0	0	0	0	0	0	0	20	29	1	3	0	0	3	0	1	37
17:15	18	0	1	0	0	0	1	1	21	44	2	3	0	0	1	0	1	51
17:30	16	0	0	0	0	0	1	0	17	52	1	4	1	0	1	0	1	60
17:45	17	1	0	0	0	0	1	0	19	53	2	1	0	0	1	1	1	59
Total	71	1	1	0	0	0	3	1	77	178	6	11	1	0	6	1	4	207

Site No. 1
Location Blackthorn Drive(N) / Birch Avenue / Blackthorn Drive(S) / Carmanhall Road
Date Thursday 11 April 2019

Time	A to B - Blackthorn Drive(N) to Birch Avenue								Veh.	A to A - Blackthorn Drive(N) to Blackthorn Drive(N)								Veh.
	CAR	TAXI	LGV	OGV1	OGV2	PSV	M/C	P/C	Total	CAR	TAXI	LGV	OGV1	OGV2	PSV	M/C	P/C	Total
7:00	8	0	0	0	0	0	0	0	8	0	0	0	0	0	0	0	0	0
7:15	2	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0
7:30	5	0	1	0	0	0	0	0	6	0	0	0	0	0	0	0	0	0
7:45	11	0	0	0	0	0	0	0	11	0	0	0	0	0	0	0	0	0
8:00	10	0	0	0	0	0	0	0	10	0	0	0	0	0	0	0	0	0
8:15	18	0	0	0	0	0	0	0	18	0	0	0	0	0	0	0	0	0
8:30	11	0	0	0	0	0	0	0	11	0	0	0	0	0	0	0	0	0
8:45	21	0	3	0	0	0	0	0	24	0	0	0	0	0	0	0	0	0
9:00	24	0	2	0	0	0	0	0	26	0	0	0	0	0	0	0	0	0
9:15	12	0	1	0	0	0	0	0	13	0	0	0	0	0	0	0	0	0
9:30	15	0	2	0	0	0	0	0	17	0	0	0	0	0	0	0	0	0
9:45	9	0	2	1	0	0	0	0	12	0	0	0	0	0	0	0	0	0
Total	146	0	11	1	0	0	0	0	158	0	0	0	0	0	0	0	0	0

Peak Hour 8:00 to 9:00

8:00	10	0	0	0	0	0	0	0	10	0	0	0	0	0	0	0	0	0
8:15	18	0	0	0	0	0	0	0	18	0	0	0	0	0	0	0	0	0
8:30	11	0	0	0	0	0	0	0	11	0	0	0	0	0	0	0	0	0
8:45	21	0	3	0	0	0	0	0	24	0	0	0	0	0	0	0	0	0
Total	60	0	3	0	0	0	0	0	63	0	0	0	0	0	0	0	0	0

Date Thursday 11 April 2019

Time	A to B - Blackthorn Drive(N) to Birch Avenue								Veh.	A to A - Blackthorn Drive(N) to Blackthorn Drive(N)								Veh.
	CAR	TAXI	LGV	OGV1	OGV2	PSV	M/C	P/C	Total	CAR	TAXI	LGV	OGV1	OGV2	PSV	M/C	P/C	Total
16:00	9	0	2	0	0	0	0	0	11	0	0	0	0	0	0	0	0	0
16:15	11	0	2	0	0	0	0	0	13	0	0	0	0	0	0	0	0	0
16:30	6	0	2	0	0	0	0	0	8	0	0	0	0	0	0	0	0	0
16:45	9	0	1	0	0	0	0	0	10	0	0	0	0	0	0	0	0	0
17:00	8	0	0	0	0	0	0	0	8	0	0	0	0	0	0	0	0	0
17:15	5	0	0	1	0	0	0	0	6	0	0	0	0	0	0	0	0	0
17:30	9	0	0	0	0	0	0	1	10	0	0	0	0	0	0	0	0	0
17:45	9	0	0	0	0	0	0	0	9	1	0	0	0	0	0	0	0	1
18:00	5	0	1	0	0	1	0	0	7	0	0	0	0	0	0	0	0	0
18:15	5	0	0	0	0	0	0	0	5	0	0	0	0	0	0	0	0	0
18:30	6	1	0	0	0	0	0	0	7	0	0	0	0	0	0	0	0	0
18:45	5	0	2	0	0	0	0	1	8	0	0	0	0	0	0	0	0	0
Total	87	1	10	1	0	1	0	2	102	1	0	0	0	0	0	0	0	1

Peak Hour 17:00 to 18:00

17:00	8	0	0	0	0	0	0	0	8	0	0	0	0	0	0	0	0	0
17:15	5	0	0	1	0	0	0	0	6	0	0	0	0	0	0	0	0	0
17:30	9	0	0	0	0	0	0	1	10	0	0	0	0	0	0	0	0	0
17:45	9	0	0	0	0	0	0	0	9	1	0	0	0	0	0	0	0	1
Total	31	0	0	1	0	0	0	1	33	1	0	0	0	0	0	0	0	1

Site No. 1
Location Blackthorn Drive(N) / Birch Avenue / Blackthorn Drive(S) / Carmanhall Road
Date Thursday 11 April 2019

Time	B to A - Birch Avenue to Blackthorn Drive(N)								Veh. Total	B to D - Birch Avenue to Carmanhall Road								Veh. Total
	CAR	TAXI	LGV	OGV1	OGV2	PSV	M/C	P/C		CAR	TAXI	LGV	OGV1	OGV2	PSV	M/C	P/C	
7:00	3	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0
7:15	3	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0
7:30	7	0	4	0	0	0	0	1	12	4	0	1	0	0	0	0	0	5
7:45	2	0	2	1	0	0	1	0	6	0	0	0	0	0	0	0	0	0
8:00	1	0	1	0	0	0	0	0	2	2	0	0	0	0	0	0	0	2
8:15	4	0	0	1	0	0	0	0	5	10	0	0	0	0	0	0	0	10
8:30	6	0	2	0	0	0	0	0	8	8	0	0	0	0	0	0	0	8
8:45	6	0	1	1	0	0	0	0	8	3	0	2	0	0	0	0	0	5
9:00	7	0	1	0	0	0	0	0	8	5	0	1	0	0	0	0	0	6
9:15	12	0	3	0	0	0	0	0	15	3	0	1	1	0	0	0	0	5
9:30	12	0	2	0	0	0	0	0	14	8	1	2	0	0	0	0	0	11
9:45	7	0	4	1	0	0	0	0	12	3	0	2	0	0	0	0	0	5
Total	70	0	20	4	0	0	1	1	96	46	1	9	1	0	0	0	0	57

Peak Hour 8:00 to 9:00

8:00	1	0	1	0	0	0	0	0	2	2	0	0	0	0	0	0	0	2
8:15	4	0	0	1	0	0	0	0	5	10	0	0	0	0	0	0	0	10
8:30	6	0	2	0	0	0	0	0	8	8	0	0	0	0	0	0	0	8
8:45	6	0	1	1	0	0	0	0	8	3	0	2	0	0	0	0	0	5
Total	17	0	4	2	0	0	0	0	23	23	0	2	0	0	0	0	0	25

Date Thursday 11 April 2019

Time	B to A - Birch Avenue to Blackthorn Drive(N)								Veh. Total	B to D - Birch Avenue to Carmanhall Road								Veh. Total
	CAR	TAXI	LGV	OGV1	OGV2	PSV	M/C	P/C		CAR	TAXI	LGV	OGV1	OGV2	PSV	M/C	P/C	
16:00	14	0	0	0	0	0	0	0	14	4	0	2	1	0	0	0	0	7
16:15	19	0	3	1	0	0	0	0	23	5	0	1	0	0	0	0	0	6
16:30	22	0	1	0	0	0	0	0	23	6	0	1	0	0	0	1	0	8
16:45	19	0	1	0	0	0	1	0	21	6	0	0	0	0	0	0	0	6
17:00	40	0	2	0	0	0	1	0	43	6	0	0	0	0	0	0	0	6
17:15	32	0	3	0	0	0	1	0	36	7	0	0	0	0	0	0	0	7
17:30	37	0	0	0	0	0	0	0	37	14	0	0	0	0	0	0	0	14
17:45	24	0	0	0	0	0	0	0	24	4	0	1	0	0	0	1	0	6
18:00	16	0	0	0	0	0	0	0	16	11	0	2	0	0	0	0	0	13
18:15	15	0	0	0	0	0	0	0	15	3	0	0	0	0	0	0	0	3
18:30	13	0	4	0	0	0	0	0	17	9	0	0	0	0	0	0	0	9
18:45	8	0	0	0	0	0	0	0	8	5	0	0	0	0	0	0	0	5
Total	259	0	14	1	0	0	3	0	277	80	0	7	1	0	0	2	0	90

Peak Hour 17:00 to 18:00

17:00	40	0	2	0	0	0	1	0	43	6	0	0	0	0	0	0	0	6
17:15	32	0	3	0	0	0	1	0	36	7	0	0	0	0	0	0	0	7
17:30	37	0	0	0	0	0	0	0	37	14	0	0	0	0	0	0	0	14
17:45	24	0	0	0	0	0	0	0	24	4	0	1	0	0	0	1	0	6
Total	133	0	5	0	0	0	2	0	140	31	0	1	0	0	0	1	0	33

Site No. 1
Location Blackthorn Drive(N) / Birch Avenue / Blackthorn Drive(S) / Carmanhall Road
Date Thursday 11 April 2019

Time	B to C - Birch Avenue to Blackthorn Drive(S)								Veh. Total	B to B - Birch Avenue to Birch Avenue								Veh. Total
	CAR	TAXI	LGV	OGV1	OGV2	PSV	M/C	P/C		CAR	TAXI	LGV	OGV1	OGV2	PSV	M/C	P/C	
7:00	3	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0
7:15	1	0	1	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0
7:30	4	0	2	0	0	0	0	0	6	0	0	0	0	0	0	0	0	0
7:45	2	0	2	0	1	0	0	0	5	0	0	0	0	0	0	0	0	0
8:00	3	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0
8:15	3	0	3	1	1	0	0	0	8	0	0	0	0	0	0	0	0	0
8:30	2	0	3	0	0	0	0	0	5	0	0	0	0	0	0	0	0	0
8:45	6	0	2	0	0	0	0	0	8	0	0	0	0	0	0	0	0	0
9:00	4	0	2	0	0	0	0	0	6	0	0	0	0	0	0	0	0	0
9:15	7	0	3	1	2	0	0	0	13	0	0	0	0	0	0	0	0	0
9:30	9	0	2	0	0	0	0	0	11	0	0	0	0	0	0	0	0	0
9:45	8	1	8	0	0	0	0	0	17	0	0	0	0	0	0	0	0	0
Total	52	1	28	2	4	0	0	0	87	0	0	0	0	0	0	0	0	0

Peak Hour 8:00 to 9:00

Time	CAR	TAXI	LGV	OGV1	OGV2	PSV	M/C	P/C	Veh. Total	CAR	TAXI	LGV	OGV1	OGV2	PSV	M/C	P/C	Veh. Total
8:00	3	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0
8:15	3	0	3	1	1	0	0	0	8	0	0	0	0	0	0	0	0	0
8:30	2	0	3	0	0	0	0	0	5	0	0	0	0	0	0	0	0	0
8:45	6	0	2	0	0	0	0	0	8	0	0	0	0	0	0	0	0	0
Total	14	0	8	1	1	0	0	0	24	0	0	0	0	0	0	0	0	0

Date Thursday 11 April 2019

Time	B to C - Birch Avenue to Blackthorn Drive(S)								Veh. Total	B to B - Birch Avenue to Birch Avenue								Veh. Total
	CAR	TAXI	LGV	OGV1	OGV2	PSV	M/C	P/C		CAR	TAXI	LGV	OGV1	OGV2	PSV	M/C	P/C	
16:00	20	0	6	0	0	0	0	0	26	0	0	0	0	0	0	0	0	0
16:15	23	0	1	0	0	0	0	0	24	0	0	0	0	0	0	0	0	0
16:30	23	0	2	0	0	0	0	0	25	0	0	0	0	0	0	0	0	0
16:45	22	0	4	0	0	0	0	0	26	0	0	0	0	0	0	0	0	0
17:00	26	0	1	0	0	0	0	0	27	0	0	0	0	0	0	0	0	0
17:15	12	0	1	0	0	0	0	0	13	0	0	0	0	0	0	0	0	0
17:30	26	0	3	1	0	0	0	0	30	0	0	0	0	0	0	0	0	0
17:45	19	0	1	0	0	0	0	0	20	0	0	0	0	0	0	0	0	0
18:00	17	0	0	0	0	1	0	0	18	0	0	0	0	0	0	0	0	0
18:15	22	0	3	0	0	0	0	0	25	0	0	0	0	0	0	0	0	0
18:30	22	0	1	0	0	0	0	0	23	0	0	0	0	0	0	0	0	0
18:45	14	0	0	0	0	0	0	0	14	0	0	0	0	0	0	0	0	0
Total	246	0	23	1	0	1	0	0	271	0	0	0	0	0	0	0	0	0

Peak Hour 17:00 to 18:00

Time	CAR	TAXI	LGV	OGV1	OGV2	PSV	M/C	P/C	Veh. Total	CAR	TAXI	LGV	OGV1	OGV2	PSV	M/C	P/C	Veh. Total
17:00	26	0	1	0	0	0	0	0	27	0	0	0	0	0	0	0	0	0
17:15	12	0	1	0	0	0	0	0	13	0	0	0	0	0	0	0	0	0
17:30	26	0	3	1	0	0	0	0	30	0	0	0	0	0	0	0	0	0
17:45	19	0	1	0	0	0	0	0	20	0	0	0	0	0	0	0	0	0
Total	83	0	6	1	0	0	0	0	90	0	0	0	0	0	0	0	0	0

Site No. 1
Location Blackthorn Drive(N) / Birch Avenue / Blackthorn Drive(S) / Carmanhall Road
Date Thursday 11 April 2019

Time	C to B - Blackthorn Drive(S) to Birch Avenue								Veh. Total	C to A - Blackthorn Drive(S) to Blackthorn Drive(N)								Veh. Total
	CAR	TAXI	LGV	OGV1	OGV2	PSV	M/C	P/C		CAR	TAXI	LGV	OGV1	OGV2	PSV	M/C	P/C	
7:00	9	0	1	0	0	0	0	0	10	51	3	6	2	1	0	1	4	68
7:15	16	0	2	0	0	0	1	1	20	85	0	10	2	1	1	0	2	101
7:30	20	0	3	0	0	0	0	0	23	130	4	5	1	0	1	0	2	143
7:45	17	0	1	0	0	0	1	0	19	161	3	10	1	0	0	0	1	176
8:00	24	0	3	0	0	0	0	0	27	158	2	9	4	0	0	1	6	180
8:15	28	0	8	0	0	0	0	1	37	127	0	8	0	0	1	0	5	141
8:30	30	0	4	0	0	0	0	0	34	95	2	6	2	1	1	1	3	111
8:45	21	0	6	1	1	0	0	1	30	92	5	4	3	0	0	1	5	110
9:00	21	1	6	0	0	0	0	0	28	67	3	8	1	0	0	0	0	79
9:15	30	0	5	0	0	0	0	1	36	57	2	7	2	1	1	0	2	72
9:30	18	0	8	0	0	0	0	0	26	68	4	12	2	0	1	1	0	88
9:45	19	0	5	0	0	0	0	0	24	69	4	14	0	0	1	0	0	88
Total	253	1	52	1	1	0	2	4	314	1160	32	99	20	4	7	5	30	1357

Peak Hour 8:00 to 9:00

8:00	24	0	3	0	0	0	0	0	27	158	2	9	4	0	0	1	6	180
8:15	28	0	8	0	0	0	0	1	37	127	0	8	0	0	1	0	5	141
8:30	30	0	4	0	0	0	0	0	34	95	2	6	2	1	1	1	3	111
8:45	21	0	6	1	1	0	0	1	30	92	5	4	3	0	0	1	5	110
Total	103	0	21	1	1	0	0	2	128	472	9	27	9	1	2	3	19	542

Date Thursday 11 April 2019

Time	C to B - Blackthorn Drive(S) to Birch Avenue								Veh. Total	C to A - Blackthorn Drive(S) to Blackthorn Drive(N)								Veh. Total
	CAR	TAXI	LGV	OGV1	OGV2	PSV	M/C	P/C		CAR	TAXI	LGV	OGV1	OGV2	PSV	M/C	P/C	
16:00	12	0	3	1	0	0	0	0	16	48	0	4	1	0	0	0	1	54
16:15	13	0	3	0	0	0	0	0	16	63	0	3	1	0	0	1	1	69
16:30	11	0	0	1	0	0	0	0	12	67	0	3	2	0	0	0	3	75
16:45	8	0	0	0	0	0	0	0	8	72	0	6	0	0	0	1	0	79
17:00	8	1	0	0	0	0	0	0	9	84	2	2	0	0	1	2	1	92
17:15	6	0	0	0	0	0	0	0	6	79	2	5	1	0	0	3	0	90
17:30	5	0	1	0	0	0	0	0	6	75	1	2	0	0	0	0	2	80
17:45	3	0	1	0	0	0	0	0	4	74	2	6	0	0	0	0	2	84
18:00	8	0	3	0	0	0	0	0	11	60	1	1	1	0	0	0	1	64
18:15	7	0	1	0	0	0	0	0	8	71	2	5	0	0	1	1	2	82
18:30	3	0	0	0	0	0	0	0	3	54	2	5	0	0	0	0	2	63
18:45	6	0	0	0	0	0	0	0	6	59	1	0	0	0	0	0	0	60
Total	90	1	12	2	0	0	0	0	105	806	13	42	6	0	2	8	15	892

Peak Hour 17:00 to 18:00

17:00	8	1	0	0	0	0	0	0	9	84	2	2	0	0	1	2	1	92
17:15	6	0	0	0	0	0	0	0	6	79	2	5	1	0	0	3	0	90
17:30	5	0	1	0	0	0	0	0	6	75	1	2	0	0	0	0	2	80
17:45	3	0	1	0	0	0	0	0	4	74	2	6	0	0	0	0	2	84
Total	22	1	2	0	0	0	0	0	25	312	7	15	1	0	1	5	5	346

Site No. 1
Location Blackthorn Drive(N) / Birch Avenue / Blackthorn Drive(S) / Carmanhall Road
Date Thursday 11 April 2019

Time	C to D - Blackthorn Drive(S) to Carmanhall Road								Veh.	C to C - Blackthorn Drive(S) to Blackthorn Drive(S)								Veh.
	CAR	TAXI	LGV	OGV1	OGV2	PSV	M/C	P/C	Total	CAR	TAXI	LGV	OGV1	OGV2	PSV	M/C	P/C	Total
7:00	24	0	3	0	1	0	0	2	30	1	0	0	0	0	0	0	0	1
7:15	36	1	4	0	0	0	0	3	44	0	0	0	0	0	0	0	0	0
7:30	46	0	1	2	0	0	0	2	51	0	0	0	0	0	0	0	0	0
7:45	36	0	5	1	0	0	0	3	45	0	0	0	0	0	0	0	0	0
8:00	50	0	0	1	0	0	3	2	56	0	0	0	0	0	0	0	0	0
8:15	74	1	1	0	0	0	1	1	78	0	0	0	0	0	0	0	0	0
8:30	54	2	5	2	0	0	0	4	67	0	0	0	0	0	0	0	0	0
8:45	70	0	4	0	0	0	1	4	79	0	0	0	0	0	0	0	0	0
9:00	69	1	3	0	0	0	0	0	73	0	0	0	0	0	0	0	0	0
9:15	59	0	6	6	0	0	0	0	71	0	0	0	0	0	0	0	0	0
9:30	45	1	4	2	0	0	0	1	53	0	0	0	0	0	0	0	0	0
9:45	54	1	4	1	0	0	1	0	61	0	0	0	0	0	0	0	0	0
Total	617	7	40	15	1	0	6	22	708	1	0	0	0	0	0	0	0	1

Peak Hour 8:00 to 9:00

8:00	50	0	0	1	0	0	3	2	56	0	0	0	0	0	0	0	0	0
8:15	74	1	1	0	0	0	1	1	78	0	0	0	0	0	0	0	0	0
8:30	54	2	5	2	0	0	0	4	67	0	0	0	0	0	0	0	0	0
8:45	70	0	4	0	0	0	1	4	79	0	0	0	0	0	0	0	0	0
Total	248	3	10	3	0	0	5	11	280	0	0	0	0	0	0	0	0	0

Date Thursday 11 April 2019

Time	C to D - Blackthorn Drive(S) to Carmanhall Road								Veh.	C to C - Blackthorn Drive(S) to Blackthorn Drive(S)								Veh.
	CAR	TAXI	LGV	OGV1	OGV2	PSV	M/C	P/C	Total	CAR	TAXI	LGV	OGV1	OGV2	PSV	M/C	P/C	Total
16:00	27	1	8	0	0	0	0	1	37	0	0	0	0	0	0	0	0	0
16:15	26	3	5	0	1	0	0	0	35	0	0	0	0	0	0	0	0	0
16:30	22	1	1	0	0	0	0	1	25	0	0	0	0	0	0	0	0	0
16:45	26	0	1	1	0	0	1	0	29	0	0	0	0	0	0	0	0	0
17:00	20	1	2	0	0	0	0	0	23	0	0	0	0	0	0	0	0	0
17:15	24	0	0	0	0	0	0	0	24	0	0	0	0	0	0	0	0	0
17:30	19	0	1	0	0	0	0	0	20	0	0	0	0	0	0	0	0	0
17:45	25	0	2	0	0	0	0	0	27	0	0	0	0	0	0	0	0	0
18:00	27	1	1	0	0	0	0	0	29	0	0	0	0	0	0	0	0	0
18:15	19	2	1	0	0	0	0	0	22	1	0	0	0	0	0	0	0	1
18:30	32	1	1	0	0	0	1	0	35	0	0	0	0	0	0	0	0	0
18:45	30	3	1	0	0	0	1	0	35	1	0	0	0	0	0	0	0	1
Total	297	13	24	1	1	0	3	2	341	2	0	0	0	0	0	0	0	2

Peak Hour 17:00 to 18:00

17:00	20	1	2	0	0	0	0	0	23	0	0	0	0	0	0	0	0	0
17:15	24	0	0	0	0	0	0	0	24	0	0	0	0	0	0	0	0	0
17:30	19	0	1	0	0	0	0	0	20	0	0	0	0	0	0	0	0	0
17:45	25	0	2	0	0	0	0	0	27	0	0	0	0	0	0	0	0	0
Total	88	1	5	0	0	0	0	0	94	0	0	0	0	0	0	0	0	0

Site No. 1
Location Blackthorn Drive(N) / Birch Avenue / Blackthorn Drive(S) / Carmanhall Road
Date Thursday 11 April 2019

Time	D to C - Carmanhall Road to Blackthorn Drive(S)								Veh. Total	D to B - Carmanhall Road to Birch Avenue								Veh. Total
	CAR	TAXI	LGV	OGV1	OGV2	PSV	M/C	P/C		CAR	TAXI	LGV	OGV1	OGV2	PSV	M/C	P/C	
7:00	10	1	0	0	0	0	2	0	13	5	0	1	0	0	0	0	0	6
7:15	12	0	2	0	0	0	0	1	15	8	0	1	0	0	0	0	0	9
7:30	11	1	2	1	1	0	0	0	16	10	0	2	0	0	0	0	1	13
7:45	12	1	1	1	0	0	0	0	15	9	0	0	1	0	0	1	0	11
8:00	13	0	1	0	0	0	0	0	14	16	0	0	0	0	0	0	0	16
8:15	21	0	0	1	0	0	0	0	22	14	0	0	0	0	0	1	0	15
8:30	15	0	2	2	0	0	0	2	21	19	0	3	0	0	0	0	0	22
8:45	10	1	3	5	0	0	0	1	20	21	0	3	0	0	0	0	0	24
9:00	21	2	6	1	0	0	0	2	32	15	0	2	1	0	0	0	0	18
9:15	17	0	10	0	0	0	1	0	28	16	1	6	0	0	0	0	0	23
9:30	20	1	8	2	0	0	0	0	31	3	0	3	1	0	0	0	0	7
9:45	22	1	6	2	0	1	1	0	33	9	0	1	0	0	0	0	0	10
Total	184	8	41	15	1	1	4	6	260	145	1	22	3	0	0	2	1	174

Peak Hour 8:00 to 9:00

8:00	13	0	1	0	0	0	0	0	14	16	0	0	0	0	0	0	0	16
8:15	21	0	0	1	0	0	0	0	22	14	0	0	0	0	0	1	0	15
8:30	15	0	2	2	0	0	0	2	21	19	0	3	0	0	0	0	0	22
8:45	10	1	3	5	0	0	0	1	20	21	0	3	0	0	0	0	0	24
Total	59	1	6	8	0	0	0	3	77	70	0	6	0	0	0	1	0	77

Date Thursday 11 April 2019

Time	D to C - Carmanhall Road to Blackthorn Drive(S)								Veh. Total	D to B - Carmanhall Road to Birch Avenue								Veh. Total
	CAR	TAXI	LGV	OGV1	OGV2	PSV	M/C	P/C		CAR	TAXI	LGV	OGV1	OGV2	PSV	M/C	P/C	
16:00	73	1	3	1	0	0	0	0	78	6	0	3	0	0	0	0	0	9
16:15	74	0	10	1	0	0	0	0	85	7	0	0	0	0	0	0	0	7
16:30	90	3	8	0	0	0	0	3	104	8	0	1	0	0	0	0	0	9
16:45	66	1	4	0	0	0	2	4	77	7	0	0	0	0	0	0	0	7
17:00	87	0	3	0	0	0	2	0	92	2	0	1	0	0	0	0	0	3
17:15	91	0	9	1	0	0	0	4	105	8	0	2	0	0	0	0	0	10
17:30	91	0	1	0	0	0	1	4	97	16	0	0	0	0	0	0	0	16
17:45	94	0	5	0	1	0	1	3	104	10	0	0	0	0	0	0	1	11
18:00	75	0	3	0	0	0	2	1	81	8	0	2	0	0	0	0	0	10
18:15	77	2	1	0	0	0	0	2	82	9	0	1	0	0	0	0	0	10
18:30	68	1	2	0	0	0	0	2	73	9	0	0	1	0	0	0	0	10
18:45	56	4	3	0	0	0	0	3	66	12	0	0	0	0	0	0	0	12
Total	942	12	52	3	1	0	8	26	1044	102	0	10	1	0	0	0	1	114

Peak Hour 17:00 to 18:00

17:00	87	0	3	0	0	0	2	0	92	2	0	1	0	0	0	0	0	3
17:15	91	0	9	1	0	0	0	4	105	8	0	2	0	0	0	0	0	10
17:30	91	0	1	0	0	0	1	4	97	16	0	0	0	0	0	0	0	16
17:45	94	0	5	0	1	0	1	3	104	10	0	0	0	0	0	0	1	11
Total	363	0	18	1	1	0	4	11	398	36	0	3	0	0	0	0	1	40

Site No. 1
Location Blackthorn Drive(N) / Birch Avenue / Blackthorn Drive(S) / Carmanhall Road
Date Thursday 11 April 2019

Time	D to A - Carmanhall Road to Blackthorn Drive(N)								Veh. Total	D to D - Carmanhall Road to Carmanhall Road								Veh. Total
	CAR	TAXI	LGV	OGV1	OGV2	PSV	M/C	P/C		CAR	TAXI	LGV	OGV1	OGV2	PSV	M/C	P/C	
7:00	6	1	1	0	0	0	0	0	8	0	0	0	0	0	0	0	0	0
7:15	6	0	2	0	0	0	0	0	8	0	0	0	0	0	0	0	0	0
7:30	19	1	2	0	0	0	0	1	23	0	0	0	0	0	0	0	0	0
7:45	15	0	1	0	0	0	0	0	16	0	0	0	0	0	0	0	0	0
8:00	15	0	0	0	0	0	0	0	15	0	0	0	0	0	0	0	0	0
8:15	7	0	0	0	0	0	0	0	7	0	0	0	0	0	0	0	0	0
8:30	13	1	2	0	0	0	0	1	17	0	0	0	0	0	0	0	0	0
8:45	11	0	4	1	0	0	0	0	16	0	0	0	0	0	0	0	0	0
9:00	11	0	2	0	0	0	1	0	14	0	0	0	0	0	0	0	0	0
9:15	11	1	2	2	0	0	0	0	16	0	0	0	0	0	0	0	0	0
9:30	12	0	1	2	0	0	0	0	15	0	0	0	0	0	0	0	0	0
9:45	21	2	3	1	0	0	0	0	27	0	0	0	0	0	0	0	0	0
Total	147	6	20	6	0	0	1	2	182	0	0	0	0	0	0	0	0	0

Peak Hour 8:00 to 9:00

8:00	15	0	0	0	0	0	0	0	15	0	0	0	0	0	0	0	0	0
8:15	7	0	0	0	0	0	0	0	7	0	0	0	0	0	0	0	0	0
8:30	13	1	2	0	0	0	0	1	17	0	0	0	0	0	0	0	0	0
8:45	11	0	4	1	0	0	0	0	16	0	0	0	0	0	0	0	0	0
Total	46	1	6	1	0	0	0	1	55	0	0	0	0	0	0	0	0	0

Date Thursday 11 April 2019

Time	D to A - Carmanhall Road to Blackthorn Drive(N)								Veh. Total	D to D - Carmanhall Road to Carmanhall Road								Veh. Total
	CAR	TAXI	LGV	OGV1	OGV2	PSV	M/C	P/C		CAR	TAXI	LGV	OGV1	OGV2	PSV	M/C	P/C	
16:00	27	1	1	1	0	0	0	0	30	0	0	0	0	0	0	0	0	0
16:15	33	0	5	0	0	0	0	0	38	0	0	0	0	0	0	0	0	0
16:30	37	0	3	1	0	0	1	0	42	0	0	0	0	0	0	0	0	0
16:45	49	1	1	0	0	0	1	1	53	0	0	0	0	0	0	0	0	0
17:00	48	1	0	0	0	0	0	0	49	0	0	0	0	0	0	0	0	0
17:15	65	0	1	0	0	0	0	0	66	0	0	0	0	0	0	0	0	0
17:30	51	1	1	0	0	0	0	2	55	0	0	0	0	0	0	0	0	0
17:45	55	1	1	0	0	0	0	1	58	0	0	0	0	0	0	0	0	0
18:00	34	2	1	0	0	0	0	2	39	0	0	0	0	0	0	0	0	0
18:15	27	0	1	0	0	0	2	2	32	0	0	0	0	0	0	0	0	0
18:30	36	0	1	0	0	0	0	0	37	0	0	0	0	0	0	0	0	0
18:45	21	1	1	0	0	0	0	0	23	0	0	0	0	0	0	0	0	0
Total	483	8	17	2	0	0	4	8	522	0	0	0	0	0	0	0	0	0

Peak Hour 17:00 to 18:00

17:00	48	1	0	0	0	0	0	0	49	0	0	0	0	0	0	0	0	0
17:15	65	0	1	0	0	0	0	0	66	0	0	0	0	0	0	0	0	0
17:30	51	1	1	0	0	0	0	2	55	0	0	0	0	0	0	0	0	0
17:45	55	1	1	0	0	0	0	1	58	0	0	0	0	0	0	0	0	0
Total	219	3	3	0	0	0	0	3	228	0	0	0	0	0	0	0	0	0

Site No. 1

Location Blackthorn Drive(N) / Birch Avenue / Blackthorn Drive(S) / Carmanhall Road

Date Thursday 11 April 2019

Time	To Arm A - Blackthorn Drive(N)								Veh. Total	From Arm A - Blackthorn Drive(N)								Veh. Total
	CAR	TAXI	LGV	OGV1	OGV2	PSV	M/C	P/C		CAR	TAXI	LGV	OGV1	OGV2	PSV	M/C	P/C	
7:00	60	4	7	2	1	0	1	4	79	28	1	1	0	0	3	0	0	33
7:15	94	0	12	2	1	1	0	2	112	30	0	3	0	0	1	0	0	34
7:30	156	5	11	1	0	1	0	4	178	48	1	6	0	1	1	2	0	59
7:45	178	3	13	2	0	0	1	1	198	72	2	2	0	0	1	0	2	79
8:00	174	2	10	4	0	0	1	6	197	78	3	4	0	0	2	0	4	91
8:15	138	0	8	1	0	1	0	5	153	79	2	4	2	0	1	1	1	90
8:30	114	3	10	2	1	1	1	4	136	79	1	1	1	0	1	1	2	86
8:45	109	5	9	5	0	0	1	5	134	94	0	6	1	0	0	0	3	104
9:00	85	3	11	1	0	0	1	0	101	103	3	8	3	0	3	0	5	125
9:15	80	3	12	4	1	1	0	2	103	79	4	4	0	0	2	0	0	89
9:30	92	4	15	4	0	1	1	0	117	60	1	7	0	1	3	0	0	72
9:45	97	6	21	2	0	1	0	0	127	56	2	8	2	0	1	1	1	71
Total	1377	38	139	30	4	7	7	33	1635	806	20	54	9	2	19	5	18	933

Peak Hour 8:00 to 9:00

8:00	174	2	10	4	0	0	1	6	197	78	3	4	0	0	2	0	4	91
8:15	138	0	8	1	0	1	0	5	153	79	2	4	2	0	1	1	1	90
8:30	114	3	10	2	1	1	1	4	136	79	1	1	1	0	1	1	2	86
8:45	109	5	9	5	0	0	1	5	134	94	0	6	1	0	0	0	3	104
Total	535	10	37	12	1	2	3	20	620	330	6	15	4	0	4	2	10	371

Date Thursday 11 April 2019

Time	To Arm A - Blackthorn Drive(N)								Veh. Total	From Arm A - Blackthorn Drive(N)								Veh. Total
	CAR	TAXI	LGV	OGV1	OGV2	PSV	M/C	P/C		CAR	TAXI	LGV	OGV1	OGV2	PSV	M/C	P/C	
16:00	89	1	5	2	0	0	0	1	98	85	2	9	2	0	2	0	0	100
16:15	115	0	11	2	0	0	1	1	130	79	1	9	0	0	0	0	0	89
16:30	126	0	7	3	0	0	1	3	140	75	0	7	1	0	0	0	2	85
16:45	140	1	8	0	0	0	3	1	153	62	2	8	0	0	0	0	3	75
17:00	172	3	4	0	0	1	3	1	184	57	1	3	0	0	3	0	1	65
17:15	176	2	9	1	0	0	4	0	192	67	2	4	1	0	1	1	2	78
17:30	163	2	3	0	0	0	0	4	172	77	1	4	1	0	1	1	2	87
17:45	154	3	7	0	0	0	0	3	167	80	3	1	0	0	1	2	1	88
18:00	110	3	2	1	0	0	0	3	119	77	0	4	0	0	2	2	3	88
18:15	113	2	6	0	0	1	3	4	129	78	2	4	0	0	1	0	4	89
18:30	103	2	10	0	0	0	0	2	117	77	7	1	0	0	2	0	0	87
18:45	88	2	1	0	0	0	0	0	91	80	3	3	0	1	1	1	3	92
Total	1549	21	73	9	0	2	15	23	1692	894	24	57	5	1	14	7	21	1023

Peak Hour 17:00 to 18:00

17:00	172	3	4	0	0	1	3	1	184	57	1	3	0	0	3	0	1	65
17:15	176	2	9	1	0	0	4	0	192	67	2	4	1	0	1	1	2	78
17:30	163	2	3	0	0	0	0	4	172	77	1	4	1	0	1	1	2	87
17:45	154	3	7	0	0	0	0	3	167	80	3	1	0	0	1	2	1	88
Total	665	10	23	1	0	1	7	8	715	281	7	12	2	0	6	4	6	318

Site No. 1

Location Blackthorn Drive(N) / Birch Avenue / Blackthorn Drive(S) / Carmanhall Road

Date Thursday 11 April 2019

Time	To Arm B - Birch Avenue								Veh. Total	From Arm B - Birch Avenue								Veh. Total
	CAR	TAXI	LGV	OGV1	OGV2	PSV	M/C	P/C		CAR	TAXI	LGV	OGV1	OGV2	PSV	M/C	P/C	
7:00	22	0	2	0	0	0	0	0	24	6	0	0	0	0	0	0	0	6
7:15	26	0	3	0	0	0	1	1	31	4	0	1	0	0	0	0	0	5
7:30	35	0	6	0	0	0	0	1	42	15	0	7	0	0	0	0	1	23
7:45	37	0	1	1	0	0	2	0	41	4	0	4	1	1	0	1	0	11
8:00	50	0	3	0	0	0	0	0	53	6	0	1	0	0	0	0	0	7
8:15	60	0	8	0	0	0	1	1	70	17	0	3	2	1	0	0	0	23
8:30	60	0	7	0	0	0	0	0	67	16	0	5	0	0	0	0	0	21
8:45	63	0	12	1	1	0	0	1	78	15	0	5	1	0	0	0	0	21
9:00	60	1	10	1	0	0	0	0	72	16	0	4	0	0	0	0	0	20
9:15	58	1	12	0	0	0	0	1	72	22	0	7	2	2	0	0	0	33
9:30	36	0	13	1	0	0	0	0	50	29	1	6	0	0	0	0	0	36
9:45	37	0	8	1	0	0	0	0	46	18	1	14	1	0	0	0	0	34
Total	544	2	85	5	1	0	4	5	646	168	2	57	7	4	0	1	1	240

Peak Hour 8:00 to 9:00

8:00	50	0	3	0	0	0	0	0	53	6	0	1	0	0	0	0	0	7
8:15	60	0	8	0	0	0	1	1	70	17	0	3	2	1	0	0	0	23
8:30	60	0	7	0	0	0	0	0	67	16	0	5	0	0	0	0	0	21
8:45	63	0	12	1	1	0	0	1	78	15	0	5	1	0	0	0	0	21
Total	233	0	30	1	1	0	1	2	268	54	0	14	3	1	0	0	0	72

Date Thursday 11 April 2019

Time	To Arm B - Birch Avenue								Veh. Total	From Arm B - Birch Avenue								Veh. Total
	CAR	TAXI	LGV	OGV1	OGV2	PSV	M/C	P/C		CAR	TAXI	LGV	OGV1	OGV2	PSV	M/C	P/C	
16:00	27	0	8	1	0	0	0	0	36	38	0	8	1	0	0	0	0	47
16:15	31	0	5	0	0	0	0	0	36	47	0	5	1	0	0	0	0	53
16:30	25	0	3	1	0	0	0	0	29	51	0	4	0	0	0	1	0	56
16:45	24	0	1	0	0	0	0	0	25	47	0	5	0	0	0	1	0	53
17:00	18	1	1	0	0	0	0	0	20	72	0	3	0	0	0	1	0	76
17:15	19	0	2	1	0	0	0	0	22	51	0	4	0	0	0	1	0	56
17:30	30	0	1	0	0	0	0	1	32	77	0	3	1	0	0	0	0	81
17:45	22	0	1	0	0	0	0	1	24	47	0	2	0	0	0	1	0	50
18:00	21	0	6	0	0	1	0	0	28	44	0	2	0	0	1	0	0	47
18:15	21	0	2	0	0	0	0	0	23	40	0	3	0	0	0	0	0	43
18:30	18	1	0	1	0	0	0	0	20	44	0	5	0	0	0	0	0	49
18:45	23	0	2	0	0	0	0	1	26	27	0	0	0	0	0	0	0	27
Total	279	2	32	4	0	1	0	3	321	585	0	44	3	0	1	5	0	638

Peak Hour 17:00 to 18:00

17:00	18	1	1	0	0	0	0	0	20	72	0	3	0	0	0	1	0	76
17:15	19	0	2	1	0	0	0	0	22	51	0	4	0	0	0	1	0	56
17:30	30	0	1	0	0	0	0	1	32	77	0	3	1	0	0	0	0	81
17:45	22	0	1	0	0	0	0	1	24	47	0	2	0	0	0	1	0	50
Total	89	1	5	1	0	0	0	2	98	247	0	12	1	0	0	3	0	263

Site No. 1
Location Blackthorn Drive(N) / Birch Avenue / Blackthorn Drive(S) / Carmanhall Road
Date Thursday 11 April 2019

Time	To Arm C - Blackthorn Drive(S)								Veh. Total	From Arm C - Blackthorn Drive(S)								Veh. Total
	CAR	TAXI	LGV	OGV1	OGV2	PSV	M/C	P/C		CAR	TAXI	LGV	OGV1	OGV2	PSV	M/C	P/C	
7:00	26	2	0	0	0	3	2	0	33	85	3	10	2	2	0	1	6	109
7:15	31	0	5	0	0	1	0	1	38	137	1	16	2	1	1	1	6	165
7:30	45	1	7	1	2	1	1	0	58	196	4	9	3	0	1	0	4	217
7:45	46	3	4	1	1	1	0	2	58	214	3	16	2	0	0	1	4	240
8:00	58	2	5	0	0	2	0	1	68	232	2	12	5	0	0	4	8	263
8:15	63	1	4	3	1	1	0	0	73	229	1	17	0	0	1	1	7	256
8:30	56	1	6	3	0	1	1	3	71	179	4	15	4	1	1	1	7	212
8:45	47	1	8	6	0	0	0	4	66	183	5	14	4	1	0	2	10	219
9:00	71	3	11	2	0	3	0	3	93	157	5	17	1	0	0	0	0	180
9:15	62	3	15	1	2	2	1	0	86	146	2	18	8	1	1	0	3	179
9:30	46	2	13	2	1	3	0	0	67	131	5	24	4	0	1	1	1	167
9:45	55	2	17	3	0	2	1	0	80	142	5	23	1	0	1	1	0	173
Total	606	21	95	22	7	20	6	14	791	2031	40	191	36	6	7	13	56	2380

Peak Hour 8:00 to 9:00

8:00	58	2	5	0	0	2	0	1	68	232	2	12	5	0	0	4	8	263
8:15	63	1	4	3	1	1	0	0	73	229	1	17	0	0	1	1	7	256
8:30	56	1	6	3	0	1	1	3	71	179	4	15	4	1	1	1	7	212
8:45	47	1	8	6	0	0	0	4	66	183	5	14	4	1	0	2	10	219
Total	224	5	23	12	1	4	1	8	278	823	12	58	13	2	2	8	32	950

Date Thursday 11 April 2019

Time	To Arm C - Blackthorn Drive(S)								Veh. Total	From Arm C - Blackthorn Drive(S)								Veh. Total
	CAR	TAXI	LGV	OGV1	OGV2	PSV	M/C	P/C		CAR	TAXI	LGV	OGV1	OGV2	PSV	M/C	P/C	
16:00	150	2	15	3	0	2	0	0	172	87	1	15	2	0	0	0	2	107
16:15	143	0	17	1	0	0	0	0	161	102	3	11	1	1	0	1	1	120
16:30	158	3	14	1	0	0	0	5	181	100	1	4	3	0	0	0	4	112
16:45	126	3	12	0	0	0	2	6	149	106	0	7	1	0	0	2	0	116
17:00	142	1	7	0	0	3	2	1	156	112	4	4	0	0	1	2	1	124
17:15	147	2	13	1	0	1	0	5	169	109	2	5	1	0	0	3	0	120
17:30	169	1	8	2	0	1	1	5	187	99	1	4	0	0	0	0	2	106
17:45	166	2	7	0	1	1	2	4	183	102	2	9	0	0	0	0	2	115
18:00	144	0	5	0	0	2	4	3	158	95	2	5	1	0	0	0	1	104
18:15	149	2	7	0	0	1	0	5	164	98	4	7	0	0	1	1	2	113
18:30	149	5	3	0	0	2	0	2	161	89	3	6	0	0	0	1	2	101
18:45	131	6	4	0	1	1	1	5	149	96	4	1	0	0	0	1	0	102
Total	1774	27	112	8	2	14	12	41	1990	1195	27	78	9	1	2	11	17	1340

Peak Hour 17:00 to 18:00

17:00	142	1	7	0	0	3	2	1	156	112	4	4	0	0	1	2	1	124
17:15	147	2	13	1	0	1	0	5	169	109	2	5	1	0	0	3	0	120
17:30	169	1	8	2	0	1	1	5	187	99	1	4	0	0	0	0	2	106
17:45	166	2	7	0	1	1	2	4	183	102	2	9	0	0	0	0	2	115
Total	624	6	35	3	1	6	5	15	695	422	9	22	1	0	1	5	5	465

Site No. 1

Location Blackthorn Drive(N) / Birch Avenue / Blackthorn Drive(S) / Carmanhall Road

Date Thursday 11 April 2019

Time	To Arm D - Carmanhall Road								Veh. Total	From Arm D - Carmanhall Road								Veh. Total
	CAR	TAXI	LGV	OGV1	OGV2	PSV	M/C	P/C		CAR	TAXI	LGV	OGV1	OGV2	PSV	M/C	P/C	
7:00	32	0	4	0	1	0	0	2	39	21	2	2	0	0	0	2	0	27
7:15	46	1	5	0	0	0	0	3	55	26	0	5	0	0	0	0	1	32
7:30	63	1	4	2	0	0	1	2	73	40	2	6	1	1	0	0	2	52
7:45	65	0	6	1	0	0	0	3	75	36	1	2	2	0	0	1	0	42
8:00	78	1	0	1	0	0	3	5	88	44	0	1	0	0	0	0	0	45
8:15	106	2	4	1	0	0	2	2	117	42	0	0	1	0	0	1	0	44
8:30	91	2	5	2	0	0	0	5	105	47	1	7	2	0	0	0	3	60
8:45	115	0	6	0	0	0	1	4	126	42	1	10	6	0	0	0	1	60
9:00	107	3	7	2	0	0	0	4	123	47	2	10	2	0	0	1	2	64
9:15	91	1	8	7	0	0	0	0	107	44	2	18	2	0	0	1	0	67
9:30	81	2	8	2	0	0	0	1	94	35	1	12	5	0	0	0	0	53
9:45	79	3	9	1	0	0	2	1	95	52	3	10	3	0	1	1	0	70
Total	954	16	66	19	1	0	9	32	1097	476	15	83	24	1	1	7	9	616

Peak Hour 8:00 to 9:00

8:00	78	1	0	1	0	0	3	5	88	44	0	1	0	0	0	0	0	45
8:15	106	2	4	1	0	0	2	2	117	42	0	0	1	0	0	1	0	44
8:30	91	2	5	2	0	0	0	5	105	47	1	7	2	0	0	0	3	60
8:45	115	0	6	0	0	0	1	4	126	42	1	10	6	0	0	0	1	60
Total	390	5	15	4	0	0	6	16	436	175	2	18	9	0	0	1	4	209

Date Thursday 11 April 2019

Time	To Arm D - Carmanhall Road								Veh. Total	From Arm D - Carmanhall Road								Veh. Total
	CAR	TAXI	LGV	OGV1	OGV2	PSV	M/C	P/C		CAR	TAXI	LGV	OGV1	OGV2	PSV	M/C	P/C	
16:00	50	2	11	1	0	0	0	1	65	106	2	7	2	0	0	0	0	117
16:15	53	4	7	0	1	0	0	0	65	114	0	15	1	0	0	0	0	130
16:30	52	1	3	0	0	0	1	1	58	135	3	12	1	0	0	1	3	155
16:45	47	0	4	1	0	0	1	1	54	122	2	5	0	0	0	3	5	137
17:00	46	1	2	0	0	0	0	0	49	137	1	4	0	0	0	2	0	144
17:15	49	0	1	0	0	0	1	1	52	164	0	12	1	0	0	0	4	181
17:30	49	0	1	0	0	0	1	0	51	158	1	2	0	0	0	1	6	168
17:45	46	1	3	0	0	0	2	0	52	159	1	6	0	1	0	1	5	173
18:00	58	1	4	0	0	0	0	1	64	117	2	6	0	0	0	2	3	130
18:15	46	4	2	0	0	0	0	1	53	113	2	3	0	0	0	2	4	124
18:30	53	3	2	0	0	0	1	0	59	113	1	3	1	0	0	0	2	120
18:45	50	4	1	0	0	0	1	0	56	89	5	4	0	0	0	0	3	101
Total	599	21	41	2	1	0	8	6	678	1527	20	79	6	1	0	12	35	1680

Peak Hour 17:00 to 18:00

17:00	46	1	2	0	0	0	0	0	49	137	1	4	0	0	0	2	0	144
17:15	49	0	1	0	0	0	1	1	52	164	0	12	1	0	0	0	4	181
17:30	49	0	1	0	0	0	1	0	51	158	1	2	0	0	0	1	6	168
17:45	46	1	3	0	0	0	2	0	52	159	1	6	0	1	0	1	5	173
Total	190	2	7	0	0	0	4	1	204	618	3	24	1	1	0	4	15	666

Site No. 2
Location Carmanhall Road(W) / Corrig Road / Carmanhall Road(E)
Date Thursday 11 April 2019

Time	A to C - Carmanhall Road(W) to Carmanhall Road(E)								Veh. Total	A to B - Carmanhall Road(W) to Corrig Road								Veh. Total
	CAR	TAXI	LGV	OGV1	OGV2	PSV	M/C	P/C		CAR	TAXI	LGV	OGV1	OGV2	PSV	M/C	P/C	
7:00	23	0	2	0	1	0	0	1	27	1	0	1	0	0	0	0	0	2
7:15	30	0	2	0	0	0	0	4	36	4	0	1	0	0	0	0	0	5
7:30	36	1	3	1	0	0	1	1	43	7	0	0	0	0	0	0	0	7
7:45	38	0	6	1	0	0	0	2	47	23	0	0	0	0	0	0	0	23
8:00	43	0	0	0	0	0	1	5	49	17	0	2	0	0	0	1	1	21
8:15	49	2	2	0	0	0	1	2	56	26	0	1	1	0	0	1	1	30
8:30	41	2	4	1	0	0	1	6	55	14	0	0	0	0	0	0	0	14
8:45	51	1	5	1	0	0	1	6	65	26	0	0	0	0	0	0	0	26
9:00	47	1	7	0	0	0	1	0	56	17	0	2	0	0	0	0	0	19
9:15	38	1	5	4	0	0	0	0	48	14	1	1	0	0	0	0	0	16
9:30	29	3	5	1	0	0	0	3	41	15	0	0	0	0	0	0	0	15
9:45	27	2	4	0	0	0	0	0	33	14	0	2	1	0	0	1	0	18
Total	452	13	45	9	1	0	6	30	556	178	1	10	2	0	0	3	2	196

Peak Hour 8:15 to 9:15

8:15	49	2	2	0	0	0	1	2	56	26	0	1	1	0	0	1	1	30
8:30	41	2	4	1	0	0	1	6	55	14	0	0	0	0	0	0	0	14
8:45	51	1	5	1	0	0	1	6	65	26	0	0	0	0	0	0	0	26
9:00	47	1	7	0	0	0	1	0	56	17	0	2	0	0	0	0	0	19
Total	188	6	18	2	0	0	4	14	232	83	0	3	1	0	0	1	1	89

Date Thursday 11 April 2019

Time	A to C - Carmanhall Road(W) to Carmanhall Road(E)								Veh. Total	A to B - Carmanhall Road(W) to Corrig Road								Veh. Total
	CAR	TAXI	LGV	OGV1	OGV2	PSV	M/C	P/C		CAR	TAXI	LGV	OGV1	OGV2	PSV	M/C	P/C	
16:00	16	0	7	0	0	0	0	1	24	7	1	5	1	0	0	0	0	14
16:15	18	3	2	0	0	0	0	0	23	8	0	3	0	0	0	0	0	11
16:30	16	1	1	0	0	0	1	1	20	11	0	2	0	0	0	0	0	13
16:45	22	0	1	0	0	0	1	0	24	10	0	3	1	0	0	0	0	14
17:00	16	0	3	0	0	0	0	1	20	8	0	0	0	0	0	0	0	8
17:15	21	0	2	0	0	0	0	0	23	4	0	1	0	0	0	0	0	5
17:30	26	0	1	0	0	0	0	1	28	3	0	0	0	0	0	2	0	5
17:45	18	1	0	0	0	0	1	1	21	5	0	1	0	0	0	0	0	6
18:00	19	0	3	0	0	0	1	1	24	7	0	1	0	0	0	0	0	8
18:15	20	2	1	0	0	0	0	1	24	7	0	0	0	0	0	0	0	7
18:30	23	2	0	0	0	0	0	1	26	2	0	0	0	0	0	0	0	2
18:45	23	2	1	0	0	0	1	1	28	7	0	0	0	0	0	0	0	7
Total	238	11	22	0	0	0	5	9	285	79	1	16	2	0	0	2	0	100

Peak Hour 17:00 to 18:00

17:00	16	0	3	0	0	0	0	1	20	8	0	0	0	0	0	0	0	8
17:15	21	0	2	0	0	0	0	0	23	4	0	1	0	0	0	0	0	5
17:30	26	0	1	0	0	0	0	1	28	3	0	0	0	0	0	2	0	5
17:45	18	1	0	0	0	0	1	1	21	5	0	1	0	0	0	0	0	6
Total	81	1	6	0	0	0	1	3	92	20	0	2	0	0	0	2	0	24

Site No. 2

Location Carmanhall Road(W) / Corrig Road / Carmanhall Road(E)

Date Thursday 11 April 2019

Time	A to A - Carmanhall Road(W) to Carmanhall Road(W)								Veh. Total	B to A - Corrig Road to Carmanhall Road(W)								Veh. Total
	CAR	TAXI	LGV	OGV1	OGV2	PSV	M/C	P/C		CAR	TAXI	LGV	OGV1	OGV2	PSV	M/C	P/C	
7:00	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1
7:15	0	0	0	0	0	0	0	0	0	8	0	0	0	0	0	0	1	9
7:30	0	0	0	0	0	0	0	0	0	6	0	2	1	0	0	0	0	9
7:45	0	0	0	0	0	0	0	0	0	13	1	1	0	0	0	0	0	15
8:00	0	0	0	0	0	0	0	0	0	19	0	0	0	0	0	0	0	19
8:15	0	0	0	0	0	0	0	0	0	11	0	0	2	0	0	0	0	13
8:30	0	0	0	0	0	0	0	0	0	18	3	5	0	0	0	0	0	26
8:45	0	0	0	0	0	0	0	0	0	13	0	1	5	0	0	0	0	19
9:00	0	0	0	0	0	0	0	0	0	10	1	3	1	0	0	0	0	15
9:15	0	0	0	0	0	0	0	0	0	13	1	4	0	0	0	0	0	18
9:30	0	0	1	0	0	0	0	0	1	2	0	2	0	0	0	0	1	5
9:45	0	0	0	0	0	0	0	0	0	13	2	0	0	1	0	0	0	16
Total	0	0	1	0	0	0	0	0	1	127	8	18	9	1	0	0	2	165

Peak Hour 8:15 to 9:15

Time	CAR	TAXI	LGV	OGV1	OGV2	PSV	M/C	P/C	Veh. Total	CAR	TAXI	LGV	OGV1	OGV2	PSV	M/C	P/C	Veh. Total
8:15	0	0	0	0	0	0	0	0	0	11	0	0	2	0	0	0	0	13
8:30	0	0	0	0	0	0	0	0	0	18	3	5	0	0	0	0	0	26
8:45	0	0	0	0	0	0	0	0	0	13	0	1	5	0	0	0	0	19
9:00	0	0	0	0	0	0	0	0	0	10	1	3	1	0	0	0	0	15
Total	0	0	0	0	0	0	0	0	0	52	4	9	8	0	0	0	0	73

Date Thursday 11 April 2019

Time	A to A - Carmanhall Road(W) to Carmanhall Road(W)								Veh. Total	B to A - Corrig Road to Carmanhall Road(W)								Veh. Total
	CAR	TAXI	LGV	OGV1	OGV2	PSV	M/C	P/C		CAR	TAXI	LGV	OGV1	OGV2	PSV	M/C	P/C	
16:00	1	0	0	0	0	0	0	0	1	23	0	0	1	0	0	0	0	24
16:15	0	0	0	0	0	0	0	0	0	29	0	2	0	0	0	0	0	31
16:30	1	0	0	0	0	0	0	0	1	32	0	2	0	0	0	0	0	34
16:45	0	0	0	0	0	0	0	0	0	36	1	3	0	0	0	2	0	42
17:00	0	0	0	0	0	0	0	0	0	49	0	3	1	0	0	1	1	55
17:15	0	0	0	0	0	0	0	0	0	43	0	4	0	0	0	0	0	47
17:30	1	0	0	0	0	0	0	0	1	47	1	2	0	0	0	1	3	54
17:45	0	0	0	0	0	0	0	0	0	34	1	1	0	0	0	1	0	37
18:00	0	0	0	0	0	0	0	0	0	27	0	1	0	0	0	1	0	29
18:15	0	0	0	0	0	0	0	0	0	17	0	0	0	0	0	1	0	18
18:30	1	0	0	0	0	0	0	0	1	26	0	1	0	0	0	0	0	27
18:45	0	0	0	0	0	0	0	0	0	9	0	0	0	0	0	0	0	9
Total	4	0	0	0	0	0	0	0	4	372	3	19	2	0	0	7	4	407

Peak Hour 17:00 to 18:00

Time	CAR	TAXI	LGV	OGV1	OGV2	PSV	M/C	P/C	Veh. Total	CAR	TAXI	LGV	OGV1	OGV2	PSV	M/C	P/C	Veh. Total
17:00	0	0	0	0	0	0	0	0	0	49	0	3	1	0	0	1	1	55
17:15	0	0	0	0	0	0	0	0	0	43	0	4	0	0	0	0	0	47
17:30	1	0	0	0	0	0	0	0	1	47	1	2	0	0	0	1	3	54
17:45	0	0	0	0	0	0	0	0	0	34	1	1	0	0	0	1	0	37
Total	1	0	0	0	0	0	0	0	1	173	2	10	1	0	0	3	4	193

Site No. 2
Location Carmanhall Road(W) / Corrig Road / Carmanhall Road(E)
Date Thursday 11 April 2019

Time	B to C - Corrig Road to Carmanhall Road(E)								Veh. Total	B to B - Corrig Road to Corrig Road								Veh. Total
	CAR	TAXI	LGV	OGV1	OGV2	PSV	M/C	P/C		CAR	TAXI	LGV	OGV1	OGV2	PSV	M/C	P/C	
7:00	7	0	1	0	0	0	0	0	8	0	0	0	0	0	0	0	0	0
7:15	10	0	0	0	0	0	0	2	12	0	0	0	0	0	0	0	0	0
7:30	3	1	2	0	0	0	0	0	6	0	0	0	0	0	0	0	0	0
7:45	8	0	2	0	0	0	0	0	10	0	0	0	0	0	0	0	0	0
8:00	9	1	2	0	0	0	0	1	13	0	0	0	0	0	0	0	0	0
8:15	11	0	2	2	0	0	0	0	15	0	0	0	0	0	0	0	0	0
8:30	9	1	3	1	0	0	0	4	18	0	0	0	0	0	0	0	0	0
8:45	9	2	1	0	0	0	0	0	12	0	0	0	0	0	0	0	0	0
9:00	15	1	0	1	0	0	0	1	18	0	0	0	0	0	0	0	0	0
9:15	13	1	2	1	0	0	1	1	19	0	0	0	0	0	0	0	0	0
9:30	9	0	3	2	0	0	0	1	15	0	0	0	0	0	0	0	0	0
9:45	9	0	4	0	0	0	1	0	14	0	0	0	0	0	0	0	0	0
Total	112	7	22	7	0	0	2	10	160	0	0	0	0	0	0	0	0	0

Peak Hour 8:15 to 9:15

8:15	11	0	2	2	0	0	0	0	15	0	0	0	0	0	0	0	0	0
8:30	9	1	3	1	0	0	0	4	18	0	0	0	0	0	0	0	0	0
8:45	9	2	1	0	0	0	0	0	12	0	0	0	0	0	0	0	0	0
9:00	15	1	0	1	0	0	0	1	18	0	0	0	0	0	0	0	0	0
Total	44	4	6	4	0	0	0	5	63	0	0	0	0	0	0	0	0	0

Date Thursday 11 April 2019

Time	B to C - Corrig Road to Carmanhall Road(E)								Veh. Total	B to B - Corrig Road to Corrig Road								Veh. Total
	CAR	TAXI	LGV	OGV1	OGV2	PSV	M/C	P/C		CAR	TAXI	LGV	OGV1	OGV2	PSV	M/C	P/C	
16:00	7	1	0	0	0	0	0	1	9	0	0	0	0	0	0	0	0	0
16:15	15	2	3	0	0	0	0	0	20	0	0	0	0	0	0	0	0	0
16:30	9	0	1	0	0	1	0	1	12	0	0	0	0	0	0	0	0	0
16:45	7	2	1	0	0	0	0	1	11	0	0	0	0	0	0	0	0	0
17:00	13	0	1	0	0	0	1	0	15	0	0	0	0	0	0	0	0	0
17:15	12	1	0	0	0	0	0	3	16	0	0	0	0	0	0	0	0	0
17:30	11	0	0	0	0	0	1	3	15	0	0	0	0	0	0	0	0	0
17:45	10	1	1	0	0	0	2	1	15	0	0	0	0	0	0	0	0	0
18:00	11	0	1	0	0	0	0	0	12	0	0	0	0	0	0	0	0	0
18:15	5	0	0	0	0	0	0	1	6	0	0	0	0	0	0	0	0	0
18:30	7	1	0	0	0	0	0	0	8	0	0	0	0	0	0	0	0	0
18:45	4	1	0	0	0	0	0	1	6	0	0	0	0	0	0	0	0	0
Total	111	9	8	0	0	1	4	12	145	0	0	0	0	0	0	0	0	0

Peak Hour 17:00 to 18:00

17:00	13	0	1	0	0	0	1	0	15	0	0	0	0	0	0	0	0	0
17:15	12	1	0	0	0	0	0	3	16	0	0	0	0	0	0	0	0	0
17:30	11	0	0	0	0	0	1	3	15	0	0	0	0	0	0	0	0	0
17:45	10	1	1	0	0	0	2	1	15	0	0	0	0	0	0	0	0	0
Total	46	2	2	0	0	0	4	7	61	0	0	0	0	0	0	0	0	0

Site No. 2
Location Carmanhall Road(W) / Corrig Road / Carmanhall Road(E)
Date Thursday 11 April 2019

Time	C to B - Carmanhall Road(E) to Corrig Road								Veh. Total	C to A - Carmanhall Road(E) to Carmanhall Road(W)								Veh. Total
	CAR	TAXI	LGV	OGV1	OGV2	PSV	M/C	P/C		CAR	TAXI	LGV	OGV1	OGV2	PSV	M/C	P/C	
7:00	2	0	0	0	0	0	0	0	2	15	1	2	0	0	0	2	0	20
7:15	5	0	0	0	0	0	0	1	6	14	0	4	0	0	0	1	0	19
7:30	3	0	0	1	0	0	0	0	4	26	1	4	1	1	0	0	2	35
7:45	3	0	1	0	0	0	1	1	6	19	0	3	2	0	0	1	0	25
8:00	4	0	0	0	0	0	0	2	6	26	0	1	0	0	0	0	0	27
8:15	11	0	3	0	0	0	0	2	16	37	0	1	0	0	0	1	1	40
8:30	9	1	2	0	0	0	0	0	12	35	0	6	1	0	0	0	2	44
8:45	5	1	0	0	0	0	0	1	7	29	1	6	1	0	0	0	0	37
9:00	8	1	1	0	0	0	0	2	12	37	1	7	1	0	0	1	1	48
9:15	5	1	0	0	0	0	0	0	6	32	2	13	3	0	0	1	2	53
9:30	6	0	1	0	0	0	0	0	7	22	1	11	2	0	0	0	0	36
9:45	3	0	4	0	0	0	0	0	7	31	1	9	1	0	0	1	0	43
Total	64	4	12	1	0	0	1	9	91	323	8	67	12	1	0	8	8	427

Peak Hour 8:15 to 9:15

8:15	11	0	3	0	0	0	0	2	16	37	0	1	0	0	0	1	1	40
8:30	9	1	2	0	0	0	0	0	12	35	0	6	1	0	0	0	2	44
8:45	5	1	0	0	0	0	0	1	7	29	1	6	1	0	0	0	0	37
9:00	8	1	1	0	0	0	0	2	12	37	1	7	1	0	0	1	1	48
Total	33	3	6	0	0	0	0	5	47	138	2	20	3	0	0	2	4	169

Date Thursday 11 April 2019

Time	C to B - Carmanhall Road(E) to Corrig Road								Veh. Total	C to A - Carmanhall Road(E) to Carmanhall Road(W)								Veh. Total
	CAR	TAXI	LGV	OGV1	OGV2	PSV	M/C	P/C		CAR	TAXI	LGV	OGV1	OGV2	PSV	M/C	P/C	
16:00	1	0	1	0	0	0	0	0	2	61	0	8	1	0	0	0	0	70
16:15	0	0	0	0	0	0	0	0	0	57	0	14	1	0	0	1	0	73
16:30	3	0	0	0	0	0	0	0	3	74	3	8	0	0	0	1	4	90
16:45	1	0	0	0	0	0	0	0	1	55	0	0	0	0	0	1	5	61
17:00	5	0	0	0	0	0	0	0	5	79	1	4	0	0	0	1	2	87
17:15	1	0	0	0	0	0	0	1	2	61	0	4	0	0	0	0	4	69
17:30	5	0	1	0	0	0	0	2	8	75	0	0	0	0	0	0	6	81
17:45	3	0	0	0	0	0	0	0	3	73	0	5	0	1	0	1	7	87
18:00	3	0	0	0	0	0	0	0	3	51	0	3	0	0	0	1	2	57
18:15	3	1	0	0	0	0	0	1	5	53	0	2	0	0	0	0	3	58
18:30	2	2	0	0	0	0	0	1	5	45	0	1	1	0	0	1	0	48
18:45	2	1	0	0	0	0	0	0	3	45	1	1	0	0	0	0	3	50
Total	29	4	2	0	0	0	0	5	40	729	5	50	3	1	0	7	36	831

Peak Hour 17:00 to 18:00

17:00	5	0	0	0	0	0	0	0	5	79	1	4	0	0	0	1	2	87
17:15	1	0	0	0	0	0	0	1	2	61	0	4	0	0	0	0	4	69
17:30	5	0	1	0	0	0	0	2	8	75	0	0	0	0	0	0	6	81
17:45	3	0	0	0	0	0	0	0	3	73	0	5	0	1	0	1	7	87
Total	14	0	1	0	0	0	0	3	18	288	1	13	0	1	0	2	19	324

Site No. 2
Location Carmanhall Road(W) / Corrig Road / Carmanhall Road(E)
Date Thursday 11 April 2019

Time	C to C - Carmanhall Road(E) to Carmanhall Road(E)								Veh. Total
	CAR	TAXI	LGV	OGV1	OGV2	PSV	M/C	P/C	
7:00	0	0	0	0	0	0	0	0	0
7:15	0	0	0	0	0	0	0	0	0
7:30	0	0	0	0	0	0	0	0	0
7:45	0	0	1	0	0	0	0	0	1
8:00	0	0	0	0	0	0	0	0	0
8:15	0	0	0	0	0	0	0	0	0
8:30	0	0	0	0	0	0	0	0	0
8:45	0	0	0	0	0	0	0	0	0
9:00	0	0	0	0	0	0	0	0	0
9:15	0	0	0	0	0	0	0	0	0
9:30	0	0	0	0	0	0	0	0	0
9:45	0	0	0	0	0	0	0	0	0
Total	0	0	1	0	0	0	0	0	1

Peak Hour 8:15 to 9:15

8:15	0	0	0	0	0	0	0	0	0
8:30	0	0	0	0	0	0	0	0	0
8:45	0	0	0	0	0	0	0	0	0
9:00	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0

Date Thursday 11 April 2019

Time	C to C - Carmanhall Road(E) to Carmanhall Road(E)								Veh. Total
	CAR	TAXI	LGV	OGV1	OGV2	PSV	M/C	P/C	
16:00	0	0	0	0	0	0	0	0	0
16:15	0	1	0	0	0	0	0	0	1
16:30	0	0	0	0	0	0	0	0	0
16:45	0	1	0	0	0	0	0	0	1
17:00	0	0	0	0	0	0	0	0	0
17:15	0	0	0	0	0	0	0	0	0
17:30	0	0	0	0	0	0	0	0	0
17:45	0	0	0	0	0	0	0	0	0
18:00	0	0	0	0	0	0	0	0	0
18:15	0	0	0	0	0	0	0	0	0
18:30	0	0	0	0	0	0	0	0	0
18:45	0	0	0	0	0	0	0	0	0
Total	0	2	0	0	0	0	0	0	2

Peak Hour 17:00 to 18:00

17:00	0	0	0	0	0	0	0	0	0
17:15	0	0	0	0	0	0	0	0	0
17:30	0	0	0	0	0	0	0	0	0
17:45	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0

Site No. 2
Location Carmanhall Road(W) / Corrig Road / Carmanhall Road(E)
Date Thursday 11 April 2019

Time	To Arm A - Carmanhall Road(W)								Veh. Total	From Arm A - Carmanhall Road(W)								Veh. Total
	CAR	TAXI	LGV	OGV1	OGV2	PSV	M/C	P/C		CAR	TAXI	LGV	OGV1	OGV2	PSV	M/C	P/C	
7:00	16	1	2	0	0	0	2	0	21	24	0	3	0	1	0	0	1	29
7:15	22	0	4	0	0	0	1	1	28	34	0	3	0	0	0	0	4	41
7:30	32	1	6	2	1	0	0	2	44	43	1	3	1	0	0	1	1	50
7:45	32	1	4	2	0	0	1	0	40	61	0	6	1	0	0	0	2	70
8:00	45	0	1	0	0	0	0	0	46	60	0	2	0	0	0	2	6	70
8:15	48	0	1	2	0	0	1	1	53	75	2	3	1	0	0	2	3	86
8:30	53	3	11	1	0	0	0	2	70	55	2	4	1	0	0	1	6	69
8:45	42	1	7	6	0	0	0	0	56	77	1	5	1	0	0	1	6	91
9:00	47	2	10	2	0	0	1	1	63	64	1	9	0	0	0	1	0	75
9:15	45	3	17	3	0	0	1	2	71	52	2	6	4	0	0	0	0	64
9:30	24	1	14	2	0	0	0	1	42	44	3	6	1	0	0	0	3	57
9:45	44	3	9	1	1	0	1	0	59	41	2	6	1	0	0	1	0	51
Total	450	16	86	21	2	0	8	10	593	630	14	56	11	1	0	9	32	753

Peak Hour 8:15 to 9:15

8:15	48	0	1	2	0	0	1	1	53	75	2	3	1	0	0	2	3	86
8:30	53	3	11	1	0	0	0	2	70	55	2	4	1	0	0	1	6	69
8:45	42	1	7	6	0	0	0	0	56	77	1	5	1	0	0	1	6	91
9:00	47	2	10	2	0	0	1	1	63	64	1	9	0	0	0	1	0	75
Total	190	6	29	11	0	0	2	4	242	271	6	21	3	0	0	5	15	321

Date Thursday 11 April 2019

Time	To Arm A - Carmanhall Road(W)								Veh. Total	From Arm A - Carmanhall Road(W)								Veh. Total
	CAR	TAXI	LGV	OGV1	OGV2	PSV	M/C	P/C		CAR	TAXI	LGV	OGV1	OGV2	PSV	M/C	P/C	
16:00	85	0	8	2	0	0	0	0	95	24	1	12	1	0	0	0	1	39
16:15	86	0	16	1	0	0	1	0	104	26	3	5	0	0	0	0	0	34
16:30	107	3	10	0	0	0	1	4	125	28	1	3	0	0	0	1	1	34
16:45	91	1	3	0	0	0	3	5	103	32	0	4	1	0	0	1	0	38
17:00	128	1	7	1	0	0	2	3	142	24	0	3	0	0	0	0	1	28
17:15	104	0	8	0	0	0	0	4	116	25	0	3	0	0	0	0	0	28
17:30	123	1	2	0	0	0	1	9	136	30	0	1	0	0	0	2	1	34
17:45	107	1	6	0	1	0	2	7	124	23	1	1	0	0	0	1	1	27
18:00	78	0	4	0	0	0	2	2	86	26	0	4	0	0	0	1	1	32
18:15	70	0	2	0	0	0	1	3	76	27	2	1	0	0	0	0	1	31
18:30	72	0	2	1	0	0	1	0	76	26	2	0	0	0	0	0	1	29
18:45	54	1	1	0	0	0	0	3	59	30	2	1	0	0	0	1	1	35
Total	1105	8	69	5	1	0	14	40	1242	321	12	38	2	0	0	7	9	389

Peak Hour 17:00 to 18:00

17:00	128	1	7	1	0	0	2	3	142	24	0	3	0	0	0	0	1	28
17:15	104	0	8	0	0	0	0	4	116	25	0	3	0	0	0	0	0	28
17:30	123	1	2	0	0	0	1	9	136	30	0	1	0	0	0	2	1	34
17:45	107	1	6	0	1	0	2	7	124	23	1	1	0	0	0	1	1	27
Total	462	3	23	1	1	0	5	23	518	102	1	8	0	0	0	3	3	117

Site No. 2
Location Carmanhall Road(W) / Corrig Road / Carmanhall Road(E)
Date Thursday 11 April 2019

Time	To Arm B - Corrig Road								Veh. Total	From Arm B - Corrig Road								Veh. Total
	CAR	TAXI	LGV	OGV1	OGV2	PSV	M/C	P/C		CAR	TAXI	LGV	OGV1	OGV2	PSV	M/C	P/C	
7:00	3	0	1	0	0	0	0	0	4	8	0	1	0	0	0	0	0	9
7:15	9	0	1	0	0	0	0	1	11	18	0	0	0	0	0	0	3	21
7:30	10	0	0	1	0	0	0	0	11	9	1	4	1	0	0	0	0	15
7:45	26	0	1	0	0	0	1	1	29	21	1	3	0	0	0	0	0	25
8:00	21	0	2	0	0	0	1	3	27	28	1	2	0	0	0	0	1	32
8:15	37	0	4	1	0	0	1	3	46	22	0	2	4	0	0	0	0	28
8:30	23	1	2	0	0	0	0	0	26	27	4	8	1	0	0	0	4	44
8:45	31	1	0	0	0	0	0	1	33	22	2	2	5	0	0	0	0	31
9:00	25	1	3	0	0	0	0	2	31	25	2	3	2	0	0	0	1	33
9:15	19	2	1	0	0	0	0	0	22	26	2	6	1	0	0	1	1	37
9:30	21	0	1	0	0	0	0	0	22	11	0	5	2	0	0	0	2	20
9:45	17	0	6	1	0	0	1	0	25	22	2	4	0	1	0	1	0	30
Total	242	5	22	3	0	0	4	11	287	239	15	40	16	1	0	2	12	325

Peak Hour 8:15 to 9:15

Time	CAR	TAXI	LGV	OGV1	OGV2	PSV	M/C	P/C	Veh. Total	CAR	TAXI	LGV	OGV1	OGV2	PSV	M/C	P/C	Veh. Total
8:15	37	0	4	1	0	0	1	3	46	22	0	2	4	0	0	0	0	28
8:30	23	1	2	0	0	0	0	0	26	27	4	8	1	0	0	0	4	44
8:45	31	1	0	0	0	0	0	1	33	22	2	2	5	0	0	0	0	31
9:00	25	1	3	0	0	0	0	2	31	25	2	3	2	0	0	0	1	33
Total	116	3	9	1	0	0	1	6	136	96	8	15	12	0	0	0	5	136

Date Thursday 11 April 2019

Time	To Arm B - Corrig Road								Veh. Total	From Arm B - Corrig Road								Veh. Total
	CAR	TAXI	LGV	OGV1	OGV2	PSV	M/C	P/C		CAR	TAXI	LGV	OGV1	OGV2	PSV	M/C	P/C	
16:00	8	1	6	1	0	0	0	0	16	30	1	0	1	0	0	0	1	33
16:15	8	0	3	0	0	0	0	0	11	44	2	5	0	0	0	0	0	51
16:30	14	0	2	0	0	0	0	0	16	41	0	3	0	0	1	0	1	46
16:45	11	0	3	1	0	0	0	0	15	43	3	4	0	0	0	2	1	53
17:00	13	0	0	0	0	0	0	0	13	62	0	4	1	0	0	2	1	70
17:15	5	0	1	0	0	0	0	1	7	55	1	4	0	0	0	0	3	63
17:30	8	0	1	0	0	0	2	2	13	58	1	2	0	0	0	2	6	69
17:45	8	0	1	0	0	0	0	0	9	44	2	2	0	0	0	3	1	52
18:00	10	0	1	0	0	0	0	0	11	38	0	2	0	0	0	1	0	41
18:15	10	1	0	0	0	0	0	1	12	22	0	0	0	0	0	1	1	24
18:30	4	2	0	0	0	0	0	1	7	33	1	1	0	0	0	0	0	35
18:45	9	1	0	0	0	0	0	0	10	13	1	0	0	0	0	0	1	15
Total	108	5	18	2	0	0	2	5	140	483	12	27	2	0	1	11	16	552

Peak Hour 17:00 to 18:00

Time	CAR	TAXI	LGV	OGV1	OGV2	PSV	M/C	P/C	Veh. Total	CAR	TAXI	LGV	OGV1	OGV2	PSV	M/C	P/C	Veh. Total
17:00	13	0	0	0	0	0	0	0	13	62	0	4	1	0	0	2	1	70
17:15	5	0	1	0	0	0	0	1	7	55	1	4	0	0	0	0	3	63
17:30	8	0	1	0	0	0	2	2	13	58	1	2	0	0	0	2	6	69
17:45	8	0	1	0	0	0	0	0	9	44	2	2	0	0	0	3	1	52
Total	34	0	3	0	0	0	2	3	42	219	4	12	1	0	0	7	11	254

Site No. 2
Location Carmanhall Road(W) / Corrig Road / Carmanhall Road(E)
Date Thursday 11 April 2019

Time	To Arm C - Carmanhall Road(E)								Veh. Total	From Arm C - Carmanhall Road(E)								Veh. Total
	CAR	TAXI	LGV	OGV1	OGV2	PSV	M/C	P/C		CAR	TAXI	LGV	OGV1	OGV2	PSV	M/C	P/C	
7:00	30	0	3	0	1	0	0	1	35	17	1	2	0	0	0	2	0	22
7:15	40	0	2	0	0	0	0	6	48	19	0	4	0	0	0	1	1	25
7:30	39	2	5	1	0	0	1	1	49	29	1	4	2	1	0	0	2	39
7:45	46	0	9	1	0	0	0	2	58	22	0	5	2	0	0	2	1	32
8:00	52	1	2	0	0	0	1	6	62	30	0	1	0	0	0	0	2	33
8:15	60	2	4	2	0	0	1	2	71	48	0	4	0	0	0	1	3	56
8:30	50	3	7	2	0	0	1	10	73	44	1	8	1	0	0	0	2	56
8:45	60	3	6	1	0	0	1	6	77	34	2	6	1	0	0	0	1	44
9:00	62	2	7	1	0	0	1	1	74	45	2	8	1	0	0	1	3	60
9:15	51	2	7	5	0	0	1	1	67	37	3	13	3	0	0	1	2	59
9:30	38	3	8	3	0	0	0	4	56	28	1	12	2	0	0	0	0	43
9:45	36	2	8	0	0	0	1	0	47	34	1	13	1	0	0	1	0	50
Total	564	20	68	16	1	0	8	40	717	387	12	80	13	1	0	9	17	519

Peak Hour 8:15 to 9:15

8:15	60	2	4	2	0	0	1	2	71	48	0	4	0	0	0	1	3	56
8:30	50	3	7	2	0	0	1	10	73	44	1	8	1	0	0	0	2	56
8:45	60	3	6	1	0	0	1	6	77	34	2	6	1	0	0	0	1	44
9:00	62	2	7	1	0	0	1	1	74	45	2	8	1	0	0	1	3	60
Total	232	10	24	6	0	0	4	19	295	171	5	26	3	0	0	2	9	216

Date Thursday 11 April 2019

Time	To Arm C - Carmanhall Road(E)								Veh. Total	From Arm C - Carmanhall Road(E)								Veh. Total
	CAR	TAXI	LGV	OGV1	OGV2	PSV	M/C	P/C		CAR	TAXI	LGV	OGV1	OGV2	PSV	M/C	P/C	
16:00	23	1	7	0	0	0	0	2	33	62	0	9	1	0	0	0	0	72
16:15	33	6	5	0	0	0	0	0	44	57	1	14	1	0	0	1	0	74
16:30	25	1	2	0	0	1	1	2	32	77	3	8	0	0	0	1	4	93
16:45	29	3	2	0	0	0	1	1	36	56	1	0	0	0	0	1	5	63
17:00	29	0	4	0	0	0	1	1	35	84	1	4	0	0	0	1	2	92
17:15	33	1	2	0	0	0	0	3	39	62	0	4	0	0	0	0	5	71
17:30	37	0	1	0	0	0	1	4	43	80	0	1	0	0	0	0	8	89
17:45	28	2	1	0	0	0	3	2	36	76	0	5	0	1	0	1	7	90
18:00	30	0	4	0	0	0	1	1	36	54	0	3	0	0	0	1	2	60
18:15	25	2	1	0	0	0	0	2	30	56	1	2	0	0	0	0	4	63
18:30	30	3	0	0	0	0	0	1	34	47	2	1	1	0	0	1	1	53
18:45	27	3	1	0	0	0	1	2	34	47	2	1	0	0	0	0	3	53
Total	349	22	30	0	0	1	9	21	432	758	11	52	3	1	0	7	41	873

Peak Hour 17:00 to 18:00

17:00	29	0	4	0	0	0	1	1	35	84	1	4	0	0	0	1	2	92
17:15	33	1	2	0	0	0	0	3	39	62	0	4	0	0	0	0	5	71
17:30	37	0	1	0	0	0	1	4	43	80	0	1	0	0	0	0	8	89
17:45	28	2	1	0	0	0	3	2	36	76	0	5	0	1	0	1	7	90
Total	127	3	8	0	0	0	5	10	153	302	1	14	0	1	0	2	22	342

Site No. 3
Location Blackthorn Road(N) / Carmanhall Road / Blackthorn Road(S)
Date Thursday 11 April 2019

Time	A to C - Blackthorn Road(N) to Blackthorn Road(S)								Veh. Total	A to B - Blackthorn Road(N) to Carmanhall Road								Veh. Total
	CAR	TAXI	LGV	OGV1	OGV2	PSV	M/C	P/C		CAR	TAXI	LGV	OGV1	OGV2	PSV	M/C	P/C	
7:00	1	0	0	0	0	0	0	0	1	4	0	0	0	0	0	0	0	4
7:15	7	0	0	1	0	0	0	0	8	4	0	2	0	0	0	0	0	6
7:30	5	1	1	0	0	0	0	0	7	12	1	1	0	0	0	0	0	14
7:45	11	0	0	0	0	0	0	1	12	10	0	0	0	0	0	1	1	12
8:00	19	0	1	0	0	0	0	3	23	15	0	1	0	0	0	1	0	17
8:15	16	1	2	1	0	0	0	2	22	16	0	2	0	0	0	0	1	19
8:30	21	0	1	1	0	0	0	3	26	21	2	1	1	0	0	0	0	25
8:45	18	0	3	1	0	0	0	0	22	16	0	0	0	0	0	0	0	16
9:00	15	0	1	1	0	0	0	1	18	16	0	3	0	0	0	0	0	19
9:15	9	0	0	0	0	0	0	2	11	8	0	1	0	0	0	0	0	9
9:30	5	0	1	0	0	0	0	0	6	9	0	0	0	0	0	0	0	9
9:45	6	0	1	0	0	0	0	0	7	6	0	4	0	0	0	0	0	10
Total	133	2	11	5	0	0	0	12	163	137	3	15	1	0	0	2	2	160

Peak Hour 8:00 to 9:00

8:00	19	0	1	0	0	0	0	3	23	15	0	1	0	0	0	1	0	17
8:15	16	1	2	1	0	0	0	2	22	16	0	2	0	0	0	0	1	19
8:30	21	0	1	1	0	0	0	3	26	21	2	1	1	0	0	0	0	25
8:45	18	0	3	1	0	0	0	0	22	16	0	0	0	0	0	0	0	16
Total	74	1	7	3	0	0	0	8	93	68	2	4	1	0	0	1	1	77

Date Thursday 11 April 2019

Time	A to C - Blackthorn Road(N) to Blackthorn Road(S)								Veh. Total	A to B - Blackthorn Road(N) to Carmanhall Road								Veh. Total
	CAR	TAXI	LGV	OGV1	OGV2	PSV	M/C	P/C		CAR	TAXI	LGV	OGV1	OGV2	PSV	M/C	P/C	
16:00	17	0	4	0	0	0	0	0	21	9	1	3	1	0	0	0	0	14
16:15	5	0	2	0	0	0	0	0	7	9	0	3	0	0	0	0	0	12
16:30	6	0	0	0	0	0	0	0	6	14	0	1	0	0	0	0	0	15
16:45	12	1	1	0	0	0	0	0	14	8	0	1	0	0	0	1	0	10
17:00	4	0	0	0	0	0	0	1	5	4	0	1	0	0	0	0	0	5
17:15	5	0	0	0	0	0	0	0	5	4	0	0	0	0	0	0	0	4
17:30	7	0	0	0	0	0	0	2	9	12	0	1	0	0	0	0	1	14
17:45	2	0	1	0	0	0	0	0	3	3	0	0	0	0	0	0	0	3
18:00	3	0	1	0	0	0	0	0	4	8	0	0	0	0	0	1	0	9
18:15	6	0	0	0	0	0	0	1	7	2	1	0	0	0	0	0	0	3
18:30	3	0	0	0	0	1	0	0	4	4	1	0	0	0	0	0	0	5
18:45	1	0	0	0	0	0	0	0	1	5	0	0	0	0	0	0	0	5
Total	71	1	9	0	0	1	0	4	86	82	3	10	1	0	0	2	1	99

Peak Hour 16:30 to 17:30

16:30	6	0	0	0	0	0	0	0	6	14	0	1	0	0	0	0	0	15
16:45	12	1	1	0	0	0	0	0	14	8	0	1	0	0	0	1	0	10
17:00	4	0	0	0	0	0	0	1	5	4	0	1	0	0	0	0	0	5
17:15	5	0	0	0	0	0	0	0	5	4	0	0	0	0	0	0	0	4
Total	27	1	1	0	0	0	0	1	30	30	0	3	0	0	0	1	0	34

Site No. 3

Location Blackthorn Road(N) / Carmanhall Road / Blackthorn Road(S)

Date Thursday 11 April 2019

Time	A to A - Blackthorn Road(N) to Blackthorn Road(N)								Veh. Total	B to A - Carmanhall Road to Blackthorn Road(N)								Veh. Total
	CAR	TAXI	LGV	OGV1	OGV2	PSV	M/C	P/C		CAR	TAXI	LGV	OGV1	OGV2	PSV	M/C	P/C	
7:00	0	0	0	0	0	0	0	0	0	13	0	5	1	0	0	0	1	20
7:15	0	0	0	0	0	0	0	0	0	16	1	5	0	0	0	0	1	23
7:30	0	0	0	0	0	0	0	0	0	18	1	5	1	0	0	0	0	25
7:45	0	0	0	0	0	0	0	0	0	19	1	10	2	0	0	0	0	32
8:00	0	0	0	0	0	0	0	0	0	22	1	8	0	0	0	0	0	31
8:15	0	0	0	0	0	0	0	0	0	25	2	11	4	0	0	0	0	42
8:30	0	1	0	0	0	0	0	0	1	29	4	6	0	0	0	0	1	40
8:45	0	0	0	0	0	0	0	0	0	29	3	11	2	0	0	0	0	45
9:00	0	0	0	0	0	0	0	0	0	29	2	8	2	0	0	0	0	41
9:15	0	0	0	1	0	0	0	0	1	21	5	5	4	0	0	0	0	35
9:30	0	0	0	0	0	0	0	0	0	26	4	14	1	0	0	0	0	45
9:45	0	0	0	0	0	0	0	0	0	21	1	15	5	0	0	1	0	43
Total	0	1	0	1	0	0	0	0	2	268	25	103	22	0	0	1	3	422

Peak Hour 8:00 to 9:00

8:00	0	0	0	0	0	0	0	0	0	22	1	8	0	0	0	0	0	31
8:15	0	0	0	0	0	0	0	0	0	25	2	11	4	0	0	0	0	42
8:30	0	1	0	0	0	0	0	0	1	29	4	6	0	0	0	0	1	40
8:45	0	0	0	0	0	0	0	0	0	29	3	11	2	0	0	0	0	45
Total	0	1	0	0	0	0	0	0	1	105	10	36	6	0	0	0	1	158

Date Thursday 11 April 2019

Time	A to A - Blackthorn Road(N) to Blackthorn Road(N)								Veh. Total	B to A - Carmanhall Road to Blackthorn Road(N)								Veh. Total
	CAR	TAXI	LGV	OGV1	OGV2	PSV	M/C	P/C		CAR	TAXI	LGV	OGV1	OGV2	PSV	M/C	P/C	
16:00	0	0	0	0	0	0	0	0	0	70	4	11	3	1	0	0	1	90
16:15	1	0	0	0	0	0	0	0	1	56	3	7	1	0	0	0	1	68
16:30	0	0	0	0	0	0	0	0	0	72	3	8	0	0	1	1	0	85
16:45	0	0	0	0	0	0	0	0	0	63	6	3	1	0	0	3	0	76
17:00	0	0	0	0	0	0	0	0	0	86	0	7	0	1	0	2	0	96
17:15	0	0	0	0	0	0	0	0	0	76	0	3	0	0	0	0	3	82
17:30	0	0	0	0	0	0	0	0	0	63	1	3	0	0	0	3	1	71
17:45	0	0	0	0	0	0	0	0	0	73	2	3	0	0	0	5	0	83
18:00	0	0	0	0	0	0	0	0	0	75	1	2	0	0	0	2	0	80
18:15	0	0	0	0	0	0	0	0	0	65	3	0	0	0	0	1	1	70
18:30	0	0	0	0	0	0	0	0	0	52	3	0	0	0	0	1	0	56
18:45	0	0	0	0	0	0	0	0	0	35	2	1	0	0	0	1	0	39
Total	1	0	0	0	0	0	0	0	1	786	28	48	5	2	1	19	7	896

Peak Hour 16:30 to 17:30

16:30	0	0	0	0	0	0	0	0	0	72	3	8	0	0	1	1	0	85
16:45	0	0	0	0	0	0	0	0	0	63	6	3	1	0	0	3	0	76
17:00	0	0	0	0	0	0	0	0	0	86	0	7	0	1	0	2	0	96
17:15	0	0	0	0	0	0	0	0	0	76	0	3	0	0	0	0	3	82
Total	0	0	0	0	0	0	0	0	0	297	9	21	1	1	1	6	3	339

Site No. 3
Location Blackthorn Road(N) / Carmanhall Road / Blackthorn Road(S)
Date Thursday 11 April 2019

Time	B to C - Carmanhall Road to Blackthorn Road(S)								Veh. Total	B to B - Carmanhall Road to Carmanhall Road								Veh. Total
	CAR	TAXI	LGV	OGV1	OGV2	PSV	M/C	P/C		CAR	TAXI	LGV	OGV1	OGV2	PSV	M/C	P/C	
7:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45	1	0	3	0	0	0	0	0	4	0	0	0	0	0	0	0	0	0
8:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15	1	0	0	0	0	0	0	1	2	0	0	0	0	0	0	0	0	0
8:30	1	0	1	0	0	0	0	2	4	0	0	0	0	0	0	0	0	0
8:45	1	0	0	0	0	0	0	1	2	0	0	0	0	0	0	0	0	0
9:00	2	0	1	0	0	0	0	1	4	0	0	0	0	0	0	0	0	0
9:15	2	0	0	2	0	0	0	0	4	0	0	0	0	0	0	0	0	0
9:30	3	0	0	0	0	0	0	1	4	0	0	0	0	0	0	0	0	0
9:45	0	1	0	1	0	0	0	0	2	0	0	0	0	0	0	0	0	0
Total	11	1	5	3	0	0	0	6	26	0	0	0	0	0	0	0	0	0

Peak Hour 8:00 to 9:00

8:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15	1	0	0	0	0	0	0	1	2	0	0	0	0	0	0	0	0	0
8:30	1	0	1	0	0	0	0	2	4	0	0	0	0	0	0	0	0	0
8:45	1	0	0	0	0	0	0	1	2	0	0	0	0	0	0	0	0	0
Total	3	0	1	0	0	0	0	4	8	0	0	0	0	0	0	0	0	0

Date Thursday 11 April 2019

Time	B to C - Carmanhall Road to Blackthorn Road(S)								Veh. Total	B to B - Carmanhall Road to Carmanhall Road								Veh. Total
	CAR	TAXI	LGV	OGV1	OGV2	PSV	M/C	P/C		CAR	TAXI	LGV	OGV1	OGV2	PSV	M/C	P/C	
16:00	4	0	0	0	0	0	0	2	6	0	0	0	0	0	0	0	0	0
16:15	5	0	0	0	0	0	0	0	5	0	0	0	0	0	0	0	0	0
16:30	2	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0
16:45	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
17:00	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
17:15	1	0	0	0	0	0	0	2	3	0	0	0	0	0	0	0	0	0
17:30	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0
17:45	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
18:00	2	0	0	0	0	0	0	1	3	0	0	0	0	0	0	0	0	0
18:15	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0
18:30	1	0	0	0	0	0	0	1	2	0	0	0	0	0	0	0	0	0
18:45	2	0	0	0	0	0	0	1	3	0	0	0	0	0	0	0	0	0
Total	20	0	0	0	0	0	0	9	29	0	0	0	0	0	0	0	0	0

Peak Hour 16:30 to 17:30

16:30	2	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0
16:45	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
17:00	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
17:15	1	0	0	0	0	0	0	2	3	0	0	0	0	0	0	0	0	0
Total	5	0	0	0	0	0	0	2	7	0	0	0	0	0	0	0	0	0

Site No. 3
Location Blackthorn Road(N) / Carmanhall Road / Blackthorn Road(S)
Date Thursday 11 April 2019

Time	C to B - Blackthorn Road(S) to Carmanhall Road								Veh. Total	C to A - Blackthorn Road(S) to Blackthorn Road(N)								Veh. Total
	CAR	TAXI	LGV	OGV1	OGV2	PSV	M/C	P/C		CAR	TAXI	LGV	OGV1	OGV2	PSV	M/C	P/C	
7:00	38	1	15	1	0	0	1	0	56	62	2	9	1	0	3	1	0	78
7:15	57	0	8	2	0	0	1	0	68	104	1	8	1	0	10	0	0	124
7:30	57	1	11	1	0	0	0	2	72	137	6	10	1	0	4	0	0	158
7:45	64	0	14	3	0	0	2	1	84	163	3	12	2	0	7	1	0	188
8:00	71	0	11	4	0	0	1	1	88	162	7	7	0	0	6	0	5	187
8:15	92	0	7	2	0	0	3	6	110	134	3	8	4	0	6	0	1	156
8:30	91	0	8	1	0	0	1	0	101	133	6	13	3	0	8	0	4	167
8:45	102	3	3	1	0	0	1	5	115	122	6	14	6	0	5	0	4	157
9:00	68	2	17	1	0	0	1	3	92	100	7	23	1	0	4	0	0	135
9:15	59	4	9	1	1	0	2	1	77	104	4	12	2	1	6	0	4	133
9:30	40	1	15	0	0	0	0	0	56	86	9	13	4	2	8	0	1	123
9:45	56	1	10	1	0	0	1	0	69	104	5	26	4	1	4	1	0	145
Total	795	13	128	18	1	0	14	19	988	1411	59	155	29	4	71	3	19	1751

Peak Hour 8:00 to 9:00

8:00	71	0	11	4	0	0	1	1	88	162	7	7	0	0	6	0	5	187
8:15	92	0	7	2	0	0	3	6	110	134	3	8	4	0	6	0	1	156
8:30	91	0	8	1	0	0	1	0	101	133	6	13	3	0	8	0	4	167
8:45	102	3	3	1	0	0	1	5	115	122	6	14	6	0	5	0	4	157
Total	356	3	29	8	0	0	6	12	414	551	22	42	13	0	25	0	14	667

Date Thursday 11 April 2019

Time	C to B - Blackthorn Road(S) to Carmanhall Road								Veh. Total	C to A - Blackthorn Road(S) to Blackthorn Road(N)								Veh. Total
	CAR	TAXI	LGV	OGV1	OGV2	PSV	M/C	P/C		CAR	TAXI	LGV	OGV1	OGV2	PSV	M/C	P/C	
16:00	29	1	7	0	0	0	0	0	37	173	6	20	2	0	6	3	3	213
16:15	29	0	3	1	0	0	2	0	35	140	2	18	0	1	5	3	5	174
16:30	28	3	5	1	1	0	0	0	38	187	5	10	2	0	11	1	5	221
16:45	32	1	3	0	0	0	0	3	39	196	4	12	2	0	3	3	4	224
17:00	36	1	2	0	0	0	0	3	42	229	3	7	2	0	9	0	7	257
17:15	42	0	1	0	0	0	0	3	46	198	5	5	1	0	6	3	11	229
17:30	31	0	2	0	0	0	0	3	36	194	7	5	1	0	4	5	11	227
17:45	34	0	4	0	0	0	1	4	43	202	3	8	0	0	5	2	9	229
18:00	32	0	1	0	0	0	1	1	35	190	3	5	0	0	5	0	24	227
18:15	29	1	2	0	0	0	0	3	35	140	5	3	0	2	5	4	9	168
18:30	34	3	0	0	0	0	1	0	38	124	3	5	0	0	5	1	3	141
18:45	35	0	2	0	0	0	0	1	38	102	2	3	1	0	5	1	4	118
Total	391	10	32	2	1	0	5	21	462	2075	48	101	11	3	69	26	95	2428

Peak Hour 16:30 to 17:30

16:30	28	3	5	1	1	0	0	0	38	187	5	10	2	0	11	1	5	221
16:45	32	1	3	0	0	0	0	3	39	196	4	12	2	0	3	3	4	224
17:00	36	1	2	0	0	0	0	3	42	229	3	7	2	0	9	0	7	257
17:15	42	0	1	0	0	0	0	3	46	198	5	5	1	0	6	3	11	229
Total	138	5	11	1	1	0	0	9	165	810	17	34	7	0	29	7	27	931

Site No. 3
Location Blackthorn Road(N) / Carmanhall Road / Blackthorn Road(S)
Date Thursday 11 April 2019

Time	C to C - Blackthorn Road(S) to Blackthorn Road(S)								Veh. Total
	CAR	TAXI	LGV	OGV1	OGV2	PSV	M/C	P/C	
7:00	0	0	0	0	0	0	0	0	0
7:15	0	0	0	0	0	0	0	0	0
7:30	0	0	0	0	0	0	0	0	0
7:45	0	0	0	0	0	0	0	0	0
8:00	0	0	0	0	0	0	0	0	0
8:15	0	0	0	0	0	0	0	0	0
8:30	0	0	0	0	0	0	0	0	0
8:45	0	0	0	0	0	0	0	0	0
9:00	0	0	0	0	0	0	0	0	0
9:15	0	0	0	0	0	0	0	0	0
9:30	0	0	0	0	0	0	0	0	0
9:45	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0

Peak Hour 8:00 to 9:00

8:00	0	0	0	0	0	0	0	0	0
8:15	0	0	0	0	0	0	0	0	0
8:30	0	0	0	0	0	0	0	0	0
8:45	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0

Date Thursday 11 April 2019

Time	C to C - Blackthorn Road(S) to Blackthorn Road(S)								Veh. Total
	CAR	TAXI	LGV	OGV1	OGV2	PSV	M/C	P/C	
16:00	0	0	0	0	0	0	0	0	0
16:15	0	0	0	0	0	0	0	0	0
16:30	0	0	0	0	0	0	0	0	0
16:45	0	0	0	0	0	0	0	0	0
17:00	0	0	0	0	0	0	0	0	0
17:15	0	0	0	0	0	0	0	0	0
17:30	0	0	0	0	0	0	0	0	0
17:45	0	0	0	0	0	0	0	0	0
18:00	0	0	0	0	0	0	0	0	0
18:15	0	0	0	0	0	0	0	0	0
18:30	0	0	0	0	0	0	0	0	0
18:45	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0

Peak Hour 16:30 to 17:30

16:30	0	0	0	0	0	0	0	0	0
16:45	0	0	0	0	0	0	0	0	0
17:00	0	0	0	0	0	0	0	0	0
17:15	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0

Site No. 3

Location Blackthorn Road(N) / Carmanhall Road / Blackthorn Road(S)

Date Thursday 11 April 2019

Time	To Arm A - Blackthorn Road(N)								Veh. Total	From Arm A - Blackthorn Road(N)								Veh. Total
	CAR	TAXI	LGV	OGV1	OGV2	PSV	M/C	P/C		CAR	TAXI	LGV	OGV1	OGV2	PSV	M/C	P/C	
7:00	75	2	14	2	0	3	1	1	98	5	0	0	0	0	0	0	0	5
7:15	120	2	13	1	0	10	0	1	147	11	0	2	1	0	0	0	0	14
7:30	155	7	15	2	0	4	0	0	183	17	2	2	0	0	0	0	0	21
7:45	182	4	22	4	0	7	1	0	220	21	0	0	0	0	0	1	2	24
8:00	184	8	15	0	0	6	0	5	218	34	0	2	0	0	0	1	3	40
8:15	159	5	19	8	0	6	0	1	198	32	1	4	1	0	0	0	3	41
8:30	162	11	19	3	0	8	0	5	208	42	3	2	2	0	0	0	3	52
8:45	151	9	25	8	0	5	0	4	202	34	0	3	1	0	0	0	0	38
9:00	129	9	31	3	0	4	0	0	176	31	0	4	1	0	0	0	1	37
9:15	125	9	17	7	1	6	0	4	169	17	0	1	1	0	0	0	2	21
9:30	112	13	27	5	2	8	0	1	168	14	0	1	0	0	0	0	0	15
9:45	125	6	41	9	1	4	2	0	188	12	0	5	0	0	0	0	0	17
Total	1679	85	258	52	4	71	4	22	2175	270	6	26	7	0	0	2	14	325

Peak Hour 8:00 to 9:00

Time	CAR	TAXI	LGV	OGV1	OGV2	PSV	M/C	P/C	Veh. Total	CAR	TAXI	LGV	OGV1	OGV2	PSV	M/C	P/C	Veh. Total
8:00	184	8	15	0	0	6	0	5	218	34	0	2	0	0	0	1	3	40
8:15	159	5	19	8	0	6	0	1	198	32	1	4	1	0	0	0	3	41
8:30	162	11	19	3	0	8	0	5	208	42	3	2	2	0	0	0	3	52
8:45	151	9	25	8	0	5	0	4	202	34	0	3	1	0	0	0	0	38
Total	656	33	78	19	0	25	0	15	826	142	4	11	4	0	0	1	9	171

Date Thursday 11 April 2019

Time	To Arm A - Blackthorn Road(N)								Veh. Total	From Arm A - Blackthorn Road(N)								Veh. Total
	CAR	TAXI	LGV	OGV1	OGV2	PSV	M/C	P/C		CAR	TAXI	LGV	OGV1	OGV2	PSV	M/C	P/C	
16:00	243	10	31	5	1	6	3	4	303	26	1	7	1	0	0	0	0	35
16:15	197	5	25	1	1	5	3	6	243	15	0	5	0	0	0	0	0	20
16:30	259	8	18	2	0	12	2	5	306	20	0	1	0	0	0	0	0	21
16:45	259	10	15	3	0	3	6	4	300	20	1	2	0	0	0	1	0	24
17:00	315	3	14	2	1	9	2	7	353	8	0	1	0	0	0	0	1	10
17:15	274	5	8	1	0	6	3	14	311	9	0	0	0	0	0	0	0	9
17:30	257	8	8	1	0	4	8	12	298	19	0	1	0	0	0	0	3	23
17:45	275	5	11	0	0	5	7	9	312	5	0	1	0	0	0	0	0	6
18:00	265	4	7	0	0	5	2	24	307	11	0	1	0	0	0	1	0	13
18:15	205	8	3	0	2	5	5	10	238	8	1	0	0	0	0	0	1	10
18:30	176	6	5	0	0	5	2	3	197	7	1	0	0	0	1	0	0	9
18:45	137	4	4	1	0	5	2	4	157	6	0	0	0	0	0	0	0	6
Total	2862	76	149	16	5	70	45	102	3325	154	4	19	1	0	1	2	5	186

Peak Hour 16:30 to 17:30

Time	CAR	TAXI	LGV	OGV1	OGV2	PSV	M/C	P/C	Veh. Total	CAR	TAXI	LGV	OGV1	OGV2	PSV	M/C	P/C	Veh. Total
16:30	259	8	18	2	0	12	2	5	306	20	0	1	0	0	0	0	0	21
16:45	259	10	15	3	0	3	6	4	300	20	1	2	0	0	0	1	0	24
17:00	315	3	14	2	1	9	2	7	353	8	0	1	0	0	0	0	1	10
17:15	274	5	8	1	0	6	3	14	311	9	0	0	0	0	0	0	0	9
Total	1107	26	55	8	1	30	13	30	1270	57	1	4	0	0	0	1	1	64

Site No. 3
Location Blackthorn Road(N) / Carmanhall Road / Blackthorn Road(S)
Date Thursday 11 April 2019

Time	To Arm B - Carmanhall Road								Veh. Total	From Arm B - Carmanhall Road								Veh. Total
	CAR	TAXI	LGV	OGV1	OGV2	PSV	M/C	P/C		CAR	TAXI	LGV	OGV1	OGV2	PSV	M/C	P/C	
7:00	42	1	15	1	0	0	1	0	60	13	0	5	1	0	0	0	1	20
7:15	61	0	10	2	0	0	1	0	74	16	1	5	0	0	0	0	1	23
7:30	69	2	12	1	0	0	0	2	86	18	1	5	1	0	0	0	0	25
7:45	74	0	14	3	0	0	3	2	96	20	1	13	2	0	0	0	0	36
8:00	86	0	12	4	0	0	2	1	105	22	1	8	0	0	0	0	0	31
8:15	108	0	9	2	0	0	3	7	129	26	2	11	4	0	0	0	1	44
8:30	112	2	9	2	0	0	1	0	126	30	4	7	0	0	0	0	3	44
8:45	118	3	3	1	0	0	1	5	131	30	3	11	2	0	0	0	1	47
9:00	84	2	20	1	0	0	1	3	111	31	2	9	2	0	0	0	1	45
9:15	67	4	10	1	1	0	2	1	86	23	5	5	6	0	0	0	0	39
9:30	49	1	15	0	0	0	0	0	65	29	4	14	1	0	0	0	1	49
9:45	62	1	14	1	0	0	1	0	79	21	2	15	6	0	0	1	0	45
Total	932	16	143	19	1	0	16	21	1148	279	26	108	25	0	0	1	9	448

Peak Hour 8:00 to 9:00

Time	CAR	TAXI	LGV	OGV1	OGV2	PSV	M/C	P/C	Veh. Total	CAR	TAXI	LGV	OGV1	OGV2	PSV	M/C	P/C	Veh. Total
8:00	86	0	12	4	0	0	2	1	105	22	1	8	0	0	0	0	0	31
8:15	108	0	9	2	0	0	3	7	129	26	2	11	4	0	0	0	1	44
8:30	112	2	9	2	0	0	1	0	126	30	4	7	0	0	0	0	3	44
8:45	118	3	3	1	0	0	1	5	131	30	3	11	2	0	0	0	1	47
Total	424	5	33	9	0	0	7	13	491	108	10	37	6	0	0	0	5	166

Date Thursday 11 April 2019

Time	To Arm B - Carmanhall Road								Veh. Total	From Arm B - Carmanhall Road								Veh. Total
	CAR	TAXI	LGV	OGV1	OGV2	PSV	M/C	P/C		CAR	TAXI	LGV	OGV1	OGV2	PSV	M/C	P/C	
16:00	38	2	10	1	0	0	0	0	51	74	4	11	3	1	0	0	3	96
16:15	38	0	6	1	0	0	2	0	47	61	3	7	1	0	0	0	1	73
16:30	42	3	6	1	1	0	0	0	53	74	3	8	0	0	1	1	0	87
16:45	40	1	4	0	0	0	1	3	49	64	6	3	1	0	0	3	0	77
17:00	40	1	3	0	0	0	0	3	47	87	0	7	0	1	0	2	0	97
17:15	46	0	1	0	0	0	0	3	50	77	0	3	0	0	0	0	5	85
17:30	43	0	3	0	0	0	0	4	50	63	1	3	0	0	0	3	2	72
17:45	37	0	4	0	0	0	1	4	46	74	2	3	0	0	0	5	0	84
18:00	40	0	1	0	0	0	2	1	44	77	1	2	0	0	0	2	1	83
18:15	31	2	2	0	0	0	0	3	38	65	3	0	0	0	0	1	2	71
18:30	38	4	0	0	0	0	1	0	43	53	3	0	0	0	0	1	1	58
18:45	40	0	2	0	0	0	0	1	43	37	2	1	0	0	0	1	1	42
Total	473	13	42	3	1	0	7	22	561	806	28	48	5	2	1	19	16	925

Peak Hour 16:30 to 17:30

Time	CAR	TAXI	LGV	OGV1	OGV2	PSV	M/C	P/C	Veh. Total	CAR	TAXI	LGV	OGV1	OGV2	PSV	M/C	P/C	Veh. Total
16:30	42	3	6	1	1	0	0	0	53	74	3	8	0	0	1	1	0	87
16:45	40	1	4	0	0	0	1	3	49	64	6	3	1	0	0	3	0	77
17:00	40	1	3	0	0	0	0	3	47	87	0	7	0	1	0	2	0	97
17:15	46	0	1	0	0	0	0	3	50	77	0	3	0	0	0	0	5	85
Total	168	5	14	1	1	0	1	9	199	302	9	21	1	1	1	6	5	346

Site No. 3
Location Blackthorn Road(N) / Carmanhall Road / Blackthorn Road(S)
Date Thursday 11 April 2019

Time	To Arm C - Blackthorn Road(S)								Veh. Total	From Arm C - Blackthorn Road(S)								Veh. Total
	CAR	TAXI	LGV	OGV1	OGV2	PSV	M/C	P/C		CAR	TAXI	LGV	OGV1	OGV2	PSV	M/C	P/C	
7:00	1	0	0	0	0	0	0	0	1	100	3	24	2	0	3	2	0	134
7:15	7	0	0	1	0	0	0	0	8	161	1	16	3	0	10	1	0	192
7:30	5	1	1	0	0	0	0	0	7	194	7	21	2	0	4	0	2	230
7:45	12	0	3	0	0	0	0	1	16	227	3	26	5	0	7	3	1	272
8:00	19	0	1	0	0	0	0	3	23	233	7	18	4	0	6	1	6	275
8:15	17	1	2	1	0	0	0	3	24	226	3	15	6	0	6	3	7	266
8:30	22	0	2	1	0	0	0	5	30	224	6	21	4	0	8	1	4	268
8:45	19	0	3	1	0	0	0	1	24	224	9	17	7	0	5	1	9	272
9:00	17	0	2	1	0	0	0	2	22	168	9	40	2	0	4	1	3	227
9:15	11	0	0	2	0	0	0	2	15	163	8	21	3	2	6	2	5	210
9:30	8	0	1	0	0	0	0	1	10	126	10	28	4	2	8	0	1	179
9:45	6	1	1	1	0	0	0	0	9	160	6	36	5	1	4	2	0	214
Total	144	3	16	8	0	0	0	18	189	2206	72	283	47	5	71	17	38	2739

Peak Hour 8:00 to 9:00

Time	CAR	TAXI	LGV	OGV1	OGV2	PSV	M/C	P/C	Veh. Total	CAR	TAXI	LGV	OGV1	OGV2	PSV	M/C	P/C	Veh. Total
8:00	19	0	1	0	0	0	0	3	23	233	7	18	4	0	6	1	6	275
8:15	17	1	2	1	0	0	0	3	24	226	3	15	6	0	6	3	7	266
8:30	22	0	2	1	0	0	0	5	30	224	6	21	4	0	8	1	4	268
8:45	19	0	3	1	0	0	0	1	24	224	9	17	7	0	5	1	9	272
Total	77	1	8	3	0	0	0	12	101	907	25	71	21	0	25	6	26	1081

Date Thursday 11 April 2019

Time	To Arm C - Blackthorn Road(S)								Veh. Total	From Arm C - Blackthorn Road(S)								Veh. Total
	CAR	TAXI	LGV	OGV1	OGV2	PSV	M/C	P/C		CAR	TAXI	LGV	OGV1	OGV2	PSV	M/C	P/C	
16:00	21	0	4	0	0	0	0	2	27	202	7	27	2	0	6	3	3	250
16:15	10	0	2	0	0	0	0	0	12	169	2	21	1	1	5	5	5	209
16:30	8	0	0	0	0	0	0	0	8	215	8	15	3	1	11	1	5	259
16:45	13	1	1	0	0	0	0	0	15	228	5	15	2	0	3	3	7	263
17:00	5	0	0	0	0	0	0	1	6	265	4	9	2	0	9	0	10	299
17:15	6	0	0	0	0	0	0	2	8	240	5	6	1	0	6	3	14	275
17:30	7	0	0	0	0	0	0	3	10	225	7	7	1	0	4	5	14	263
17:45	3	0	1	0	0	0	0	0	4	236	3	12	0	0	5	3	13	272
18:00	5	0	1	0	0	0	0	1	7	222	3	6	0	0	5	1	25	262
18:15	6	0	0	0	0	0	0	2	8	169	6	5	0	2	5	4	12	203
18:30	4	0	0	0	0	1	0	1	6	158	6	5	0	0	5	2	3	179
18:45	3	0	0	0	0	0	0	1	4	137	2	5	1	0	5	1	5	156
Total	91	1	9	0	0	1	0	13	115	2466	58	133	13	4	69	31	116	2890

Peak Hour 16:30 to 17:30

Time	CAR	TAXI	LGV	OGV1	OGV2	PSV	M/C	P/C	Veh. Total	CAR	TAXI	LGV	OGV1	OGV2	PSV	M/C	P/C	Veh. Total
16:30	8	0	0	0	0	0	0	0	8	215	8	15	3	1	11	1	5	259
16:45	13	1	1	0	0	0	0	0	15	228	5	15	2	0	3	3	7	263
17:00	5	0	0	0	0	0	0	1	6	265	4	9	2	0	9	0	10	299
17:15	6	0	0	0	0	0	0	2	8	240	5	6	1	0	6	3	14	275
Total	32	1	1	0	0	0	0	3	37	948	22	45	8	1	29	7	36	1096

Site: 1
Location: Blackthorn Drive(N) / Birch Avenue / Blackthorn Drive(S) / Carmanhall Road
Date: Thursday 11 April 2019

	ARM A		
Time	Lane 1	Lane 2	Lane 3
7:00	3	1	1
7:05	1	1	1
7:10	2	1	1
7:15	2	1	0
7:20	2	1	1
7:25	1	1	1
7:30	2	2	1
7:35	6	2	1
7:40	5	2	1
7:45	6	2	1
7:50	5	2	1
7:55	3	1	4
8:00	6	3	1
8:05	5	2	1
8:10	4	1	1
8:15	3	1	3
8:20	11	3	2
8:25	9	8	8
8:30	4	5	2
8:35	7	0	5
8:40	6	4	1
8:45	5	2	2
8:50	6	2	3
8:55	7	4	4
9:00	15	4	4
9:05	10	2	2
9:10	10	3	2
9:15	5	4	7
9:20	11	2	5
9:25	6	2	2
9:30	9	1	2
9:35	5	2	1
9:40	4	2	1
9:45	2	5	3
9:50	5	2	3
9:55	6	0	1
Max Queue	15	8	8

	ARM B
Time	Lane 1
7:00	2
7:05	1
7:10	0
7:15	0
7:20	1
7:25	2
7:30	2
7:35	2
7:40	3
7:45	1
7:50	0
7:55	2
8:00	3
8:05	1
8:10	2
8:15	3
8:20	4
8:25	4
8:30	2
8:35	3
8:40	3
8:45	3
8:50	3
8:55	2
9:00	1
9:05	2
9:10	4
9:15	4
9:20	4
9:25	5
9:30	2
9:35	4
9:40	4
9:45	2
9:50	6
9:55	6
Max Queue	6

	ARM A		
Time	Lane 1	Lane 2	Lane 3
16:00	10	6	2
16:05	8	3	1
16:10	7	4	2
16:15	5	4	2
16:20	6	7	1
16:25	5	5	3
16:30	5	5	1
16:35	6	5	3
16:40	7	5	2
16:45	4	2	0
16:50	4	1	1
16:55	6	5	3
17:00	6	2	1
17:05	2	1	2
17:10	8	4	1
17:15	7	5	1
17:20	4	2	3
17:25	7	3	1
17:30	5	3	2
17:35	13	3	1
17:40	9	6	1
17:45	8	7	1
17:50	8	2	2
17:55	3	3	1
18:00	5	7	1
18:05	4	2	3
18:10	3	6	1
18:15	7	3	1
18:20	6	2	1
18:25	7	3	1
18:30	9	11	1
18:35	6	3	1
18:40	4	2	0
18:45	10	8	1
18:50	3	3	2
18:55	4	4	4
Max Queue	13	11	4

	ARM B
Time	Lane 1
16:00	4
16:05	6
16:10	6
16:15	5
16:20	8
16:25	9
16:30	8
16:35	6
16:40	6
16:45	5
16:50	3
16:55	3
17:00	14
17:05	14
17:10	6
17:15	8
17:20	6
17:25	9
17:30	9
17:35	13
17:40	8
17:45	4
17:50	7
17:55	5
18:00	7
18:05	3
18:10	10
18:15	8
18:20	5
18:25	4
18:30	7
18:35	10
18:40	5
18:45	3
18:50	4
18:55	4
Max Queue	14

Site: 1
Location: Blackthorn Drive(N) / Birch Avenue / Blackthorn Drive(S) / Carmanhall Road
Date: Thursday 11 April 2019

	ARM C		
Time	Lane 1	Lane 2	Lane 3
7:00	2	2	3
7:05	2	3	2
7:10	2	6	1
7:15	0	5	4
7:20	2	3	3
7:25	1	9	2
7:30	5	11	4
7:35	3	9	4
7:40	4	17	5
7:45	3	11	3
7:50	4	24	8
7:55	2	16	4
8:00	7	15	4
8:05	3	13	3
8:10	5	12	6
8:15	4	12	5
8:20	7	9	6
8:25	3	19	5
8:30	8	11	6
8:35	7	8	9
8:40	5	7	6
8:45	6	7	11
8:50	4	6	9
8:55	4	5	11
9:00	3	7	12
9:05	6	12	10
9:10	5	6	12
9:15	4	7	8
9:20	4	5	5
9:25	6	3	8
9:30	4	6	7
9:35	6	4	8
9:40	6	4	8
9:45	6	6	5
9:50	3	4	8
9:55	3	11	7
Max Queue	8	24	12

	ARM D	
Time	Lane 1	Lane 2
7:00	1	2
7:05	0	1
7:10	1	2
7:15	0	1
7:20	1	3
7:25	0	2
7:30	2	6
7:35	1	3
7:40	1	4
7:45	0	2
7:50	0	3
7:55	0	3
8:00	1	2
8:05	0	3
8:10	1	4
8:15	0	4
8:20	0	4
8:25	0	2
8:30	0	3
8:35	0	7
8:40	0	5
8:45	0	7
8:50	0	3
8:55	1	5
9:00	0	5
9:05	1	4
9:10	1	5
9:15	1	3
9:20	1	3
9:25	0	6
9:30	0	4
9:35	2	8
9:40	0	3
9:45	2	5
9:50	3	6
9:55	5	3
Max Queue	5	8

	ARM C		
Time	Lane 1	Lane 2	Lane 3
16:00	1	4	5
16:05	2	4	7
16:10	3	6	3
16:15	5	7	3
16:20	2	4	4
16:25	2	5	5
16:30	7	3	3
16:35	4	5	2
16:40	6	4	2
16:45	2	3	3
16:50	4	5	6
16:55	2	6	3
17:00	2	5	1
17:05	2	5	3
17:10	4	11	5
17:15	4	3	3
17:20	3	6	3
17:25	3	8	2
17:30	2	4	2
17:35	2	5	1
17:40	5	5	3
17:45	3	4	2
17:50	5	4	4
17:55	3	5	5
18:00	5	5	6
18:05	2	2	2
18:10	1	7	3
18:15	2	6	3
18:20	3	7	2
18:25	1	5	4
18:30	1	5	4
18:35	1	5	6
18:40	3	7	4
18:45	1	4	3
18:50	2	4	3
18:55	3	3	3
Max Queue	7	11	7

	ARM D	
Time	Lane 1	Lane 2
16:00	1	2
16:05	3	5
16:10	3	5
16:15	2	4
16:20	2	4
16:25	4	5
16:30	3	8
16:35	2	5
16:40	5	5
16:45	1	9
16:50	2	4
16:55	1	5
17:00	4	10
17:05	0	26
17:10	3	23
17:15	5	25
17:20	3	19
17:25	8	13
17:30	0	18
17:35	4	19
17:40	3	9
17:45	5	26
17:50	5	25
17:55	0	5
18:00	3	5
18:05	2	4
18:10	2	4
18:15	1	2
18:20	3	5
18:25	3	5
18:30	5	14
18:35	3	4
18:40	3	4
18:45	3	4
18:50	5	8
18:55	0	6
Max Queue	8	26

Site: 2
Location: Carmanhall Road(W) / Corrig Road / Carmanhall Road(E)
Date: Thursday 11 April 2019

	ARM A
Time	Lane 1
7:00	0
7:05	0
7:10	0
7:15	0
7:20	0
7:25	0
7:30	0
7:35	2
7:40	0
7:45	0
7:50	0
7:55	2
8:00	0
8:05	0
8:10	0
8:15	0
8:20	0
8:25	0
8:30	3
8:35	1
8:40	0
8:45	3
8:50	2
8:55	3
9:00	0
9:05	0
9:10	0
9:15	7
9:20	0
9:25	1
9:30	0
9:35	0
9:40	1
9:45	3
9:50	0
9:55	0
Max Queue	7

	ARM B	
Time	Lane 1	Lane 2
7:00	0	0
7:05	0	0
7:10	0	1
7:15	0	1
7:20	0	0
7:25	0	1
7:30	0	0
7:35	0	0
7:40	0	1
7:45	0	0
7:50	0	0
7:55	0	1
8:00	0	1
8:05	1	1
8:10	0	2
8:15	0	1
8:20	1	2
8:25	0	2
8:30	0	4
8:35	1	2
8:40	0	1
8:45	1	1
8:50	1	1
8:55	2	1
9:00	1	1
9:05	0	1
9:10	1	2
9:15	1	1
9:20	1	2
9:25	2	2
9:30	0	2
9:35	0	2
9:40	0	1
9:45	1	1
9:50	1	1
9:55	0	2
Max Queue	2	4

	ARM A
Time	Lane 1
16:00	0
16:05	0
16:10	0
16:15	1
16:20	3
16:25	0
16:30	1
16:35	2
16:40	0
16:45	3
16:50	0
16:55	0
17:00	0
17:05	1
17:10	0
17:15	0
17:20	0
17:25	0
17:30	0
17:35	1
17:40	0
17:45	0
17:50	0
17:55	0
18:00	0
18:05	0
18:10	1
18:15	0
18:20	0
18:25	0
18:30	0
18:35	0
18:40	0
18:45	0
18:50	0
18:55	1
Max Queue	3

	ARM B	
Time	Lane 1	Lane 2
16:00	0	1
16:05	2	1
16:10	2	1
16:15	2	4
16:20	1	2
16:25	0	2
16:30	1	3
16:35	2	1
16:40	0	0
16:45	2	1
16:50	0	1
16:55	1	1
17:00	1	0
17:05	13	1
17:10	14	1
17:15	9	1
17:20	1	1
17:25	0	1
17:30	3	2
17:35	0	1
17:40	1	1
17:45	5	0
17:50	1	3
17:55	0	1
18:00	1	1
18:05	1	1
18:10	1	0
18:15	1	1
18:20	1	0
18:25	1	0
18:30	1	1
18:35	1	0
18:40	1	1
18:45	0	0
18:50	1	1
18:55	0	1
Max Queue	14	4

Site: 2
Location: Carmanhall Road(W) / Corrig Road / Carmanhall Road(E)
Date: Thursday 11 April 2019

	ARM C
Time	Lane 1
7:00	0
7:05	0
7:10	0
7:15	0
7:20	0
7:25	0
7:30	0
7:35	0
7:40	0
7:45	0
7:50	0
7:55	0
8:00	0
8:05	0
8:10	0
8:15	0
8:20	0
8:25	0
8:30	0
8:35	0
8:40	0
8:45	0
8:50	0
8:55	0
9:00	0
9:05	0
9:10	0
9:15	0
9:20	0
9:25	0
9:30	0
9:35	0
9:40	0
9:45	0
9:50	0
9:55	0
Max Queue	0

	ARM C
Time	Lane 1
16:00	0
16:05	0
16:10	0
16:15	0
16:20	0
16:25	0
16:30	0
16:35	0
16:40	0
16:45	0
16:50	0
16:55	0
17:00	0
17:05	8
17:10	12
17:15	2
17:20	0
17:25	0
17:30	0
17:35	0
17:40	0
17:45	1
17:50	0
17:55	1
18:00	0
18:05	0
18:10	0
18:15	0
18:20	0
18:25	0
18:30	0
18:35	0
18:40	0
18:45	0
18:50	0
18:55	0
Max Queue	12

Site: 3
Location: Blackthorn Road(N) / Carmanhall Road / Blackthorn Road(S)
Date: Thursday 11 April 2019

	ARM A	
Time	Lane 1	Lane 2
7:00	0	0
7:05	0	0
7:10	0	1
7:15	0	1
7:20	0	1
7:25	0	0
7:30	0	1
7:35	0	2
7:40	0	0
7:45	0	2
7:50	1	3
7:55	0	1
8:00	0	3
8:05	0	5
8:10	0	2
8:15	0	5
8:20	0	2
8:25	0	4
8:30	0	6
8:35	0	10
8:40	0	2
8:45	0	2
8:50	0	2
8:55	0	4
9:00	0	3
9:05	0	2
9:10	0	1
9:15	0	2
9:20	0	1
9:25	0	0
9:30	0	0
9:35	0	1
9:40	0	1
9:45	0	0
9:50	0	0
9:55	0	1
Max Queue	1	10

	ARM B	
Time	Lane 1	Lane 2
7:00	1	0
7:05	1	0
7:10	1	0
7:15	2	0
7:20	2	0
7:25	1	0
7:30	2	0
7:35	2	0
7:40	2	0
7:45	2	0
7:50	2	0
7:55	4	0
8:00	3	0
8:05	3	0
8:10	5	0
8:15	2	0
8:20	2	0
8:25	6	0
8:30	2	0
8:35	3	0
8:40	6	0
8:45	6	0
8:50	2	1
8:55	4	0
9:00	2	0
9:05	3	0
9:10	2	0
9:15	3	0
9:20	4	0
9:25	6	0
9:30	8	0
9:35	4	0
9:40	2	0
9:45	5	0
9:50	3	0
9:55	9	0
Max Queue	9	1

	ARM A	
Time	Lane 1	Lane 2
16:00	0	1
16:05	0	2
16:10	0	2
16:15	0	3
16:20	0	0
16:25	0	0
16:30	0	3
16:35	0	0
16:40	0	1
16:45	0	1
16:50	0	1
16:55	0	1
17:00	0	2
17:05	0	1
17:10	0	1
17:15	0	0
17:20	0	0
17:25	0	1
17:30	0	1
17:35	0	1
17:40	0	4
17:45	0	1
17:50	0	0
17:55	0	0
18:00	0	2
18:05	0	0
18:10	0	1
18:15	0	0
18:20	0	1
18:25	0	0
18:30	0	1
18:35	0	0
18:40	0	0
18:45	0	0
18:50	0	0
18:55	0	1
Max Queue	0	4

	ARM B	
Time	Lane 1	Lane 2
16:00	5	0
16:05	16	0
16:10	17	0
16:15	3	0
16:20	9	0
16:25	7	0
16:30	8	0
16:35	13	0
16:40	16	0
16:45	5	0
16:50	5	0
16:55	4	0
17:00	11	0
17:05	18	0
17:10	22	0
17:15	15	0
17:20	6	0
17:25	7	1
17:30	6	0
17:35	18	0
17:40	22	0
17:45	24	0
17:50	16	0
17:55	4	0
18:00	12	0
18:05	9	0
18:10	5	0
18:15	4	0
18:20	2	1
18:25	5	0
18:30	4	0
18:35	2	0
18:40	1	0
18:45	3	0
18:50	3	0
18:55	1	0
Max Queue	24	1

Site: 3
Location: Blackthorn Road(N) / Carmanhall Road / Blackthorn Road(S)
Date: Thursday 11 April 2019

	ARM C	
Time	Lane 1	Lane 2
7:00	0	0
7:05	0	0
7:10	0	0
7:15	0	0
7:20	2	0
7:25	0	0
7:30	7	0
7:35	0	0
7:40	0	0
7:45	0	0
7:50	0	0
7:55	0	0
8:00	0	0
8:05	0	0
8:10	0	0
8:15	0	0
8:20	0	0
8:25	0	0
8:30	0	0
8:35	0	0
8:40	0	0
8:45	0	0
8:50	0	0
8:55	0	0
9:00	0	0
9:05	0	0
9:10	0	0
9:15	0	0
9:20	1	0
9:25	0	0
9:30	0	0
9:35	0	0
9:40	0	0
9:45	0	0
9:50	0	0
9:55	0	0
Max Queue	7	0

	ARM C	
Time	Lane 1	Lane 2
16:00	0	0
16:05	9	0
16:10	0	0
16:15	0	0
16:20	0	0
16:25	0	0
16:30	0	0
16:35	0	0
16:40	0	0
16:45	0	0
16:50	0	0
16:55	0	0
17:00	0	0
17:05	3	0
17:10	0	0
17:15	0	0
17:20	0	0
17:25	0	0
17:30	0	0
17:35	8	2
17:40	7	0
17:45	7	0
17:50	0	0
17:55	1	0
18:00	0	0
18:05	0	0
18:10	0	0
18:15	0	0
18:20	0	0
18:25	2	0
18:30	0	0
18:35	0	0
18:40	0	0
18:45	0	0
18:50	0	0
18:55	0	0
Max Queue	9	2

Site No. 1
Location Blackthorn Drive(N) / Birch Avenue / Blackthorn Drive(S) / Carmanhall Road
Date Thursday 11 April 2019

Time	ARM A		Ped. Total	ARM B		Ped. Total
	Eastbound	Westbound		Northbound	Southbound	
7:00	1	0	1	2	1	3
7:15	0	0	0	0	1	1
7:30	3	3	6	4	2	6
7:45	0	4	4	7	1	8
8:00	3	3	6	3	1	4
8:15	5	6	11	7	4	11
8:30	4	9	13	4	3	7
8:45	5	7	12	5	2	7
9:00	4	5	9	4	5	9
9:15	1	3	4	0	10	10
9:30	2	3	5	4	3	7
9:45	3	3	6	2	0	2
Total	31	46	77	42	33	75

Date Thursday 11 April 2019

Time	ARM A		Ped. Total	ARM B		Ped. Total
	Eastbound	Westbound		Northbound	Southbound	
16:00	3	5	8	1	6	7
16:15	4	0	4	0	3	3
16:30	13	3	16	0	4	4
16:45	7	2	9	3	3	6
17:00	10	2	12	2	9	11
17:15	10	2	12	3	2	5
17:30	6	3	9	3	11	14
17:45	10	3	13	1	2	3
18:00	3	3	6	2	7	9
18:15	5	2	7	1	2	3
18:30	7	2	9	15	0	15
18:45	6	10	16	0	6	6
Total	84	37	121	31	55	86

Site No. 1
Location Blackthorn Drive(N) / Birch Avenue / Blackthorn Drive(S) / Carmanhall Road
Date Thursday 11 April 2019

Time	ARM C		Ped. Total	ARM D		Ped. Total
	Eastbound	Westbound		Northbound	Southbound	
7:00	3	0	3	11	5	16
7:15	1	0	1	10	5	15
7:30	1	0	1	16	7	23
7:45	0	0	0	11	12	23
8:00	0	0	0	14	17	31
8:15	0	1	1	18	24	42
8:30	1	2	3	25	18	43
8:45	2	1	3	13	12	25
9:00	0	2	2	5	16	21
9:15	0	0	0	9	8	17
9:30	0	0	0	9	11	20
9:45	0	0	0	4	13	17
Total	8	6	14	145	148	293

Date Thursday 11 April 2019

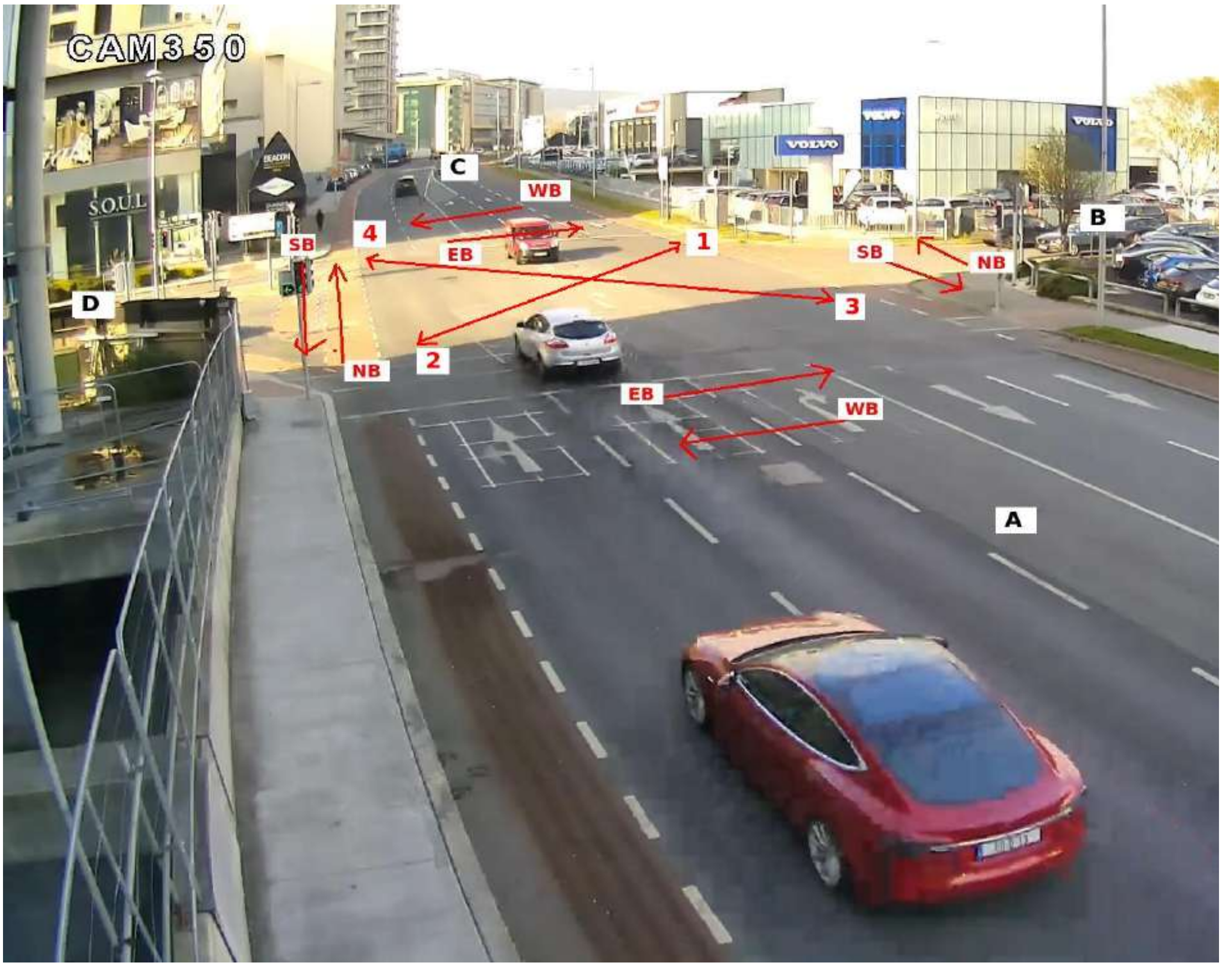
Time	ARM C		Ped. Total	ARM D		Ped. Total
	Eastbound	Westbound		Northbound	Southbound	
16:00	1	1	2	5	15	20
16:15	0	3	3	4	12	16
16:30	2	0	2	5	16	21
16:45	1	0	1	2	13	15
17:00	0	1	1	8	25	33
17:15	0	1	1	10	15	25
17:30	2	4	6	8	22	30
17:45	1	1	2	4	5	9
18:00	0	1	1	4	7	11
18:15	0	0	0	6	11	17
18:30	0	0	0	9	18	27
18:45	2	0	2	10	3	13
Total	9	12	21	75	162	237

Site No. 1
Location Blackthorn Drive(N) / Birch Avenue / Blackthorn Drive(S) / Carmanhall Road
Date Thursday 11 April 2019

Time	Zig Zag		Ped. Total	Zig Zag		Ped. Total
	1 to 2	2 to 1		3 to 4	4 to 3	
7:00	0	0	0	0	0	0
7:15	0	0	0	0	0	0
7:30	0	0	0	0	0	0
7:45	0	0	0	2	0	2
8:00	0	0	0	0	0	0
8:15	0	2	2	0	0	0
8:30	0	21	21	2	0	2
8:45	0	3	3	0	0	0
9:00	5	0	5	0	0	0
9:15	2	0	2	0	0	0
9:30	0	1	1	0	0	0
9:45	0	1	1	0	0	0
Total	7	28	35	4	0	4

Date

Time	Zig Zag		Ped. Total	Zig Zag		Ped. Total
	1 to 2	2 to 1		3 to 4	4 to 3	
16:00	0	0	0	0	0	0
16:15	0	0	0	0	0	0
16:30	0	0	0	1	0	1
16:45	0	1	1	0	1	1
17:00	1	0	1	0	0	0
17:15	0	0	0	0	0	0
17:30	2	3	5	1	3	4
17:45	0	4	4	0	0	0
18:00	0	0	0	0	0	0
18:15	0	1	1	0	0	0
18:30	2	0	2	0	0	0
18:45	0	0	0	0	0	0
Total	5	9	14	2	4	6


CAM350
C
WB
4
EB
SB
1
SB
NB
B
D
3
NB
2
EB
WB
A
S.O.U.L
VOLVO


2019-04-11
09:24:03:32
PEUGEOT

Site No. 2
Location Carmanhall Road(W) / Corrig Road / Carmanhall Road(E)
Date Thursday 11 April 2019

Time	ARM A		Ped. Total	ARM B		Ped. Total
	Northbound	Southbound		Eastbound	Westbound	
7:00	2	0	2	4	1	5
7:15	6	0	6	2	1	3
7:30	0	2	2	13	8	21
7:45	3	3	6	18	4	22
8:00	4	1	5	18	9	27
8:15	5	3	8	26	9	35
8:30	3	4	7	31	15	46
8:45	3	2	5	29	10	39
9:00	3	1	4	24	15	39
9:15	2	2	4	9	10	19
9:30	0	0	0	12	7	19
9:45	1	4	5	13	8	21
Total	32	22	54	199	97	296

Date Thursday 11 April 2019

Time	ARM A		Ped. Total	ARM B		Ped. Total
	Northbound	Southbound		Eastbound	Westbound	
16:00	3	2	5	7	3	10
16:15	1	1	2	3	18	21
16:30	0	5	5	6	15	21
16:45	2	8	10	3	12	15
17:00	3	9	12	5	37	42
17:15	0	11	11	11	23	34
17:30	10	7	17	13	33	46
17:45	2	7	9	7	32	39
18:00	3	4	7	8	17	25
18:15	6	3	9	11	21	32
18:30	1	6	7	13	10	23
18:45	0	6	6	1	15	16
Total	31	69	100	88	236	324

Site No. 2
Location Carmanhall Road(W) / Corrig Road / Carmanhall Road(E)
Date Thursday 11 April 2019

Time	ARM C		Ped. Total
	Northbound	Southbound	
7:00	2	0	2
7:15	2	0	2
7:30	2	1	3
7:45	1	0	1
8:00	6	0	6
8:15	3	3	6
8:30	2	0	2
8:45	2	1	3
9:00	5	2	7
9:15	2	0	2
9:30	1	1	2
9:45	3	1	4
Total	31	9	40

Date Thursday 11 April 2019

Time	ARM C		Ped. Total
	Northbound	Southbound	
16:00	3	0	3
16:15	3	1	4
16:30	8	1	9
16:45	2	1	3
17:00	23	0	23
17:15	8	0	8
17:30	12	1	13
17:45	12	1	13
18:00	10	0	10
18:15	6	0	6
18:30	2	0	2
18:45	5	2	7
Total	94	7	101

Site No. 3
Location Blackthorn Road(N) / Carmanhall Road / Blackthorn Road(S)
Date Thursday 11 April 2019

Time	ARM A		Ped. Total	ARM B		Ped. Total
	Eastbound	Westbound		Northbound	Southbound	
7:00	0	1	1	1	3	4
7:15	1	0	1	5	3	8
7:30	1	1	2	1	4	5
7:45	0	0	0	3	8	11
8:00	1	0	1	2	3	5
8:15	2	0	2	10	16	26
8:30	4	2	6	4	8	12
8:45	2	2	4	9	12	21
9:00	1	0	1	14	9	23
9:15	0	3	3	10	9	19
9:30	1	1	2	5	5	10
9:45	0	0	0	4	7	11
Total	13	10	23	68	87	155

Date Thursday 11 April 2019

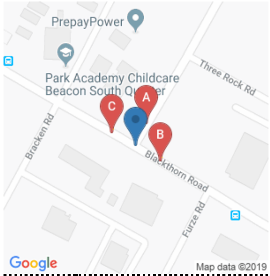
Time	ARM A		Ped. Total	ARM B		Ped. Total
	Eastbound	Westbound		Northbound	Southbound	
16:00	0	4	4	8	2	10
16:15	5	4	9	7	2	9
16:30	0	0	0	2	6	8
16:45	2	0	2	8	4	12
17:00	1	3	4	4	12	16
17:15	0	1	1	9	8	17
17:30	2	1	3	10	9	19
17:45	1	0	1	9	11	20
18:00	0	0	0	12	12	24
18:15	1	1	2	7	5	12
18:30	0	0	0	10	6	16
18:45	0	0	0	16	4	20
Total	12	14	26	102	81	183

Site No. 3
Location Blackthorn Road(N) / Carmanhall Road / Blackthorn Road(S)
Date Thursday 11 April 2019

Time	ARM C		Ped. Total
	Eastbound	Westbound	
7:00	0	0	0
7:15	0	0	0
7:30	2	0	2
7:45	3	1	4
8:00	4	1	5
8:15	7	0	7
8:30	2	0	2
8:45	2	0	2
9:00	0	1	1
9:15	0	0	0
9:30	0	1	1
9:45	3	1	4
Total	23	5	28

Date Thursday 11 April 2019

Time	ARM C		Ped. Total
	Eastbound	Westbound	
16:00	0	0	0
16:15	0	1	1
16:30	0	0	0
16:45	0	2	2
17:00	0	3	3
17:15	1	3	4
17:30	1	2	3
17:45	0	5	5
18:00	1	0	1
18:15	2	2	4
18:30	1	0	1
18:45	0	0	0
Total	6	18	24



IDASO

Survey Name: 109 19151 Sandyford
Site: Site4
Location: Corrig Road/Blackthorn Road
Date: 23-May-2019

	A => A									A => B									A => C								
TIME	P/C	M/C	CAR	TAXI	LGV	HGV	PSV	TOT	PCU	P/C	M/C	CAR	TAXI	LGV	HGV	PSV	TOT	PCU	P/C	M/C	CAR	TAXI	LGV	HGV	PSV	TOT	PCU
07:00	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	2	2	0	0	5	0	3	0	0	8	8
07:15	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	2	2	0	0	5	0	3	1	0	9	10.3
07:30	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	2	2	0	0	12	0	6	1	0	19	20.3
07:45	0	0	0	0	0	0	0	0	0	0	0	7	0	0	0	0	7	7	1	0	9	0	5	1	0	16	16.5
H/TOT	0	0	0	0	0	0	0	0	0	0	0	11	0	2	0	0	13	13	1	0	31	0	17	3	0	52	55.1
08:00	0	0	0	0	0	0	0	0	0	0	0	4	0	0	0	0	4	4	0	0	8	0	4	1	0	13	14.3
08:15	0	0	0	0	0	0	0	0	0	4	0	6	0	2	2	0	14	13.4	1	0	8	2	10	1	0	22	22.5
08:30	0	0	0	0	0	0	0	0	0	0	0	9	1	2	1	0	13	14.3	0	0	4	0	5	1	0	10	11.3
08:45	0	0	0	0	0	0	0	0	0	0	0	9	0	1	3	0	13	16.9	0	0	10	3	7	0	0	20	20
H/TOT	0	0	0	0	0	0	0	0	0	4	0	28	1	5	6	0	44	48.6	1	0	30	5	26	3	0	65	68.1
09:00	0	0	0	0	0	0	0	0	0	2	0	8	0	5	0	0	15	13.4	1	0	8	1	5	0	0	15	14.2
09:15	0	0	0	0	0	0	0	0	0	0	0	4	0	0	0	0	4	4	1	0	7	0	4	0	0	12	11.2
09:30	0	0	0	0	0	0	0	0	0	0	0	2	0	2	0	0	4	4	1	1	6	0	4	0	0	12	10.6
09:45	0	0	0	0	0	0	0	0	0	0	0	10	0	2	0	0	12	12	0	0	11	2	6	1	0	20	21.3
H/TOT	0	0	0	0	0	0	0	0	0	2	0	24	0	9	0	0	35	33.4	3	1	32	3	19	1	0	59	57.3
10:00	0	0	0	0	0	0	0	0	0	0	0	4	0	3	0	0	7	7	0	0	8	0	6	0	0	14	14
10:15	0	0	0	0	0	0	0	0	0	0	0	6	0	3	1	0	10	11.3	0	0	6	2	5	4	0	17	22.2
10:30	0	0	0	0	0	0	0	0	0	0	0	2	0	2	0	0	4	4	0	0	6	1	5	0	1	13	14
10:45	0	0	0	0	0	0	0	0	0	0	0	6	0	2	1	0	9	10.3	0	0	8	4	9	1	0	22	23.3
H/TOT	0	0	0	0	0	0	0	0	0	0	0	18	0	10	2	0	30	32.6	0	0	28	7	25	5	1	66	73.5
11:00	0	0	0	0	0	0	0	0	0	0	0	6	0	3	0	0	9	9	0	0	7	0	5	1	0	13	14.3
11:15	0	0	0	0	0	0	0	0	0	0	0	9	1	3	1	0	14	15.3	0	0	12	1	5	0	0	18	18
11:30	0	0	0	0	0	0	0	0	0	0	0	5	0	2	0	0	7	7	0	0	13	0	6	4	0	23	28.2
11:45	0	0	0	0	0	0	0	0	0	0	0	4	0	1	0	0	5	5	0	0	13	1	7	0	0	21	21
H/TOT	0	0	0	0	0	0	0	0	0	0	0	24	1	9	1	0	35	36.3	0	0	45	2	23	5	0	75	81.5
12:00	0	0	0	0	0	0	0	0	0	0	0	5	0	2	1	0	8	9.3	0	0	12	2	2	1	0	17	18.3
12:15	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	3	3	0	0	10	0	6	2	0	18	20.6
12:30	0	0	0	0	0	0	0	0	0	0	0	9	0	2	0	0	11	11	0	0	9	1	1	1	0	12	13.3
12:45	0	0	0	0	0	0	0	0	0	0	0	8	0	2	0	0	10	10	0	0	20	0	6	2	0	28	30.6
H/TOT	0	0	0	0	0	0	0	0	0	0	0	22	0	9	1	0	32	33.3	0	0	51	3	15	6	0	75	82.8
13:00	0	0	0	0	0	0	0	0	0	0	0	7	0	4	0	0	11	11	0	1	13	0	5	0	0	19	18.4
13:15	0	0	0	0	0	0	0	0	0	0	1	9	0	1	0	0	11	10.4	0	0	9	0	2	0	0	11	11
13:30	0	0	0	0	0	0	0	0	0	0	0	7	0	4	1	0	12	13.3	0	0	14	0	6	1	0	21	22.3
13:45	0	0	0	0	0	0	0	0	0	0	0	11	0	3	2	0	16	18.6	0	0	15	1	7	1	0	24	25.3
H/TOT	0	0	0	0	0	0	0	0	0	0	1	34	0	12	3	0	50	53.3	0	1	51	1	20	2	0	75	77
14:00	0	0	0	0	0	0	0	0	0	0	0	4	0	1	0	0	5	5	0	0	11	0	4	0	0	15	15
14:15	0	0	0	0	0	0	0	0	0	0	0	5	1	3	0	0	9	9	0	0	14	2	4	2	0	22	24.6
14:30	0	0	0	0	0	0	0	0	0	0	0	7	0	4	0	0	11	11	1	0	12	0	8	1	0	22	22.5
14:45	0	0	0	0	0	0	0	0	0	0	0	8	0	1	2	0	11	13.6	0	0	19	1	8	1	0	29	30.3
H/TOT	0	0	0	0	0	0	0	0	0	0	0	24	1	9	2	0	36	38.6	1	0	56	3	24	4	0	88	92.4
15:00	0	0	0	0	0	0	0	0	0	0	0	6	1	3	2	0	12	14.6	0	1	19	1	5	1	0	27	27.7
15:15	0	0	0	0	0	0	0	0	0	0	0	3	0	0	1	0	4	5.3	0	1	9	0	6	0	0	16	15.4
15:30	0	0	0	0	0	0	0	0	0	0	0	5	0	0	1	0	6	7.3	1	0	17	0	5	0	0	23	22.2
15:45	0	0	0	0	0	0	0	0	0	0	0	8	0	1	0	0	9	9	1	0	13	0	8	0	0	22	21.2
H/TOT	0	0	0	0	0	0	0	0	0	0	0	22	1	4	4	0	31	36.2	2	2	58	1	24	1	0	88	86.5
16:00	0	0	0	0	0	0	0	0	0	0	0	8	0	3	1	0	12	13.3	2	0	18	0	1	1	0	22	21.7
16:15	0	0	0	0	0	0	0	0	0	0	0	6	0	2	1	0	9	10.3	0	1	13	1	3	1	0	19	19.7
16:30	0	0	0	0	0	0	0	0	0	1	0	7	0	0	1	0	9	9.5	1	1	25	3	2	1	0	33	32.9
16:45	0	0	0	0	0	0	0	0	0	0	0	4	1	1	1	0	7	8.3	0	0	16	0	0	0	0	16	16
H/TOT	0	0	0	0	0	0	0	0	0	1	0	25	1	6	4	0	37	41.4	3	2	72	4	6	3	0	90	90.3
17:00	0	0	0	0	0	0	0	0	0	0	0	9	0	0	0	0	9	9	1	0	20	1	2	0	0	24	23.2
17:15	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	1	2	0	24	0	2	0	0	28	26.4
17:30	0	0	0	0	0	0	0	0	0	0	0	6	0	1	0	0	7	7	4	0	12	0	1	0	0	17	13.8
17:45	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	1	5	0	17	0	0	0	0	22	18
H/TOT	0	0	0	0	0	0	0	0	0	0	0	17	0	1	0	0	18	18	12	0	73	1	5	0	0	91	81.4
18:00	0	0	0	0	0	0	0	0	0	0	0	4	1	0	0	0	5	5	1	0	20	0	0	0	0	21	20.2
18:15	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	2	2	0	0	11	0	0	0	0	11	11
18:30	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	2	2	1	0	23	0	1	0	0	25	24.2
18:45	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	2	2	1	0	11	1	1	0	0	14	13.2
H/TOT	0	0	0	0	0	0	0	0	0	0	0	9	2	0	0	0	11	11	3	0	65	1	2	0	0	71	68.6
12 TOT	0	0	0	0	0	0	0	0	0	7	1	258	7	76	23	0	372	395.7	26	6	592	31	206	33	1	895	914.5

B => A									B => B									B => C								
P/C	M/C	CAR	TAXI	LGV	HGV	PSV	TOT	PCU	P/C	M/C	CAR	TAXI	LGV	HGV	PSV	TOT	PCU	P/C	M/C	CAR	TAXI	LGV	HGV	PSV	TOT	PCU
0	0	3	0	1	0	0	4	4	0	0	0	0	0	0	0	0	0	2	0	22	3	6	2	2	37	40
0	0	4	0	1	0	0	5	5	0	0	0	0	0	0	0	0	0	2	0	29	1	9	0	0	41	39.4
0	0	2	0	1	0	0	3	3	0	0	0	0	0	0	0	0	0	2	0	38	1	6	2	0	49	50
0	0	6	0	3	0	0	9	9	0	0	1	0	0	0	0	1	1	3	1	46	3	9	0	0	62	59
0	0	15	0	6	0	0	21	21	0	0	1	0	0	0	0	1	1	9	1	135	8	30	4	2	189	188.4
0	0	15	0	3	0	0	18	18	0	0	0	0	0	0	0	0	0	2	0	61	3	6	4	0	76	79.6
0	1	16	1	5	1	0	24	24.7	0	0	0	0	0	0	0	0	0	2	2	72	2	9	3	2	92	95.1
0	1	19	3	1	1	0	25	25.7	0	0	0	0	0	0	0	0	0	2	0	92	2	10	4	0	110	113.6
0	0	24	1	2	1	0	28	29.3	0	0	0	0	0	0	0	0	0	1	2	94	7	9	5	1	119	124.5
0	2	74	5	11	3	0	95	97.7	0	0	0	0	0	0	0	0	0	7	4	319	14	34	16	3	397	412.8
0	1	7	0	7	1	0	16	16.7	0	0	0	0	0	0	0	0	0	3	0	78	6	6	4	2	99	103.8
0	0	7	1	3	0	0	11	11	0	0	0	0	0	0	0	0	0	3	0	55	6	11	1	1	77	76.9
0	0	7	1	2	0	0	10	10	0	0	0	0	0	0	0	0	0	3	0	75	2	14	2	0	96	96.2
0	0	4	2	2	1	0	9	10.3	0	0	0	0	0	0	0	0	0	0	1	60	3	9	6	0	79	86.2
0	1	25	4	14	2	0	46	48	0	0	0	0	0	0	0	0	0	9	1	268	17	40	13	3	351	363.1
0	0	7	0	4	1	0	12	13.3	0	0	0	0	0	0	0	0	0	0	1	76	6	17	5	5	110	120.9
0	0	5	1	2	0	0	8	8	0	0	0	0	0	0	0	0	0	0	1	67	4	15	5	0	92	97.9
0	0	7	0	4	2	0	13	15.6	0	0	0	0	0	0	0	0	0	0	0	61	4	13	1	1	80	82.3
0	0	5	0	5	0	0	10	10	0	0	0	0	0	0	0	0	0	0	0	73	3	7	5	0	88	94.5
0	0	24	1	15	3	0	43	46.9	0	0	0	0	0	0	0	0	0	0	2	277	17	52	16	6	370	395.6
0	0	6	3	3	1	0	13	14.3	0	0	0	0	0	0	0	0	0	0	0	69	6	16	1	1	93	95.3
0	0	5	0	0	0	0	5	5	0	0	0	0	0	0	0	0	0	0	3	81	4	19	2	0	109	109.8
0	0	9	1	5	1	0	16	17.3	0	0	0	0	0	0	0	0	0	0	2	75	3	13	5	0	98	103.3
0	0	7	1	3	1	0	12	13.3	0	0	0	0	0	0	0	0	0	0	1	73	6	15	2	0	97	99
0	0	27	5	11	3	0	46	49.9	0	0	0	0	0	0	0	0	0	0	6	298	19	63	10	1	397	407.4
0	0	10	0	2	0	0	12	12	0	0	0	0	0	0	0	0	0	0	1	86	6	21	3	2	119	124.3
0	0	7	0	8	0	0	15	15	0	0	1	0	0	0	0	1	1	2	0	72	3	16	4	0	97	100.6
0	0	13	0	3	0	0	16	16	0	0	0	0	0	0	0	0	0	0	0	85	5	13	0	0	103	103
0	0	11	0	5	1	0	17	18.3	0	0	1	0	0	0	0	1	1	1	0	95	9	12	0	1	118	118.2
0	0	41	0	18	1	0	60	61.3	0	0	2	0	0	0	0	2	2	3	1	338	23	62	7	3	437	446.1
1	1	18	0	3	3	0	26	28.5	0	0	0	0	0	0	0	0	0	1	0	99	7	16	3	1	127	131.1
1	0	10	0	0	1	0	12	12.5	0	0	0	0	0	0	0	0	0	3	1	85	2	15	3	0	109	109.9
0	0	8	1	5	2	0	16	18.6	0	0	0	0	0	0	0	0	0	0	0	95	6	11	4	0	116	121.2
0	1	9	0	1	0	0	11	10.4	0	0	0	0	0	0	0	0	0	1	0	98	6	14	4	0	123	127.4
2	2	45	1	9	6	0	65	70	0	0	0	0	0	0	0	0	0	5	1	377	21	56	14	1	475	489.6
0	1	7	0	5	0	0	13	12.4	0	0	0	0	0	0	0	0	0	3	2	107	3	14	5	1	135	138.9
0	0	7	2	5	0	0	14	14	0	0	1	0	0	0	0	1	1	0	4	66	2	19	4	0	95	97.8
0	0	9	0	1	2	0	12	14.6	0	0	0	0	0	0	0	0	0	1	1	85	0	14	5	0	106	111.1
0	0	6	1	3	0	0	10	10	0	0	0	0	0	0	0	0	0	1	0	60	5	8	4	0	78	82.4
0	1	29	3	14	2	0	49	51	0	0	1	0	0	0	0	1	1	5	7	318	10	55	18	1	414	430.2
1	1	12	1	5	0	0	20	18.6	0	0	0	0	0	0	0	0	0	3	0	83	3	23	4	1	117	120.8
0	0	11	0	1	1	0	13	14.3	0	0	0	0	0	0	0	0	0	0	1	74	3	19	3	0	100	103.3
0	1	8	0	0	1	0	10	10.7	0	0	0	0	0	0	0	0	0	0	0	84	3	20	2	0	109	111.6
0	0	8	0	0	2	0	10	12.6	0	0	0	0	0	0	0	0	0	4	2	93	2	12	3	1	117	117.5
1	2	39	1	6	4	0	53	56.2	0	0	0	0	0	0	0	0	0	7	3	334	11	74	12	2	443	453.2
0	0	8	0	11	0	0	19	19	0	0	0	0	0	0	0	0	0	2	0	94	1	13	4	3	117	123.6
0	1	3	1	0	1	0	6	6.7	0	0	0	0	0	0	0	0	0	3	2	68	3	12	1	1	90	88.7
2	2	9	1	2	0	0	16	13.2	0	0	0	0	0	0	0	0	0	4	1	89	1	4	0	1	100	97.2
1	0	15	1	1	0	0	18	17.2	0	0	0	0	0	0	0	0	0	13	2	96	2	6	1	0	120	109.7
3	3	35	3	14	1	0	59	56.1	0	0	0	0	0	0	0	0	0	22	5	347	7	35	6	5	427	419.2
0	0	21	0	3	1	0	25	26.3	0	0	0	0	0	0	0	0	0	24	3	106	0	8	1	1	143	124.3
0	0	17	1	5	0	0	23	23	0	0	0	0	0	0	0	0	0	13	1	72	0	4	0	1	91	81
2	0	22	0	0	0	0	24	22.4	0	0	0	0	0	0	0	0	0	16	1	94	2	4	0	0	117	103.6
0	0	10	1	2	0	0	13	13	0	0	0	0	0	0	0	0	0	12	1	66	1	1	0	0	81	70.8
2	0	70	2	10	1	0	85	84.7	0	0	0	0	0	0	0	0	0	65	6	338	3	17	1	2	432	379.7
1	0	11	0	0	0	0	12	11.2	0	0	0	0	0	0	0	0	0	6	1	61	1	3	1	1	74	70.9
0	0	2	0	0	0	0	2	2	0	0	0	0	0	0	0	0	0	4	1	72	2	0	1	1	81	79.5
1	0	3	0	0	0	0	4	3.2	0	0	0	0	0	0	0	0	0	10	0	55	0	5	1	1	72	66.3
1	0	5	0	0	0	0	6	5.2	0	0	1	0	0	0	0	1	1	7	1	57	3	8	1	0	77	72.1
3	0	21	0	0	0	0	24	21.6	0	0	1	0	0	0	0	1	1	27	3	245	6	16	4	3	304	288.8
11	11	445	25	128	26	0	646	664.4	0	0	5	0	0	0	0	5	5	159	40	3594	156	534	121	32	4636	4674

C => A									C => B									C => C								
P/C	M/C	CAR	TAXI	LGV	HGV	PSV	TOT	PCU	P/C	M/C	CAR	TAXI	LGV	HGV	PSV	TOT	PCU	P/C	M/C	CAR	TAXI	LGV	HGV	PSV	TOT	PCU
1	0	22	0	9	2	0	34	35.8	3	0	51	1	6	0	3	64	64.6	0	0	0	0	0	0	0	0	0
1	0	37	1	5	1	0	45	45.5	6	0	49	1	11	2	2	71	70.8	0	0	0	0	0	0	0	0	0
1	0	43	0	4	1	0	49	49.5	5	0	49	2	6	2	2	66	66.6	0	0	0	0	0	0	0	0	0
0	0	27	0	2	1	0	30	31.3	7	0	66	2	5	2	2	84	83	0	0	0	0	0	0	0	0	0
3	0	129	1	20	5	0	158	162.1	21	0	215	6	28	6	9	285	285	0	0	0	0	0	0	0	0	0
3	1	46	1	4	1	0	56	54.3	5	0	71	1	6	0	3	86	85	0	0	0	0	0	0	0	0	0
1	0	45	1	5	1	0	53	53.5	12	0	62	4	8	1	1	88	80.7	0	0	0	0	0	0	0	0	0
2	0	40	2	4	1	0	49	48.7	11	2	83	4	2	0	3	105	98	0	0	0	0	0	0	0	0	0
2	1	37	2	8	1	0	51	50.1	14	0	77	3	1	3	1	99	92.7	0	0	0	0	0	0	0	0	0
8	2	168	6	21	4	0	209	206.6	42	2	293	12	17	4	8	378	356.4	0	0	0	0	0	0	0	0	0
0	0	22	1	2	0	1	26	27	2	2	59	6	12	3	2	86	89.1	0	0	1	0	0	0	0	1	1
2	0	24	2	5	0	1	34	33.4	2	1	70	2	10	2	1	88	89.4	0	0	0	0	0	0	0	0	0
1	0	25	0	3	0	2	31	32.2	1	2	59	3	5	1	2	73	74.3	0	0	0	0	0	0	0	0	0
0	0	18	3	9	2	0	32	34.6	3	0	53	2	9	5	1	73	78.1	0	0	0	0	0	0	0	0	0
3	0	89	6	19	2	4	123	127.2	8	5	241	13	36	11	6	320	330.9	0	0	1	0	0	0	0	1	1
1	0	16	0	8	2	0	27	28.8	2	1	41	2	7	3	1	57	59.7	0	0	0	0	0	0	0	0	0
0	0	16	4	8	2	0	30	32.6	1	0	34	4	5	1	2	47	49.5	0	0	0	0	1	0	0	1	1
0	0	10	1	5	0	0	16	16	1	1	50	4	9	0	2	67	67.6	0	0	0	0	0	0	0	0	0
0	0	18	1	5	2	2	28	32.6	0	0	42	5	11	1	2	61	64.3	0	0	0	0	0	0	0	0	0
1	0	60	6	26	6	2	101	110	4	2	167	15	32	5	7	232	241.1	0	0	0	0	1	0	0	1	1
1	0	16	3	6	0	1	27	27.2	0	1	51	4	11	2	0	69	71	0	0	0	0	0	0	0	0	0
0	0	21	2	9	0	2	34	36	1	1	38	4	11	2	1	58	60.2	0	0	0	0	0	0	0	0	0
0	0	14	1	7	5	0	27	33.5	0	1	42	1	18	2	2	66	70	0	0	0	0	0	0	0	0	0
0	1	14	1	5	1	0	22	22.7	0	1	36	2	9	1	1	50	51.7	0	0	0	0	0	0	0	0	0
1	1	65	7	27	6	3	110	119.4	1	4	167	11	49	7	4	243	252.9	0	0	0	0	0	0	0	0	0
0	0	22	0	6	2	0	30	32.6	0	0	42	2	19	1	0	64	65.3	0	0	0	0	0	0	0	0	0
0	0	15	2	3	2	0	22	24.6	0	0	44	2	7	1	2	56	59.3	0	0	0	0	0	0	0	0	0
0	0	24	3	8	3	0	38	41.9	1	0	44	1	11	0	1	58	58.2	0	0	0	0	0	0	0	0	0
1	0	13	1	11	1	0	27	27.5	0	1	52	7	8	4	1	73	78.6	0	0	0	0	0	0	0	0	0
1	0	74	6	28	8	0	117	126.6	1	1	182	12	45	6	4	251	261.4	0	0	0	0	0	0	0	0	0
0	0	16	0	8	0	0	24	24	1	0	47	0	10	0	0	58	57.2	0	0	0	0	0	0	0	0	0
0	0	18	2	4	1	1	26	28.3	0	1	52	3	8	1	2	67	69.7	0	0	0	0	0	0	0	0	0
0	0	16	1	3	1	1	22	24.3	0	1	55	0	6	3	2	67	72.3	0	0	0	0	0	0	0	0	0
0	0	30	2	1	2	0	35	37.6	1	2	67	4	11	2	1	88	89.6	0	0	0	0	0	0	0	0	0
0	0	80	5	16	4	2	107	114.2	2	4	221	7	35	6	5	280	288.8	0	0	0	0	0	0	0	0	0
1	1	17	2	6	1	0	28	27.9	2	0	71	2	12	0	0	87	85.4	0	0	0	0	0	0	0	0	0
0	0	22	1	6	2	0	31	33.6	1	1	38	2	9	2	1	54	56.2	0	0	0	0	0	0	0	0	0
0	0	20	0	11	0	0	31	31	0	0	45	3	12	1	1	62	64.3	0	0	0	0	0	0	0	0	0
0	0	16	2	4	0	0	22	22	1	0	44	2	13	2	1	63	65.8	0	0	0	0	0	0	0	0	0
1	1	75	5	27	3	0	112	114.5	4	1	198	9	46	5	3	266	271.7	0	0	0	0	0	0	0	0	0
0	1	14	1	6	1	0	23	23.7	0	0	44	1	10	2	1	58	61.6	0	0	0	0	0	0	0	0	0
0	0	12	2	2	0	0	16	16	3	0	44	4	8	0	1	60	58.6	0	0	0	0	0	0	0	0	0
0	0	11	0	6	0	0	17	17	0	1	46	1	6	3	2	59	64.3	0	0	0	0	0	0	0	0	0
1	0	13	1	1	0	0	16	15.2	2	0	40	6	5	1	2	56	57.7	0	0	0	0	0	0	0	0	0
1	1	50	4	15	1	0	72	71.9	5	1	174	12	29	6	6	233	242.2	0	0	0	0	0	0	0	0	0
0	1	18	1	4	3	0	27	30.3	1	0	42	2	7	0	1	53	53.2	0	0	0	0	0	0	0	0	0
2	1	12	1	6	1	0	23	22.1	0	0	32	1	4	0	1	38	39	0	0	0	0	0	0	0	0	0
0	0	14	0	1	1	0	16	17.3	0	1	46	2	3	2	5	59	66	0	0	0	0	0	0	0	0	0
1	0	33	1	2	0	0	37	36.2	0	2	42	0	3	2	0	49	50.4	0	0	0	0	0	0	0	0	0
3	2	77	3	13	5	0	103	105.9	1	3	162	5	17	4	7	199	208.6	0	0	0	0	0	0	0	0	0
1	0	29	1	3	0	0	34	33.2	5	2	44	2	2	0	2	57	53.8	0	0	0	0	0	0	0	0	0
0	1	23	1	0	0	0	25	24.4	0	1	48	1	3	2	1	56	59	0	0	0	0	0	0	0	0	0
3	0	22	1	2	0	0	28	25.6	3	0	46	2	2	0	2	55	54.6	0	0	0	0	0	0	0	0	0
1	0	19	2	1	0	0	23	22.2	1	1	38	3	0	0	1	44	43.6	0	0	0	0	0	0	0	0	0
5	1	93	5	6	0	0	110	105.4	9	4	176	8	7	2	6	212	211	0	0	0	0	0	0	0	0	0
1	0	24	0	1	0	0	26	25.2	1	0	32	1	0	0	2	36	37.2	0	0	0	0	0	0	0	0	0
0	0	19	1	0	0	0	20	20	0	0	34	1	6	0	1	42	43	0	0	0	0	0	0	0	0	0
0	0	8	0	0	2	0	10	12.6	1	0	17	1	0	1	1	21	22.5	0	0	0	0	0	0	0	0	0
1	0	8	0	1	0	0	10	9.2	0	0	42	1	0	0	2	45	47	0	0	0	0	0	0	0	0	0
2	0	59	1	2	2	0	66	67	2	0	125	4	6	1	6	144	149.7	0	0	0	0	0	0	0	0	0
29	8	1019	55	220	46	11	1388	1431	100	27	2321	114	347	63	71	3043	3100	0	0	1	0	1	0	0	2	2

IDASO

Survey Name: 109 19151 Sandyford
Site: Site4
Location: Corrig Road/Blackthorn Road
Date: 23-May-2019

TIME	A1	A2	B1	B2	C1	C2
7:00	0	5	0	0	5	0
7:05	0	0	0	0	5	0
7:10	0	5	0	0	5	0
7:15	0	10	0	0	15	0
7:20	0	5	0	0	25	5
7:25	5	5	0	0	10	10
7:30	0	20	0	0	15	0
7:35	5	5	0	5	20	0
7:40	0	5	0	0	10	0
7:45	0	5	0	0	15	15
7:50	5	5	0	5	20	0
7:55	0	0	0	0	20	5
8:00	0	5	0	10	25	15
8:05	0	10	0	5	35	5
8:10	5	10	0	5	20	15
8:15	5	10	0	0	15	10
8:20	0	10	0	5	20	5
8:25	5	10	0	5	20	15
8:30	10	5	0	5	20	0
8:35	5	10	0	5	15	15
8:40	10	5	0	5	20	10
8:45	10	10	0	15	20	5
8:50	10	10	0	5	25	10
8:55	5	10	5	5	15	10
9:00	0	5	20	5	20	10
9:05	0	5	0	5	25	15
9:10	0	30	0	0	15	0
9:15	0	5	0	5	15	5
9:20	0	5	0	0	10	15
9:25	5	5	0	5	5	15
9:30	0	5	0	0	10	15
9:35	5	5	0	0	5	10
9:40	0	0	0	0	5	15
9:45	0	30	0	5	5	10
9:50	0	10	0	0	5	5
9:55	5	5	0	0	5	5

TIME	A1	A2	B1	B2	C1	C2
10:00	0	5	0	0	10	5
10:05	0	15	0	5	10	5
10:10	0	5	0	5	0	5
10:15	5	10	0	5	20	10
10:20	0	10	0	0	15	0
10:25	0	15	0	0	0	0
10:30	0	10	0	0	20	10
10:35	0	15	0	10	5	5
10:40	0	5	0	5	10	0
10:45	5	10	0	0	20	15
10:50	0	10	0	5	0	0
10:55	5	5	0	0	0	10
11:00	5	5	0	0	0	20
11:05	5	5	0	0	0	0
11:10	5	5	0	10	5	0
11:15	5	15	0	0	0	0
11:20	0	10	0	0	0	0
11:25	5	10	0	5	15	0
11:30	5	10	5	0	15	15
11:35	0	15	0	0	0	0
11:40	5	15	5	5	5	0
11:45	5	10	0	0	15	5
11:50	0	5	0	5	0	0
11:55	0	15	0	0	15	0
12:00	10	5	0	0	10	10
12:05	0	20	0	0	10	5
12:10	0	5	0	5	15	10
12:15	10	5	0	0	15	5
12:20	5	5	0	0	5	0
12:25	0	10	0	0	15	15
12:30	5	5	0	0	10	10
12:35	5	10	0	0	25	5
12:40	0	15	0	0	20	5
12:45	5	5	0	0	15	5
12:50	5	10	0	0	25	5
12:55	5	20	0	10	15	20

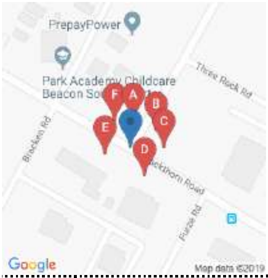
Queue's are measured in meters

Cannot be seen from camera
+ Signifies queue stretches to a minimum length of x and beyond the view of the camera
# Signifies queue stretches to the next significant junction
* Indicates an estimated queue length due to obscured vision.
M Indicates that the lane ends and the vehicles queing merged into another lane to queue.

Queue lengths are compiled from CCTV observations and are therefore subject to the limitations of the camera view.

TIME	A1	A2	B1	B2	C1	C2
13:00	5	20	0	5	15	0
13:05	0	10	0	5	10	5
13:10	5	10	0	5	15	0
13:15	0	5	0	0	20	15
13:20	5	5	0	0	15	15
13:25	0	5	0	0	15	10
13:30	5	5	0	0	15	15
13:35	0	0	0	0	10	10
13:40	0	20	0	5	15	0
13:45	5	15	0	5	20	15
13:50	5	10	0	0	20	0
13:55	10	5	0	0	10	15
14:00	5	5	0	0	20	10
14:05	5	15	0	5	15	10
14:10	0	10	5	0	10	5
14:15	5	15	0	0	15	0
14:20	0	10	0	0	10	5
14:25	5	10	0	0	25	5
14:30	5	15	0	5	10	0
14:35	5	5	0	0	15	15
14:40	0	10	0	0	0	5
14:45	0	5	0	0	10	0
14:50	10	20	0	0	5	0
14:55	5	5	0	0	10	0
15:00	10	5	0	5	20	5
15:05	0	15	0	0	0	0
15:10	5	10	0	0	10	0
15:15	0	5	0	5	15	5
15:20	0	10	0	0	5	0
15:25	0	5	0	5	10	5
15:30	0	5	0	0	5	5
15:35	5	5	0	0	0	0
15:40	0	10	0	0	0	0
15:45	5	15	0	0	20	5
15:50	0	10	0	5	0	0
15:55	0	10	0	0	0	0

TIME	A1	A2	B1	B2	C1	C2
16:00	0	10	0	0	10	0
16:05	5	5	0	5	15	5
16:10	5	10	10	15	20	0
16:15	0	5	0	0	0	0
16:20	5	5	0	0	10	0
16:25	0	5	0	0	5	0
16:30	5	10	0	0	0	0
16:35	0	15	0	0	35	20
16:40	0	10	5	5	15	5
16:45	0	10	0	10	5	5
16:50	5	0	0	15	15	5
16:55	0	10	0	5	15	5
17:00	5	15	0	5	20	0
17:05	5	15	0	0	20	0
17:10	5	0	0	10	20	5
17:15	0	5	0	0	15	0
17:20	5	10	0	5	15	0
17:25	0	15	0	5	10	0
17:30	5	5	0	0	15	5
17:35	5	5	0	0	20	5
17:40	5	5	0	15	20	10
17:45	0	5	0	0	15	0
17:50	5	5	0	0	15	10
17:55	0	10	0	0	5	10
18:00	0	5	0	0	15	0
18:05	0	10	0	0	15	5
18:10	0	5	0	0	15	0
18:15	5	5	0	5	5	0
18:20	0	5	0	0	10	0
18:25	0	5	0	0	15	0
18:30	0	10	0	0	0	0
18:35	0	5	0	0	20	0
18:40	0	5	0	0	10	0
18:45	0	10	0	0	0	0
18:50	0	5	0	0	0	0
18:55	0	5	0	0	0	0



IDASO

Survey Name: 109 19151 Sandyford
Site: Site4
Location: Corrig Rd / Blackthorn Rd
Date: 23-May-2019

	A => B			B => A			C => D			D => C			E => F			F => E		
TIME	Adult	Child	TOT	Adult	Child	TOT	Adult	Child	TOT	Adult	Child	TOT	Adult	Child	TOT	Adult	Child	TOT
07:00	2	0	2	0	0	0	1	0	1	1	0	1	8	0	8	4	0	4
07:15	1	0	1	0	0	0	1	0	1	0	0	0	0	0	0	11	0	11
07:30	2	0	2	2	0	2	1	0	1	1	0	1	4	0	4	11	0	11
07:45	2	0	2	1	0	1	1	0	1	0	0	0	1	0	1	34	0	34
H/TOT	7	0	7	3	0	3	4	0	4	2	0	2	13	0	13	60	0	60
08:00	3	0	3	2	0	2	2	0	2	1	0	1	8	0	8	26	1	27
08:15	3	0	3	1	0	1	7	0	7	0	0	0	6	0	6	27	2	29
08:30	2	0	2	1	0	1	3	0	3	1	0	1	3	0	3	33	0	33
08:45	3	0	3	4	0	4	5	0	5	0	0	0	4	0	4	60	1	61
H/TOT	11	0	11	8	0	8	17	0	17	2	0	2	21	0	21	146	4	150
09:00	2	0	2	0	0	0	2	0	2	0	0	0	4	0	4	25	1	26
09:15	4	0	4	0	0	0	1	0	1	0	0	0	5	0	5	14	0	14
09:30	2	0	2	1	0	1	1	0	1	0	0	0	2	0	2	17	0	17
09:45	0	0	0	0	0	0	3	0	3	1	0	1	18	0	18	12	0	12
H/TOT	8	0	8	1	0	1	7	0	7	1	0	1	29	0	29	68	1	69
10:00	1	0	1	0	0	0	0	0	0	1	0	1	1	0	1	2	0	2
10:15	0	0	0	1	0	1	1	0	1	0	0	0	3	0	3	3	0	3
10:30	0	0	0	0	0	0	1	0	1	1	0	1	10	0	10	4	0	4
10:45	0	0	0	2	0	2	1	0	1	1	0	1	7	1	8	3	0	3
H/TOT	1	0	1	3	0	3	3	0	3	3	0	3	21	1	22	12	0	12
11:00	1	0	1	1	0	1	1	0	1	0	0	0	0	0	0	6	0	6
11:15	3	0	3	0	0	0	0	0	0	2	0	2	0	0	0	0	0	0
11:30	1	0	1	3	0	3	4	0	4	0	0	0	4	0	4	3	0	3
11:45	0	0	0	1	0	1	0	0	0	0	0	0	3	0	3	7	0	7
H/TOT	5	0	5	5	0	5	5	0	5	2	0	2	7	0	7	16	0	16
12:00	0	0	0	2	0	2	0	0	0	0	0	0	22	0	22	1	0	1
12:15	1	0	1	3	0	3	1	0	1	5	0	5	14	0	14	9	0	9
12:30	3	0	3	2	0	2	0	0	0	9	0	9	33	0	33	13	0	13
12:45	7	0	7	3	0	3	7	0	7	13	0	13	31	0	31	16	0	16
H/TOT	11	0	11	10	0	10	8	0	8	27	0	27	100	0	100	39	0	39
13:00	1	0	1	3	0	3	5	0	5	2	0	2	21	0	21	7	0	7
13:15	9	0	9	6	0	6	7	0	7	5	0	5	13	0	13	18	0	18
13:30	3	0	3	8	0	8	1	0	1	5	0	5	19	0	19	33	0	33
13:45	2	0	2	5	0	5	8	0	8	0	0	0	11	0	11	20	0	20
H/TOT	15	0	15	22	0	22	21	0	21	12	0	12	64	0	64	78	0	78
14:00	3	0	3	1	0	1	11	0	11	0	0	0	5	0	5	12	0	12
14:15	0	0	0	2	0	2	3	0	3	0	0	0	0	0	0	9	0	9
14:30	1	0	1	0	0	0	0	0	0	1	0	1	8	0	8	14	0	14
14:45	1	0	1	0	0	0	1	0	1	0	0	0	7	1	8	7	0	7
H/TOT	5	0	5	3	0	3	15	0	15	1	0	1	20	1	21	42	0	42
15:00	0	0	0	1	0	1	0	0	0	3	0	3	6	0	6	3	0	3
15:15	2	0	2	0	0	0	1	0	1	1	0	1	1	0	1	4	0	4
15:30	1	0	1	2	0	2	1	0	1	2	0	2	2	0	2	1	0	1
15:45	2	0	2	0	0	0	1	0	1	0	0	0	3	0	3	4	0	4
H/TOT	5	0	5	3	0	3	3	0	3	6	0	6	12	0	12	12	0	12
16:00	0	0	0	1	0	1	1	0	1	1	0	1	9	0	9	1	0	1
16:15	0	0	0	0	0	0	0	0	0	0	0	0	8	0	8	1	0	1
16:30	0	0	0	1	0	1	2	0	2	2	0	2	12	0	12	3	0	3
16:45	2	0	2	1	0	1	1	0	1	3	0	3	9	0	9	3	0	3
H/TOT	2	0	2	3	0	3	4	0	4	6	0	6	38	0	38	8	0	8
17:00	3	0	3	4	0	4	0	0	0	8	0	8	35	0	35	6	0	6
17:15	2	0	2	4	0	4	1	0	1	3	0	3	28	0	28	4	0	4
17:30	2	0	2	1	0	1	1	0	1	8	0	8	43	1	44	3	0	3
17:45	1	0	1	0	0	0	0	0	0	7	0	7	29	0	29	2	0	2
H/TOT	8	0	8	9	0	9	2	0	2	26	0	26	135	1	136	15	0	15
18:00	4	0	4	1	0	1	0	0	0	2	0	2	37	0	37	2	0	2
18:15	0	0	0	0	0	0	0	0	0	1	0	1	12	0	12	2	0	2
18:30	4	0	4	0	0	0	0	0	0	1	0	1	15	0	15	1	0	1
18:45	2	0	2	0	0	0	1	0	1	0	0	0	3	0	3	0	0	0
H/TOT	10	0	10	1	0	1	1	0	1	4	0	4	67	0	67	5	0	5
12 TOT	88	0	88	71	0	71	90	0	90	92	0	92	527	3	530	501	5	506

Appendix 14.2

Traffic Flow Diagrams

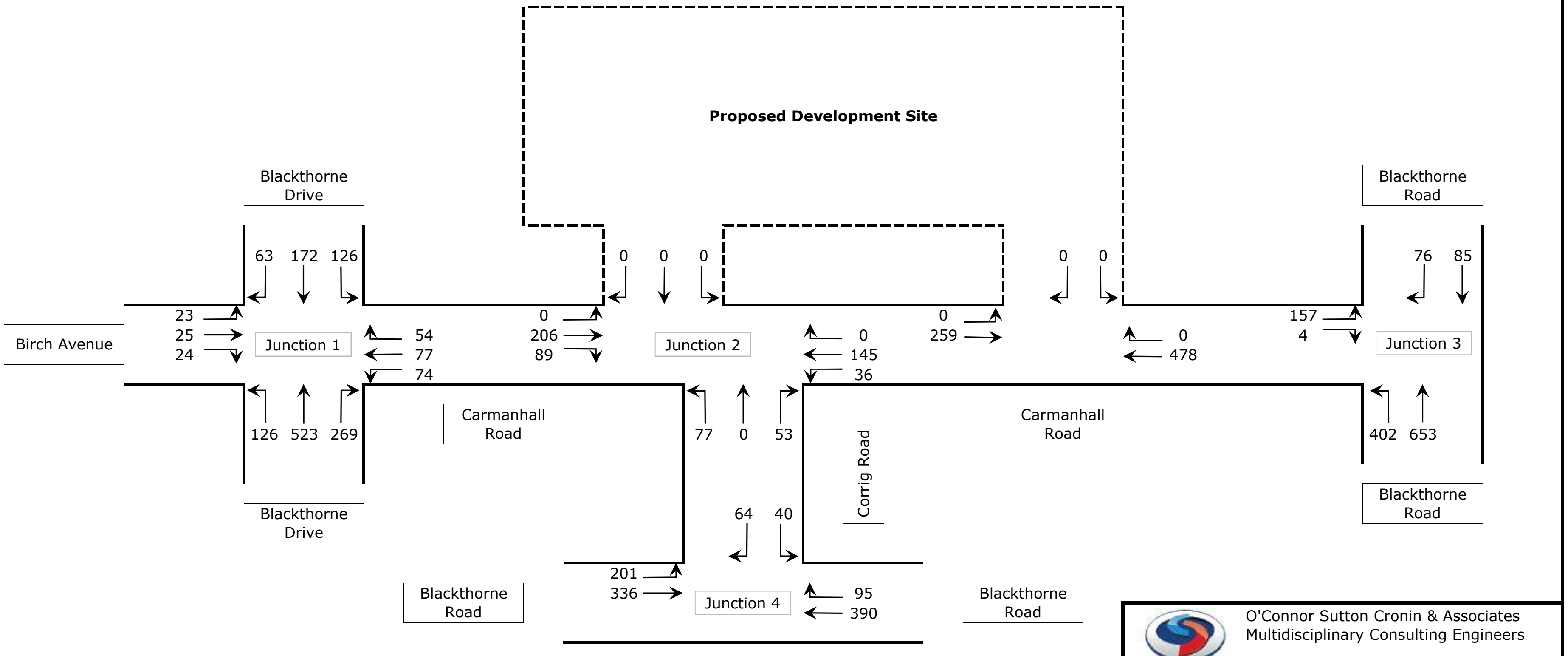


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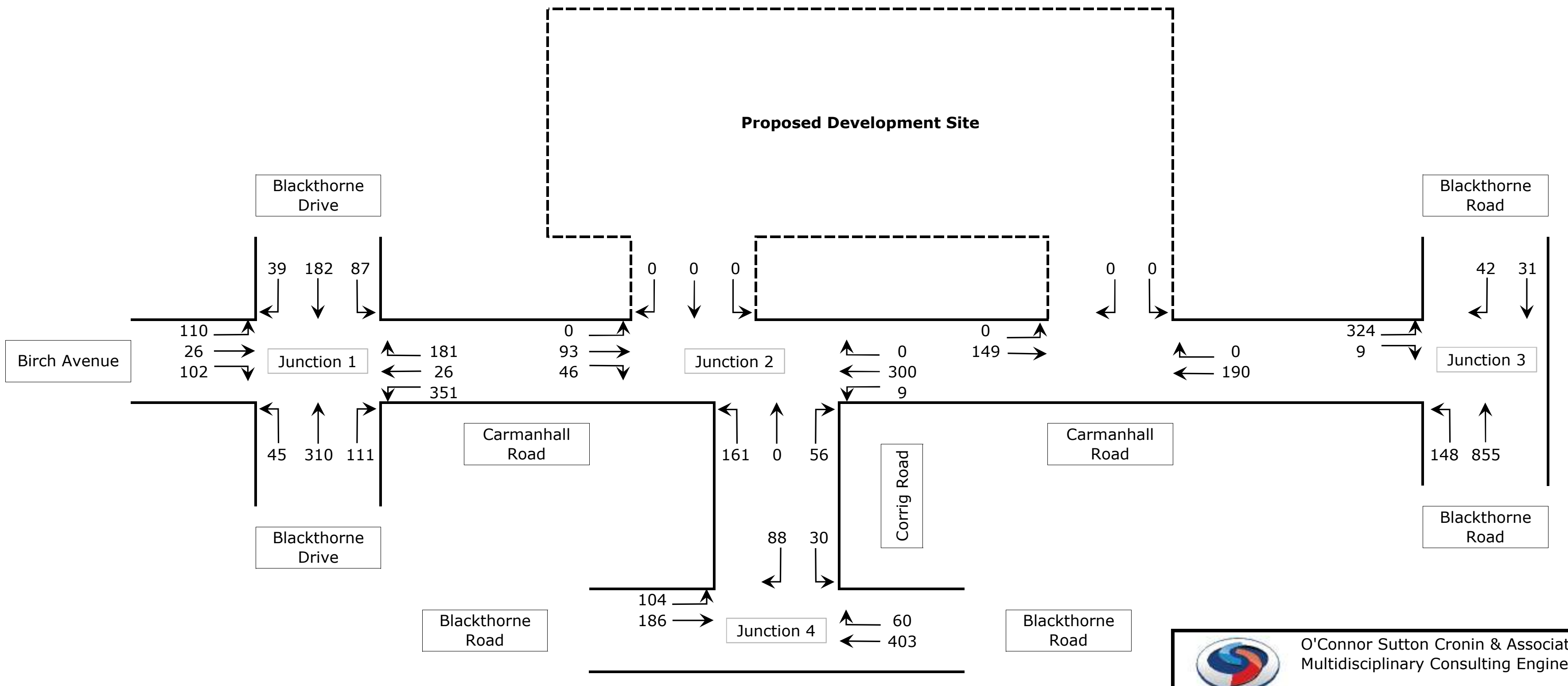
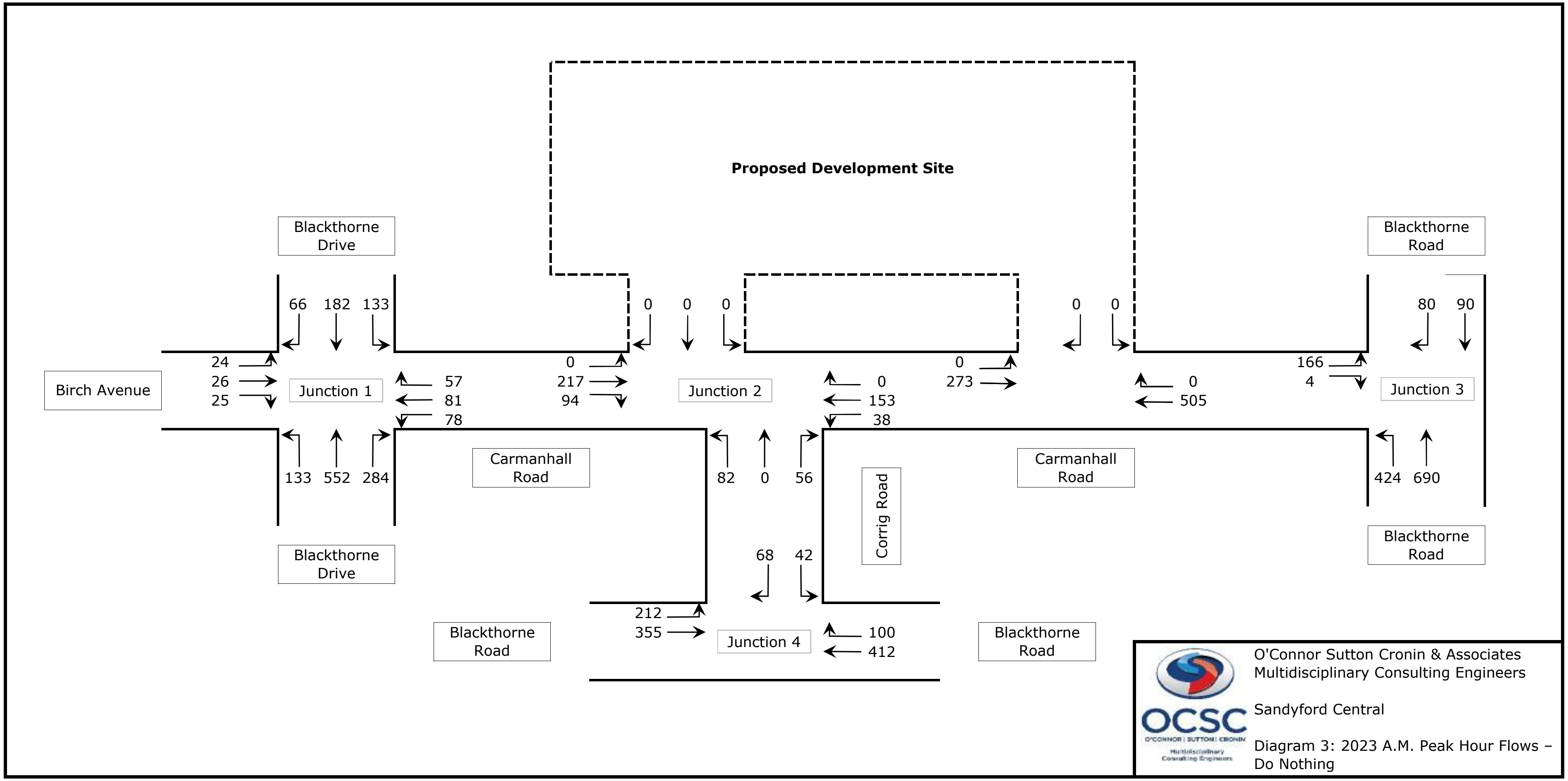
Diagram 1: 2019 A.M. Peak Hour Base Flows (08:00 – 09:00)

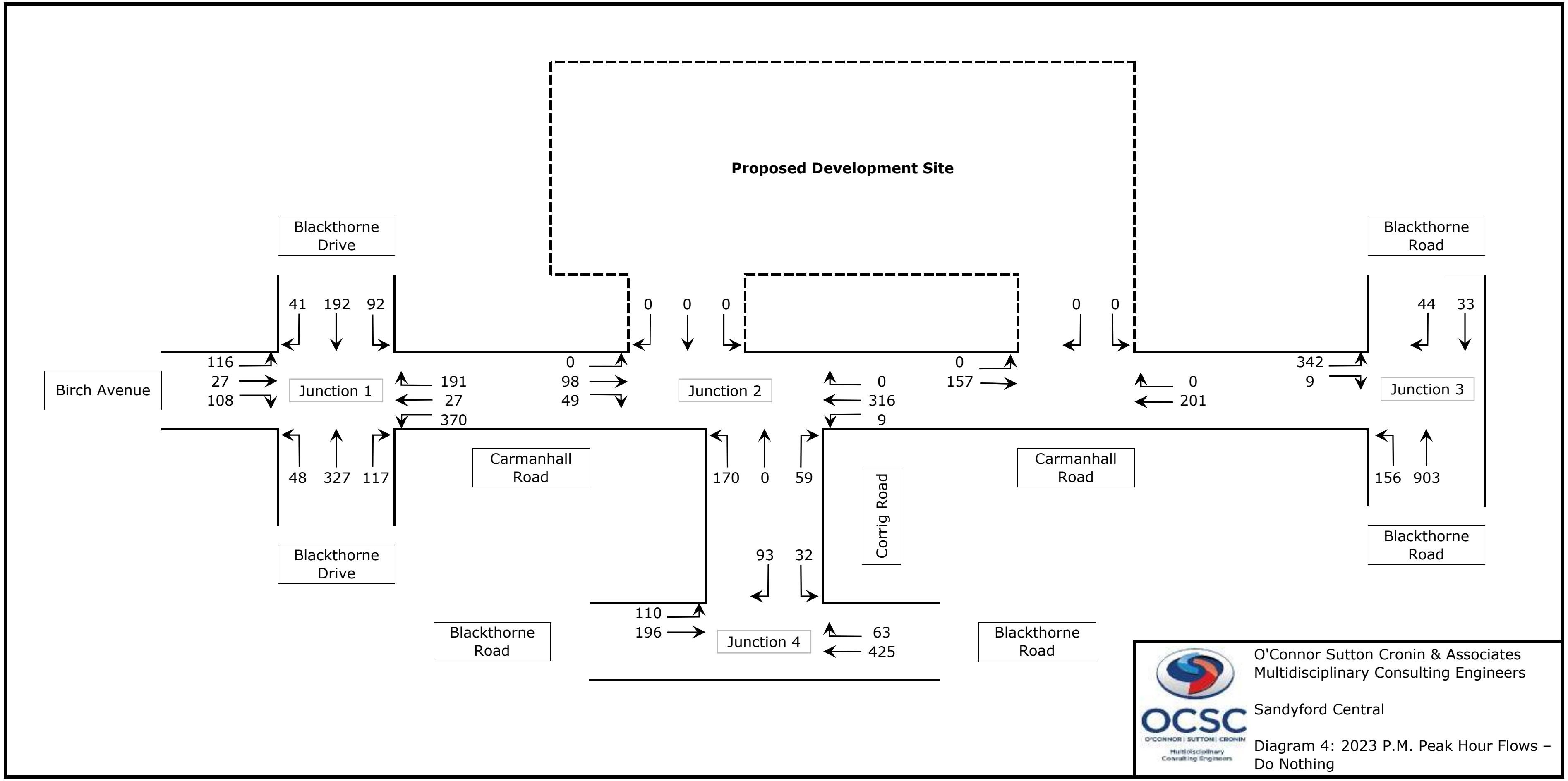


O'Connor Sutton Cronin & Associates
Multidisciplinary Consulting Engineers

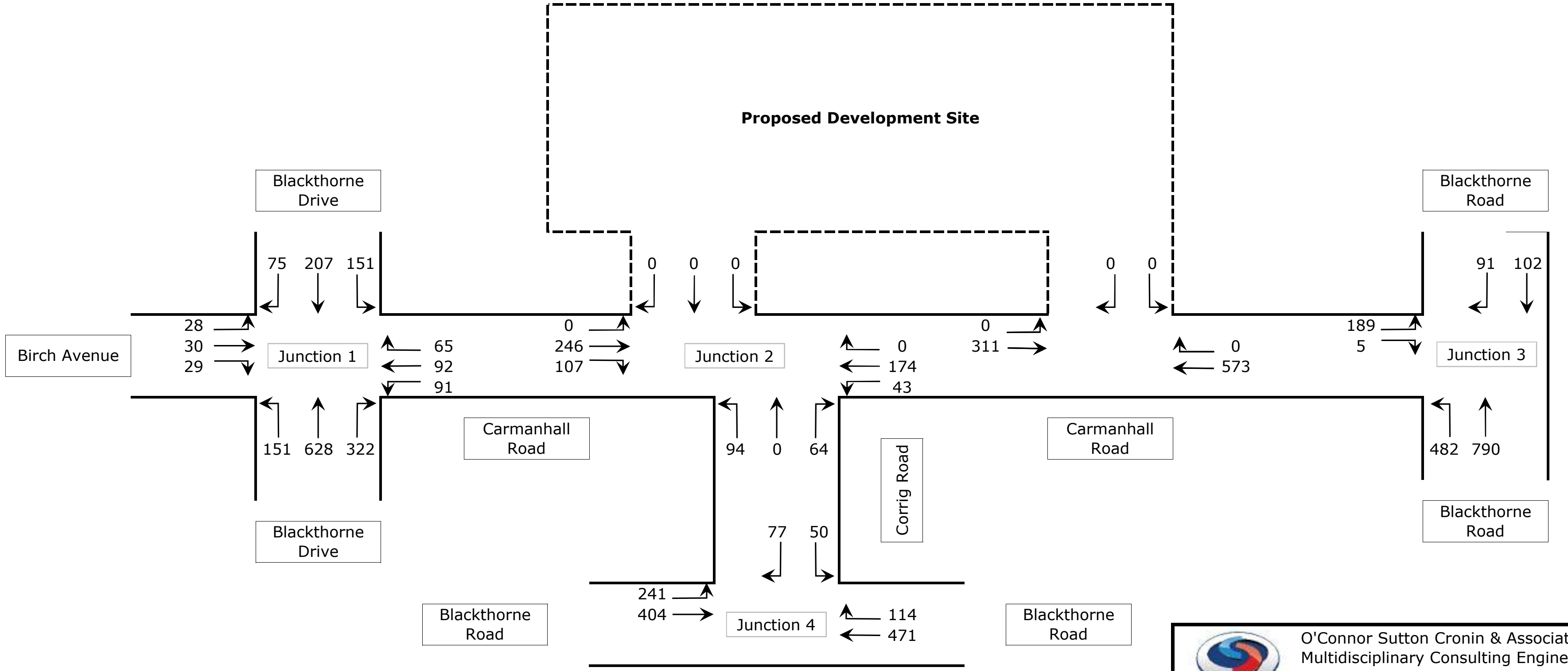
Sandyford Central

Diagram 2: 2019 A.M. Peak Hour Base Flows (16:15 – 17:15)


Proposed Development Site
Blackthorne Drive
Blackthorne Road
Birch Avenue
Junction 1
Junction 2
Junction 3
Junction 4
Carmanhall Road
Carmanhall Road
Corrig Road
Blackthorne Drive
Blackthorne Road
Blackthorne Road
Blackthorne Road
66 182 133
24
26
25
57
81
78
133 552 284
0
217
94
0 0 0
0
153
38
82 0 56
0
273
0 0
0
505
166
4
80 90
424 690
68 42
212
355
100
412
O'Connor Sutton Cronin & Associates
Multidisciplinary Consulting Engineers
OCSC
Sandyford Central
Diagram 3: 2023 A.M. Peak Hour Flows – Do Nothing



Proposed Development Site
Blackthorne Drive
Blackthorne Road
Birch Avenue
Junction 1
Junction 2
Junction 3
Junction 4
Carmanhall Road
Carmanhall Road
Corrig Road
Blackthorne Drive
Blackthorne Road
Blackthorne Road
Blackthorne Road
41 192 92
116 27 108
191 27 370
48 327 117
0 0 0
0 98 49
0 316 9
170 0 59
0 157
0 0
0 201
342 9
44 33
156 903
93 32
110 196
63 425
O'Connor Sutton Cronin & Associates
Multidisciplinary Consulting Engineers
Sandyford Central
Diagram 4: 2023 P.M. Peak Hour Flows – Do Nothing



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Multidisciplinary Consulting Engineers

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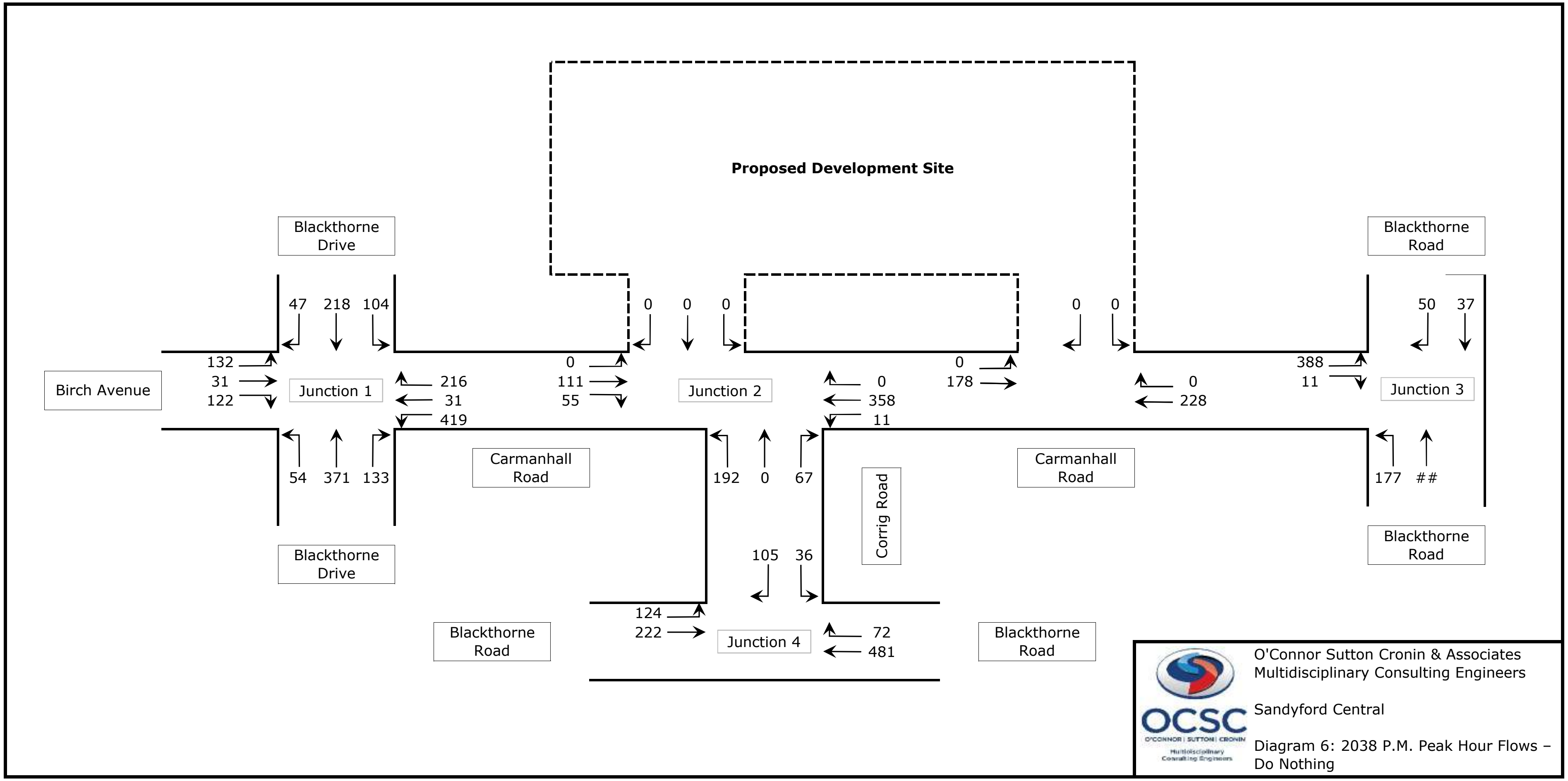
Diagram 5: 2038 A.M. Peak Hour Flows – Do Nothing


Proposed Development Site
Blackthorne Drive
Birch Avenue
Junction 1
47 218 104
132
31
122
216
31
419
54 371 133
Blackthorne Drive
Carmanhall Road
0
111
55
0 0 0
Junction 2
192 0 67
0
358
11
0
178
0 0
0
228
Corrig Road
Carmanhall Road
Blackthorne Road
50 37
388
11
Junction 3
177 ##
Blackthorne Road
105 36
124
222
Junction 4
72
481
Blackthorne Road
Blackthorne Road
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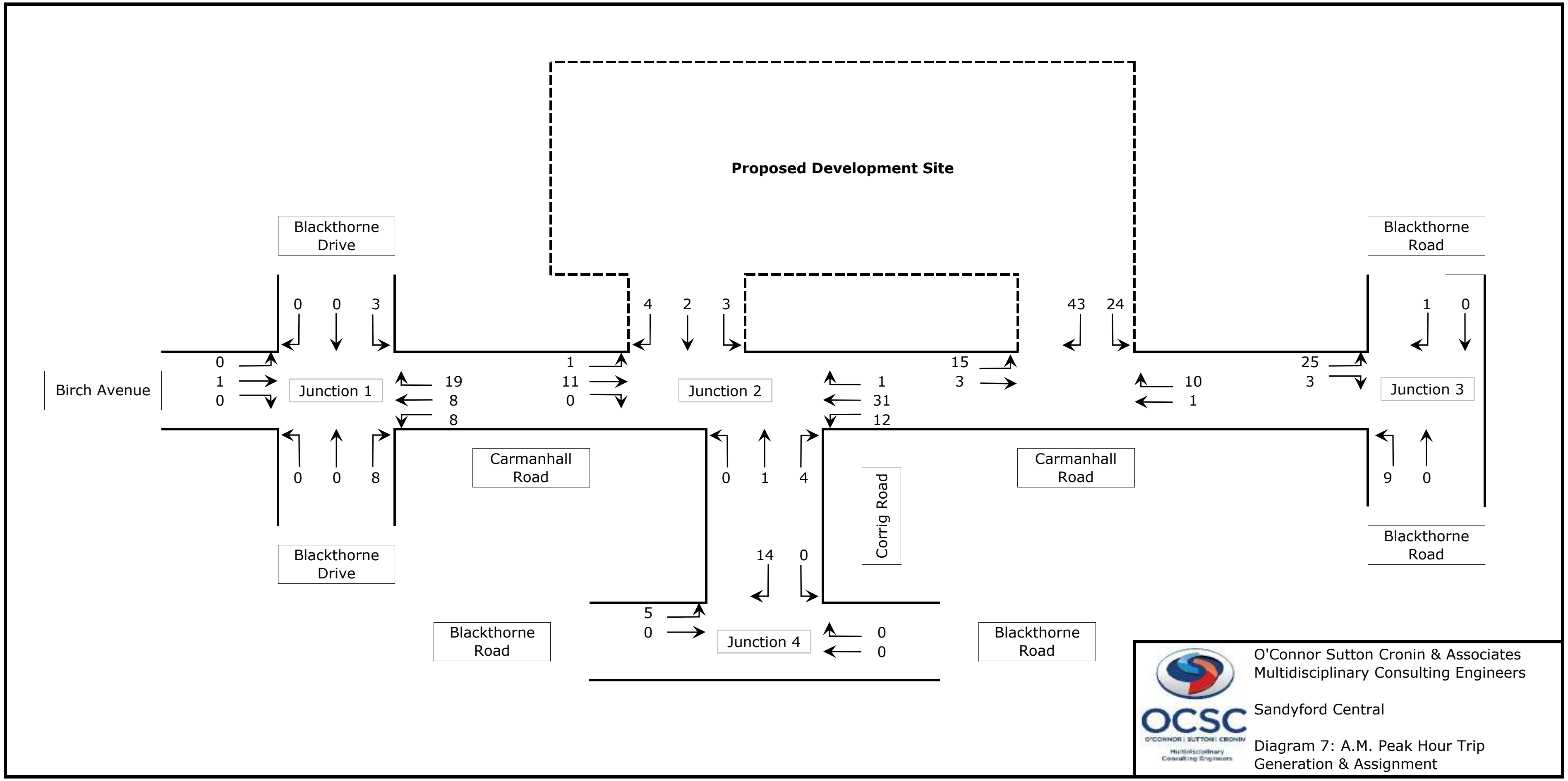
Sandyford Central
Diagram 6: 2038 P.M. Peak Hour Flows – Do Nothing



Proposed Development Site
Blackthorne Drive
Blackthorne Road
Birch Avenue
Junction 1
Junction 2
Junction 3
Junction 4
Carmanhall Road
Carmanhall Road
Corrig Road
Blackthorne Drive
Blackthorne Road
Blackthorne Road
Blackthorne Road
0 0 3
4 2 3
43 24
1 0
0
1
0
19
8
8
1
11
0
1
31
12
15
3
10
1
25
3
0 0 8
0 1 4
9 0
14 0
5
0
0
0
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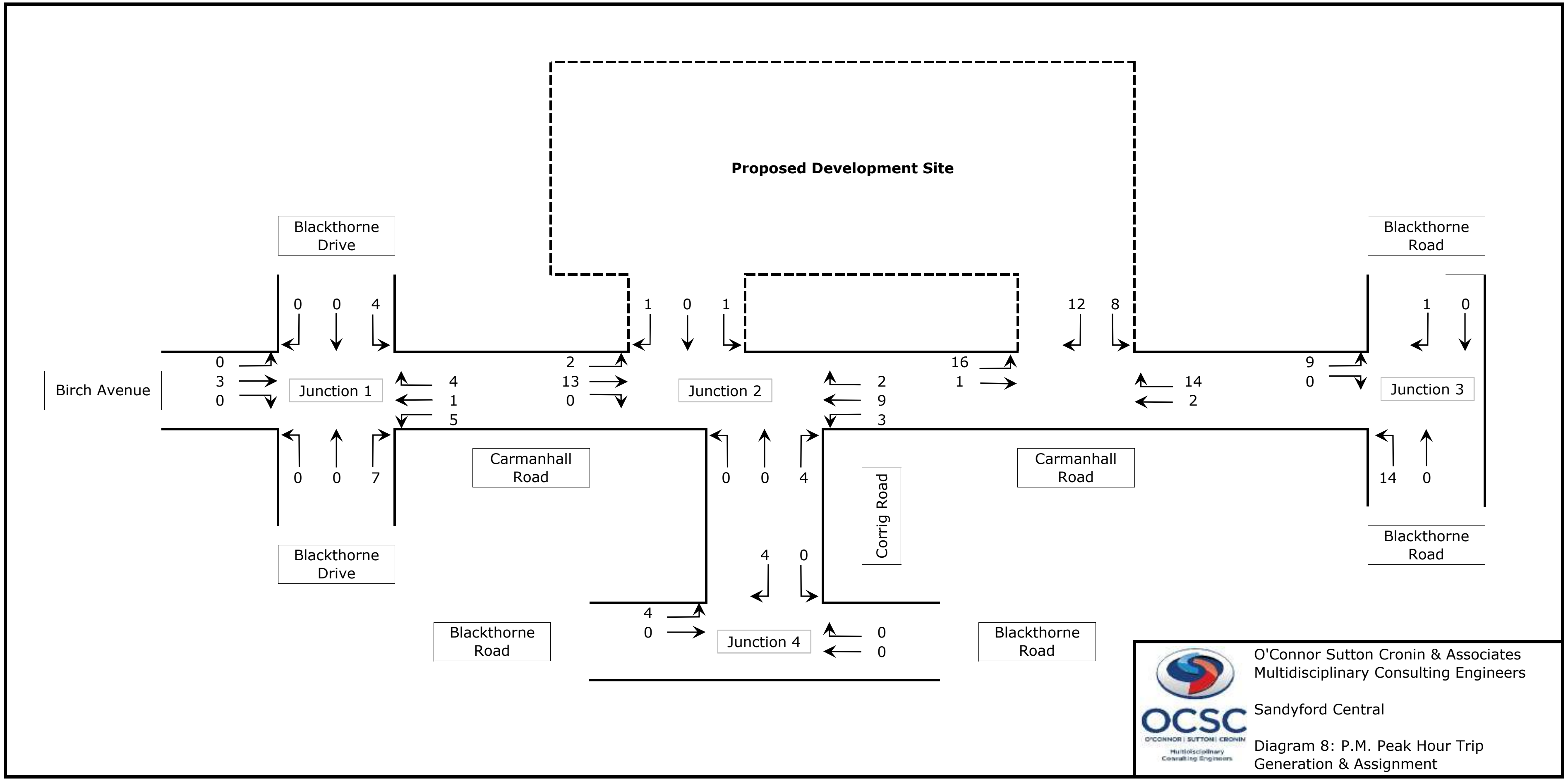
Diagram 7: A.M. Peak Hour Trip Generation & Assignment


Proposed Development Site
Blackthorne Drive
Blackthorne Road
Birch Avenue
Junction 1
Junction 2
Junction 3
Junction 4
Carmanhall Road
Carmanhall Road
Corrig Road
Blackthorne Drive
Blackthorne Road
Blackthorne Road
Blackthorne Road
0 0 4
0 3 0
4 1 5
0 0 7
1 0 1
2 13 0
2 9 3
0 0 4
12 8
16 1
14 2
9 0
1 0
14 0
4 0
4 0
0 0
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Sandyford Central
Diagram 8: P.M. Peak Hour Trip Generation & Assignment

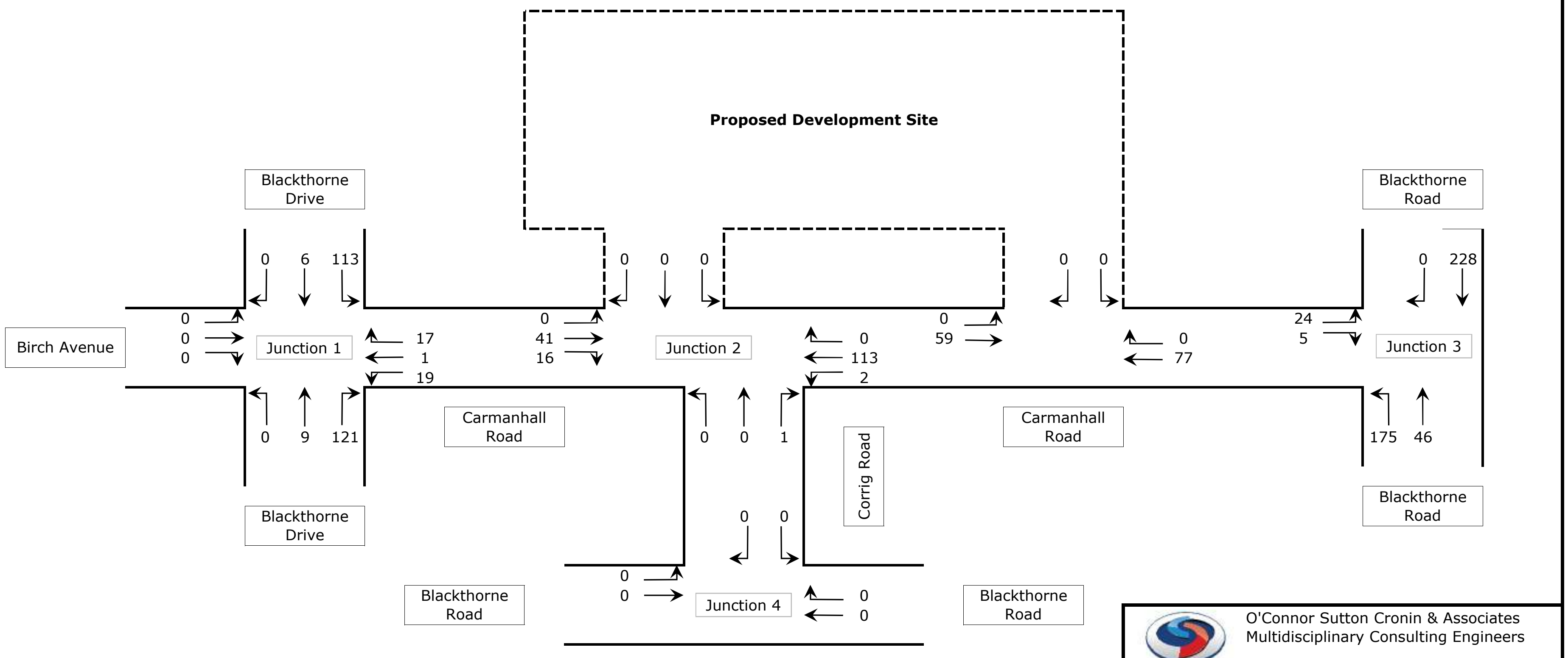

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Diagram 9: 3rd Party Development A.M. Peak Hour Trip Generation & Assignment;

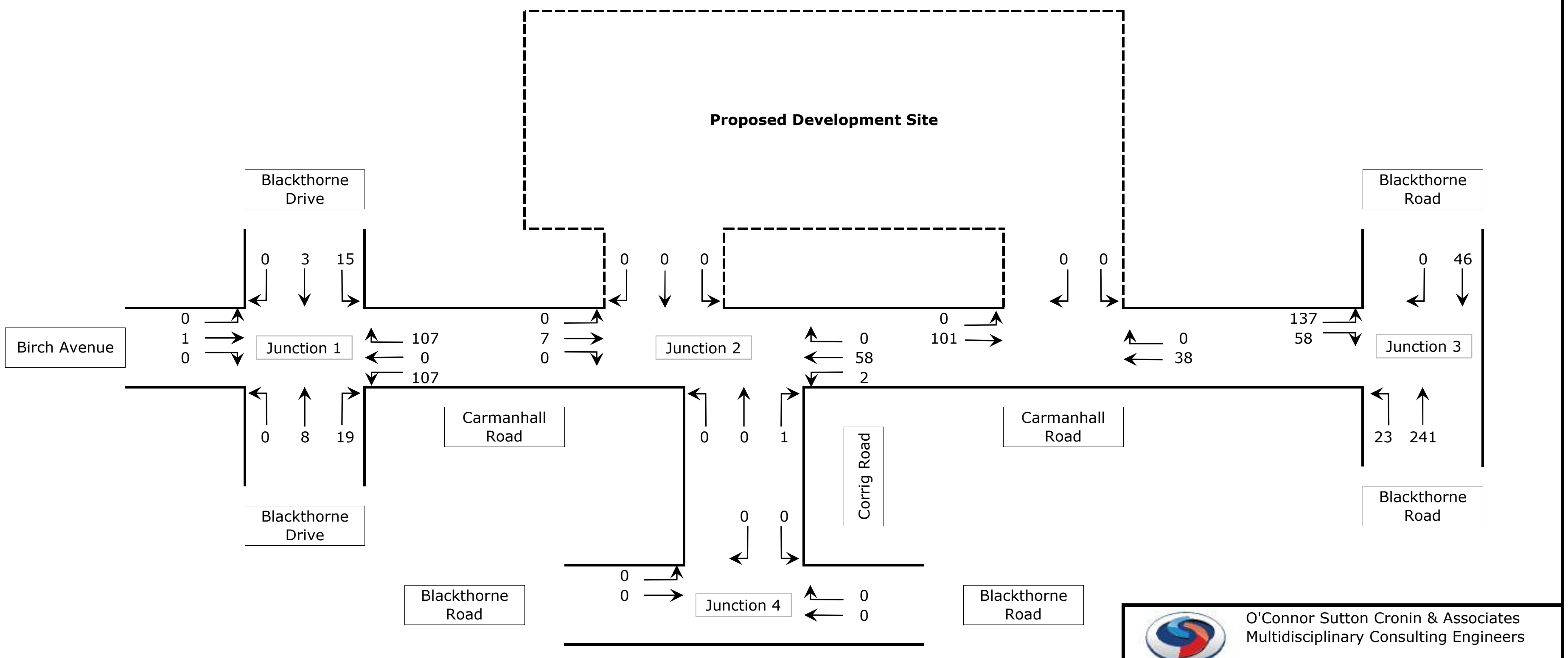

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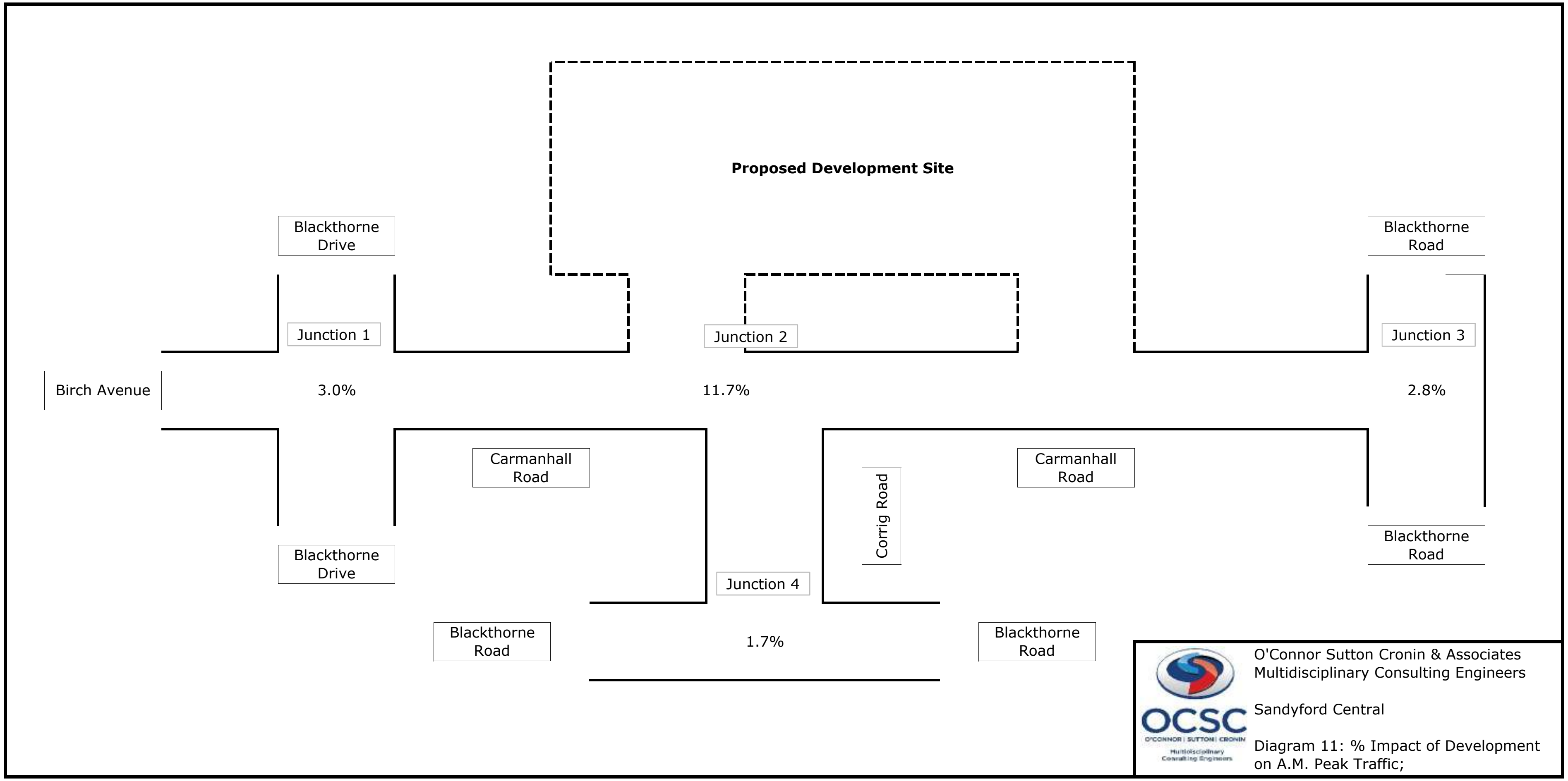
Diagram 10: 3rd Party Development P.M. Peak Hour Trip Generation & Assignment.


Proposed Development Site
Blackthorne Drive
Blackthorne Road
Junction 1
Junction 2
Junction 3
Birch Avenue
3.0%
11.7%
2.8%
Carmanhall Road
Corrig Road
Carmanhall Road
Blackthorne Drive
Blackthorne Road
Junction 4
Blackthorne Road
1.7%
Blackthorne Road
OCSC
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Sandyford Central
Diagram 11: % Impact of Development on A.M. Peak Traffic;

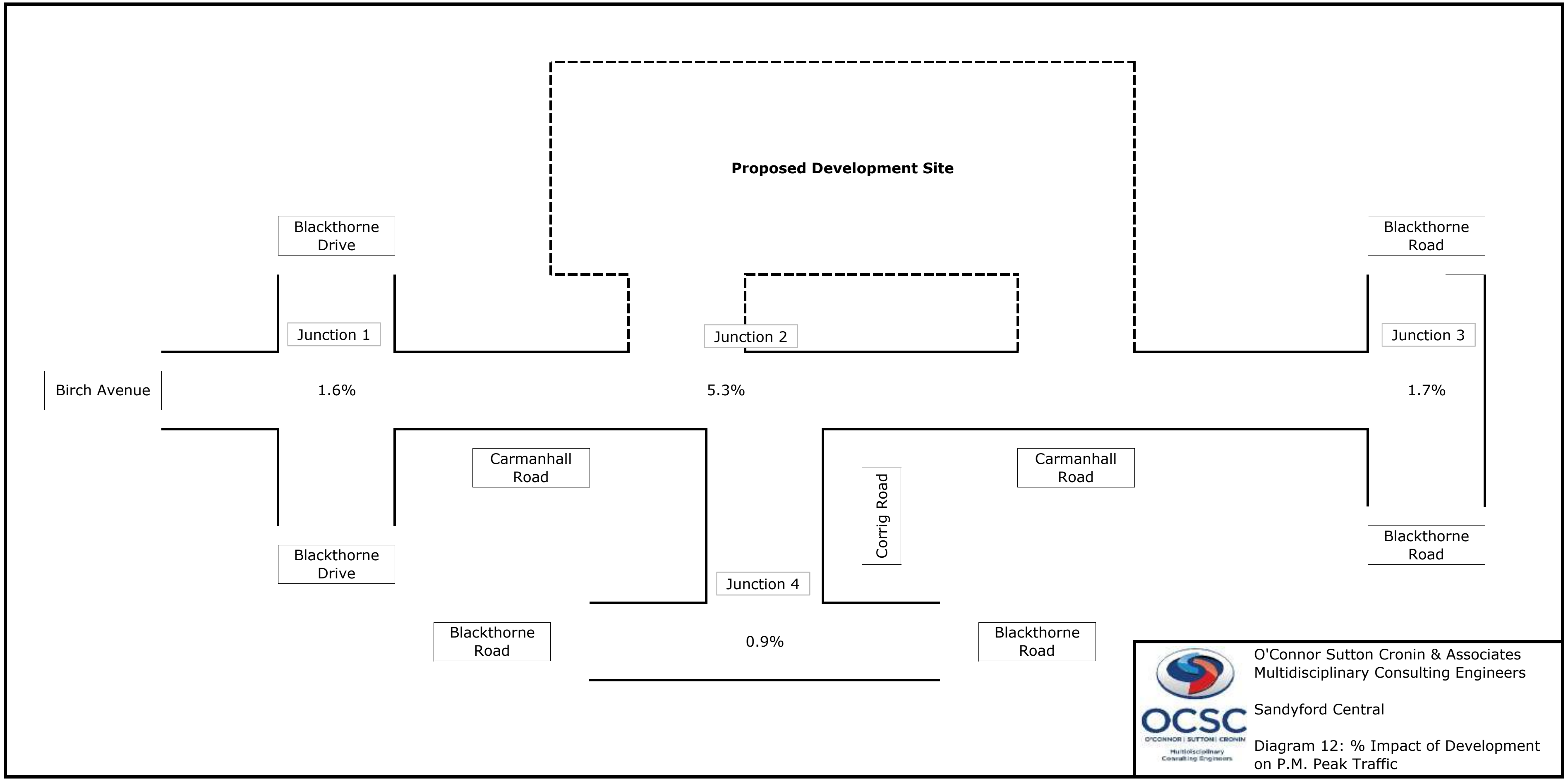
Proposed Development Site
Blackthorne Drive
Blackthorne Road
Junction 1
Junction 2
Junction 3
Birch Avenue
1.6%
5.3%
1.7%
Carmanhall Road
Corrig Road
Carmanhall Road
Blackthorne Drive
Blackthorne Road
Junction 4
Blackthorne Road
0.9%
Blackthorne Road
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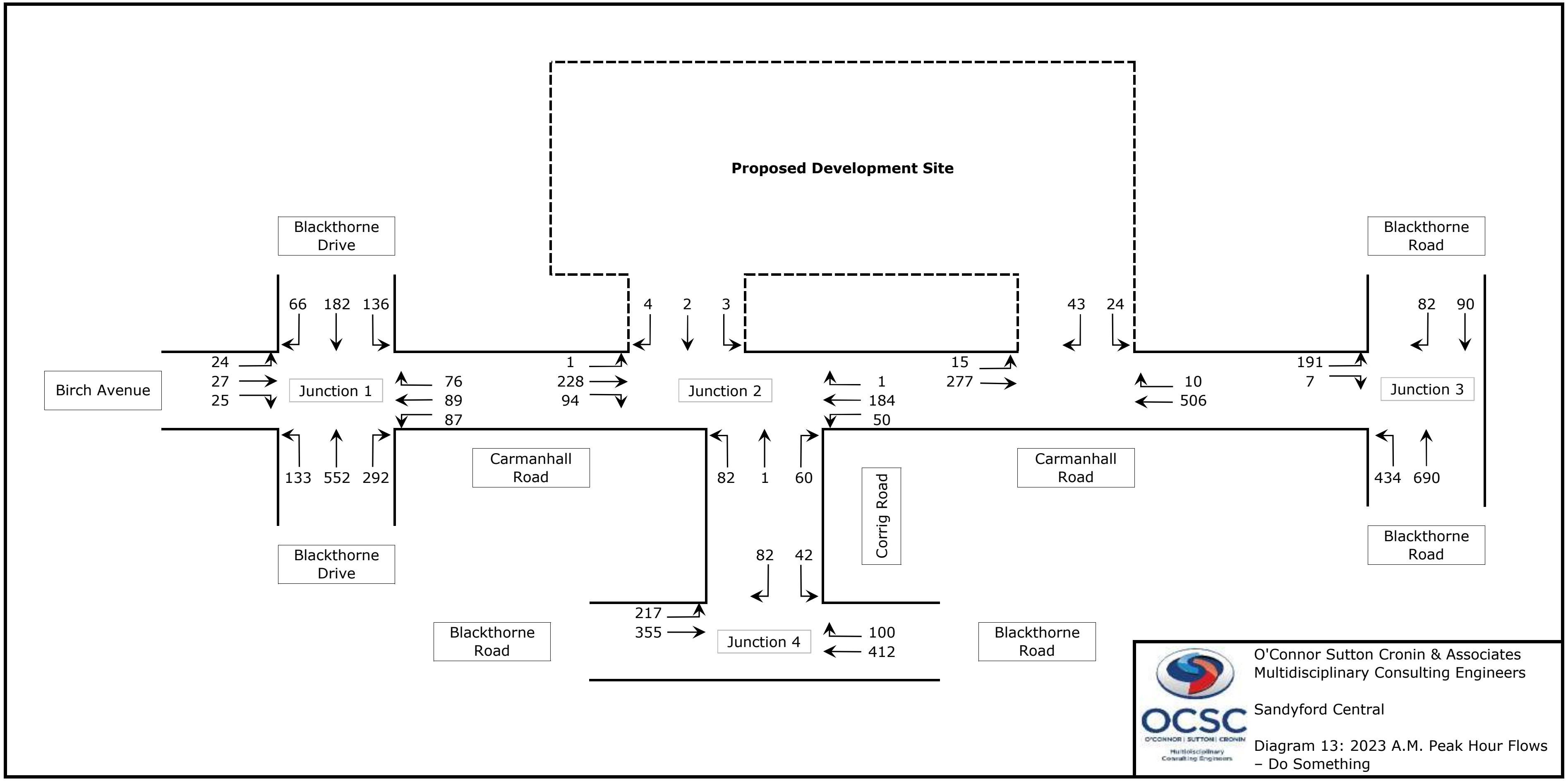
Diagram 12: % Impact of Development on P.M. Peak Traffic



Proposed Development Site
Blackthorne Drive
Blackthorne Road
Birch Avenue
Junction 1
Junction 2
Junction 3
Junction 4
Carmanhall Road
Carmanhall Road
Corrig Road
Blackthorne Drive
Blackthorne Road
Blackthorne Road
Blackthorne Road
66 182 136
24 27 25
76 89 87
133 552 292
1 228 94
4 2 3
1 184 50
82 1 60
15 277
43 24
10 506
191 7
82 90
434 690
82 42
217 355
100 412
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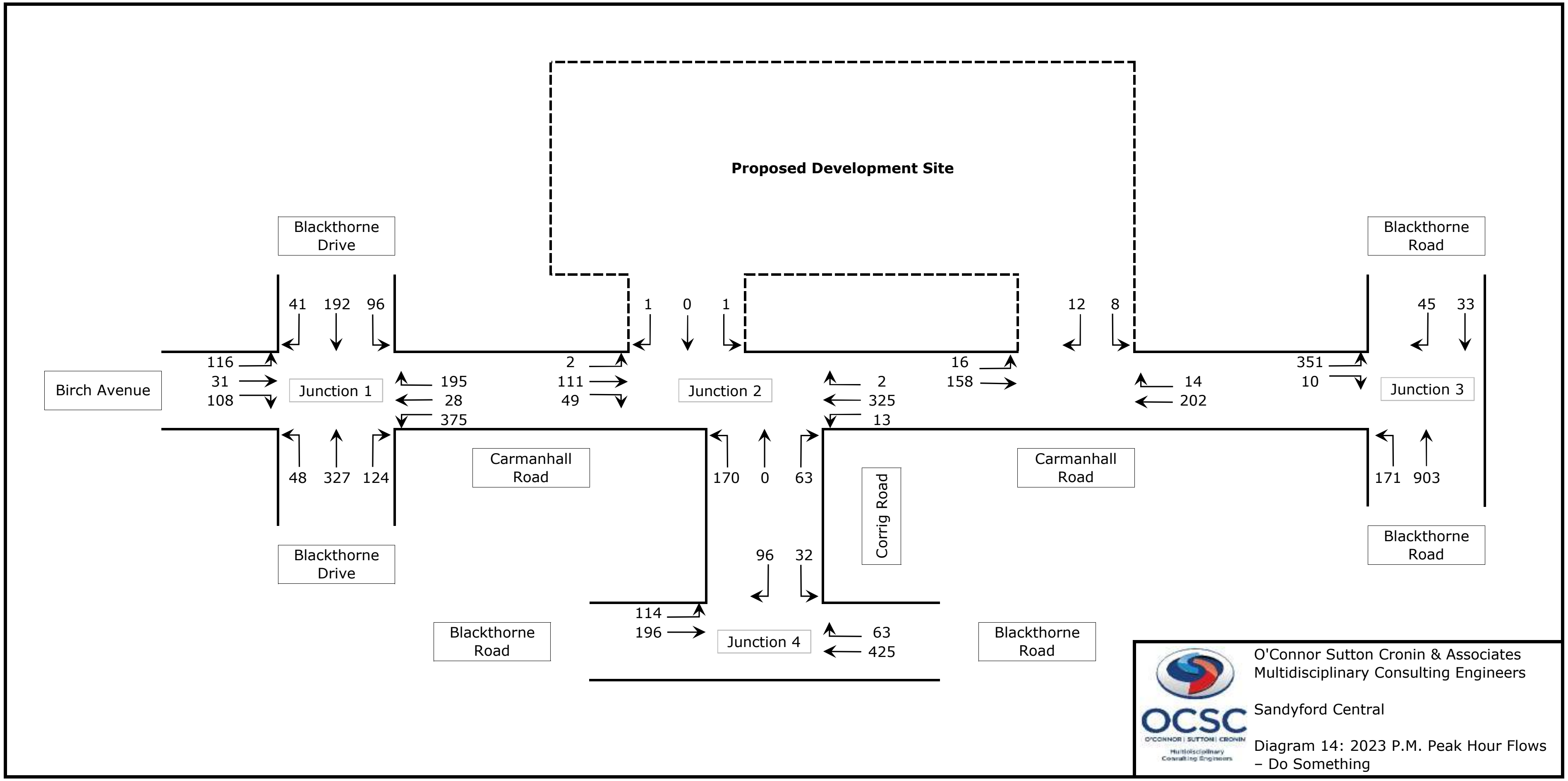
Diagram 13: 2023 A.M. Peak Hour Flows – Do Something


Proposed Development Site
Blackthorne Drive
Birch Avenue
Junction 1
116
31
108
41
192
96
195
28
375
48
327
124
Blackthorne Drive
2
111
49
1
0
1
Junction 2
2
325
13
170
0
63
Carmanhall Road
Corrig Road
16
158
12
8
14
202
Carmanhall Road
Blackthorne Road
45
33
351
10
Junction 3
171
903
Blackthorne Road
96
32
114
196
Junction 4
63
425
Blackthorne Road
Blackthorne Road
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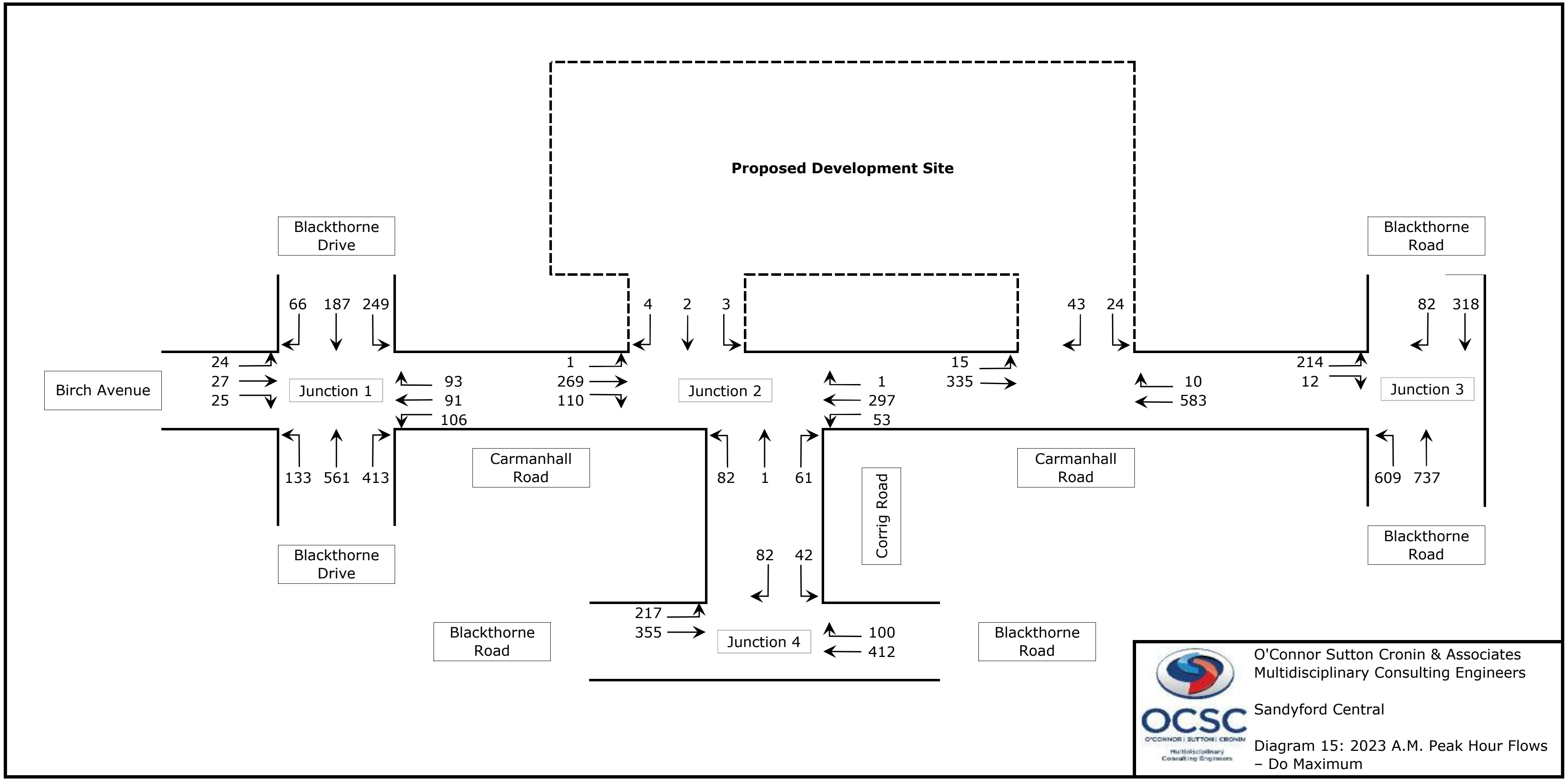
Sandyford Central
Diagram 14: 2023 P.M. Peak Hour Flows – Do Something



Proposed Development Site
Blackthorne Drive
Birch Avenue
Junction 1
66 187 249
24
27
25
93
91
106
133 561 413
Blackthorne Drive
Carmanhall Road
1
269
110
4 2 3
Junction 2
1
297
53
82 1 61
Corrig Road
15
335
43 24
10
583
Carmanhall Road
Blackthorne Road
82 318
214
12
Junction 3
609 737
Blackthorne Road
82 42
217
355
Junction 4
100
412
Blackthorne Road
Blackthorne Road
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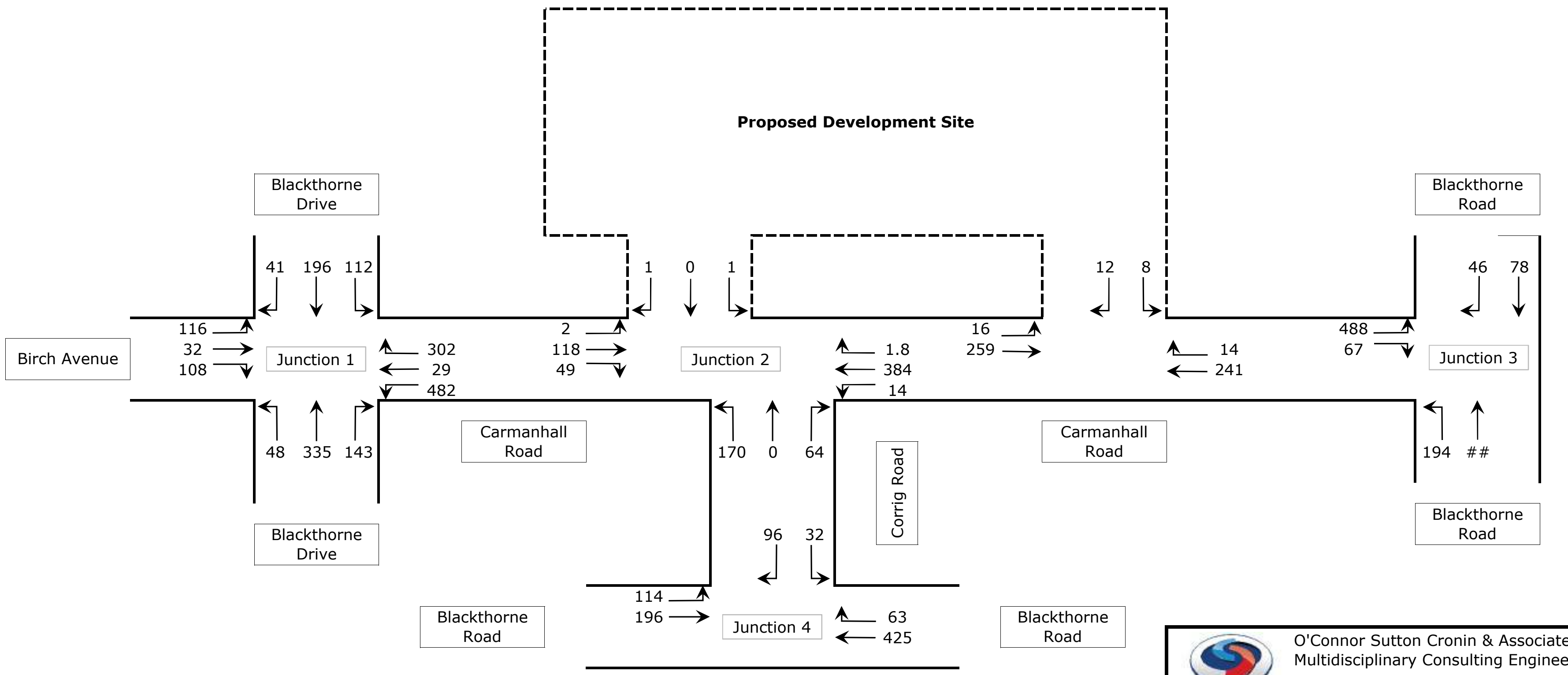
Multidisciplinary Consulting Engineers
Sandyford Central
Diagram 15: 2023 A.M. Peak Hour Flows – Do Maximum
OCSC



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Sandyford Central

Diagram 16: 2023 P.M. Peak Hour Flows – Do Maximum

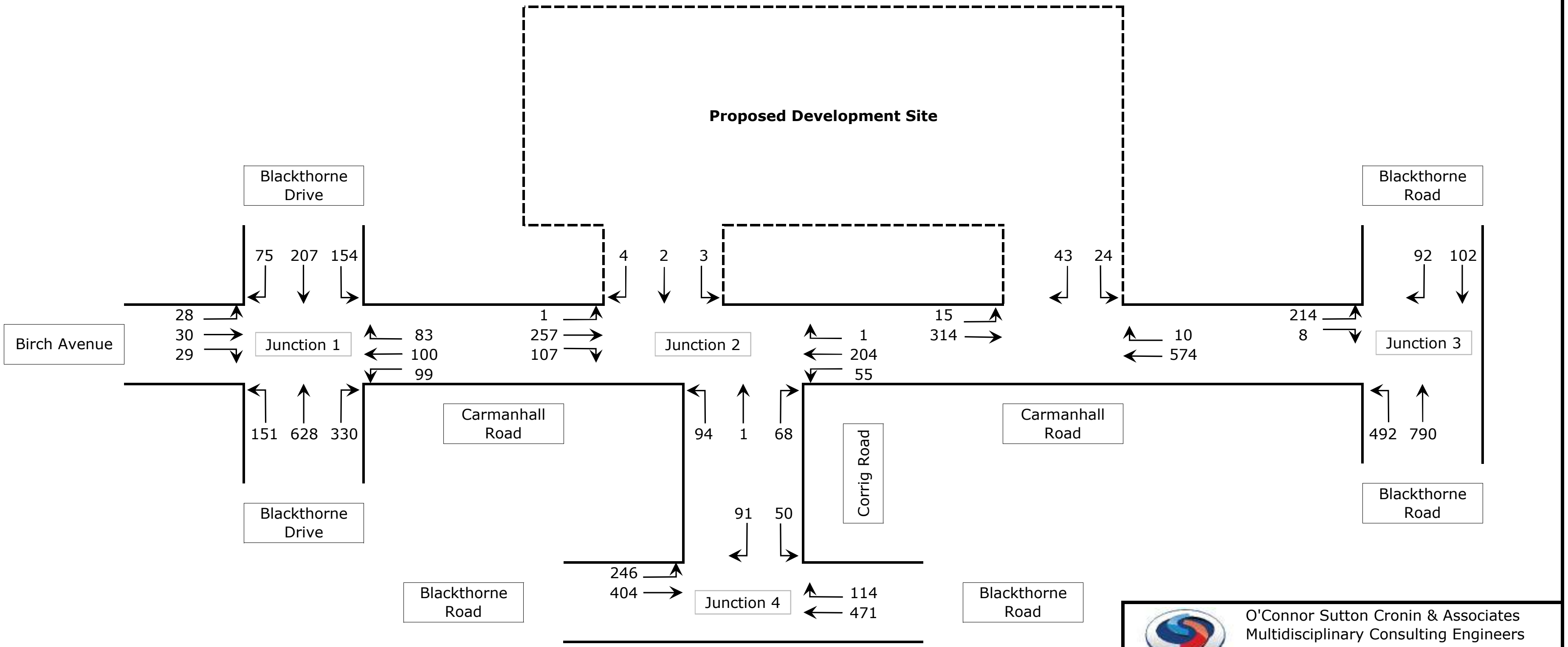

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Diagram 17: 2038 A.M. Peak Hour Flows – Do Something

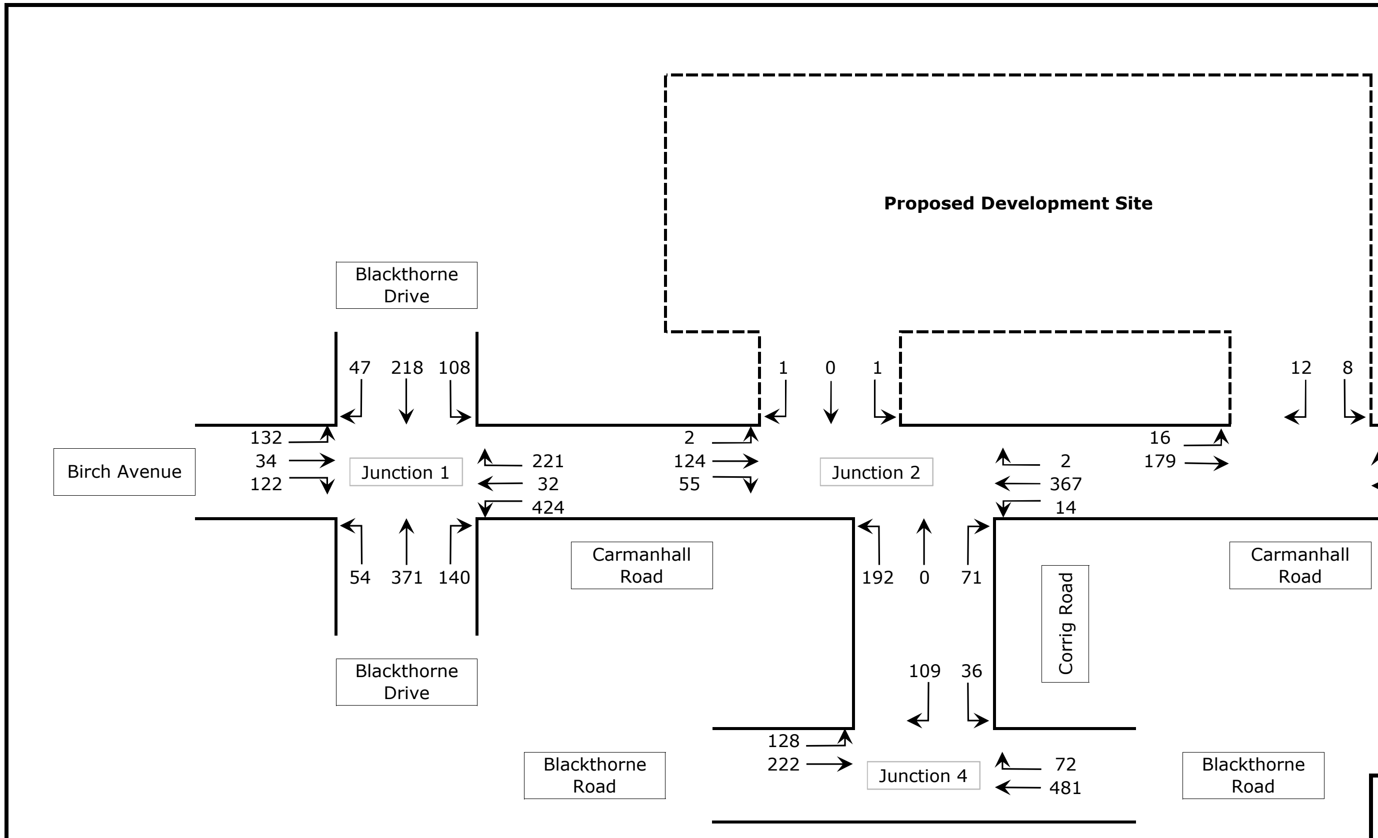

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Diagram 18: 2038 P.M. Peak Hour Flows – Do Something

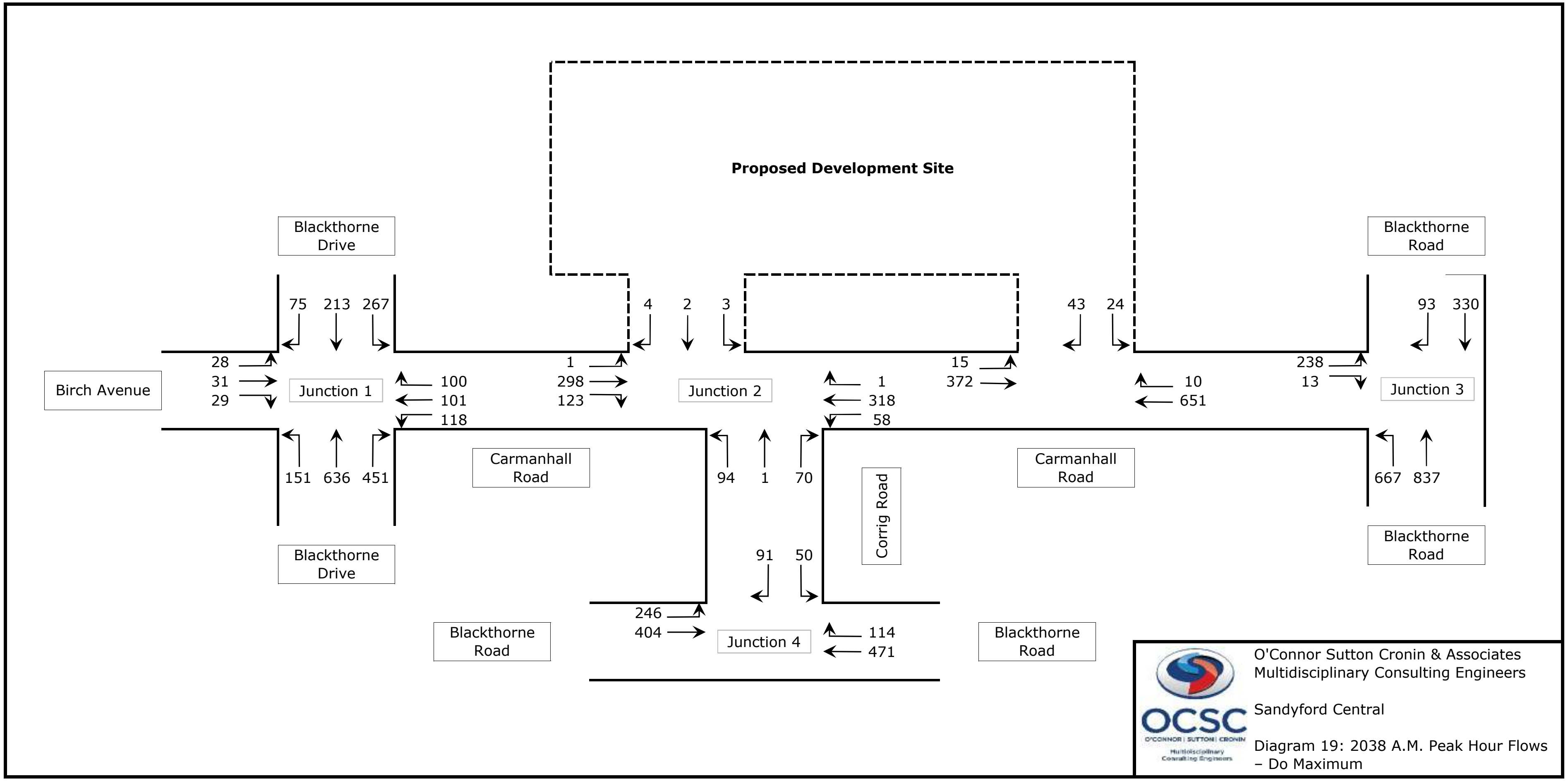

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Diagram 19: 2038 A.M. Peak Hour Flows – Do Maximum

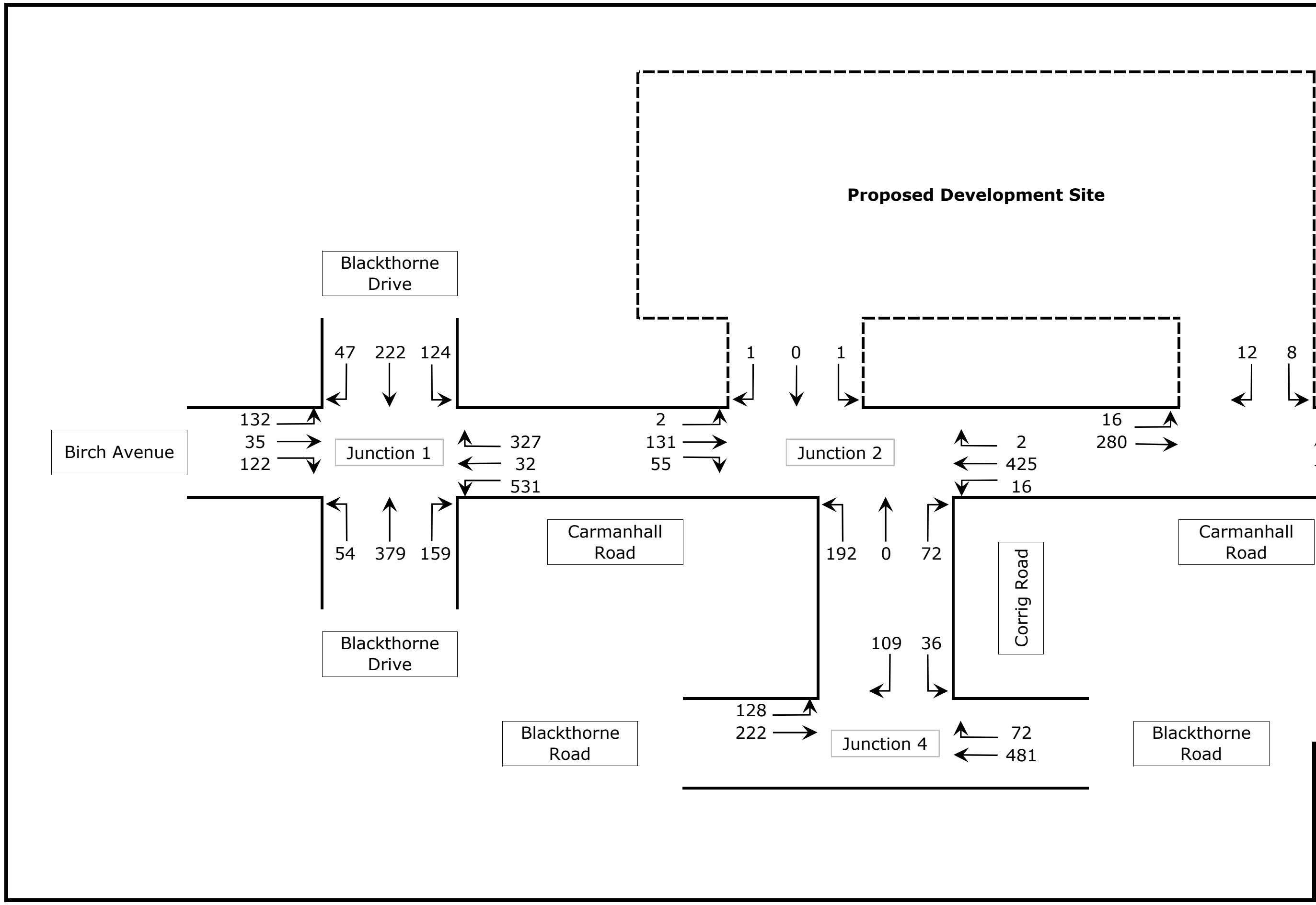

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Diagram 20: 2038 P.M. Peak Hour Flows – Do Maximum

Appendix 14.3

Calibration Output File

Site 1		
A.M. Peak Hour Model Calibration Summary		
	Average Queue	Modelled Queue
Blackthorn Drive N	6.1	3.4
	2.9	1.5
	2.8	1.5
Birch Avenue	2.8	1.8
	-	
Blackthorn Drive S	5.3	3.3
	10.3	8.1
	6.8	3.7
Carmanhall Road	0.3	0.1
	4.1	3.1

Site 1		
P.M. Peak Hour Model Calibration Summary		
	Average Queue	Modelled Queue
Blackthorn Drive N	5.3	2.7
	3.8	1.5
	1.7	1.5
Birch Avenue	7.3	6.5
	-	
Blackthorn Drive S	3.5	1.5
	5.3	3.5
	3.3	1.5
Carmanhall Road	2.4	1.5
	9.0	5.3

Site 2		
A.M. Peak Hour Model Calibration Summary		
	Average Queue	Modelled Queue
Carmanhall Road W	1.0	0.4
Corrig Road	0.6	0.2
	1.6	0.2
Carmanhall Road E	0.0	0.0

Site 2		
P.M. Peak Hour Model Calibration Summary		
	Average Queue	Modelled Queue
Carmanhall Road W	0.9	0.2
Corrig Road	3.1	0.4
	1.4	0.2
Carmanhall Road E	1.7	0.0

Site 3		
A.M. Peak Hour Model Calibration Summary		
	Average Queue	Modelled Queue
Blackthorn Road N	3.9	0.5
Carmanhall Road	3.7	0.6
Blackthorn Road S	0.0	0.0

Site 3		
A.M. Peak Hour Model Calibration Summary		
	Average Queue	Modelled Queue
Blackthorn Road N	1.2	0.1
Carmanhall Road	10.1	3.6
Blackthorn Road S	0.3	0.0

Site 4		
A.M. Peak Hour Model Calibration Summary		
	Average Queue	Modelled Queue
Blackthorn Road W	4.2	0.0
	1.9	0.0
Corrig Road	1.1	0.1
	1.8	0.2
Blackthorn Road E	0.1	0.0
	1.2	0.8

Site 4		
A.M. Peak Hour Model Calibration Summary		
	Average Queue	Modelled Queue
Blackthorn Road W	2.7	0.0
	0.8	0.0
Corrig Road	0.5	0.1
	1.7	0.3
Blackthorn Road E	0.1	0.0
	0.8	0.4

Appendix 14.4

Model Output Files

TRANSYT 15

Version: 15.5.2.7994

For sales and distribution information, program advice and maintenance, contact TRL:
+44 (0)1344 379777 software@trl.co.uk www.trlsoftware.co.uk

Filename: Junction 1 2023 DM.t15
Path: C:\Users\shane.mcgivney\Desktop
Report generation date: 08/07/2019 13:48:53

File summary

File description

File title	2023 DM
Location	
Site number	
UTCRegion	
Driving side	Left
Date	11/06/2019
Version	
Status	(new file)
Identifier	
Client	
Jobnumber	
Enumerator	OCSC\shane.mcgivney
Description	

Model and Results

Enable controller offsets	Enable fuel consumption	Enable quick flares	Display journey time results	Display level of service results	Display blocking and starvation results	Display end of red and green queue results	Display excess queue results	Display separate uniform and random results	Display unweighted results	Display TRANSYT 12 style timings	Display effective greens in results	Display Red-With-Amber	Display End-Of-Green Amber

Units

Cost units	Speed units	Distance units	Fuel economy units	Fuel rate units	Mass units	Traffic units input	Traffic units results	Flow units	Average delay units	Total delay units	Rate of delay units
£	kph	m	mpg	l/h	kg	PCU	PCU	perHour	s	-Hour	perHour

Sorting

Show names instead of IDs	Sorting direction	Sorting type	Ignore prefixes when sorting	Analysis/demand set sorting	Link grouping	Source grouping	Colour Analysis/Demand Sets
	Ascending	Numerical		ID	Normal	Normal	✓

Network Diagrams

A1 - AM PEAK
D1 - AM PEAK*

Summary

Data Errors and Warnings

No errors or warnings

Run Summary

Analysis set used	Run start time	Run finish time	Modelling start time (HH:mm)	Network Cycle Time (s)	Performance Index (£ per hr)	Total network delay (PCU-hr/hr)	Highest DOS (%)	Item with highest DOS	Number of oversaturated items	Percentage of oversaturated items (%)	Item with worst signalised PRC	Item with worst unsignalised PRC	Ite wit wor over PR
1	08/07/2019 13:48:48	08/07/2019 13:48:49	08:00	100	159.99	10.13	46.78	10/1	0	0	10/1	4/1	10/

Analysis Set Details

Name	Description	Demand set	Include in report	Locked
AM PEAK		D1	✓	

Demand Set Details

Name	Description	Composite	Demand sets	Start time (HH:mm)	Locked
AM PEAK				08:00	

Network Options

Network timings

Network cycle time (s)	Restrict to SCOOT cycle times	Time segment length (min)	Number of time segments	Modelled time period (min)
100		60	1	60

Signals options

Start displacement (s)	End displacement (s)
2	3

Advanced

Phase minimum broken penalty (£)	Phase maximum broken penalty (£)	Intergreen broken penalty (£)	Starting Red-with-Amber (s)
10000.00	10000.00	10000.00	2

Traffic options

Traffic model	Vehicle flow scaling factor (%)	Pedestrian flow scaling factor (%)	Cruise times or speeds
Platoon Dispersion (PDM)	100	100	Cruise Speeds

Advanced

Resolution	DOS Threshold (%)	Cruise scaling factor (%)	Use link stop weightings	Use link delay weightings	Exclude pedestrians from results calculation	Random delay mode	Type of Vehicle-in-Service	Type of random parameter	PCU Length (m)	Calculate results for Path Segments	Generate PDM Profile Data
1	90	100	✓	✓		Complex	Uniform (TRANSYT)	Uniform (TRANSYT)	5.75		✓

Normal Traffic parameters

Dispersion type	Dispersion coefficient	Travel time coefficient
Default	35	80

Normal Traffic Types

Name	PCU Factor
Normal	1.00

Bus parameters

Name	PCU Factor	Dispersion type	Acceleration (ms^[-2])	Stationary time coefficient	Cruise time coefficient
Bus	1.00	Default	0.94	30	85

Tram parameters

Name	PCU Factor	Dispersion type	Acceleration (ms^[-2])	Stationary time coefficient	Cruise time coefficient
Tram	1.00	Default	0.94	100	100

Pedestrian parameters

Dispersion type
Default

Optimisation options

Enable optimisation	Auto redistribute	Optimisation level	Enable OUT Profile accuracy
	✓		✓

Advanced

Optimisation type	Hill climb increments	OUTProfile accuracy	Use enhanced optimisation	Auto optimisation order	Optimisation order	Master controller	Offsets relative to master controller	Master controller offset after each run
				✓				Do nothing

Economics

Vehicle Monetary Value Of Delay (£ per PCU-hr)	Vehicle Monetary Value Of Stops (£ per 100 stops)	Pedestrian monetary value of delay (£ per Ped-hr)
14.20	2.60	14.20

Arms and Traffic Streams

Arms

Arm	Name	Description	Traffic node
1			1
2			1
3			1
4			2
5			
6			
7			1
8			3
9			1
10			1
11			
12			1
13			1
14			1
15			4
16			
17			
18			1
19			
20			1

Traffic Streams

Arm	Traffic Stream	Name	Description	Auto length	Length (m)	Has Saturation Flow	Saturation flow source	Saturation flow (PCU/hr)	Auto-calculate cell saturation flow	Cell saturation flow (PCU/hr)	Is signal controlled	Is give way	Traffic type	Allow Nearside Turn On Red
1	1				100.00	✓	Sum of lanes	1791	✓	1800	✓		Normal	
2	1				40.00	✓	Sum of lanes	2080	✓	1800	✓		Normal	
3	1				40.00	✓	Sum of lanes	2080	✓	1800	✓		Normal	
4	1				50.00	✓	Sum of lanes	2080					Normal	
5	1			✓	115.49								Normal	
6	1			✓	115.59								Normal	
7	1				14.00	✓	Sum of lanes	1664	✓	1800		✓	Normal	
8	1				30.00	✓	Sum of lanes	1914					Normal	
9	1				35.00	✓	Sum of lanes	1554	✓	1800		✓	Normal	
10	1				35.00	✓	Sum of lanes	1873	✓	1800	✓		Normal	
11	1			✓	83.84								Normal	
12	1				100.00	✓	Sum of lanes	1786	✓	1800	✓		Normal	
13	1				35.00	✓	Sum of lanes	2080	✓	1800	✓		Normal	
14	1				35.00	✓	Sum of lanes	2027	✓	1800	✓		Normal	
15	1				50.00	✓	Sum of lanes	2080					Normal	
16	1			✓	118.42								Normal	
17	1			✓	121.12								Normal	
18	1				100.00	✓	Sum of lanes	1828			✓		Normal	
19	1				100.00								Normal	
20	1				14.00	✓	Sum of lanes	1664	✓	1800		✓	Normal	

Lanes

Arm	Traffic Stream	Lane	Name	Description	Use RR67	Surface condition	Site quality factor	Gradient (%)	Width (m)	Use connector turning radius	Proportion that turn (%)	Turning radius (m)	Nearside lane	Saturation flow (PCU/hr)
1	1	1	(untitled)		✓	N/A	N/A	0	3.25	✓	54	9.71	✓	1791
2	1	1	(untitled)		✓	N/A	N/A	0	3.25	✓	0	99999.00		2080
3	1	1	(untitled)		✓	N/A	N/A	0	3.25	✓	0	99999.00		2080
4	1	1	(untitled)		✓	N/A	N/A	0	3.25	✓	0	99999.00		2080
5	1	1	(untitled)											
6	1	1	(untitled)											
7	1	1	(untitled)		✓	N/A	N/A	0	3.25	✓	100	6.00		1664
8	1	1	(untitled)		✓	N/A	N/A	0	3.25	✓	61	66.82	✓	1914
9	1	1	(untitled)		✓	N/A	N/A	0	3.25	✓	100	6.05	✓	1554
10	1	1	(untitled)		✓	N/A	N/A	0	3.25	✓	51	21.54	✓	1873
11	1	1	(untitled)											
12	1	1	(untitled)		✓	N/A	N/A	0	3.25	✓	72	12.57	✓	1786
13	1	1	(untitled)		✓	N/A	N/A	0	3.25		0	100.00		2080
14	1	1	(untitled)		✓	N/A	N/A	0	3.25	✓	100	56.93		2027
15	1	1	(untitled)		✓	N/A	N/A	0	3.25	✓	0	99999.00		2080
16	1	1	(untitled)											
17	1	1	(untitled)											
18	1	1	(untitled)		✓	N/A	N/A	0	3.25	✓	67	16.38	✓	1828
19	1	1	(untitled)											
20	1	1	(untitled)		✓	N/A	N/A	0	3.25	✓	100	6.00		1664

Signals

Arm	Traffic Stream	Controller stream	Phase	Second phase enabled
1	1	1	A	
2	1	1	A	
3	1	1	A	
10	1	1	C	
12	1	1	B	
13	1	1	B	
14	1	1	B	
18	1	1	C	

Give Way Data

Arm	Traffic Stream	Opposed traffic	Use Step-wise Opposed Turn Model	Number of storage spaces	Use connector turning radius	Radius of turn (m)	Visibility restricted
7	1	Movement	✓	0	✓	6.00	
9	1	Movement	✓	0	✓	99999.00	
20	1	Movement	✓	0	✓	6.00	

Give Way Data - Movements

Arm	Traffic Stream	Movement	Destination traffic stream	Max Flow (Unopposed) (PCU/hr)	Percentage opposed (%)
7	1	1	11/1	1664	100
9	1	1	5/1	1554	100
		2	6/1	1554	100
20	1	1	19/1	1664	100

Give Way Data - Movements - Conflicts

Arm	Traffic Stream	Movement	Destination traffic stream	Description	Controlling type	Controlling from traffic stream	Controlling to traffic stream	Percentage opposing (%)	Upstream signals visible	Conflict shift	Conflict duration
7	1	1	11/1		TrafficStreamMovement	12/1	5/1	100		0	0
					TrafficStreamMovement	12/1	6/1	100		0	0
					TrafficStreamMovement	13/1	11/1	100		0	0
9	1	1	5/1		TrafficStreamMovement	18/1	5/1	100		0	0
					TrafficStreamMovement	13/1	5/1	100		0	0
		2	6/1		TrafficStreamMovement	18/1	6/1	100		0	0
					TrafficStreamMovement	12/1	6/1	100		0	0
20	1	1	19/1		TrafficStreamMovement	1/1	19/1	100		0	0
					TrafficStreamMovement	1/1	17/1	100		0	0
					TrafficStreamMovement	2/1	16/1	100		0	0

Signal Timings

Network Default: 100s cycle time; 100 steps

Interstage Matrix for Controller Stream 1

		To			
		1	2	3	4
From	1	0	0	5	0
	2	0	0	6	0
	3	6	6	0	0
	4	0	0	0	0

Resultant Stages

Controller stream	Resultant Stage	Is base stage	Library Stage ID	Phases in this stage	Stage start (s)	Stage end (s)	Stage duration (s)	User stage minimum (s)	Stage minimum (s)
1	1	✓	1	A	83	89	6	1	1
	2	✓	2	A,B	89	37	48	1	7
	3	✓	3	C	43	63	20	1	7
	4	✓	4	D	63	83	20	1	20

Final Prediction Table

Traffic Stream Results

			SIGNALS			FLOWS		PERFORMANCE				PER PCU			QUEUES	
Arm	Traffic Stream	Name	Traffic node	Controller stream	Phase	Calculated flow entering (PCU/hr)	Calculated sat flow (PCU/hr)	Actual green (s (per cycle))	Wasted time total (s (per cycle))	Degree of saturation (%)	Practical reserve capacity (%)	JourneyTime (s)	Mean Delay per Veh (s)	Mean stops per Veh (%)	Mean max queue (PCU)	D wei mu
1	1		1	1	A	251	1791	54	0.00	25	253	24.41	12.41	49.62	3.46	
2	1		1	1	A	460	2080	54	0.00	40	124	18.52	13.72	46.42	5.93	
3	1		1	1	A	414	2080	54	9.74	44	105	20.14	15.34	56.65	5.39	
4	1		2			874	2080	100	10.11	47	93	7.59	1.59	14.39	4.33	
5	1					171	Unrestricted	100	13.00	0	Unrestricted	13.86	0.00	0.00	0.00	
6	1					171	Unrestricted	100	13.00	0	Unrestricted	13.87	0.00	0.00	0.00	
7	1		1			414	1476	100	45.00	28	221	3.18	1.50	7.40	1.50	
8	1		3			302	1914	100	0.00	16	470	3.78	0.18	0.00	0.01	
9	1		1			118	1287	100	0.00	9	881	4.37	0.17	2.14	1.45	
10	1		1	1	C	184	1873	20	0.00	47	92	42.85	38.65	87.40	4.57	
11	1					691	Unrestricted	100	29.00	0	Unrestricted	10.06	0.00	0.00	0.00	
12	1		1	1	B	348	1786	48	0.00	40	126	29.51	17.51	58.69	5.94	
13	1		1	1	B	98	2080	48	0.00	10	836	18.06	13.86	51.54	1.46	
14	1		1	1	B	66	2027	48	0.11	7	1251	17.84	13.64	51.13	1.45	
15	1		4			164	2080	100	0.00	8	1041	6.07	0.07	0.00	0.00	
16	1					534	Unrestricted	100	17.00	0	Unrestricted	14.21	0.00	0.00	0.00	
17	1					162	Unrestricted	100	22.00	0	Unrestricted	14.53	0.00	0.00	0.00	
18	1		1	1	C	82	1828	20	0.00	21	321	45.96	33.96	82.08	1.90	
19	1					292	Unrestricted	100	17.00	0	Unrestricted	12.00	0.00	0.00	0.00	
20	1		1			66	1079	100	51.00	6	1371	7.09	5.41	53.69	1.45	

Network Results

	Distance travelled (PCU-km/hr)	Time spent (PCU-hr/hr)	Mean journey speed (kph)	Total delay (PCU-hr/hr)	Weighted cost of delay (£ per hr)	Weighted cost of stops (£ per hr)	Excess queue penalty (£ per hr)	Performance Index (£ per hr)
Normal traffic	396.55	23.35	16.98	10.13	143.90	16.09	0.00	159.99
Bus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tram	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pedestrians								
TOTAL	396.55	23.35	16.98	10.13	143.90	16.09	0.00	159.99

- *< = adjusted flow warning (upstream links/traffic streams are over-saturated)*
- ** = Traffic Stream - Normal, Bus or Tram Stop or Delay weighting has been set to a value other than 100%*
- *^ = Traffic Stream - Normal, Bus or Tram Stop or Delay Path weighting has been set to a value other than 100%*
- *+ = average link/traffic stream excess queue is greater than 0*
- ***P.I. = PERFORMANCE INDEX***

TRANSYT 15

Version: 15.5.2.7994

Filename: Junction 1 2023 DM OPTIM.t15
Path: C:\Users\shane.mcgivney\Desktop
Report generation date: 08/07/2019 13:49:55

File summary

File description

File title	2023 DM
Location	
Site number	
UTCRegion	
Driving side	Left
Date	11/06/2019
Version	
Status	(new file)
Identifier	
Client	
Jobnumber	
Enumerator	OCSC\shane.mcgivney
Description	

Model and Results

Enable controller offsets	Enable fuel consumption	Enable quick flares	Display journey time results	Display level of service results	Display blocking and starvation results	Display end of red and green queue results	Display excess queue results	Display separate uniform and random results	Display unweighted results	Display TRANSYT 12 style timings	Display effective greens in results	Display Red-With-Amber	Display End-Of-Green Amber

Units

Cost units	Speed units	Distance units	Fuel economy units	Fuel rate units	Mass units	Traffic units input	Traffic units results	Flow units	Average delay units	Total delay units	Rate of delay units
£	kph	m	mpg	l/h	kg	PCU	PCU	perHour	s	-Hour	perHour

Sorting

Show names instead of IDs	Sorting direction	Sorting type	Ignore prefixes when sorting	Analysis/demand set sorting	Link grouping	Source grouping	Colour Analysis/Demand Sets
	Ascending	Numerical		ID	Normal	Normal	✓

Network Diagrams

A1 - AM PEAK
D1 - AM PEAK*

Summary

Data Errors and Warnings

No errors or warnings

Run Summary

Analysis set used	Run start time	Run finish time	Modelling start time (HH:mm)	Network Cycle Time (s)	Performance Index (£ per hr)	Total network delay (PCU-hr/hr)	Highest DOS (%)	Item with highest DOS	Number of oversaturated items	Percentage of oversaturated items (%)	Item with worst signalised PRC	Item with worst unsignalised PRC	Ite wit wor over PR
1	08/07/2019 13:49:46	08/07/2019 13:49:46	08:00	100	141.52	8.97	65.49	10/1	0	0	10/1	4/1	10/

Analysis Set Details

Name	Description	Demand set	Include in report	Locked
AM PEAK		D1	✓	

Demand Set Details

Name	Description	Composite	Demand sets	Start time (HH:mm)	Locked
AM PEAK				08:00	

Network Options

Network timings

Network cycle time (s)	Restrict to SCOOT cycle times	Time segment length (min)	Number of time segments	Modelled time period (min)
100		60	1	60

Signals options

Start displacement (s)	End displacement (s)
2	3

Advanced

Phase minimum broken penalty (£)	Phase maximum broken penalty (£)	Intergreen broken penalty (£)	Starting Red-with-Amber (s)
10000.00	10000.00	10000.00	2

Traffic options

Traffic model	Vehicle flow scaling factor (%)	Pedestrian flow scaling factor (%)	Cruise times or speeds
Platoon Dispersion (PDM)	100	100	Cruise Speeds

Advanced

Resolution	DOS Threshold (%)	Cruise scaling factor (%)	Use link stop weightings	Use link delay weightings	Exclude pedestrians from results calculation	Random delay mode	Type of Vehicle-in-Service	Type of random parameter	PCU Length (m)	Calculate results for Path Segments	Generate PDM Profile Data
1	90	100	✓	✓		Complex	Uniform (TRANSYT)	Uniform (TRANSYT)	5.75		✓

Normal Traffic parameters

Dispersion type	Dispersion coefficient	Travel time coefficient
Default	35	80

Normal Traffic Types

Name	PCU Factor
Normal	1.00

Bus parameters

Name	PCU Factor	Dispersion type	Acceleration (ms^[-2])	Stationary time coefficient	Cruise time coefficient
Bus	1.00	Default	0.94	30	85

Tram parameters

Name	PCU Factor	Dispersion type	Acceleration (ms^[-2])	Stationary time coefficient	Cruise time coefficient
Tram	1.00	Default	0.94	100	100

Pedestrian parameters

Dispersion type
Default

Optimisation options

Enable optimisation	Auto redistribute	Optimisation level	Enable OUT Profile accuracy
✓	✓	Extended - Offsets And Green Splits	✓

Advanced

Optimisation type	Hill climb increments	OUTProfile accuracy	Use enhanced optimisation	Auto optimisation order	Optimisation order	Master controller	Offsets relative to master controller	Master controller offset after each run
Hill Climb (Fast)	15, 40, -1, 15, 40, 1, -1, 1, -15, -5, -1, 15, 1	50, 50, 5, 5, 0.5, 0.5, 0.05, 0.05, 0.05, 0.05, 0.05, 0.05, 0.05		✓	1			Do nothing

Economics

Vehicle Monetary Value Of Delay (£ per PCU-hr)	Vehicle Monetary Value Of Stops (£ per 100 stops)	Pedestrian monetary value of delay (£ per Ped-hr)
14.20	2.60	14.20

Arms and Traffic Streams

Arms

Arm	Name	Description	Traffic node
1			1
2			1
3			1
4			2
5			
6			
7			1
8			3
9			1
10			1
11			
12			1
13			1
14			1
15			4
16			
17			
18			1
19			
20			1

Traffic Streams

Arm	Traffic Stream	Name	Description	Auto length	Length (m)	Has Saturation Flow	Saturation flow source	Saturation flow (PCU/hr)	Auto-calculate cell saturation flow	Cell saturation flow (PCU/hr)	Is signal controlled	Is give way	Traffic type	Allow Nearside Turn On Red
1	1				100.00	✓	Sum of lanes	1791	✓	1800	✓		Normal	
2	1				40.00	✓	Sum of lanes	2080	✓	1800	✓		Normal	
3	1				40.00	✓	Sum of lanes	2080	✓	1800	✓		Normal	
4	1				50.00	✓	Sum of lanes	2080					Normal	
5	1			✓	115.49								Normal	
6	1			✓	115.59								Normal	
7	1				14.00	✓	Sum of lanes	1664	✓	1800		✓	Normal	
8	1				30.00	✓	Sum of lanes	1914					Normal	
9	1				35.00	✓	Sum of lanes	1554	✓	1800		✓	Normal	
10	1				35.00	✓	Sum of lanes	1873	✓	1800	✓		Normal	
11	1			✓	83.84								Normal	
12	1				100.00	✓	Sum of lanes	1786	✓	1800	✓		Normal	
13	1				35.00	✓	Sum of lanes	2080	✓	1800	✓		Normal	
14	1				35.00	✓	Sum of lanes	2027	✓	1800	✓		Normal	
15	1				50.00	✓	Sum of lanes	2080					Normal	
16	1			✓	118.42								Normal	
17	1			✓	121.12								Normal	
18	1				100.00	✓	Sum of lanes	1828			✓		Normal	
19	1				100.00								Normal	
20	1				14.00	✓	Sum of lanes	1664	✓	1800		✓	Normal	

Lanes

Arm	Traffic Stream	Lane	Name	Description	Use RR67	Surface condition	Site quality factor	Gradient (%)	Width (m)	Use connector turning radius	Proportion that turn (%)	Turning radius (m)	Nearside lane	Saturation flow (PCU/hr)
1	1	1	(untitled)		✓	N/A	N/A	0	3.25	✓	54	9.71	✓	1791
2	1	1	(untitled)		✓	N/A	N/A	0	3.25	✓	0	99999.00		2080
3	1	1	(untitled)		✓	N/A	N/A	0	3.25	✓	0	99999.00		2080
4	1	1	(untitled)		✓	N/A	N/A	0	3.25	✓	0	99999.00		2080
5	1	1	(untitled)											
6	1	1	(untitled)											
7	1	1	(untitled)		✓	N/A	N/A	0	3.25	✓	100	6.00		1664
8	1	1	(untitled)		✓	N/A	N/A	0	3.25	✓	61	66.82	✓	1914
9	1	1	(untitled)		✓	N/A	N/A	0	3.25	✓	100	6.05	✓	1554
10	1	1	(untitled)		✓	N/A	N/A	0	3.25	✓	51	21.54	✓	1873
11	1	1	(untitled)											
12	1	1	(untitled)		✓	N/A	N/A	0	3.25	✓	72	12.57	✓	1786
13	1	1	(untitled)		✓	N/A	N/A	0	3.25		0	100.00		2080
14	1	1	(untitled)		✓	N/A	N/A	0	3.25	✓	100	56.93		2027
15	1	1	(untitled)		✓	N/A	N/A	0	3.25	✓	0	99999.00		2080
16	1	1	(untitled)											
17	1	1	(untitled)											
18	1	1	(untitled)		✓	N/A	N/A	0	3.25	✓	67	16.38	✓	1828
19	1	1	(untitled)											
20	1	1	(untitled)		✓	N/A	N/A	0	3.25	✓	100	6.00		1664

Signals

Arm	Traffic Stream	Controller stream	Phase	Second phase enabled
1	1	1	A	
2	1	1	A	
3	1	1	A	
10	1	1	C	
12	1	1	B	
13	1	1	B	
14	1	1	B	
18	1	1	C	

Give Way Data

Arm	Traffic Stream	Opposed traffic	Use Step-wise Opposed Turn Model	Number of storage spaces	Use connector turning radius	Radius of turn (m)	Visibility restricted
7	1	Movement	✓	0	✓	6.00	
9	1	Movement	✓	0	✓	99999.00	
20	1	Movement	✓	0	✓	6.00	

Give Way Data - Movements

Arm	Traffic Stream	Movement	Destination traffic stream	Max Flow (Unopposed) (PCU/hr)	Percentage opposed (%)
7	1	1	11/1	1664	100
9	1	1	5/1	1554	100
		2	6/1	1554	100
20	1	1	19/1	1664	100

Give Way Data - Movements - Conflicts

Arm	Traffic Stream	Movement	Destination traffic stream	Description	Controlling type	Controlling from traffic stream	Controlling to traffic stream	Percentage opposing (%)	Upstream signals visible	Conflict shift	Conflict duration
7	1	1	11/1		TrafficStreamMovement	12/1	5/1	100		0	0
					TrafficStreamMovement	12/1	6/1	100		0	0
					TrafficStreamMovement	13/1	11/1	100		0	0
9	1	1	5/1		TrafficStreamMovement	18/1	5/1	100		0	0
					TrafficStreamMovement	13/1	5/1	100		0	0
		2	6/1		TrafficStreamMovement	18/1	6/1	100		0	0
					TrafficStreamMovement	12/1	6/1	100		0	0
20	1	1	19/1		TrafficStreamMovement	1/1	19/1	100		0	0
					TrafficStreamMovement	1/1	17/1	100		0	0
					TrafficStreamMovement	2/1	16/1	100		0	0

Signal Timings

Network Default: 100s cycle time; 100 steps

Interstage Matrix for Controller Stream 1

		To			
		1	2	3	4
From	1	0	0	5	0
	2	0	0	6	0
	3	6	6	0	0
	4	0	0	0	0

Resultant Stages

Controller stream	Resultant Stage	Is base stage	Library Stage ID	Phases in this stage	Stage start (s)	Stage end (s)	Stage duration (s)	User stage minimum (s)	Stage minimum (s)
1	1	✓	1	A	83	84	1	1	1
	2	✓	2	A,B	84	43	59	1	7
	3	✓	3	C	49	63	14	1	7
	4	✓	4	D	63	83	20	1	20

Final Prediction Table

Traffic Stream Results

				SIGNALS		FLOWS		PERFORMANCE				PER PCU			QUEUES	
Arm	Traffic Stream	Name	Traffic node	Controller stream	Phase	Calculated flow entering (PCU/hr)	Calculated sat flow (PCU/hr)	Actual green (s (per cycle))	Wasted time total (s (per cycle))	Degree of saturation (%)	Practical reserve capacity (%)	JourneyTime (s)	Mean Delay per Veh (s)	Mean stops per Veh (%)	Mean max queue (PCU)	we m
1	1		1	1	A	251	1791	60	0.00	23	292	21.34	9.34	42.91	3.04	
2	1		1	1	A	460	2080	60	0.00	36	148	15.54	10.74	45.52	5.82	
3	1		1	1	A	414	2080	60	8.58	38	137	17.51	12.71	52.63	5.26	
4	1		2			874	2080	100	4.12	44	105	6.80	0.80	4.25	1.87	
5	1					171	Unrestricted	100	6.00	0	Unrestricted	13.86	0.00	0.00	0.00	
6	1					171	Unrestricted	100	6.00	0	Unrestricted	13.87	0.00	0.00	0.00	
7	1		1			414	1468	100	39.00	28	219	3.08	1.40	7.40	1.50	
8	1		3			302	1914	100	0.00	16	470	3.78	0.18	0.00	0.01	
9	1		1			118	1286	100	0.00	9	881	4.37	0.17	2.06	1.45	
10	1		1	1	C	184	1873	14	0.00	65	37	56.17	51.97	102.49	5.26	
11	1					691	Unrestricted	100	23.00	0	Unrestricted	10.06	0.00	0.00	0.00	
12	1		1	1	B	348	1786	59	0.00	32	177	22.75	10.75	46.18	4.56	
13	1		1	1	B	98	2080	59	0.00	8	1046	12.72	8.52	40.12	1.45	
14	1		1	1	B	66	2027	59	0.11	5	1555	12.62	8.42	40.09	1.45	
15	1		4			164	2080	100	0.00	8	1041	6.07	0.07	0.00	0.00	
16	1					534	Unrestricted	100	14.00	0	Unrestricted	14.21	0.00	0.00	0.00	
17	1					162	Unrestricted	100	18.00	0	Unrestricted	14.53	0.00	0.00	0.00	
18	1		1	1	C	82	1828	14	0.00	30	201	52.61	40.61	89.59	2.07	
19	1					292	Unrestricted	100	14.00	0	Unrestricted	12.00	0.00	0.00	0.00	
20	1		1			66	1051	100	40.00	6	1333	7.26	5.58	46.72	1.45	

Network Results

	Distance travelled (PCU-km/hr)	Time spent (PCU-hr/hr)	Mean journey speed (kph)	Total delay (PCU-hr/hr)	Weighted cost of delay (£ per hr)	Weighted cost of stops (£ per hr)	Excess queue penalty (£ per hr)	Performance Index (£ per hr)
Normal traffic	396.55	22.19	17.87	8.97	127.42	14.10	0.00	141.52
Bus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tram	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pedestrians								
TOTAL	396.55	22.19	17.87	8.97	127.42	14.10	0.00	141.52

- *< = adjusted flow warning (upstream links/traffic streams are over-saturated)*
- ** = Traffic Stream - Normal, Bus or Tram Stop or Delay weighting has been set to a value other than 100%*
- *^ = Traffic Stream - Normal, Bus or Tram Stop or Delay Path weighting has been set to a value other than 100%*
- *+ = average link/traffic stream excess queue is greater than 0*
- ***P.I. = PERFORMANCE INDEX***

TRANSYT 15

Version: 15.5.2.7994

For sales and distribution information, program advice and maintenance, contact TRL:
+44 (0)1344 379777 software@trl.co.uk www.trlsoftware.co.uk

Filename: Junction 1 2023 DM.t15
Path: C:\Users\shane.mcgivney\Desktop
Report generation date: 08/07/2019 13:48:53

File summary

File description

File title	2023 DM
Location	
Site number	
UTCRegion	
Driving side	Left
Date	11/06/2019
Version	
Status	(new file)
Identifier	
Client	
Jobnumber	
Enumerator	OCSC\shane.mcgivney
Description	

Model and Results

Enable controller offsets	Enable fuel consumption	Enable quick flares	Display journey time results	Display level of service results	Display blocking and starvation results	Display end of red and green queue results	Display excess queue results	Display separate uniform and random results	Display unweighted results	Display TRANSYT 12 style timings	Display effective greens in results	Display Red-With-Amber	Display End-Of-Green Amber

Units

Cost units	Speed units	Distance units	Fuel economy units	Fuel rate units	Mass units	Traffic units input	Traffic units results	Flow units	Average delay units	Total delay units	Rate of delay units
£	kph	m	mpg	l/h	kg	PCU	PCU	perHour	s	-Hour	perHour

Sorting

Show names instead of IDs	Sorting direction	Sorting type	Ignore prefixes when sorting	Analysis/demand set sorting	Link grouping	Source grouping	Colour Analysis/Demand Sets
	Ascending	Numerical		ID	Normal	Normal	✓

Network Diagrams

A1 - AM PEAK
D1 - AM PEAK*

Summary

Data Errors and Warnings

No errors or warnings

Run Summary

Analysis set used	Run start time	Run finish time	Modelling start time (HH:mm)	Network Cycle Time (s)	Performance Index (£ per hr)	Total network delay (PCU-hr/hr)	Highest DOS (%)	Item with highest DOS	Number of oversaturated items	Percentage of oversaturated items (%)	Item with worst signalised PRC	Item with worst unsignalised PRC	Ite wit wor over PR
1	08/07/2019 13:48:48	08/07/2019 13:48:49	08:00	100	159.99	10.13	46.78	10/1	0	0	10/1	4/1	10/

Analysis Set Details

Name	Description	Demand set	Include in report	Locked
AM PEAK		D1	✓	

Demand Set Details

Name	Description	Composite	Demand sets	Start time (HH:mm)	Locked
AM PEAK				08:00	

Network Options

Network timings

Network cycle time (s)	Restrict to SCOOT cycle times	Time segment length (min)	Number of time segments	Modelled time period (min)
100		60	1	60

Signals options

Start displacement (s)	End displacement (s)
2	3

Advanced

Phase minimum broken penalty (£)	Phase maximum broken penalty (£)	Intergreen broken penalty (£)	Starting Red-with-Amber (s)
10000.00	10000.00	10000.00	2

Traffic options

Traffic model	Vehicle flow scaling factor (%)	Pedestrian flow scaling factor (%)	Cruise times or speeds
Platoon Dispersion (PDM)	100	100	Cruise Speeds

Advanced

Resolution	DOS Threshold (%)	Cruise scaling factor (%)	Use link stop weightings	Use link delay weightings	Exclude pedestrians from results calculation	Random delay mode	Type of Vehicle-in-Service	Type of random parameter	PCU Length (m)	Calculate results for Path Segments	Generate PDM Profile Data
1	90	100	✓	✓		Complex	Uniform (TRANSYT)	Uniform (TRANSYT)	5.75		✓

Normal Traffic parameters

Dispersion type	Dispersion coefficient	Travel time coefficient
Default	35	80

Normal Traffic Types

Name	PCU Factor
Normal	1.00

Bus parameters

Name	PCU Factor	Dispersion type	Acceleration (ms^[-2])	Stationary time coefficient	Cruise time coefficient
Bus	1.00	Default	0.94	30	85

Tram parameters

Name	PCU Factor	Dispersion type	Acceleration (ms^[-2])	Stationary time coefficient	Cruise time coefficient
Tram	1.00	Default	0.94	100	100

Pedestrian parameters

Dispersion type
Default

Optimisation options

Enable optimisation	Auto redistribute	Optimisation level	Enable OUT Profile accuracy
	✓		✓

Advanced

Optimisation type	Hill climb increments	OUTProfile accuracy	Use enhanced optimisation	Auto optimisation order	Optimisation order	Master controller	Offsets relative to master controller	Master controller offset after each run
				✓				Do nothing

Economics

Vehicle Monetary Value Of Delay (£ per PCU-hr)	Vehicle Monetary Value Of Stops (£ per 100 stops)	Pedestrian monetary value of delay (£ per Ped-hr)
14.20	2.60	14.20

Arms and Traffic Streams

Arms

Arm	Name	Description	Traffic node
1			1
2			1
3			1
4			2
5			
6			
7			1
8			3
9			1
10			1
11			
12			1
13			1
14			1
15			4
16			
17			
18			1
19			
20			1

Traffic Streams

Arm	Traffic Stream	Name	Description	Auto length	Length (m)	Has Saturation Flow	Saturation flow source	Saturation flow (PCU/hr)	Auto-calculate cell saturation flow	Cell saturation flow (PCU/hr)	Is signal controlled	Is give way	Traffic type	Allow Nearside Turn On Red
1	1				100.00	✓	Sum of lanes	1791	✓	1800	✓		Normal	
2	1				40.00	✓	Sum of lanes	2080	✓	1800	✓		Normal	
3	1				40.00	✓	Sum of lanes	2080	✓	1800	✓		Normal	
4	1				50.00	✓	Sum of lanes	2080					Normal	
5	1			✓	115.49								Normal	
6	1			✓	115.59								Normal	
7	1				14.00	✓	Sum of lanes	1664	✓	1800		✓	Normal	
8	1				30.00	✓	Sum of lanes	1914					Normal	
9	1				35.00	✓	Sum of lanes	1554	✓	1800		✓	Normal	
10	1				35.00	✓	Sum of lanes	1873	✓	1800	✓		Normal	
11	1			✓	83.84								Normal	
12	1				100.00	✓	Sum of lanes	1786	✓	1800	✓		Normal	
13	1				35.00	✓	Sum of lanes	2080	✓	1800	✓		Normal	
14	1				35.00	✓	Sum of lanes	2027	✓	1800	✓		Normal	
15	1				50.00	✓	Sum of lanes	2080					Normal	
16	1			✓	118.42								Normal	
17	1			✓	121.12								Normal	
18	1				100.00	✓	Sum of lanes	1828			✓		Normal	
19	1				100.00								Normal	
20	1				14.00	✓	Sum of lanes	1664	✓	1800		✓	Normal	

Lanes

Arm	Traffic Stream	Lane	Name	Description	Use RR67	Surface condition	Site quality factor	Gradient (%)	Width (m)	Use connector turning radius	Proportion that turn (%)	Turning radius (m)	Nearside lane	Saturation flow (PCU/hr)
1	1	1	(untitled)		✓	N/A	N/A	0	3.25	✓	54	9.71	✓	1791
2	1	1	(untitled)		✓	N/A	N/A	0	3.25	✓	0	99999.00		2080
3	1	1	(untitled)		✓	N/A	N/A	0	3.25	✓	0	99999.00		2080
4	1	1	(untitled)		✓	N/A	N/A	0	3.25	✓	0	99999.00		2080
5	1	1	(untitled)											
6	1	1	(untitled)											
7	1	1	(untitled)		✓	N/A	N/A	0	3.25	✓	100	6.00		1664
8	1	1	(untitled)		✓	N/A	N/A	0	3.25	✓	61	66.82	✓	1914
9	1	1	(untitled)		✓	N/A	N/A	0	3.25	✓	100	6.05	✓	1554
10	1	1	(untitled)		✓	N/A	N/A	0	3.25	✓	51	21.54	✓	1873
11	1	1	(untitled)											
12	1	1	(untitled)		✓	N/A	N/A	0	3.25	✓	72	12.57	✓	1786
13	1	1	(untitled)		✓	N/A	N/A	0	3.25		0	100.00		2080
14	1	1	(untitled)		✓	N/A	N/A	0	3.25	✓	100	56.93		2027
15	1	1	(untitled)		✓	N/A	N/A	0	3.25	✓	0	99999.00		2080
16	1	1	(untitled)											
17	1	1	(untitled)											
18	1	1	(untitled)		✓	N/A	N/A	0	3.25	✓	67	16.38	✓	1828
19	1	1	(untitled)											
20	1	1	(untitled)		✓	N/A	N/A	0	3.25	✓	100	6.00		1664

Signals

Arm	Traffic Stream	Controller stream	Phase	Second phase enabled
1	1	1	A	
2	1	1	A	
3	1	1	A	
10	1	1	C	
12	1	1	B	
13	1	1	B	
14	1	1	B	
18	1	1	C	

Give Way Data

Arm	Traffic Stream	Opposed traffic	Use Step-wise Opposed Turn Model	Number of storage spaces	Use connector turning radius	Radius of turn (m)	Visibility restricted
7	1	Movement	✓	0	✓	6.00	
9	1	Movement	✓	0	✓	99999.00	
20	1	Movement	✓	0	✓	6.00	

Give Way Data - Movements

Arm	Traffic Stream	Movement	Destination traffic stream	Max Flow (Unopposed) (PCU/hr)	Percentage opposed (%)
7	1	1	11/1	1664	100
9	1	1	5/1	1554	100
		2	6/1	1554	100
20	1	1	19/1	1664	100

Give Way Data - Movements - Conflicts

Arm	Traffic Stream	Movement	Destination traffic stream	Description	Controlling type	Controlling from traffic stream	Controlling to traffic stream	Percentage opposing (%)	Upstream signals visible	Conflict shift	Conflict duration
7	1	1	11/1		TrafficStreamMovement	12/1	5/1	100		0	0
					TrafficStreamMovement	12/1	6/1	100		0	0
					TrafficStreamMovement	13/1	11/1	100		0	0
9	1	1	5/1		TrafficStreamMovement	18/1	5/1	100		0	0
					TrafficStreamMovement	13/1	5/1	100		0	0
		2	6/1		TrafficStreamMovement	18/1	6/1	100		0	0
					TrafficStreamMovement	12/1	6/1	100		0	0
20	1	1	19/1		TrafficStreamMovement	1/1	19/1	100		0	0
					TrafficStreamMovement	1/1	17/1	100		0	0
					TrafficStreamMovement	2/1	16/1	100		0	0

Signal Timings

Network Default: 100s cycle time; 100 steps

Interstage Matrix for Controller Stream 1

		To			
		1	2	3	4
From	1	0	0	5	0
	2	0	0	6	0
	3	6	6	0	0
	4	0	0	0	0

Resultant Stages

Controller stream	Resultant Stage	Is base stage	Library Stage ID	Phases in this stage	Stage start (s)	Stage end (s)	Stage duration (s)	User stage minimum (s)	Stage minimum (s)
1	1	✓	1	A	83	89	6	1	1
	2	✓	2	A,B	89	37	48	1	7
	3	✓	3	C	43	63	20	1	7
	4	✓	4	D	63	83	20	1	20

Final Prediction Table

Traffic Stream Results

				SIGNALS		FLOWS		PERFORMANCE				PER PCU			QUEUES	
Arm	Traffic Stream	Name	Traffic node	Controller stream	Phase	Calculated flow entering (PCU/hr)	Calculated sat flow (PCU/hr)	Actual green (s (per cycle))	Wasted time total (s (per cycle))	Degree of saturation (%)	Practical reserve capacity (%)	JourneyTime (s)	Mean Delay per Veh (s)	Mean stops per Veh (%)	Mean max queue (PCU)	D wei mu
1	1		1	1	A	251	1791	54	0.00	25	253	24.41	12.41	49.62	3.46	
2	1		1	1	A	460	2080	54	0.00	40	124	18.52	13.72	46.42	5.93	
3	1		1	1	A	414	2080	54	9.74	44	105	20.14	15.34	56.65	5.39	
4	1		2			874	2080	100	10.11	47	93	7.59	1.59	14.39	4.33	
5	1					171	Unrestricted	100	13.00	0	Unrestricted	13.86	0.00	0.00	0.00	
6	1					171	Unrestricted	100	13.00	0	Unrestricted	13.87	0.00	0.00	0.00	
7	1		1			414	1476	100	45.00	28	221	3.18	1.50	7.40	1.50	
8	1		3			302	1914	100	0.00	16	470	3.78	0.18	0.00	0.01	
9	1		1			118	1287	100	0.00	9	881	4.37	0.17	2.14	1.45	
10	1		1	1	C	184	1873	20	0.00	47	92	42.85	38.65	87.40	4.57	
11	1					691	Unrestricted	100	29.00	0	Unrestricted	10.06	0.00	0.00	0.00	
12	1		1	1	B	348	1786	48	0.00	40	126	29.51	17.51	58.69	5.94	
13	1		1	1	B	98	2080	48	0.00	10	836	18.06	13.86	51.54	1.46	
14	1		1	1	B	66	2027	48	0.11	7	1251	17.84	13.64	51.13	1.45	
15	1		4			164	2080	100	0.00	8	1041	6.07	0.07	0.00	0.00	
16	1					534	Unrestricted	100	17.00	0	Unrestricted	14.21	0.00	0.00	0.00	
17	1					162	Unrestricted	100	22.00	0	Unrestricted	14.53	0.00	0.00	0.00	
18	1		1	1	C	82	1828	20	0.00	21	321	45.96	33.96	82.08	1.90	
19	1					292	Unrestricted	100	17.00	0	Unrestricted	12.00	0.00	0.00	0.00	
20	1		1			66	1079	100	51.00	6	1371	7.09	5.41	53.69	1.45	

Network Results

	Distance travelled (PCU-km/hr)	Time spent (PCU-hr/hr)	Mean journey speed (kph)	Total delay (PCU-hr/hr)	Weighted cost of delay (£ per hr)	Weighted cost of stops (£ per hr)	Excess queue penalty (£ per hr)	Performance Index (£ per hr)
Normal traffic	396.55	23.35	16.98	10.13	143.90	16.09	0.00	159.99
Bus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tram	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pedestrians								
TOTAL	396.55	23.35	16.98	10.13	143.90	16.09	0.00	159.99

- *< = adjusted flow warning (upstream links/traffic streams are over-saturated)*
- ** = Traffic Stream - Normal, Bus or Tram Stop or Delay weighting has been set to a value other than 100%*
- *^ = Traffic Stream - Normal, Bus or Tram Stop or Delay Path weighting has been set to a value other than 100%*
- *+ = average link/traffic stream excess queue is greater than 0*
- ***P.I. = PERFORMANCE INDEX***

TRANSYT 15

Filename: Junction 1 2023 DN.t15
Path: C:\Users\shane.mcgivney\Desktop
Report generation date: 08/07/2019 13:42:07

File summary

File description

File title	2023 DN
Location	
Site number	
UTCRegion	
Driving side	Left
Date	11/06/2019
Version	
Status	(new file)
Identifier	
Client	
Jobnumber	
Enumerator	OCSC\shane.mcgivney
Description	

Model and Results

Enable controller offsets	Enable fuel consumption	Enable quick flares	Display journey time results	Display level of service results	Display blocking and starvation results	Display end of red and green queue results	Display excess queue results	Display separate uniform and random results	Display unweighted results	Display TRANSYT 12 style timings	Display effective greens in results	Display Red-With-Amber	Display End-Of-Green Amber

Units

Cost units	Speed units	Distance units	Fuel economy units	Fuel rate units	Mass units	Traffic units input	Traffic units results	Flow units	Average delay units	Total delay units	Rate of delay units
£	kph	m	mpg	l/h	kg	PCU	PCU	perHour	s	-Hour	perHour

Sorting

Show names instead of IDs	Sorting direction	Sorting type	Ignore prefixes when sorting	Analysis/demand set sorting	Link grouping	Source grouping	Colour Analysis/Demand Sets
	Ascending	Numerical		ID	Normal	Normal	✓

Network Diagrams

A1 - AM PEAK
D1 - AM PEAK*

Summary

Data Errors and Warnings

No errors or warnings

Run Summary

Analysis set used	Run start time	Run finish time	Modelling start time (HH:mm)	Network Cycle Time (s)	Performance Index (£ per hr)	Total network delay (PCU-hr/hr)	Highest DOS (%)	Item with highest DOS	Number of oversaturated items	Percentage of oversaturated items (%)	Item with worst signalised PRC	Item with worst unsignalised PRC	Ite wit wor over PR
1	08/07/2019 13:41:59	08/07/2019 13:42:00	08:00	100	123.64	7.80	39.69	2/1	0	0	2/1	4/1	2/

Analysis Set Details

Name	Description	Demand set	Include in report	Locked
AM PEAK		D1	✓	

Demand Set Details

Name	Description	Composite	Demand sets	Start time (HH:mm)	Locked
AM PEAK				08:00	

Network Options

Network timings

Network cycle time (s)	Restrict to SCOOT cycle times	Time segment length (min)	Number of time segments	Modelled time period (min)
100		60	1	60

Signals options

Start displacement (s)	End displacement (s)
2	3

Advanced

Phase minimum broken penalty (£)	Phase maximum broken penalty (£)	Intergreen broken penalty (£)	Starting Red-with-Amber (s)
10000.00	10000.00	10000.00	2

Traffic options

Traffic model	Vehicle flow scaling factor (%)	Pedestrian flow scaling factor (%)	Cruise times or speeds
Platoon Dispersion (PDM)	100	100	Cruise Speeds

Advanced

Resolution	DOS Threshold (%)	Cruise scaling factor (%)	Use link stop weightings	Use link delay weightings	Exclude pedestrians from results calculation	Random delay mode	Type of Vehicle-in-Service	Type of random parameter	PCU Length (m)	Calculate results for Path Segments	Generate PDM Profile Data
1	90	100	✓	✓		Complex	Uniform (TRANSYT)	Uniform (TRANSYT)	5.75		✓

Normal Traffic parameters

Dispersion type	Dispersion coefficient	Travel time coefficient
Default	35	80

Normal Traffic Types

Name	PCU Factor
Normal	1.00

Bus parameters

Name	PCU Factor	Dispersion type	Acceleration (ms^[-2])	Stationary time coefficient	Cruise time coefficient
Bus	1.00	Default	0.94	30	85

Tram parameters

Name	PCU Factor	Dispersion type	Acceleration (ms^[-2])	Stationary time coefficient	Cruise time coefficient
Tram	1.00	Default	0.94	100	100

Pedestrian parameters

Dispersion type
Default

Optimisation options

Enable optimisation	Auto redistribute	Optimisation level	Enable OUT Profile accuracy
	✓		✓

Advanced

Optimisation type	Hill climb increments	OUTProfile accuracy	Use enhanced optimisation	Auto optimisation order	Optimisation order	Master controller	Offsets relative to master controller	Master controller offset after each run
				✓				Do nothing

Economics

Vehicle Monetary Value Of Delay (£ per PCU-hr)	Vehicle Monetary Value Of Stops (£ per 100 stops)	Pedestrian monetary value of delay (£ per Ped-hr)
14.20	2.60	14.20

Arms and Traffic Streams

Arms

Arm	Name	Description	Traffic node
1			1
2			1
3			1
4			2
5			
6			
7			1
8			3
9			1
10			1
11			
12			1
13			1
14			1
15			4
16			
17			
18			1
19			
20			1

Traffic Streams

Arm	Traffic Stream	Name	Description	Auto length	Length (m)	Has Saturation Flow	Saturation flow source	Saturation flow (PCU/hr)	Auto-calculate cell saturation flow	Cell saturation flow (PCU/hr)	Is signal controlled	Is give way	Traffic type	Allow Nearside Turn On Red
1	1				100.00	✓	Sum of lanes	1788	✓	1800	✓		Normal	
2	1				40.00	✓	Sum of lanes	2080	✓	1800	✓		Normal	
3	1				40.00	✓	Sum of lanes	2080	✓	1800	✓		Normal	
4	1				50.00	✓	Sum of lanes	2080					Normal	
5	1			✓	115.49								Normal	
6	1			✓	115.59								Normal	
7	1				14.00	✓	Sum of lanes	1664	✓	1800		✓	Normal	
8	1				30.00	✓	Sum of lanes	1914					Normal	
9	1				35.00	✓	Sum of lanes	1554	✓	1800		✓	Normal	
10	1				35.00	✓	Sum of lanes	1885	✓	1800	✓		Normal	
11	1			✓	83.84								Normal	
12	1				100.00	✓	Sum of lanes	1812	✓	1800	✓		Normal	
13	1				35.00	✓	Sum of lanes	2080	✓	1800	✓		Normal	
14	1				35.00	✓	Sum of lanes	2027	✓	1800	✓		Normal	
15	1				50.00	✓	Sum of lanes	2080					Normal	
16	1			✓	118.42								Normal	
17	1			✓	121.12								Normal	
18	1				100.00	✓	Sum of lanes	1826			✓		Normal	
19	1				100.00								Normal	
20	1				14.00	✓	Sum of lanes	1664	✓	1800		✓	Normal	

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Lanes

Arm	Traffic Stream	Lane	Name	Description	Use RR67	Surface condition	Site quality factor	Gradient (%)	Width (m)	Use connector turning radius	Proportion that turn (%)	Turning radius (m)	Nearside lane	Saturation flow (PCU/hr)
1	1	1	(untitled)		✓	N/A	N/A	0	3.25	✓	55	9.71	✓	1788
2	1	1	(untitled)		✓	N/A	N/A	0	3.25	✓	0	99999.00		2080
3	1	1	(untitled)		✓	N/A	N/A	0	3.25	✓	0	99999.00		2080
4	1	1	(untitled)		✓	N/A	N/A	0	3.25	✓	0	99999.00		2080
5	1	1	(untitled)											
6	1	1	(untitled)											
7	1	1	(untitled)		✓	N/A	N/A	0	3.25	✓	100	6.00		1664
8	1	1	(untitled)		✓	N/A	N/A	0	3.25	✓	61	66.82	✓	1914
9	1	1	(untitled)		✓	N/A	N/A	0	3.25	✓	100	6.05	✓	1554
10	1	1	(untitled)		✓	N/A	N/A	0	3.25	✓	42	21.54	✓	1885
11	1	1	(untitled)											
12	1	1	(untitled)		✓	N/A	N/A	0	3.25	✓	59	12.57	✓	1812
13	1	1	(untitled)		✓	N/A	N/A	0	3.25		0	100.00		2080
14	1	1	(untitled)		✓	N/A	N/A	0	3.25	✓	100	56.93		2027
15	1	1	(untitled)		✓	N/A	N/A	0	3.25	✓	0	99999.00		2080
16	1	1	(untitled)											
17	1	1	(untitled)											
18	1	1	(untitled)		✓	N/A	N/A	0	3.25	✓	68	16.38	✓	1826
19	1	1	(untitled)											
20	1	1	(untitled)		✓	N/A	N/A	0	3.25	✓	100	6.00		1664

Signals

Arm	Traffic Stream	Controller stream	Phase	Second phase enabled
1	1	1	A	
2	1	1	A	
3	1	1	A	
10	1	1	C	
12	1	1	B	
13	1	1	B	
14	1	1	B	
18	1	1	C	

Give Way Data

Arm	Traffic Stream	Opposed traffic	Use Step-wise Opposed Turn Model	Number of storage spaces	Use connector turning radius	Radius of turn (m)	Visibility restricted
7	1	Movement	✓	0	✓	6.00	
9	1	Movement	✓	0	✓	99999.00	
20	1	Movement	✓	0	✓	6.00	

Give Way Data - Movements

Arm	Traffic Stream	Movement	Destination traffic stream	Max Flow (Unopposed) (PCU/hr)	Percentage opposed (%)
7	1	1	11/1	1664	100
9	1	1	5/1	1554	100
		2	6/1	1554	100
20	1	1	19/1	1664	100

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Give Way Data - Movements - Conflicts

Arm	Traffic Stream	Movement	Destination traffic stream	Description	Controlling type	Controlling from traffic stream	Controlling to traffic stream	Percentage opposing (%)	Upstream signals visible	Conflict shift	Conflict duration
7	1	1	11/1		TrafficStreamMovement	12/1	5/1	100		0	0
					TrafficStreamMovement	12/1	6/1	100		0	0
					TrafficStreamMovement	13/1	11/1	100		0	0
9	1	1	5/1		TrafficStreamMovement	18/1	5/1	100		0	0
					TrafficStreamMovement	13/1	5/1	100		0	0
		2	6/1		TrafficStreamMovement	18/1	6/1	100		0	0
					TrafficStreamMovement	12/1	6/1	100		0	0
20	1	1	19/1		TrafficStreamMovement	1/1	19/1	100		0	0
					TrafficStreamMovement	1/1	17/1	100		0	0
					TrafficStreamMovement	2/1	16/1	100		0	0

Signal Timings

Network Default: 100s cycle time; 100 steps

Interstage Matrix for Controller Stream 1

		To			
		1	2	3	4
From	1	0	0	5	0
	2	0	0	6	0
	3	6	6	0	0
	4	0	0	0	0

Resultant Stages

Controller stream	Resultant Stage	Is base stage	Library Stage ID	Phases in this stage	Stage start (s)	Stage end (s)	Stage duration (s)	User stage minimum (s)	Stage minimum (s)
1	1	✓	1	A	83	89	6	1	1
	2	✓	2	A,B	89	37	48	1	7
	3	✓	3	C	43	63	20	1	7
	4	✓	4	D	63	83	20	1	20

Generated on 08/07/2019 13:43:01 using TRANSYT 15 (15.5.2.7994)

Final Prediction Table

Traffic Stream Results

			SIGNALS			FLOWS		PERFORMANCE				PER PCU			QUEUES	
Arm	Traffic Stream	Name	Traffic node	Controller stream	Phase	Calculated flow entering (PCU/hr)	Calculated sat flow (PCU/hr)	Actual green (s (per cycle))	Wasted time total (s (per cycle))	Degree of saturation (%)	Practical reserve capacity (%)	JourneyTime (s)	Mean Delay per Veh (s)	Mean stops per Veh (%)	Mean max queue (PCU)	D wei mu
1	1		1	1	A	249	1788	54	0.00	25	255	24.39	12.39	49.61	3.43	
2	1		1	1	A	454	2080	54	0.00	40	127	18.54	13.74	46.99	5.93	
3	1		1	1	A	285	2080	54	2.33	26	246	17.22	12.42	47.14	3.68	
4	1		2			739	2080	100	9.65	39	129	7.24	1.24	12.20	3.00	
5	1					154	Unrestricted	100	25.00	0	Unrestricted	13.86	0.00	0.00	0.00	
6	1					154	Unrestricted	100	25.00	0	Unrestricted	13.87	0.00	0.00	0.00	
7	1		1			285	1485	100	45.00	19	369	2.90	1.22	12.62	1.47	
8	1		3			229	1914	100	0.00	12	652	3.73	0.13	0.00	0.01	
9	1		1			90	1296	100	0.00	7	1196	4.33	0.13	2.10	0.05	
10	1		1	1	C	139	1885	20	0.00	35	156	40.37	36.17	85.43	3.30	
11	1					445	Unrestricted	100	30.00	0	Unrestricted	10.06	0.00	0.00	0.00	
12	1		1	1	B	229	1812	48	0.00	26	249	27.60	15.60	55.70	3.54	
13	1		1	1	B	95	2080	48	0.00	9	866	18.03	13.83	51.18	1.45	
14	1		1	1	B	66	2027	48	0.11	7	1251	17.84	13.64	51.13	1.45	
15	1		4			161	2080	100	0.00	8	1063	6.07	0.07	0.00	0.00	
16	1					510	Unrestricted	100	19.00	0	Unrestricted	14.21	0.00	0.00	0.00	
17	1					142	Unrestricted	100	27.00	0	Unrestricted	14.53	0.00	0.00	0.00	
18	1		1	1	C	81	1826	20	0.00	21	326	45.93	33.93	82.07	1.87	
19	1					283	Unrestricted	100	18.00	0	Unrestricted	12.00	0.00	0.00	0.00	
20	1		1			66	1089	100	51.00	6	1385	6.68	5.00	54.00	1.45	

Network Results

	Distance travelled (PCU-km/hr)	Time spent (PCU-hr/hr)	Mean journey speed (kph)	Total delay (PCU-hr/hr)	Weighted cost of delay (£ per hr)	Weighted cost of stops (£ per hr)	Excess queue penalty (£ per hr)	Performance Index (£ per hr)
Normal traffic	334.68	18.95	17.66	7.80	110.73	12.92	0.00	123.64
Bus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tram	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pedestrians								
TOTAL	334.68	18.95	17.66	7.80	110.73	12.92	0.00	123.64

- *< = adjusted flow warning (upstream links/traffic streams are over-saturated)*
- ** = Traffic Stream - Normal, Bus or Tram Stop or Delay weighting has been set to a value other than 100%*
- *^ = Traffic Stream - Normal, Bus or Tram Stop or Delay Path weighting has been set to a value other than 100%*
- *+ = average link/traffic stream excess queue is greater than 0*
- ***P.I. = PERFORMANCE INDEX***

TRANSYT 15

Version: 15.5.2.7994

For sales and distribution information, program advice and maintenance, contact TRL:
+44 (0)1344 379777 software@trl.co.uk www.trlsoftware.co.uk

Filename: Junction 1 2023 DN.t15
Path: C:\Users\shane.mcgivney\Desktop
Report generation date: 08/07/2019 13:45:16

File summary

File description

File title	2023 DN
Location	
Site number	
UTCRegion	
Driving side	Left
Date	11/06/2019
Version	
Status	(new file)
Identifier	
Client	
Jobnumber	
Enumerator	OCSC\shane.mcgivney
Description	

Model and Results

Enable controller offsets	Enable fuel consumption	Enable quick flares	Display journey time results	Display level of service results	Display blocking and starvation results	Display end of red and green queue results	Display excess queue results	Display separate uniform and random results	Display unweighted results	Display TRANSYT 12 style timings	Display effective greens in results	Display Red-With-Amber	Display End-Of-Green Amber

Units

Cost units	Speed units	Distance units	Fuel economy units	Fuel rate units	Mass units	Traffic units input	Traffic units results	Flow units	Average delay units	Total delay units	Rate of delay units
£	kph	m	mpg	l/h	kg	PCU	PCU	perHour	s	-Hour	perHour

Sorting

Show names instead of IDs	Sorting direction	Sorting type	Ignore prefixes when sorting	Analysis/demand set sorting	Link grouping	Source grouping	Colour Analysis/Demand Sets
	Ascending	Numerical		ID	Normal	Normal	✓

Network Diagrams

A1 - AM PEAK
D1 - AM PEAK*

Summary

Data Errors and Warnings

No errors or warnings

Run Summary

Analysis set used	Run start time	Run finish time	Modelling start time (HH:mm)	Network Cycle Time (s)	Performance Index (£ per hr)	Total network delay (PCU-hr/hr)	Highest DOS (%)	Item with highest DOS	Number of oversaturated items	Percentage of oversaturated items (%)	Item with worst signalised PRC	Item with worst unsignalised PRC	Ite wit wor over PR
1	08/07/2019 13:45:13	08/07/2019 13:45:14	08:00	100	123.64	7.80	39.69	2/1	0	0	2/1	4/1	2/

Analysis Set Details

Name	Description	Demand set	Include in report	Locked
AM PEAK		D1	✓	

Demand Set Details

Name	Description	Composite	Demand sets	Start time (HH:mm)	Locked
AM PEAK				08:00	

Network Options

Network timings

Network cycle time (s)	Restrict to SCOOT cycle times	Time segment length (min)	Number of time segments	Modelled time period (min)
100		60	1	60

Signals options

Start displacement (s)	End displacement (s)
2	3

Advanced

Phase minimum broken penalty (£)	Phase maximum broken penalty (£)	Intergreen broken penalty (£)	Starting Red-with-Amber (s)
10000.00	10000.00	10000.00	2

Traffic options

Traffic model	Vehicle flow scaling factor (%)	Pedestrian flow scaling factor (%)	Cruise times or speeds
Platoon Dispersion (PDM)	100	100	Cruise Speeds

Advanced

Resolution	DOS Threshold (%)	Cruise scaling factor (%)	Use link stop weightings	Use link delay weightings	Exclude pedestrians from results calculation	Random delay mode	Type of Vehicle-in-Service	Type of random parameter	PCU Length (m)	Calculate results for Path Segments	Generate PDM Profile Data
1	90	100	✓	✓		Complex	Uniform (TRANSYT)	Uniform (TRANSYT)	5.75		✓

Normal Traffic parameters

Dispersion type	Dispersion coefficient	Travel time coefficient
Default	35	80

Normal Traffic Types

Name	PCU Factor
Normal	1.00

Bus parameters

Name	PCU Factor	Dispersion type	Acceleration (ms^[-2])	Stationary time coefficient	Cruise time coefficient
Bus	1.00	Default	0.94	30	85

Tram parameters

Name	PCU Factor	Dispersion type	Acceleration (ms^[-2])	Stationary time coefficient	Cruise time coefficient
Tram	1.00	Default	0.94	100	100

Pedestrian parameters

Dispersion type
Default

Optimisation options

Enable optimisation	Auto redistribute	Optimisation level	Enable OUT Profile accuracy
	✓		✓

Advanced

Optimisation type	Hill climb increments	OUTProfile accuracy	Use enhanced optimisation	Auto optimisation order	Optimisation order	Master controller	Offsets relative to master controller	Master controller offset after each run
				✓				Do nothing

Economics

Vehicle Monetary Value Of Delay (£ per PCU-hr)	Vehicle Monetary Value Of Stops (£ per 100 stops)	Pedestrian monetary value of delay (£ per Ped-hr)
14.20	2.60	14.20

Arms and Traffic Streams

Arms

Arm	Name	Description	Traffic node
1			1
2			1
3			1
4			2
5			
6			
7			1
8			3
9			1
10			1
11			
12			1
13			1
14			1
15			4
16			
17			
18			1
19			
20			1

Traffic Streams

Arm	Traffic Stream	Name	Description	Auto length	Length (m)	Has Saturation Flow	Saturation flow source	Saturation flow (PCU/hr)	Auto-calculate cell saturation flow	Cell saturation flow (PCU/hr)	Is signal controlled	Is give way	Traffic type	Allow Nearside Turn On Red
1	1				100.00	✓	Sum of lanes	1788	✓	1800	✓		Normal	
2	1				40.00	✓	Sum of lanes	2080	✓	1800	✓		Normal	
3	1				40.00	✓	Sum of lanes	2080	✓	1800	✓		Normal	
4	1				50.00	✓	Sum of lanes	2080					Normal	
5	1			✓	115.49								Normal	
6	1			✓	115.59								Normal	
7	1				14.00	✓	Sum of lanes	1664	✓	1800		✓	Normal	
8	1				30.00	✓	Sum of lanes	1914					Normal	
9	1				35.00	✓	Sum of lanes	1554	✓	1800		✓	Normal	
10	1				35.00	✓	Sum of lanes	1885	✓	1800	✓		Normal	
11	1			✓	83.84								Normal	
12	1				100.00	✓	Sum of lanes	1812	✓	1800	✓		Normal	
13	1				35.00	✓	Sum of lanes	2080	✓	1800	✓		Normal	
14	1				35.00	✓	Sum of lanes	2027	✓	1800	✓		Normal	
15	1				50.00	✓	Sum of lanes	2080					Normal	
16	1			✓	118.42								Normal	
17	1			✓	121.12								Normal	
18	1				100.00	✓	Sum of lanes	1826			✓		Normal	
19	1				100.00								Normal	
20	1				14.00	✓	Sum of lanes	1664	✓	1800		✓	Normal	

Lanes

Arm	Traffic Stream	Lane	Name	Description	Use RR67	Surface condition	Site quality factor	Gradient (%)	Width (m)	Use connector turning radius	Proportion that turn (%)	Turning radius (m)	Nearside lane	Saturation flow (PCU/hr)
1	1	1	(untitled)		✓	N/A	N/A	0	3.25	✓	55	9.71	✓	1788
2	1	1	(untitled)		✓	N/A	N/A	0	3.25	✓	0	99999.00		2080
3	1	1	(untitled)		✓	N/A	N/A	0	3.25	✓	0	99999.00		2080
4	1	1	(untitled)		✓	N/A	N/A	0	3.25	✓	0	99999.00		2080
5	1	1	(untitled)											
6	1	1	(untitled)											
7	1	1	(untitled)		✓	N/A	N/A	0	3.25	✓	100	6.00		1664
8	1	1	(untitled)		✓	N/A	N/A	0	3.25	✓	61	66.82	✓	1914
9	1	1	(untitled)		✓	N/A	N/A	0	3.25	✓	100	6.05	✓	1554
10	1	1	(untitled)		✓	N/A	N/A	0	3.25	✓	42	21.54	✓	1885
11	1	1	(untitled)											
12	1	1	(untitled)		✓	N/A	N/A	0	3.25	✓	59	12.57	✓	1812
13	1	1	(untitled)		✓	N/A	N/A	0	3.25		0	100.00		2080
14	1	1	(untitled)		✓	N/A	N/A	0	3.25	✓	100	56.93		2027
15	1	1	(untitled)		✓	N/A	N/A	0	3.25	✓	0	99999.00		2080
16	1	1	(untitled)											
17	1	1	(untitled)											
18	1	1	(untitled)		✓	N/A	N/A	0	3.25	✓	68	16.38	✓	1826
19	1	1	(untitled)											
20	1	1	(untitled)		✓	N/A	N/A	0	3.25	✓	100	6.00		1664

Signals

Arm	Traffic Stream	Controller stream	Phase	Second phase enabled
1	1	1	A	
2	1	1	A	
3	1	1	A	
10	1	1	C	
12	1	1	B	
13	1	1	B	
14	1	1	B	
18	1	1	C	

Give Way Data

Arm	Traffic Stream	Opposed traffic	Use Step-wise Opposed Turn Model	Number of storage spaces	Use connector turning radius	Radius of turn (m)	Visibility restricted
7	1	Movement	✓	0	✓	6.00	
9	1	Movement	✓	0	✓	99999.00	
20	1	Movement	✓	0	✓	6.00	

Give Way Data - Movements

Arm	Traffic Stream	Movement	Destination traffic stream	Max Flow (Unopposed) (PCU/hr)	Percentage opposed (%)
7	1	1	11/1	1664	100
9	1	1	5/1	1554	100
		2	6/1	1554	100
20	1	1	19/1	1664	100

Give Way Data - Movements - Conflicts

Arm	Traffic Stream	Movement	Destination traffic stream	Description	Controlling type	Controlling from traffic stream	Controlling to traffic stream	Percentage opposing (%)	Upstream signals visible	Conflict shift	Conflict duration
7	1	1	11/1		TrafficStreamMovement	12/1	5/1	100		0	0
					TrafficStreamMovement	12/1	6/1	100		0	0
					TrafficStreamMovement	13/1	11/1	100		0	0
9	1	1	5/1		TrafficStreamMovement	18/1	5/1	100		0	0
					TrafficStreamMovement	13/1	5/1	100		0	0
		2	6/1		TrafficStreamMovement	18/1	6/1	100		0	0
					TrafficStreamMovement	12/1	6/1	100		0	0
20	1	1	19/1		TrafficStreamMovement	1/1	19/1	100		0	0
					TrafficStreamMovement	1/1	17/1	100		0	0
					TrafficStreamMovement	2/1	16/1	100		0	0

Signal Timings

Network Default: 100s cycle time; 100 steps

Interstage Matrix for Controller Stream 1

		To			
		1	2	3	4
From	1	0	0	5	0
	2	0	0	6	0
	3	6	6	0	0
	4	0	0	0	0

Resultant Stages

Controller stream	Resultant Stage	Is base stage	Library Stage ID	Phases in this stage	Stage start (s)	Stage end (s)	Stage duration (s)	User stage minimum (s)	Stage minimum (s)
1	1	✓	1	A	83	89	6	1	1
	2	✓	2	A,B	89	37	48	1	7
	3	✓	3	C	43	63	20	1	7
	4	✓	4	D	63	83	20	1	20

Final Prediction Table

Traffic Stream Results

			SIGNALS			FLOWS		PERFORMANCE				PER PCU			QUEUES	
Arm	Traffic Stream	Name	Traffic node	Controller stream	Phase	Calculated flow entering (PCU/hr)	Calculated sat flow (PCU/hr)	Actual green (s (per cycle))	Wasted time total (s (per cycle))	Degree of saturation (%)	Practical reserve capacity (%)	JourneyTime (s)	Mean Delay per Veh (s)	Mean stops per Veh (%)	Mean max queue (PCU)	D wei mu
1	1		1	1	A	249	1788	54	0.00	25	255	24.39	12.39	49.61	3.43	
2	1		1	1	A	454	2080	54	0.00	40	127	18.54	13.74	46.99	5.93	
3	1		1	1	A	285	2080	54	2.33	26	246	17.22	12.42	47.14	3.68	
4	1		2			739	2080	100	9.65	39	129	7.24	1.24	12.20	3.00	
5	1					154	Unrestricted	100	25.00	0	Unrestricted	13.86	0.00	0.00	0.00	
6	1					154	Unrestricted	100	25.00	0	Unrestricted	13.87	0.00	0.00	0.00	
7	1		1			285	1485	100	45.00	19	369	2.90	1.22	12.62	1.47	
8	1		3			229	1914	100	0.00	12	652	3.73	0.13	0.00	0.01	
9	1		1			90	1296	100	0.00	7	1196	4.33	0.13	2.10	0.05	
10	1		1	1	C	139	1885	20	0.00	35	156	40.37	36.17	85.43	3.30	
11	1					445	Unrestricted	100	30.00	0	Unrestricted	10.06	0.00	0.00	0.00	
12	1		1	1	B	229	1812	48	0.00	26	249	27.60	15.60	55.70	3.54	
13	1		1	1	B	95	2080	48	0.00	9	866	18.03	13.83	51.18	1.45	
14	1		1	1	B	66	2027	48	0.11	7	1251	17.84	13.64	51.13	1.45	
15	1		4			161	2080	100	0.00	8	1063	6.07	0.07	0.00	0.00	
16	1					510	Unrestricted	100	19.00	0	Unrestricted	14.21	0.00	0.00	0.00	
17	1					142	Unrestricted	100	27.00	0	Unrestricted	14.53	0.00	0.00	0.00	
18	1		1	1	C	81	1826	20	0.00	21	326	45.93	33.93	82.07	1.87	
19	1					283	Unrestricted	100	18.00	0	Unrestricted	12.00	0.00	0.00	0.00	
20	1		1			66	1089	100	51.00	6	1385	6.68	5.00	54.00	1.45	

Network Results

	Distance travelled (PCU-km/hr)	Time spent (PCU-hr/hr)	Mean journey speed (kph)	Total delay (PCU-hr/hr)	Weighted cost of delay (£ per hr)	Weighted cost of stops (£ per hr)	Excess queue penalty (£ per hr)	Performance Index (£ per hr)
Normal traffic	334.68	18.95	17.66	7.80	110.73	12.92	0.00	123.64
Bus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tram	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pedestrians								
TOTAL	334.68	18.95	17.66	7.80	110.73	12.92	0.00	123.64

- < = adjusted flow warning (upstream links/traffic streams are over-saturated)
- * = Traffic Stream - Normal, Bus or Tram Stop or Delay weighting has been set to a value other than 100%
- ^ = Traffic Stream - Normal, Bus or Tram Stop or Delay Path weighting has been set to a value other than 100%
- + = average link/traffic stream excess queue is greater than 0
- P.I. = PERFORMANCE INDEX

TRANSYT 15

Filename: Junction 1 2023 DS.t15
Path: C:\Users\shane.mcgivney\Desktop
Report generation date: 08/07/2019 13:46:31

File summary

File description

File title	2023 DS
Location	
Site number	
UTCRegion	
Driving side	Left
Date	11/06/2019
Version	
Status	(new file)
Identifier	
Client	
Jobnumber	
Enumerator	OCSC\shane.mcgivney
Description	

Model and Results

Enable controller offsets	Enable fuel consumption	Enable quick flares	Display journey time results	Display level of service results	Display blocking and starvation results	Display end of red and green queue results	Display excess queue results	Display separate uniform and random results	Display unweighted results	Display TRANSYT 12 style timings	Display effective greens in results	Display Red-With-Amber	Display End-Of-Green Amber

Units

Cost units	Speed units	Distance units	Fuel economy units	Fuel rate units	Mass units	Traffic units input	Traffic units results	Flow units	Average delay units	Total delay units	Rate of delay units
£	kph	m	mpg	l/h	kg	PCU	PCU	perHour	s	-Hour	perHour

Sorting

Show names instead of IDs	Sorting direction	Sorting type	Ignore prefixes when sorting	Analysis/demand set sorting	Link grouping	Source grouping	Colour Analysis/Demand Sets
	Ascending	Numerical		ID	Normal	Normal	✓

Network Diagrams

A1 - AM PEAK
D1 - AM PEAK*

Summary

Data Errors and Warnings

No errors or warnings

Run Summary

Analysis set used	Run start time	Run finish time	Modelling start time (HH:mm)	Network Cycle Time (s)	Performance Index (£ per hr)	Total network delay (PCU-hr/hr)	Highest DOS (%)	Item with highest DOS	Number of oversaturated items	Percentage of oversaturated items (%)	Item with worst signalised PRC	Item with worst unsignalised PRC	Ite wit wor over PR
1	08/07/2019 13:46:25	08/07/2019 13:46:25	08:00	100	130.20	8.23	42.30	10/1	0	0	10/1	4/1	10/

Analysis Set Details

Name	Description	Demand set	Include in report	Locked
AM PEAK		D1	✓	

Demand Set Details

Name	Description	Composite	Demand sets	Start time (HH:mm)	Locked
AM PEAK				08:00	

Network Options

Network timings

Network cycle time (s)	Restrict to SCOOT cycle times	Time segment length (min)	Number of time segments	Modelled time period (min)
100		60	1	60

Signals options

Start displacement (s)	End displacement (s)
2	3

Advanced

Phase minimum broken penalty (£)	Phase maximum broken penalty (£)	Intergreen broken penalty (£)	Starting Red-with-Amber (s)
10000.00	10000.00	10000.00	2

Traffic options

Traffic model	Vehicle flow scaling factor (%)	Pedestrian flow scaling factor (%)	Cruise times or speeds
Platoon Dispersion (PDM)	100	100	Cruise Speeds

Advanced

Resolution	DOS Threshold (%)	Cruise scaling factor (%)	Use link stop weightings	Use link delay weightings	Exclude pedestrians from results calculation	Random delay mode	Type of Vehicle-in-Service	Type of random parameter	PCU Length (m)	Calculate results for Path Segments	Generate PDM Profile Data
1	90	100	✓	✓		Complex	Uniform (TRANSYT)	Uniform (TRANSYT)	5.75		✓

Normal Traffic parameters

Dispersion type	Dispersion coefficient	Travel time coefficient
Default	35	80

Normal Traffic Types

Name	PCU Factor
Normal	1.00

Bus parameters

Name	PCU Factor	Dispersion type	Acceleration (ms^[-2])	Stationary time coefficient	Cruise time coefficient
Bus	1.00	Default	0.94	30	85

Tram parameters

Name	PCU Factor	Dispersion type	Acceleration (ms^[-2])	Stationary time coefficient	Cruise time coefficient
Tram	1.00	Default	0.94	100	100

Pedestrian parameters

Dispersion type
Default

Optimisation options

Enable optimisation	Auto redistribute	Optimisation level	Enable OUT Profile accuracy
	✓		✓

Advanced

Optimisation type	Hill climb increments	OUTProfile accuracy	Use enhanced optimisation	Auto optimisation order	Optimisation order	Master controller	Offsets relative to master controller	Master controller offset after each run
				✓				Do nothing

Economics

Vehicle Monetary Value Of Delay (£ per PCU-hr)	Vehicle Monetary Value Of Stops (£ per 100 stops)	Pedestrian monetary value of delay (£ per Ped-hr)
14.20	2.60	14.20

Arms and Traffic Streams

Arms

Arm	Name	Description	Traffic node
1			1
2			1
3			1
4			2
5			
6			
7			1
8			3
9			1
10			1
11			
12			1
13			1
14			1
15			4
16			
17			
18			1
19			
20			1

Traffic Streams

Arm	Traffic Stream	Name	Description	Auto length	Length (m)	Has Saturation Flow	Saturation flow source	Saturation flow (PCU/hr)	Auto-calculate cell saturation flow	Cell saturation flow (PCU/hr)	Is signal controlled	Is give way	Traffic type	Allow Nearside Turn On Red
1	1				100.00	✓	Sum of lanes	1788	✓	1800	✓		Normal	
2	1				40.00	✓	Sum of lanes	2080	✓	1800	✓		Normal	
3	1				40.00	✓	Sum of lanes	2080	✓	1800	✓		Normal	
4	1				50.00	✓	Sum of lanes	2080					Normal	
5	1			✓	115.49								Normal	
6	1			✓	115.59								Normal	
7	1				14.00	✓	Sum of lanes	1664	✓	1800		✓	Normal	
8	1				30.00	✓	Sum of lanes	1913					Normal	
9	1				35.00	✓	Sum of lanes	1554	✓	1800		✓	Normal	
10	1				35.00	✓	Sum of lanes	1880	✓	1800	✓		Normal	
11	1			✓	83.84								Normal	
12	1				100.00	✓	Sum of lanes	1812	✓	1800	✓		Normal	
13	1				35.00	✓	Sum of lanes	2080	✓	1800	✓		Normal	
14	1				35.00	✓	Sum of lanes	2027	✓	1800	✓		Normal	
15	1				50.00	✓	Sum of lanes	2080					Normal	
16	1			✓	118.42								Normal	
17	1			✓	121.12								Normal	
18	1				100.00	✓	Sum of lanes	1828			✓		Normal	
19	1				100.00								Normal	
20	1				14.00	✓	Sum of lanes	1664	✓	1800		✓	Normal	

Lanes

Arm	Traffic Stream	Lane	Name	Description	Use RR67	Surface condition	Site quality factor	Gradient (%)	Width (m)	Use connector turning radius	Proportion that turn (%)	Turning radius (m)	Nearside lane	Saturation flow (PCU/hr)
1	1	1	(untitled)		✓	N/A	N/A	0	3.25	✓	55	9.71	✓	1788
2	1	1	(untitled)		✓	N/A	N/A	0	3.25	✓	0	99999.00		2080
3	1	1	(untitled)		✓	N/A	N/A	0	3.25	✓	0	99999.00		2080
4	1	1	(untitled)		✓	N/A	N/A	0	3.25	✓	0	99999.00		2080
5	1	1	(untitled)											
6	1	1	(untitled)											
7	1	1	(untitled)		✓	N/A	N/A	0	3.25	✓	100	6.00		1664
8	1	1	(untitled)		✓	N/A	N/A	0	3.25	✓	63	66.82	✓	1913
9	1	1	(untitled)		✓	N/A	N/A	0	3.25	✓	100	6.05	✓	1554
10	1	1	(untitled)		✓	N/A	N/A	0	3.25	✓	46	21.54	✓	1880
11	1	1	(untitled)											
12	1	1	(untitled)		✓	N/A	N/A	0	3.25	✓	59	12.57	✓	1812
13	1	1	(untitled)		✓	N/A	N/A	0	3.25		0	100.00		2080
14	1	1	(untitled)		✓	N/A	N/A	0	3.25	✓	100	56.93		2027
15	1	1	(untitled)		✓	N/A	N/A	0	3.25	✓	0	99999.00		2080
16	1	1	(untitled)											
17	1	1	(untitled)											
18	1	1	(untitled)		✓	N/A	N/A	0	3.25	✓	67	16.38	✓	1828
19	1	1	(untitled)											
20	1	1	(untitled)		✓	N/A	N/A	0	3.25	✓	100	6.00		1664

Signals

Arm	Traffic Stream	Controller stream	Phase	Second phase enabled
1	1	1	A	
2	1	1	A	
3	1	1	A	
10	1	1	C	
12	1	1	B	
13	1	1	B	
14	1	1	B	
18	1	1	C	

Give Way Data

Arm	Traffic Stream	Opposed traffic	Use Step-wise Opposed Turn Model	Number of storage spaces	Use connector turning radius	Radius of turn (m)	Visibility restricted
7	1	Movement	✓	0	✓	6.00	
9	1	Movement	✓	0	✓	99999.00	
20	1	Movement	✓	0	✓	6.00	

Give Way Data - Movements

Arm	Traffic Stream	Movement	Destination traffic stream	Max Flow (Unopposed) (PCU/hr)	Percentage opposed (%)
7	1	1	11/1	1664	100
9	1	1	5/1	1554	100
		2	6/1	1554	100
20	1	1	19/1	1664	100

Give Way Data - Movements - Conflicts

Arm	Traffic Stream	Movement	Destination traffic stream	Description	Controlling type	Controlling from traffic stream	Controlling to traffic stream	Percentage opposing (%)	Upstream signals visible	Conflict shift	Conflict duration
7	1	1	11/1		TrafficStreamMovement	12/1	5/1	100		0	0
					TrafficStreamMovement	12/1	6/1	100		0	0
					TrafficStreamMovement	13/1	11/1	100		0	0
9	1	1	5/1		TrafficStreamMovement	18/1	5/1	100		0	0
					TrafficStreamMovement	13/1	5/1	100		0	0
		2	6/1		TrafficStreamMovement	18/1	6/1	100		0	0
					TrafficStreamMovement	12/1	6/1	100		0	0
20	1	1	19/1		TrafficStreamMovement	1/1	19/1	100		0	0
					TrafficStreamMovement	1/1	17/1	100		0	0
					TrafficStreamMovement	2/1	16/1	100		0	0

Signal Timings

Network Default: 100s cycle time; 100 steps

Interstage Matrix for Controller Stream 1

		To			
		1	2	3	4
From	1	0	0	5	0
	2	0	0	6	0
	3	6	6	0	0
	4	0	0	0	0

Resultant Stages

Controller stream	Resultant Stage	Is base stage	Library Stage ID	Phases in this stage	Stage start (s)	Stage end (s)	Stage duration (s)	User stage minimum (s)	Stage minimum (s)
1	1	✓	1	A	83	89	6	1	1
	2	✓	2	A,B	89	37	48	1	7
	3	✓	3	C	43	63	20	1	7
	4	✓	4	D	63	83	20	1	20

Final Prediction Table

Traffic Stream Results

				SIGNALS		FLOWS		PERFORMANCE				PER PCU			QUEUES
Arm	Traffic Stream	Name	Traffic node	Controller stream	Phase	Calculated flow entering (PCU/hr)	Calculated sat flow (PCU/hr)	Actual green (s (per cycle))	Wasted time total (s (per cycle))	Degree of saturation (%)	Practical reserve capacity (%)	JourneyTime (s)	Mean Delay per Veh (s)	Mean stops per Veh (%)	Mean max queue (PCU)
1	1		1	1	A	249	1788	54	0.00	25	255	24.39	12.39	49.61	3.43
2	1		1	1	A	454	2080	54	0.00	40	127	18.54	13.74	46.99	5.93
3	1		1	1	A	293	2080	54	3.65	27	228	17.36	12.56	48.05	3.79
4	1		2			747	2080	100	9.63	40	126	7.25	1.25	12.25	3.24
5	1					158	Unrestricted	100	23.00	0	Unrestricted	13.86	0.00	0.00	0.00
6	1					158	Unrestricted	100	23.00	0	Unrestricted	13.87	0.00	0.00	0.00
7	1		1			293	1485	100	45.00	20	356	2.98	1.30	12.25	1.47
8	1		3			265	1913	100	0.00	14	550	3.75	0.15	0.00	0.01
9	1		1			98	1296	100	0.00	8	1090	4.34	0.14	2.11	0.06
10	1		1	1	C	167	1880	20	0.00	42	113	41.81	37.61	86.30	4.00
11	1					457	Unrestricted	100	29.00	0	Unrestricted	10.06	0.00	0.00	0.00
12	1		1	1	B	232	1812	48	0.00	26	244	27.64	15.64	55.71	3.59
13	1		1	1	B	95	2080	48	0.00	9	866	18.03	13.83	51.18	1.45
14	1		1	1	B	66	2027	48	0.11	7	1251	17.84	13.64	51.13	1.45
15	1		4			161	2080	100	0.00	8	1063	6.07	0.07	0.00	0.00
16	1					520	Unrestricted	100	18.00	0	Unrestricted	14.21	0.00	0.00	0.00
17	1					152	Unrestricted	100	23.00	0	Unrestricted	14.53	0.00	0.00	0.00
18	1		1	1	C	82	1828	20	0.00	21	321	45.96	33.96	82.08	1.90
19	1					291	Unrestricted	100	17.00	0	Unrestricted	12.00	0.00	0.00	0.00
20	1		1			66	1089	100	51.00	6	1385	6.69	5.01	54.00	1.45

Network Results

	Distance travelled (PCU-km/hr)	Time spent (PCU-hr/hr)	Mean journey speed (kph)	Total delay (PCU-hr/hr)	Weighted cost of delay (£ per hr)	Weighted cost of stops (£ per hr)	Excess queue penalty (£ per hr)	Performance Index (£ per hr)
Normal traffic	343.38	19.67	17.45	8.23	116.84	13.36	0.00	130.20
Bus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tram	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pedestrians								
TOTAL	343.38	19.67	17.45	8.23	116.84	13.36	0.00	130.20

- *< = adjusted flow warning (upstream links/traffic streams are over-saturated)*
- ** = Traffic Stream - Normal, Bus or Tram Stop or Delay weighting has been set to a value other than 100%*
- *^ = Traffic Stream - Normal, Bus or Tram Stop or Delay Path weighting has been set to a value other than 100%*
- *+ = average link/traffic stream excess queue is greater than 0*
- ***P.I. = PERFORMANCE INDEX***

TRANSYT 15

Filename: Junction 1 2023 DS.t15
Path: C:\Users\shane.mcgivney\Desktop
Report generation date: 08/07/2019 13:47:03

File summary

File description

File title	2023 DS
Location	
Site number	
UTCRegion	
Driving side	Left
Date	11/06/2019
Version	
Status	(new file)
Identifier	
Client	
Jobnumber	
Enumerator	OCSC\shane.mcgivney
Description	

Model and Results

Enable controller offsets	Enable fuel consumption	Enable quick flares	Display journey time results	Display level of service results	Display blocking and starvation results	Display end of red and green queue results	Display excess queue results	Display separate uniform and random results	Display unweighted results	Display TRANSYT 12 style timings	Display effective greens in results	Display Red-With-Amber	Display End-Of-Green Amber

Units

Cost units	Speed units	Distance units	Fuel economy units	Fuel rate units	Mass units	Traffic units input	Traffic units results	Flow units	Average delay units	Total delay units	Rate of delay units
£	kph	m	mpg	l/h	kg	PCU	PCU	perHour	s	-Hour	perHour

Sorting

Show names instead of IDs	Sorting direction	Sorting type	Ignore prefixes when sorting	Analysis/demand set sorting	Link grouping	Source grouping	Colour Analysis/Demand Sets
	Ascending	Numerical		ID	Normal	Normal	✓

Network Diagrams

A2 - PM PEAK
D2 - PM PEAK*

Summary

Data Errors and Warnings

No errors or warnings

Run Summary

Analysis set used	Run start time	Run finish time	Modelling start time (HH:mm)	Network Cycle Time (s)	Performance Index (£ per hr)	Total network delay (PCU-hr/hr)	Highest DOS (%)	Item with highest DOS	Number of oversaturated items	Percentage of oversaturated items (%)	Item with worst signalised PRC	Item with worst unsignalised PRC	Ite wit wor over PR
2	08/07/2019 13:46:58	08/07/2019 13:46:58	08:00	100	139.61	9.03	67.38	18/1	0	0	18/1	8/1	18/

Analysis Set Details

Name	Description	Demand set	Include in report	Locked
PM PEAK		D2	✓	

Demand Set Details

Name	Description	Composite	Demand sets	Start time (HH:mm)	Locked
PM PEAK				08:00	

Network Options

Network timings

Network cycle time (s)	Restrict to SCOOT cycle times	Time segment length (min)	Number of time segments	Modelled time period (min)
100		60	1	60

Signals options

Start displacement (s)	End displacement (s)
2	3

Advanced

Phase minimum broken penalty (£)	Phase maximum broken penalty (£)	Intergreen broken penalty (£)	Starting Red-with-Amber (s)
10000.00	10000.00	10000.00	2

Traffic options

Traffic model	Vehicle flow scaling factor (%)	Pedestrian flow scaling factor (%)	Cruise times or speeds
Platoon Dispersion (PDM)	100	100	Cruise Speeds

Advanced

Resolution	DOS Threshold (%)	Cruise scaling factor (%)	Use link stop weightings	Use link delay weightings	Exclude pedestrians from results calculation	Random delay mode	Type of Vehicle-in-Service	Type of random parameter	PCU Length (m)	Calculate results for Path Segments	Generate PDM Profile Data
1	90	100	✓	✓		Complex	Uniform (TRANSYT)	Uniform (TRANSYT)	5.75		✓

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Normal Traffic parameters

Dispersion type	Dispersion coefficient	Travel time coefficient
Default	35	80

Normal Traffic Types

Name	PCU Factor
Normal	1.00

Bus parameters

Name	PCU Factor	Dispersion type	Acceleration (ms^[-2])	Stationary time coefficient	Cruise time coefficient
Bus	1.00	Default	0.94	30	85

Tram parameters

Name	PCU Factor	Dispersion type	Acceleration (ms^[-2])	Stationary time coefficient	Cruise time coefficient
Tram	1.00	Default	0.94	100	100

Pedestrian parameters

Dispersion type
Default

Optimisation options

Enable optimisation	Auto redistribute	Optimisation level	Enable OUT Profile accuracy
	✓		✓

Advanced

Optimisation type	Hill climb increments	OUTProfile accuracy	Use enhanced optimisation	Auto optimisation order	Optimisation order	Master controller	Offsets relative to master controller	Master controller offset after each run
				✓				Do nothing

Economics

Vehicle Monetary Value Of Delay (£ per PCU-hr)	Vehicle Monetary Value Of Stops (£ per 100 stops)	Pedestrian monetary value of delay (£ per Ped-hr)
14.20	2.60	14.20

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Arms and Traffic Streams

Arms

Arm	Name	Description	Traffic node
1			1
2			1
3			1
4			2
5			
6			
7			1
8			3
9			1
10			1
11			
12			1
13			1
14			1
15			4
16			
17			
18			1
19			
20			1

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Traffic Streams

Arm	Traffic Stream	Name	Description	Auto length	Length (m)	Has Saturation Flow	Saturation flow source	Saturation flow (PCU/hr)	Auto-calculate cell saturation flow	Cell saturation flow (PCU/hr)	Is signal controlled	Is give way	Traffic type	Allow Nearside Turn On Red
1	1				100.00	✓	Sum of lanes	1819	✓	1800	✓		Normal	
2	1				40.00	✓	Sum of lanes	2080	✓	1800	✓		Normal	
3	1				40.00	✓	Sum of lanes	2080	✓	1800	✓		Normal	
4	1				50.00	✓	Sum of lanes	2080					Normal	
5	1			✓	115.49								Normal	
6	1			✓	115.59								Normal	
7	1				14.00	✓	Sum of lanes	1664	✓	1800		✓	Normal	
8	1				30.00	✓	Sum of lanes	1924					Normal	
9	1				35.00	✓	Sum of lanes	1554	✓	1800		✓	Normal	
10	1				35.00	✓	Sum of lanes	1828	✓	1800	✓		Normal	
11	1			✓	83.84								Normal	
12	1				100.00	✓	Sum of lanes	1833	✓	1800	✓		Normal	
13	1				35.00	✓	Sum of lanes	2080	✓	1800	✓		Normal	
14	1				35.00	✓	Sum of lanes	2027	✓	1800	✓		Normal	
15	1				50.00	✓	Sum of lanes	2080					Normal	
16	1			✓	118.42								Normal	
17	1			✓	121.12								Normal	
18	1				100.00	✓	Sum of lanes	1795			✓		Normal	
19	1				100.00								Normal	
20	1				14.00	✓	Sum of lanes	1664	✓	1800		✓	Normal	

Lanes

Arm	Traffic Stream	Lane	Name	Description	Use RR67	Surface condition	Site quality factor	Gradient (%)	Width (m)	Use connector turning radius	Proportion that turn (%)	Turning radius (m)	Nearside lane	Saturation flow (PCU/hr)
1	1	1	(untitled)		✓	N/A	N/A	0	3.25	✓	43	9.71	✓	1819
2	1	1	(untitled)		✓	N/A	N/A	0	3.25	✓	0	99999.00		2080
3	1	1	(untitled)		✓	N/A	N/A	0	3.25	✓	0	99999.00		2080
4	1	1	(untitled)		✓	N/A	N/A	0	3.25	✓	0	99999.00		2080
5	1	1	(untitled)											
6	1	1	(untitled)											
7	1	1	(untitled)		✓	N/A	N/A	0	3.25	✓	100	6.00		1664
8	1	1	(untitled)		✓	N/A	N/A	0	3.25	✓	37	66.82	✓	1924
9	1	1	(untitled)		✓	N/A	N/A	0	3.25	✓	100	6.05	✓	1554
10	1	1	(untitled)		✓	N/A	N/A	0	3.25	✓	88	21.54	✓	1828
11	1	1	(untitled)											
12	1	1	(untitled)		✓	N/A	N/A	0	3.25	✓	49	12.57	✓	1833
13	1	1	(untitled)		✓	N/A	N/A	0	3.25		0	100.00		2080
14	1	1	(untitled)		✓	N/A	N/A	0	3.25	✓	100	56.93		2027
15	1	1	(untitled)		✓	N/A	N/A	0	3.25	✓	0	99999.00		2080
16	1	1	(untitled)											
17	1	1	(untitled)											
18	1	1	(untitled)		✓	N/A	N/A	0	3.25	✓	88	16.38	✓	1795
19	1	1	(untitled)											
20	1	1	(untitled)		✓	N/A	N/A	0	3.25	✓	100	6.00		1664

Signals

Arm	Traffic Stream	Controller stream	Phase	Second phase enabled
1	1	1	A	
2	1	1	A	
3	1	1	A	
10	1	1	C	
12	1	1	B	
13	1	1	B	
14	1	1	B	
18	1	1	C	

Give Way Data

Arm	Traffic Stream	Opposed traffic	Use Step-wise Opposed Turn Model	Number of storage spaces	Use connector turning radius	Radius of turn (m)	Visibility restricted
7	1	Movement	✓	0	✓	6.00	
9	1	Movement	✓	0	✓	99999.00	
20	1	Movement	✓	0	✓	6.00	

Give Way Data - Movements

Arm	Traffic Stream	Movement	Destination traffic stream	Max Flow (Unopposed) (PCU/hr)	Percentage opposed (%)
7	1	1	11/1	1664	100
9	1	1	5/1	1554	100
		2	6/1	1554	100
20	1	1	19/1	1664	100

Give Way Data - Movements - Conflicts

Arm	Traffic Stream	Movement	Destination traffic stream	Description	Controlling type	Controlling from traffic stream	Controlling to traffic stream	Percentage opposing (%)	Upstream signals visible	Conflict shift	Conflict duration
7	1	1	11/1		TrafficStreamMovement	12/1	5/1	100		0	0
					TrafficStreamMovement	12/1	6/1	100		0	0
					TrafficStreamMovement	13/1	11/1	100		0	0
9	1	1	5/1		TrafficStreamMovement	18/1	5/1	100		0	0
					TrafficStreamMovement	13/1	5/1	100		0	0
		2	6/1		TrafficStreamMovement	18/1	6/1	100		0	0
					TrafficStreamMovement	12/1	6/1	100		0	0
20	1	1	19/1		TrafficStreamMovement	1/1	19/1	100		0	0
					TrafficStreamMovement	1/1	17/1	100		0	0
					TrafficStreamMovement	2/1	16/1	100		0	0

Signal Timings

Network Default: 100s cycle time; 100 steps

Interstage Matrix for Controller Stream 1

		To			
		1	2	3	4
From	1	0	0	5	0
	2	0	0	6	0
	3	6	6	0	0
	4	0	0	0	0

Resultant Stages

Controller stream	Resultant Stage	Is base stage	Library Stage ID	Phases in this stage	Stage start (s)	Stage end (s)	Stage duration (s)	User stage minimum (s)	Stage minimum (s)
1	1	✓	1	A	83	89	6	1	1
	2	✓	2	A,B	89	37	48	1	7
	3	✓	3	C	43	63	20	1	7
	4	✓	4	D	63	83	20	1	20

Final Prediction Table

Traffic Stream Results

			SIGNALS			FLOWS		PERFORMANCE				PER PCU			QUEUES	
Arm	Traffic Stream	Name	Traffic node	Controller stream	Phase	Calculated flow entering (PCU/hr)	Calculated sat flow (PCU/hr)	Actual green (s (per cycle))	Wasted time total (s (per cycle))	Degree of saturation (%)	Practical reserve capacity (%)	JourneyTime (s)	Mean Delay per Veh (s)	Mean stops per Veh (%)	Mean max queue (PCU)	D wei mu
1	1		1	1	A	115	1819	54	0.00	11	683	23.04	11.04	46.73	1.51	
2	1		1	1	A	264	2080	54	0.00	23	290	16.97	12.17	49.47	3.63	
3	1		1	1	A	126	2080	54	0.44	11	711	15.91	11.11	47.17	1.65	
4	1		2			390	2080	100	0.00	19	380	6.20	0.20	0.00	0.02	
5	1					340	Unrestricted	100	0.00	0	Unrestricted	13.86	0.00	0.00	0.00	
6	1					340	Unrestricted	100	0.00	0	Unrestricted	13.87	0.00	0.00	0.00	
7	1		1			126	1488	100	45.00	8	963	1.85	0.17	2.78	1.45	
8	1		3			598	1924	100	0.00	31	190	4.02	0.42	0.00	0.07	
9	1		1			374	1248	100	0.00	30	200	4.93	0.73	3.02	1.51	
10	1		1	1	C	224	1828	20	0.00	58	54	46.28	42.08	91.39	5.69	
11	1					252	Unrestricted	100	24.00	0	Unrestricted	10.06	0.00	0.00	0.00	
12	1		1	1	B	195	1833	48	0.00	22	315	27.11	15.11	55.00	3.02	
13	1		1	1	B	99	2080	48	0.00	10	827	18.07	13.87	51.87	1.47	
14	1		1	1	B	41	2027	48	47.11	4	2075	17.62	13.42	51.08	1.45	
15	1		4			140	2080	100	0.00	7	1237	6.06	0.06	0.00	0.00	
16	1					478	Unrestricted	100	11.00	0	Unrestricted	14.21	0.00	0.00	0.00	
17	1					164	Unrestricted	100	20.00	0	Unrestricted	14.53	0.00	0.00	0.00	
18	1		1	1	C	254	1795	20	0.00	67	34	58.00	46.00	99.28	7.17	
19	1					118	Unrestricted	100	26.00	0	Unrestricted	12.00	0.00	0.00	0.00	
20	1		1			41	1337	100	97.00	3	2834	2.06	0.38	27.34	1.45	

Network Results

	Distance travelled (PCU-km/hr)	Time spent (PCU-hr/hr)	Mean journey speed (kph)	Total delay (PCU-hr/hr)	Weighted cost of delay (£ per hr)	Weighted cost of stops (£ per hr)	Excess queue penalty (£ per hr)	Performance Index (£ per hr)
Normal traffic	332.57	20.12	16.53	9.03	128.24	11.36	0.00	139.61
Bus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tram	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pedestrians								
TOTAL	332.57	20.12	16.53	9.03	128.24	11.36	0.00	139.61

- *< = adjusted flow warning (upstream links/traffic streams are over-saturated)*
- ** = Traffic Stream - Normal, Bus or Tram Stop or Delay weighting has been set to a value other than 100%*
- *^ = Traffic Stream - Normal, Bus or Tram Stop or Delay Path weighting has been set to a value other than 100%*
- *+ = average link/traffic stream excess queue is greater than 0*
- ***P.I. = PERFORMANCE INDEX***

TRANSYT 15

Version: 15.5.2.7994

For sales and distribution information, program advice and maintenance, contact TRL:
+44 (0)1344 379777 software@trl.co.uk www.trlsoftware.co.uk

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

Filename: Junction 1 2038 DM.t15
Path: C:\Users\shane.mcgivney\Desktop
Report generation date: 08/07/2019 13:57:20

File summary

File description

File title	2038 DMax
Location	
Site number	
UTCRegion	
Driving side	Left
Date	11/06/2019
Version	
Status	(new file)
Identifier	
Client	
Jobnumber	
Enumerator	OCSC\shane.mcgivney
Description	

Model and Results

Enable controller offsets	Enable fuel consumption	Enable quick flares	Display journey time results	Display level of service results	Display blocking and starvation results	Display end of red and green queue results	Display excess queue results	Display separate uniform and random results	Display unweighted results	Display TRANSYT 12 style timings	Display effective greens in results	Display Red-With-Amber	Display End-Of-Green Amber

Units

Cost units	Speed units	Distance units	Fuel economy units	Fuel rate units	Mass units	Traffic units input	Traffic units results	Flow units	Average delay units	Total delay units	Rate of delay units
£	kph	m	mpg	l/h	kg	PCU	PCU	perHour	s	-Hour	perHour

Sorting

Show names instead of IDs	Sorting direction	Sorting type	Ignore prefixes when sorting	Analysis/demand set sorting	Link grouping	Source grouping	Colour Analysis/Demand Sets
	Ascending	Numerical		ID	Normal	Normal	✓

Network Diagrams

A1 - AM PEAK
D1 - AM PEAK*

Summary

Data Errors and Warnings

No errors or warnings

Run Summary

Analysis set used	Run start time	Run finish time	Modelling start time (HH:mm)	Network Cycle Time (s)	Performance Index (£ per hr)	Total network delay (PCU-hr/hr)	Highest DOS (%)	Item with highest DOS	Number of oversaturated items	Percentage of oversaturated items (%)	Item with worst signalised PRC	Item with worst unsignalised PRC	Ite wit wor over PR
1	08/07/2019 13:57:14	08/07/2019 13:57:14	08:00	100	190.79	12.09	55.90	4/1	0	0	10/1	4/1	4/

Analysis Set Details

Name	Description	Demand set	Include in report	Locked
AM PEAK		D1	✓	

Demand Set Details

Name	Description	Composite	Demand sets	Start time (HH:mm)	Locked
AM PEAK				08:00	

Network Options

Network timings

Network cycle time (s)	Restrict to SCOOT cycle times	Time segment length (min)	Number of time segments	Modelled time period (min)
100		60	1	60

Signals options

Start displacement (s)	End displacement (s)
2	3

Advanced

Phase minimum broken penalty (£)	Phase maximum broken penalty (£)	Intergreen broken penalty (£)	Starting Red-with-Amber (s)
10000.00	10000.00	10000.00	2

Traffic options

Traffic model	Vehicle flow scaling factor (%)	Pedestrian flow scaling factor (%)	Cruise times or speeds
Platoon Dispersion (PDM)	100	100	Cruise Speeds

Advanced

Resolution	DOS Threshold (%)	Cruise scaling factor (%)	Use link stop weightings	Use link delay weightings	Exclude pedestrians from results calculation	Random delay mode	Type of Vehicle-in-Service	Type of random parameter	PCU Length (m)	Calculate results for Path Segments	Generate PDM Profile Data
1	90	100	✓	✓		Complex	Uniform (TRANSYT)	Uniform (TRANSYT)	5.75		✓

Normal Traffic parameters

Dispersion type	Dispersion coefficient	Travel time coefficient
Default	35	80

Normal Traffic Types

Name	PCU Factor
Normal	1.00

Bus parameters

Name	PCU Factor	Dispersion type	Acceleration (ms^[-2])	Stationary time coefficient	Cruise time coefficient
Bus	1.00	Default	0.94	30	85

Tram parameters

Name	PCU Factor	Dispersion type	Acceleration (ms^[-2])	Stationary time coefficient	Cruise time coefficient
Tram	1.00	Default	0.94	100	100

Pedestrian parameters

Dispersion type
Default

Optimisation options

Enable optimisation	Auto redistribute	Optimisation level	Enable OUT Profile accuracy
	✓		✓

Advanced

Optimisation type	Hill climb increments	OUTProfile accuracy	Use enhanced optimisation	Auto optimisation order	Optimisation order	Master controller	Offsets relative to master controller	Master controller offset after each run
				✓				Do nothing

Economics

Vehicle Monetary Value Of Delay (£ per PCU-hr)	Vehicle Monetary Value Of Stops (£ per 100 stops)	Pedestrian monetary value of delay (£ per Ped-hr)
14.20	2.60	14.20

Arms and Traffic Streams

Arms

Arm	Name	Description	Traffic node
1			1
2			1
3			1
4			2
5			
6			
7			1
8			3
9			1
10			1
11			
12			1
13			1
14			1
15			4
16			
17			
18			1
19			
20			1

Traffic Streams

Arm	Traffic Stream	Name	Description	Auto length	Length (m)	Has Saturation Flow	Saturation flow source	Saturation flow (PCU/hr)	Auto-calculate cell saturation flow	Cell saturation flow (PCU/hr)	Is signal controlled	Is give way	Traffic type	Allow Nearside Turn On Red
1	1				100.00	✓	Sum of lanes	1791	✓	1800	✓		Normal	
2	1				40.00	✓	Sum of lanes	2080	✓	1800	✓		Normal	
3	1				40.00	✓	Sum of lanes	2080	✓	1800	✓		Normal	
4	1				50.00	✓	Sum of lanes	2080					Normal	
5	1			✓	115.49								Normal	
6	1			✓	115.59								Normal	
7	1				14.00	✓	Sum of lanes	1664	✓	1800		✓	Normal	
8	1				30.00	✓	Sum of lanes	1914					Normal	
9	1				35.00	✓	Sum of lanes	1554	✓	1800		✓	Normal	
10	1				35.00	✓	Sum of lanes	1875	✓	1800	✓		Normal	
11	1			✓	83.84								Normal	
12	1				100.00	✓	Sum of lanes	1788	✓	1800	✓		Normal	
13	1				35.00	✓	Sum of lanes	2080	✓	1800	✓		Normal	
14	1				35.00	✓	Sum of lanes	2027	✓	1800	✓		Normal	
15	1				50.00	✓	Sum of lanes	2080					Normal	
16	1			✓	118.42								Normal	
17	1			✓	121.12								Normal	
18	1				100.00	✓	Sum of lanes	1826			✓		Normal	
19	1				100.00								Normal	
20	1				14.00	✓	Sum of lanes	1664	✓	1800		✓	Normal	

Lanes

Arm	Traffic Stream	Lane	Name	Description	Use RR67	Surface condition	Site quality factor	Gradient (%)	Width (m)	Use connector turning radius	Proportion that turn (%)	Turning radius (m)	Nearside lane	Saturation flow (PCU/hr)
1	1	1	(untitled)		✓	N/A	N/A	0	3.25	✓	54	9.71	✓	1791
2	1	1	(untitled)		✓	N/A	N/A	0	3.25	✓	0	99999.00		2080
3	1	1	(untitled)		✓	N/A	N/A	0	3.25	✓	0	99999.00		2080
4	1	1	(untitled)		✓	N/A	N/A	0	3.25	✓	0	99999.00		2080
5	1	1	(untitled)											
6	1	1	(untitled)											
7	1	1	(untitled)		✓	N/A	N/A	0	3.25	✓	100	6.00		1664
8	1	1	(untitled)		✓	N/A	N/A	0	3.25	✓	60	66.82	✓	1914
9	1	1	(untitled)		✓	N/A	N/A	0	3.25	✓	100	6.05	✓	1554
10	1	1	(untitled)		✓	N/A	N/A	0	3.25	✓	50	21.54	✓	1875
11	1	1	(untitled)											
12	1	1	(untitled)		✓	N/A	N/A	0	3.25	✓	71	12.57	✓	1788
13	1	1	(untitled)		✓	N/A	N/A	0	3.25		0	100.00		2080
14	1	1	(untitled)		✓	N/A	N/A	0	3.25	✓	100	56.93		2027
15	1	1	(untitled)		✓	N/A	N/A	0	3.25	✓	0	99999.00		2080
16	1	1	(untitled)											
17	1	1	(untitled)											
18	1	1	(untitled)		✓	N/A	N/A	0	3.25	✓	68	16.38	✓	1826
19	1	1	(untitled)											
20	1	1	(untitled)		✓	N/A	N/A	0	3.25	✓	100	6.00		1664

Signals

Arm	Traffic Stream	Controller stream	Phase	Second phase enabled
1	1	1	A	
2	1	1	A	
3	1	1	A	
10	1	1	C	
12	1	1	B	
13	1	1	B	
14	1	1	B	
18	1	1	C	

Give Way Data

Arm	Traffic Stream	Opposed traffic	Use Step-wise Opposed Turn Model	Number of storage spaces	Use connector turning radius	Radius of turn (m)	Visibility restricted
7	1	Movement	✓	0	✓	6.00	
9	1	Movement	✓	0	✓	99999.00	
20	1	Movement	✓	0	✓	6.00	

Give Way Data - Movements

Arm	Traffic Stream	Movement	Destination traffic stream	Max Flow (Unopposed) (PCU/hr)	Percentage opposed (%)
7	1	1	11/1	1664	100
9	1	1	5/1	1554	100
		2	6/1	1554	100
20	1	1	19/1	1664	100

Give Way Data - Movements - Conflicts

Arm	Traffic Stream	Movement	Destination traffic stream	Description	Controlling type	Controlling from traffic stream	Controlling to traffic stream	Percentage opposing (%)	Upstream signals visible	Conflict shift	Conflict duration
7	1	1	11/1		TrafficStreamMovement	12/1	5/1	100		0	0
					TrafficStreamMovement	12/1	6/1	100		0	0
					TrafficStreamMovement	13/1	11/1	100		0	0
9	1	1	5/1		TrafficStreamMovement	18/1	5/1	100		0	0
					TrafficStreamMovement	13/1	5/1	100		0	0
		2	6/1		TrafficStreamMovement	18/1	6/1	100		0	0
					TrafficStreamMovement	12/1	6/1	100		0	0
20	1	1	19/1		TrafficStreamMovement	1/1	19/1	100		0	0
					TrafficStreamMovement	1/1	17/1	100		0	0
					TrafficStreamMovement	2/1	16/1	100		0	0

Signal Timings

Network Default: 100s cycle time; 100 steps

Interstage Matrix for Controller Stream 1

		To			
		1	2	3	4
From	1	0	0	5	0
	2	0	0	6	0
	3	6	6	0	0
	4	0	0	0	0

Resultant Stages

Controller stream	Resultant Stage	Is base stage	Library Stage ID	Phases in this stage	Stage start (s)	Stage end (s)	Stage duration (s)	User stage minimum (s)	Stage minimum (s)
1	1	✓	1	A	83	89	6	1	1
	2	✓	2	A,B	89	37	48	1	7
	3	✓	3	C	43	63	20	1	7
	4	✓	4	D	63	83	20	1	20

Final Prediction Table

Traffic Stream Results

				SIGNALS		FLOWS		PERFORMANCE				PER PCU			QUEUES	
Arm	Traffic Stream	Name	Traffic node	Controller stream	Phase	Calculated flow entering (PCU/hr)	Calculated sat flow (PCU/hr)	Actual green (s (per cycle))	Wasted time total (s (per cycle))	Degree of saturation (%)	Practical reserve capacity (%)	JourneyTime (s)	Mean Delay per Veh (s)	Mean stops per Veh (%)	Mean max queue (PCU)	D wei mu
1	1		1	1	A	286	1791	54	0.00	29	210	24.80	12.80	49.75	3.95	
2	1		1	1	A	525	2080	54	0.00	46	96	18.35	13.55	41.08	5.99	
3	1		1	1	A	453	2080	54	11.71	50	79	20.41	15.61	52.20	5.26	
4	1		2			978	2080	100	15.89	56	61	9.41	3.41	26.63	8.23	
5	1					196	Unrestricted	100	0.00	0	Unrestricted	13.86	0.00	0.00	0.00	
6	1					196	Unrestricted	100	0.00	0	Unrestricted	13.87	0.00	0.00	0.00	
7	1		1			453	1458	100	45.00	31	190	3.37	1.69	7.12	1.52	
8	1		3			336	1914	100	0.00	18	413	3.80	0.20	0.00	0.02	
9	1		1			134	1267	100	0.00	11	751	4.42	0.22	2.83	1.46	
10	1		1	1	C	202	1875	20	0.00	51	75	44.01	39.81	89.71	5.04	
11	1					752	Unrestricted	100	28.00	0	Unrestricted	10.06	0.00	0.00	0.00	
12	1		1	1	B	380	1788	48	0.00	43	108	30.09	18.09	61.11	6.46	
13	1		1	1	B	112	2080	48	0.00	11	719	18.17	13.97	53.20	1.66	
14	1		1	1	B	75	2027	48	0.22	8	1086	17.94	13.74	51.15	1.45	
15	1		4			187	2080	100	0.00	9	901	6.09	0.09	0.00	0.00	
16	1					608	Unrestricted	100	16.00	0	Unrestricted	14.21	0.00	0.00	0.00	
17	1					182	Unrestricted	100	20.00	0	Unrestricted	14.53	0.00	0.00	0.00	
18	1		1	1	C	97	1826	20	0.00	25	256	46.56	34.56	83.39	2.28	
19	1					330	Unrestricted	100	16.00	0	Unrestricted	12.00	0.00	0.00	0.00	
20	1		1			75	1002	100	51.00	7	1103	9.68	8.00	54.92	1.45	

Network Results

	Distance travelled (PCU-km/hr)	Time spent (PCU-hr/hr)	Mean journey speed (kph)	Total delay (PCU-hr/hr)	Weighted cost of delay (£ per hr)	Weighted cost of stops (£ per hr)	Excess queue penalty (£ per hr)	Performance Index (£ per hr)
Normal traffic	444.83	26.92	16.53	12.09	171.68	19.11	0.00	190.79
Bus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tram	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pedestrians								
TOTAL	444.83	26.92	16.53	12.09	171.68	19.11	0.00	190.79

- *< = adjusted flow warning (upstream links/traffic streams are over-saturated)*
- ** = Traffic Stream - Normal, Bus or Tram Stop or Delay weighting has been set to a value other than 100%*
- *^ = Traffic Stream - Normal, Bus or Tram Stop or Delay Path weighting has been set to a value other than 100%*
- *+ = average link/traffic stream excess queue is greater than 0*
- ***P.I. = PERFORMANCE INDEX***

TRANSYT 15

Filename: Junction 1 2038 DM OPTIM.t15
Path: C:\Users\shane.mcgivney\Desktop
Report generation date: 08/07/2019 13:58:19

File summary

File description

File title	2038 DM OPTIM
Location	
Site number	
UTCRegion	
Driving side	Left
Date	11/06/2019
Version	
Status	(new file)
Identifier	
Client	
Jobnumber	
Enumerator	OCSC\shane.mcgivney
Description	

Model and Results

Enable controller offsets	Enable fuel consumption	Enable quick flares	Display journey time results	Display level of service results	Display blocking and starvation results	Display end of red and green queue results	Display excess queue results	Display separate uniform and random results	Display unweighted results	Display TRANSYT 12 style timings	Display effective greens in results	Display Red-With-Amber	Display End-Of-Green Amber

Units

Cost units	Speed units	Distance units	Fuel economy units	Fuel rate units	Mass units	Traffic units input	Traffic units results	Flow units	Average delay units	Total delay units	Rate of delay units
£	kph	m	mpg	l/h	kg	PCU	PCU	perHour	s	-Hour	perHour

Sorting

Show names instead of IDs	Sorting direction	Sorting type	Ignore prefixes when sorting	Analysis/demand set sorting	Link grouping	Source grouping	Colour Analysis/Demand Sets
	Ascending	Numerical		ID	Normal	Normal	✓

Network Diagrams

A1 - AM PEAK
D1 - AM PEAK*

Summary

Data Errors and Warnings

No errors or warnings

Run Summary

Analysis set used	Run start time	Run finish time	Modelling start time (HH:mm)	Network Cycle Time (s)	Performance Index (£ per hr)	Total network delay (PCU-hr/hr)	Highest DOS (%)	Item with highest DOS	Number of oversaturated items	Percentage of oversaturated items (%)	Item with worst signalised PRC	Item with worst unsignalised PRC	Ite wit wor over PR
1	08/07/2019 13:58:15	08/07/2019 13:58:15	08:00	100	169.89	10.78	71.82	10/1	0	0	10/1	4/1	10/

Analysis Set Details

Name	Description	Demand set	Include in report	Locked
AM PEAK		D1	✓	

Demand Set Details

Name	Description	Composite	Demand sets	Start time (HH:mm)	Locked
AM PEAK				08:00	

Network Options

Network timings

Network cycle time (s)	Restrict to SCOOT cycle times	Time segment length (min)	Number of time segments	Modelled time period (min)
100		60	1	60

Signals options

Start displacement (s)	End displacement (s)
2	3

Advanced

Phase minimum broken penalty (£)	Phase maximum broken penalty (£)	Intergreen broken penalty (£)	Starting Red-with-Amber (s)
10000.00	10000.00	10000.00	2

Traffic options

Traffic model	Vehicle flow scaling factor (%)	Pedestrian flow scaling factor (%)	Cruise times or speeds
Platoon Dispersion (PDM)	100	100	Cruise Speeds

Advanced

Resolution	DOS Threshold (%)	Cruise scaling factor (%)	Use link stop weightings	Use link delay weightings	Exclude pedestrians from results calculation	Random delay mode	Type of Vehicle-in-Service	Type of random parameter	PCU Length (m)	Calculate results for Path Segments	Generate PDM Profile Data
1	90	100	✓	✓		Complex	Uniform (TRANSYT)	Uniform (TRANSYT)	5.75		✓

Normal Traffic parameters

Dispersion type	Dispersion coefficient	Travel time coefficient
Default	35	80

Normal Traffic Types

Name	PCU Factor
Normal	1.00

Bus parameters

Name	PCU Factor	Dispersion type	Acceleration (ms^[-2])	Stationary time coefficient	Cruise time coefficient
Bus	1.00	Default	0.94	30	85

Tram parameters

Name	PCU Factor	Dispersion type	Acceleration (ms^[-2])	Stationary time coefficient	Cruise time coefficient
Tram	1.00	Default	0.94	100	100

Pedestrian parameters

Dispersion type
Default

Optimisation options

Enable optimisation	Auto redistribute	Optimisation level	Enable OUT Profile accuracy
✓	✓	Extended - Offsets And Green Splits	✓

Advanced

Optimisation type	Hill climb increments	OUTProfile accuracy	Use enhanced optimisation	Auto optimisation order	Optimisation order	Master controller	Offsets relative to master controller	Master controller offset after each run
Hill Climb (Fast)	15, 40, -1, 15, 40, 1, -1, 1, -15, -5, -1, 15, 1	50, 50, 5, 5, 0.5, 0.5, 0.05, 0.05, 0.05, 0.05, 0.05, 0.05, 0.05		✓	1			Do nothing

Economics

Vehicle Monetary Value Of Delay (£ per PCU-hr)	Vehicle Monetary Value Of Stops (£ per 100 stops)	Pedestrian monetary value of delay (£ per Ped-hr)
14.20	2.60	14.20

Arms and Traffic Streams

Arms

Arm	Name	Description	Traffic node
1			1
2			1
3			1
4			2
5			
6			
7			1
8			3
9			1
10			1
11			
12			1
13			1
14			1
15			4
16			
17			
18			1
19			
20			1

Traffic Streams

Arm	Traffic Stream	Name	Description	Auto length	Length (m)	Has Saturation Flow	Saturation flow source	Saturation flow (PCU/hr)	Auto-calculate cell saturation flow	Cell saturation flow (PCU/hr)	Is signal controlled	Is give way	Traffic type	Allow Nearside Turn On Red
1	1				100.00	✓	Sum of lanes	1791	✓	1800	✓		Normal	
2	1				40.00	✓	Sum of lanes	2080	✓	1800	✓		Normal	
3	1				40.00	✓	Sum of lanes	2080	✓	1800	✓		Normal	
4	1				50.00	✓	Sum of lanes	2080					Normal	
5	1			✓	115.49								Normal	
6	1			✓	115.59								Normal	
7	1				14.00	✓	Sum of lanes	1664	✓	1800		✓	Normal	
8	1				30.00	✓	Sum of lanes	1914					Normal	
9	1				35.00	✓	Sum of lanes	1554	✓	1800		✓	Normal	
10	1				35.00	✓	Sum of lanes	1875	✓	1800	✓		Normal	
11	1			✓	83.84								Normal	
12	1				100.00	✓	Sum of lanes	1788	✓	1800	✓		Normal	
13	1				35.00	✓	Sum of lanes	2080	✓	1800	✓		Normal	
14	1				35.00	✓	Sum of lanes	2027	✓	1800	✓		Normal	
15	1				50.00	✓	Sum of lanes	2080					Normal	
16	1			✓	118.42								Normal	
17	1			✓	121.12								Normal	
18	1				100.00	✓	Sum of lanes	1826			✓		Normal	
19	1				100.00								Normal	
20	1				14.00	✓	Sum of lanes	1664	✓	1800		✓	Normal	

Lanes

Arm	Traffic Stream	Lane	Name	Description	Use RR67	Surface condition	Site quality factor	Gradient (%)	Width (m)	Use connector turning radius	Proportion that turn (%)	Turning radius (m)	Nearside lane	Saturation flow (PCU/hr)
1	1	1	(untitled)		✓	N/A	N/A	0	3.25	✓	54	9.71	✓	1791
2	1	1	(untitled)		✓	N/A	N/A	0	3.25	✓	0	99999.00		2080
3	1	1	(untitled)		✓	N/A	N/A	0	3.25	✓	0	99999.00		2080
4	1	1	(untitled)		✓	N/A	N/A	0	3.25	✓	0	99999.00		2080
5	1	1	(untitled)											
6	1	1	(untitled)											
7	1	1	(untitled)		✓	N/A	N/A	0	3.25	✓	100	6.00		1664
8	1	1	(untitled)		✓	N/A	N/A	0	3.25	✓	60	66.82	✓	1914
9	1	1	(untitled)		✓	N/A	N/A	0	3.25	✓	100	6.05	✓	1554
10	1	1	(untitled)		✓	N/A	N/A	0	3.25	✓	50	21.54	✓	1875
11	1	1	(untitled)											
12	1	1	(untitled)		✓	N/A	N/A	0	3.25	✓	71	12.57	✓	1788
13	1	1	(untitled)		✓	N/A	N/A	0	3.25		0	100.00		2080
14	1	1	(untitled)		✓	N/A	N/A	0	3.25	✓	100	56.93		2027
15	1	1	(untitled)		✓	N/A	N/A	0	3.25	✓	0	99999.00		2080
16	1	1	(untitled)											
17	1	1	(untitled)											
18	1	1	(untitled)		✓	N/A	N/A	0	3.25	✓	68	16.38	✓	1826
19	1	1	(untitled)											
20	1	1	(untitled)		✓	N/A	N/A	0	3.25	✓	100	6.00		1664

Signals

Arm	Traffic Stream	Controller stream	Phase	Second phase enabled
1	1	1	A	
2	1	1	A	
3	1	1	A	
10	1	1	C	
12	1	1	B	
13	1	1	B	
14	1	1	B	
18	1	1	C	

Give Way Data

Arm	Traffic Stream	Opposed traffic	Use Step-wise Opposed Turn Model	Number of storage spaces	Use connector turning radius	Radius of turn (m)	Visibility restricted
7	1	Movement	✓	0	✓	6.00	
9	1	Movement	✓	0	✓	99999.00	
20	1	Movement	✓	0	✓	6.00	

Give Way Data - Movements

Arm	Traffic Stream	Movement	Destination traffic stream	Max Flow (Unopposed) (PCU/hr)	Percentage opposed (%)
7	1	1	11/1	1664	100
9	1	1	5/1	1554	100
		2	6/1	1554	100
20	1	1	19/1	1664	100

Give Way Data - Movements - Conflicts

Arm	Traffic Stream	Movement	Destination traffic stream	Description	Controlling type	Controlling from traffic stream	Controlling to traffic stream	Percentage opposing (%)	Upstream signals visible	Conflict shift	Conflict duration
7	1	1	11/1		TrafficStreamMovement	12/1	5/1	100		0	0
					TrafficStreamMovement	12/1	6/1	100		0	0
					TrafficStreamMovement	13/1	11/1	100		0	0
9	1	1	5/1		TrafficStreamMovement	18/1	5/1	100		0	0
					TrafficStreamMovement	13/1	5/1	100		0	0
		2	6/1		TrafficStreamMovement	18/1	6/1	100		0	0
					TrafficStreamMovement	12/1	6/1	100		0	0
20	1	1	19/1		TrafficStreamMovement	1/1	19/1	100		0	0
					TrafficStreamMovement	1/1	17/1	100		0	0
					TrafficStreamMovement	2/1	16/1	100		0	0

Signal Timings

Network Default: 100s cycle time; 100 steps

Interstage Matrix for Controller Stream 1

		To			
		1	2	3	4
From	1	0	0	5	0
	2	0	0	6	0
	3	6	6	0	0
	4	0	0	0	0

Resultant Stages

Controller stream	Resultant Stage	Is base stage	Library Stage ID	Phases in this stage	Stage start (s)	Stage end (s)	Stage duration (s)	User stage minimum (s)	Stage minimum (s)
1	1	✓	1	A	83	84	1	1	1
	2	✓	2	A,B	84	43	59	1	7
	3	✓	3	C	49	63	14	1	7
	4	✓	4	D	63	83	20	1	20

Final Prediction Table

Traffic Stream Results

				SIGNALS		FLOWS		PERFORMANCE				PER PCU			QUEUES	
Arm	Traffic Stream	Name	Traffic node	Controller stream	Phase	Calculated flow entering (PCU/hr)	Calculated sat flow (PCU/hr)	Actual green (s (per cycle))	Wasted time total (s (per cycle))	Degree of saturation (%)	Practical reserve capacity (%)	JourneyTime (s)	Mean Delay per Veh (s)	Mean stops per Veh (%)	Mean max queue (PCU)	we m
1	1		1	1	A	286	1791	60	0.00	26	244	21.64	9.64	43.57	3.46	
2	1		1	1	A	525	2080	60	0.00	41	118	15.63	10.83	40.74	5.94	
3	1		1	1	A	453	2080	60	10.41	43	109	18.02	13.22	49.15	5.16	
4	1		2			978	2080	100	9.89	52	72	7.80	1.80	15.10	5.17	
5	1					196	Unrestricted	100	0.00	0	Unrestricted	13.86	0.00	0.00	0.00	
6	1					196	Unrestricted	100	0.00	0	Unrestricted	13.87	0.00	0.00	0.00	
7	1		1			453	1451	100	39.00	31	188	3.25	1.57	7.12	1.52	
8	1		3			336	1914	100	0.00	18	413	3.80	0.20	0.00	0.02	
9	1		1			134	1267	100	0.00	11	751	4.40	0.20	2.17	0.08	
10	1		1	1	C	202	1875	14	0.00	72	25	60.45	56.25	106.08	5.99	
11	1					752	Unrestricted	100	22.00	0	Unrestricted	10.06	0.00	0.00	0.00	
12	1		1	1	B	380	1788	59	0.00	35	154	23.08	11.08	47.18	4.99	
13	1		1	1	B	112	2080	59	0.00	9	903	12.82	8.62	40.14	1.45	
14	1		1	1	B	75	2027	59	0.11	6	1357	12.67	8.47	40.10	1.45	
15	1		4			187	2080	100	0.00	9	901	6.09	0.09	0.00	0.00	
16	1					608	Unrestricted	100	13.00	0	Unrestricted	14.21	0.00	0.00	0.00	
17	1					182	Unrestricted	100	16.00	0	Unrestricted	14.53	0.00	0.00	0.00	
18	1		1	1	C	97	1826	14	0.00	35	154	53.75	41.75	91.37	2.49	
19	1					330	Unrestricted	100	13.00	0	Unrestricted	12.00	0.00	0.00	0.00	
20	1		1			75	971	100	40.00	8	1065	9.44	7.76	48.34	1.45	

Network Results

	Distance travelled (PCU-km/hr)	Time spent (PCU-hr/hr)	Mean journey speed (kph)	Total delay (PCU-hr/hr)	Weighted cost of delay (£ per hr)	Weighted cost of stops (£ per hr)	Excess queue penalty (£ per hr)	Performance Index (£ per hr)
Normal traffic	444.83	25.61	17.37	10.78	153.12	16.77	0.00	169.89
Bus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tram	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pedestrians								
TOTAL	444.83	25.61	17.37	10.78	153.12	16.77	0.00	169.89

- *< = adjusted flow warning (upstream links/traffic streams are over-saturated)*
- ** = Traffic Stream - Normal, Bus or Tram Stop or Delay weighting has been set to a value other than 100%*
- *^ = Traffic Stream - Normal, Bus or Tram Stop or Delay Path weighting has been set to a value other than 100%*
- *+ = average link/traffic stream excess queue is greater than 0*
- ***P.I. = PERFORMANCE INDEX***

TRANSYT 15

Filename: Junction 1 2038 DM OPTIM.t15
Path: C:\Users\shane.mcgivney\Desktop
Report generation date: 08/07/2019 13:58:43

File summary

File description

File title	2038 DM OPTIM
Location	
Site number	
UTCRegion	
Driving side	Left
Date	11/06/2019
Version	
Status	(new file)
Identifier	
Client	
Jobnumber	
Enumerator	OCSC\shane.mcgivney
Description	

Model and Results

Enable controller offsets	Enable fuel consumption	Enable quick flares	Display journey time results	Display level of service results	Display blocking and starvation results	Display end of red and green queue results	Display excess queue results	Display separate uniform and random results	Display unweighted results	Display TRANSYT 12 style timings	Display effective greens in results	Display Red-With-Amber	Display End-Of-Green Amber

Units

Cost units	Speed units	Distance units	Fuel economy units	Fuel rate units	Mass units	Traffic units input	Traffic units results	Flow units	Average delay units	Total delay units	Rate of delay units
£	kph	m	mpg	l/h	kg	PCU	PCU	perHour	s	-Hour	perHour

Sorting

Show names instead of IDs	Sorting direction	Sorting type	Ignore prefixes when sorting	Analysis/demand set sorting	Link grouping	Source grouping	Colour Analysis/Demand Sets
	Ascending	Numerical		ID	Normal	Normal	✓

Network Diagrams

A2 - PM PEAK
D2 - PM PEAK*

Summary

Data Errors and Warnings

No errors or warnings

Run Summary

Analysis set used	Run start time	Run finish time	Modelling start time (HH:mm)	Network Cycle Time (s)	Performance Index (£ per hr)	Total network delay (PCU-hr/hr)	Highest DOS (%)	Item with highest DOS	Number of oversaturated items	Percentage of oversaturated items (%)	Item with worst signalised PRC	Item with worst unsignalised PRC	Ite wit wor over PR
2	08/07/2019 13:58:39	08/07/2019 13:58:40	08:00	100	192.33	12.25	53.77	8/1	0	0	10/1	8/1	8/

Analysis Set Details

Name	Description	Demand set	Include in report	Locked
PM PEAK		D2	✓	

Demand Set Details

Name	Description	Composite	Demand sets	Start time (HH:mm)	Locked
PM PEAK				08:00	

Network Options

Network timings

Network cycle time (s)	Restrict to SCOOT cycle times	Time segment length (min)	Number of time segments	Modelled time period (min)
100		60	1	60

Signals options

Start displacement (s)	End displacement (s)
2	3

Advanced

Phase minimum broken penalty (£)	Phase maximum broken penalty (£)	Intergreen broken penalty (£)	Starting Red-with-Amber (s)
10000.00	10000.00	10000.00	2

Traffic options

Traffic model	Vehicle flow scaling factor (%)	Pedestrian flow scaling factor (%)	Cruise times or speeds
Platoon Dispersion (PDM)	100	100	Cruise Speeds

Advanced

Resolution	DOS Threshold (%)	Cruise scaling factor (%)	Use link stop weightings	Use link delay weightings	Exclude pedestrians from results calculation	Random delay mode	Type of Vehicle-in-Service	Type of random parameter	PCU Length (m)	Calculate results for Path Segments	Generate PDM Profile Data
1	90	100	✓	✓		Complex	Uniform (TRANSYT)	Uniform (TRANSYT)	5.75		✓

Normal Traffic parameters

Dispersion type	Dispersion coefficient	Travel time coefficient
Default	35	80

Normal Traffic Types

Name	PCU Factor
Normal	1.00

Bus parameters

Name	PCU Factor	Dispersion type	Acceleration (ms^[-2])	Stationary time coefficient	Cruise time coefficient
Bus	1.00	Default	0.94	30	85

Tram parameters

Name	PCU Factor	Dispersion type	Acceleration (ms^[-2])	Stationary time coefficient	Cruise time coefficient
Tram	1.00	Default	0.94	100	100

Pedestrian parameters

Dispersion type
Default

Optimisation options

Enable optimisation	Auto redistribute	Optimisation level	Enable OUT Profile accuracy
✓	✓	Extended - Offsets And Green Splits	✓

Advanced

Optimisation type	Hill climb increments	OUTProfile accuracy	Use enhanced optimisation	Auto optimisation order	Optimisation order	Master controller	Offsets relative to master controller	Master controller offset after each run
Hill Climb (Fast)	15, 40, -1, 15, 40, 1, -1, 1, -15, -5, -1, 15, 1	50, 50, 5, 5, 0.5, 0.5, 0.05, 0.05, 0.05, 0.05, 0.05, 0.05, 0.05		✓	1			Do nothing

Economics

Vehicle Monetary Value Of Delay (£ per PCU-hr)	Vehicle Monetary Value Of Stops (£ per 100 stops)	Pedestrian monetary value of delay (£ per Ped-hr)
14.20	2.60	14.20

Arms and Traffic Streams

Arms

Arm	Name	Description	Traffic node
1			1
2			1
3			1
4			2
5			
6			
7			1
8			3
9			1
10			1
11			
12			1
13			1
14			1
15			4
16			
17			
18			1
19			
20			1

Traffic Streams

Arm	Traffic Stream	Name	Description	Auto length	Length (m)	Has Saturation Flow	Saturation flow source	Saturation flow (PCU/hr)	Auto-calculate cell saturation flow	Cell saturation flow (PCU/hr)	Is signal controlled	Is give way	Traffic type	Allow Nearside Turn On Red
1	1				100.00	✓	Sum of lanes	1822	✓	1800	✓		Normal	
2	1				40.00	✓	Sum of lanes	2080	✓	1800	✓		Normal	
3	1				40.00	✓	Sum of lanes	2080	✓	1800	✓		Normal	
4	1				50.00	✓	Sum of lanes	2080					Normal	
5	1			✓	115.49								Normal	
6	1			✓	115.59								Normal	
7	1				14.00	✓	Sum of lanes	1664	✓	1800		✓	Normal	
8	1				30.00	✓	Sum of lanes	1923					Normal	
9	1				35.00	✓	Sum of lanes	1554	✓	1800		✓	Normal	
10	1				35.00	✓	Sum of lanes	1824	✓	1800	✓		Normal	
11	1			✓	83.84								Normal	
12	1				100.00	✓	Sum of lanes	1827	✓	1800	✓		Normal	
13	1				35.00	✓	Sum of lanes	2080	✓	1800	✓		Normal	
14	1				35.00	✓	Sum of lanes	2027	✓	1800	✓		Normal	
15	1				50.00	✓	Sum of lanes	2080					Normal	
16	1			✓	118.42								Normal	
17	1			✓	121.12								Normal	
18	1				100.00	✓	Sum of lanes	1795			✓		Normal	
19	1				100.00								Normal	
20	1				14.00	✓	Sum of lanes	1664	✓	1800		✓	Normal	

Lanes

Arm	Traffic Stream	Lane	Name	Description	Use RR67	Surface condition	Site quality factor	Gradient (%)	Width (m)	Use connector turning radius	Proportion that turn (%)	Turning radius (m)	Nearside lane	Saturation flow (PCU/hr)
1	1	1	(untitled)		✓	N/A	N/A	0	3.25	✓	42	9.71	✓	1822
2	1	1	(untitled)		✓	N/A	N/A	0	3.25	✓	0	99999.00		2080
3	1	1	(untitled)		✓	N/A	N/A	0	3.25	✓	0	99999.00		2080
4	1	1	(untitled)		✓	N/A	N/A	0	3.25	✓	0	99999.00		2080
5	1	1	(untitled)											
6	1	1	(untitled)											
7	1	1	(untitled)		✓	N/A	N/A	0	3.25	✓	100	6.00		1664
8	1	1	(untitled)		✓	N/A	N/A	0	3.25	✓	40	66.82	✓	1923
9	1	1	(untitled)		✓	N/A	N/A	0	3.25	✓	100	6.05	✓	1554
10	1	1	(untitled)		✓	N/A	N/A	0	3.25	✓	91	21.54	✓	1824
11	1	1	(untitled)											
12	1	1	(untitled)		✓	N/A	N/A	0	3.25	✓	52	12.57	✓	1827
13	1	1	(untitled)		✓	N/A	N/A	0	3.25		0	100.00		2080
14	1	1	(untitled)		✓	N/A	N/A	0	3.25	✓	100	56.93		2027
15	1	1	(untitled)		✓	N/A	N/A	0	3.25	✓	0	99999.00		2080
16	1	1	(untitled)											
17	1	1	(untitled)											
18	1	1	(untitled)		✓	N/A	N/A	0	3.25	✓	88	16.38	✓	1795
19	1	1	(untitled)											
20	1	1	(untitled)		✓	N/A	N/A	0	3.25	✓	100	6.00		1664

Signals

Arm	Traffic Stream	Controller stream	Phase	Second phase enabled
1	1	1	A	
2	1	1	A	
3	1	1	A	
10	1	1	C	
12	1	1	B	
13	1	1	B	
14	1	1	B	
18	1	1	C	

Give Way Data

Arm	Traffic Stream	Opposed traffic	Use Step-wise Opposed Turn Model	Number of storage spaces	Use connector turning radius	Radius of turn (m)	Visibility restricted
7	1	Movement	✓	0	✓	6.00	
9	1	Movement	✓	0	✓	99999.00	
20	1	Movement	✓	0	✓	6.00	

Give Way Data - Movements

Arm	Traffic Stream	Movement	Destination traffic stream	Max Flow (Unopposed) (PCU/hr)	Percentage opposed (%)
7	1	1	11/1	1664	100
9	1	1	5/1	1554	100
		2	6/1	1554	100
20	1	1	19/1	1664	100

Give Way Data - Movements - Conflicts

Arm	Traffic Stream	Movement	Destination traffic stream	Description	Controlling type	Controlling from traffic stream	Controlling to traffic stream	Percentage opposing (%)	Upstream signals visible	Conflict shift	Conflict duration
7	1	1	11/1		TrafficStreamMovement	12/1	5/1	100		0	0
					TrafficStreamMovement	12/1	6/1	100		0	0
					TrafficStreamMovement	13/1	11/1	100		0	0
9	1	1	5/1		TrafficStreamMovement	18/1	5/1	100		0	0
					TrafficStreamMovement	13/1	5/1	100		0	0
		2	6/1		TrafficStreamMovement	18/1	6/1	100		0	0
					TrafficStreamMovement	12/1	6/1	100		0	0
20	1	1	19/1		TrafficStreamMovement	1/1	19/1	100		0	0
					TrafficStreamMovement	1/1	17/1	100		0	0
					TrafficStreamMovement	2/1	16/1	100		0	0

Signal Timings

Network Default: 100s cycle time; 100 steps

Interstage Matrix for Controller Stream 1

		To			
		1	2	3	4
From	1	0	0	5	0
	2	0	0	6	0
	3	6	6	0	0
	4	0	0	0	0

Resultant Stages

Controller stream	Resultant Stage	Is base stage	Library Stage ID	Phases in this stage	Stage start (s)	Stage end (s)	Stage duration (s)	User stage minimum (s)	Stage minimum (s)
1	1	✓	1	A	83	84	1	1	1
	2	✓	2	A,B	84	20	36	1	7
	3	✓	3	C	26	63	37	1	7
	4	✓	4	D	63	83	20	1	20

Final Prediction Table

Traffic Stream Results

				SIGNALS		FLOWS		PERFORMANCE				PER PCU			QUEUES	
Arm	Traffic Stream	Name	Traffic node	Controller stream	Phase	Calculated flow entering (PCU/hr)	Calculated sat flow (PCU/hr)	Actual green (s (per cycle))	Wasted time total (s (per cycle))	Degree of saturation (%)	Practical reserve capacity (%)	JourneyTime (s)	Mean Delay per Veh (s)	Mean stops per Veh (%)	Mean max queue (PCU)	D wei mu
1	1		1	1	A	133	1822	37	0.00	19	369	33.36	21.36	64.62	2.39	
2	1		1	1	A	306	2080	37	0.00	39	132	29.05	24.25	69.06	5.87	
3	1		1	1	A	162	2080	37	8.57	26	240	29.13	24.33	81.31	3.02	
4	1		2			468	2080	100	4.68	24	281	6.36	0.36	3.23	0.82	
5	1					440	Unrestricted	100	0.00	0	Unrestricted	13.86	0.00	0.00	0.00	
6	1					440	Unrestricted	100	0.00	0	Unrestricted	13.87	0.00	0.00	0.00	
7	1		1			162	1477	100	62.00	11	720	4.51	2.83	25.27	1.46	
8	1		3			890 <	1923	100	13.92	54	67	6.53	2.93	23.37	6.49 +	
9	1		1			530	1208	100	10.00	44	105	5.74	1.54	7.31	1.62	
10	1		1	1	C	360	1824	37	0.00	52	73	29.55	25.35	60.74	6.08	
11	1					321	Unrestricted	100	40.00	0	Unrestricted	10.06	0.00	0.00	0.00	
12	1		1	1	B	238	1827	36	0.00	35	156	36.28	24.28	70.29	4.66	
13	1		1	1	B	114	2080	36	0.00	15	508	25.62	21.42	65.41	2.07	
14	1		1	1	B	47	2027	36	35.11	6	1332	24.78	20.58	63.16	1.45	
15	1		4			161	2080	100	0.00	8	1063	6.07	0.07	0.00	0.00	
16	1					602	Unrestricted	100	12.00	0	Unrestricted	14.21	0.00	0.00	0.00	
17	1					241	Unrestricted	100	19.00	0	Unrestricted	14.53	0.00	0.00	0.00	
18	1		1	1	C	289	1795	37	0.00	42	112	36.85	24.85	73.66	6.02	
19	1					135	Unrestricted	100	37.00	0	Unrestricted	12.00	0.00	0.00	0.00	
20	1		1			47	1333	100	86.00	4	2452	8.87	7.19	66.02	1.45	

Network Results

	Distance travelled (PCU-km/hr)	Time spent (PCU-hr/hr)	Mean journey speed (kph)	Total delay (PCU-hr/hr)	Weighted cost of delay (£ per hr)	Weighted cost of stops (£ per hr)	Excess queue penalty (£ per hr)	Performance Index (£ per hr)
Normal traffic	425.15	26.42	16.09	12.25	173.95	18.38	0.00	192.33
Bus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tram	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pedestrians								
TOTAL	425.15	26.42	16.09	12.25	173.95	18.38	0.00	192.33

- *< = adjusted flow warning (upstream links/traffic streams are over-saturated)*
- ** = Traffic Stream - Normal, Bus or Tram Stop or Delay weighting has been set to a value other than 100%*
- *^ = Traffic Stream - Normal, Bus or Tram Stop or Delay Path weighting has been set to a value other than 100%*
- *+ = average link/traffic stream excess queue is greater than 0*
- ***P.I. = PERFORMANCE INDEX***

TRANSYT 15

Filename: Junction 1 2038 DM.t15
Path: C:\Users\shane.mcgivney\Desktop
Report generation date: 08/07/2019 13:57:45

File summary

File description

File title	2038 DMax
Location	
Site number	
UTCRegion	
Driving side	Left
Date	11/06/2019
Version	
Status	(new file)
Identifier	
Client	
Jobnumber	
Enumerator	OCSC\shane.mcgivney
Description	

Model and Results

Enable controller offsets	Enable fuel consumption	Enable quick flares	Display journey time results	Display level of service results	Display blocking and starvation results	Display end of red and green queue results	Display excess queue results	Display separate uniform and random results	Display unweighted results	Display TRANSYT 12 style timings	Display effective greens in results	Display Red-With-Amber	Display End-Of-Green Amber

Units

Cost units	Speed units	Distance units	Fuel economy units	Fuel rate units	Mass units	Traffic units input	Traffic units results	Flow units	Average delay units	Total delay units	Rate of delay units
£	kph	m	mpg	l/h	kg	PCU	PCU	perHour	s	-Hour	perHour

Sorting

Show names instead of IDs	Sorting direction	Sorting type	Ignore prefixes when sorting	Analysis/demand set sorting	Link grouping	Source grouping	Colour Analysis/Demand Sets
	Ascending	Numerical		ID	Normal	Normal	✓

Network Diagrams

A2 - PM PEAK
D2 - PM PEAK*

Summary

Data Errors and Warnings

No errors or warnings

Run Summary

Analysis set used	Run start time	Run finish time	Modelling start time (HH:mm)	Network Cycle Time (s)	Performance Index (£ per hr)	Total network delay (PCU-hr/hr)	Highest DOS (%)	Item with highest DOS	Number of oversaturated items	Percentage of oversaturated items (%)	Item with worst signalised PRC	Item with worst unsignalised PRC	Ite wit wor over PR
2	08/07/2019 13:57:42	08/07/2019 13:57:42	08:00	100	1396.81	95.48	119.75	8/1	1	5	10/1	8/1	8/

Analysis Set Details

Name	Description	Demand set	Include in report	Locked
PM PEAK		D2	✓	

Demand Set Details

Name	Description	Composite	Demand sets	Start time (HH:mm)	Locked
PM PEAK				08:00	

Network Options

Network timings

Network cycle time (s)	Restrict to SCOOT cycle times	Time segment length (min)	Number of time segments	Modelled time period (min)
100		60	1	60

Signals options

Start displacement (s)	End displacement (s)
2	3

Advanced

Phase minimum broken penalty (£)	Phase maximum broken penalty (£)	Intergreen broken penalty (£)	Starting Red-with-Amber (s)
10000.00	10000.00	10000.00	2

Traffic options

Traffic model	Vehicle flow scaling factor (%)	Pedestrian flow scaling factor (%)	Cruise times or speeds
Platoon Dispersion (PDM)	100	100	Cruise Speeds

Advanced

Resolution	DOS Threshold (%)	Cruise scaling factor (%)	Use link stop weightings	Use link delay weightings	Exclude pedestrians from results calculation	Random delay mode	Type of Vehicle-in-Service	Type of random parameter	PCU Length (m)	Calculate results for Path Segments	Generate PDM Profile Data
1	90	100	✓	✓		Complex	Uniform (TRANSYT)	Uniform (TRANSYT)	5.75		✓

Normal Traffic parameters

Dispersion type	Dispersion coefficient	Travel time coefficient
Default	35	80

Normal Traffic Types

Name	PCU Factor
Normal	1.00

Bus parameters

Name	PCU Factor	Dispersion type	Acceleration (ms^[-2])	Stationary time coefficient	Cruise time coefficient
Bus	1.00	Default	0.94	30	85

Tram parameters

Name	PCU Factor	Dispersion type	Acceleration (ms^[-2])	Stationary time coefficient	Cruise time coefficient
Tram	1.00	Default	0.94	100	100

Pedestrian parameters

Dispersion type
Default

Optimisation options

Enable optimisation	Auto redistribute	Optimisation level	Enable OUT Profile accuracy
	✓		✓

Advanced

Optimisation type	Hill climb increments	OUTProfile accuracy	Use enhanced optimisation	Auto optimisation order	Optimisation order	Master controller	Offsets relative to master controller	Master controller offset after each run
				✓				Do nothing

Economics

Vehicle Monetary Value Of Delay (£ per PCU-hr)	Vehicle Monetary Value Of Stops (£ per 100 stops)	Pedestrian monetary value of delay (£ per Ped-hr)
14.20	2.60	14.20

Arms and Traffic Streams

Arms

Arm	Name	Description	Traffic node
1			1
2			1
3			1
4			2
5			
6			
7			1
8			3
9			1
10			1
11			
12			1
13			1
14			1
15			4
16			
17			
18			1
19			
20			1

Traffic Streams

Arm	Traffic Stream	Name	Description	Auto length	Length (m)	Has Saturation Flow	Saturation flow source	Saturation flow (PCU/hr)	Auto-calculate cell saturation flow	Cell saturation flow (PCU/hr)	Is signal controlled	Is give way	Traffic type	Allow Nearside Turn On Red
1	1				100.00	✓	Sum of lanes	1822	✓	1800	✓		Normal	
2	1				40.00	✓	Sum of lanes	2080	✓	1800	✓		Normal	
3	1				40.00	✓	Sum of lanes	2080	✓	1800	✓		Normal	
4	1				50.00	✓	Sum of lanes	2080					Normal	
5	1			✓	115.49								Normal	
6	1			✓	115.59								Normal	
7	1				14.00	✓	Sum of lanes	1664	✓	1800		✓	Normal	
8	1				30.00	✓	Sum of lanes	1923					Normal	
9	1				35.00	✓	Sum of lanes	1554	✓	1800		✓	Normal	
10	1				35.00	✓	Sum of lanes	1824	✓	1800	✓		Normal	
11	1			✓	83.84								Normal	
12	1				100.00	✓	Sum of lanes	1827	✓	1800	✓		Normal	
13	1				35.00	✓	Sum of lanes	2080	✓	1800	✓		Normal	
14	1				35.00	✓	Sum of lanes	2027	✓	1800	✓		Normal	
15	1				50.00	✓	Sum of lanes	2080					Normal	
16	1			✓	118.42								Normal	
17	1			✓	121.12								Normal	
18	1				100.00	✓	Sum of lanes	1795			✓		Normal	
19	1				100.00								Normal	
20	1				14.00	✓	Sum of lanes	1664	✓	1800		✓	Normal	

Lanes

Arm	Traffic Stream	Lane	Name	Description	Use RR67	Surface condition	Site quality factor	Gradient (%)	Width (m)	Use connector turning radius	Proportion that turn (%)	Turning radius (m)	Nearside lane	Saturation flow (PCU/hr)
1	1	1	(untitled)		✓	N/A	N/A	0	3.25	✓	42	9.71	✓	1822
2	1	1	(untitled)		✓	N/A	N/A	0	3.25	✓	0	99999.00		2080
3	1	1	(untitled)		✓	N/A	N/A	0	3.25	✓	0	99999.00		2080
4	1	1	(untitled)		✓	N/A	N/A	0	3.25	✓	0	99999.00		2080
5	1	1	(untitled)											
6	1	1	(untitled)											
7	1	1	(untitled)		✓	N/A	N/A	0	3.25	✓	100	6.00		1664
8	1	1	(untitled)		✓	N/A	N/A	0	3.25	✓	40	66.82	✓	1923
9	1	1	(untitled)		✓	N/A	N/A	0	3.25	✓	100	6.05	✓	1554
10	1	1	(untitled)		✓	N/A	N/A	0	3.25	✓	91	21.54	✓	1824
11	1	1	(untitled)											
12	1	1	(untitled)		✓	N/A	N/A	0	3.25	✓	52	12.57	✓	1827
13	1	1	(untitled)		✓	N/A	N/A	0	3.25		0	100.00		2080
14	1	1	(untitled)		✓	N/A	N/A	0	3.25	✓	100	56.93		2027
15	1	1	(untitled)		✓	N/A	N/A	0	3.25	✓	0	99999.00		2080
16	1	1	(untitled)											
17	1	1	(untitled)											
18	1	1	(untitled)		✓	N/A	N/A	0	3.25	✓	88	16.38	✓	1795
19	1	1	(untitled)											
20	1	1	(untitled)		✓	N/A	N/A	0	3.25	✓	100	6.00		1664

Signals

Arm	Traffic Stream	Controller stream	Phase	Second phase enabled
1	1	1	A	
2	1	1	A	
3	1	1	A	
10	1	1	C	
12	1	1	B	
13	1	1	B	
14	1	1	B	
18	1	1	C	

Give Way Data

Arm	Traffic Stream	Opposed traffic	Use Step-wise Opposed Turn Model	Number of storage spaces	Use connector turning radius	Radius of turn (m)	Visibility restricted
7	1	Movement	✓	0	✓	6.00	
9	1	Movement	✓	0	✓	99999.00	
20	1	Movement	✓	0	✓	6.00	

Give Way Data - Movements

Arm	Traffic Stream	Movement	Destination traffic stream	Max Flow (Unopposed) (PCU/hr)	Percentage opposed (%)
7	1	1	11/1	1664	100
9	1	1	5/1	1554	100
		2	6/1	1554	100
20	1	1	19/1	1664	100

Give Way Data - Movements - Conflicts

Arm	Traffic Stream	Movement	Destination traffic stream	Description	Controlling type	Controlling from traffic stream	Controlling to traffic stream	Percentage opposing (%)	Upstream signals visible	Conflict shift	Conflict duration
7	1	1	11/1		TrafficStreamMovement	12/1	5/1	100		0	0
					TrafficStreamMovement	12/1	6/1	100		0	0
					TrafficStreamMovement	13/1	11/1	100		0	0
9	1	1	5/1		TrafficStreamMovement	18/1	5/1	100		0	0
					TrafficStreamMovement	13/1	5/1	100		0	0
		2	6/1		TrafficStreamMovement	18/1	6/1	100		0	0
					TrafficStreamMovement	12/1	6/1	100		0	0
20	1	1	19/1		TrafficStreamMovement	1/1	19/1	100		0	0
					TrafficStreamMovement	1/1	17/1	100		0	0
					TrafficStreamMovement	2/1	16/1	100		0	0

Signal Timings

Network Default: 100s cycle time; 100 steps

Interstage Matrix for Controller Stream 1

		To			
		1	2	3	4
From	1	0	0	5	0
	2	0	0	6	0
	3	6	6	0	0
	4	0	0	0	0

Resultant Stages

Controller stream	Resultant Stage	Is base stage	Library Stage ID	Phases in this stage	Stage start (s)	Stage end (s)	Stage duration (s)	User stage minimum (s)	Stage minimum (s)
1	1	✓	1	A	83	89	6	1	1
	2	✓	2	A,B	89	37	48	1	7
	3	✓	3	C	43	63	20	1	7
	4	✓	4	D	63	83	20	1	20

Final Prediction Table

Traffic Stream Results

				SIGNALS		FLOWS		PERFORMANCE				PER PCU			QUEUES	
Arm	Traffic Stream	Name	Traffic node	Controller stream	Phase	Calculated flow entering (PCU/hr)	Calculated sat flow (PCU/hr)	Actual green (s (per cycle))	Wasted time total (s (per cycle))	Degree of saturation (%)	Practical reserve capacity (%)	JourneyTime (s)	Mean Delay per Veh (s)	Mean stops per Veh (%)	Mean max queue (PCU)	w m
1	1		1	1	A	133	1822	54	0.00	13	578	23.21	11.21	47.27	1.75	
2	1		1	1	A	306	2080	54	0.00	27	236	17.39	12.59	49.97	4.43	
3	1		1	1	A	162	2080	54	0.62	14	528	16.22	11.42	47.27	2.13	
4	1		2			468	2080	100	0.00	23	300	6.25	0.25	0.00	0.03	
5	1					396	Unrestricted	100	3.00	0	Unrestricted	13.86	0.00	0.00	0.00	
6	1					396	Unrestricted	100	3.00	0	Unrestricted	13.87	0.00	0.00	0.00	
7	1		1			162	1467	100	45.00	11	715	1.90	0.22	2.42	1.46	
8	1		3			890 <	1923	100	61.35	120	-25	335.04	331.44	287.19	96.25 +	
9	1		1			443	1219	100	54.00	36	148	5.46	1.26	9.43	1.55	
10	1		1	1	C	301 <	1824	20	0.00	78	15	70.13	65.93	85.07	7.16 +	
11	1					320	Unrestricted	100	20.00	0	Unrestricted	10.06	0.00	0.00	0.00	
12	1		1	1	B	238	1827	48	0.00	27	239	27.69	15.69	55.73	3.68	
13	1		1	1	B	114	2080	48	0.00	11	705	18.18	13.98	53.21	1.69	
14	1		1	1	B	47	2027	48	47.11	5	1798	17.69	13.49	51.09	1.45	
15	1		4			161	2080	100	0.00	8	1063	6.07	0.07	0.00	0.00	
16	1					575	Unrestricted	100	8.00	0	Unrestricted	14.21	0.00	0.00	0.00	
17	1					214	Unrestricted	100	15.00	0	Unrestricted	14.53	0.00	0.00	0.00	
18	1		1	1	C	288	1795	20	0.00	76	18	63.98	51.98	106.33	8.71	
19	1					130	Unrestricted	100	21.00	0	Unrestricted	12.00	0.00	0.00	0.00	
20	1		1			47	1286	100	95.00	4	2363	2.85	1.17	48.67	1.45	

Network Results

	Distance travelled (PCU-km/hr)	Time spent (PCU-hr/hr)	Mean journey speed (kph)	Total delay (PCU-hr/hr)	Weighted cost of delay (£ per hr)	Weighted cost of stops (£ per hr)	Excess queue penalty (£ per hr)	Performance Index (£ per hr)
Normal traffic	402.72	108.90	3.70	95.48	1355.75	41.06	0.00	1396.81
Bus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tram	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pedestrians								
TOTAL	402.72	108.90	3.70	95.48	1355.75	41.06	0.00	1396.81

- *< = adjusted flow warning (upstream links/traffic streams are over-saturated)*
- ** = Traffic Stream - Normal, Bus or Tram Stop or Delay weighting has been set to a value other than 100%*
- *^ = Traffic Stream - Normal, Bus or Tram Stop or Delay Path weighting has been set to a value other than 100%*
- *+ = average link/traffic stream excess queue is greater than 0*
- ***P.I. = PERFORMANCE INDEX***

TRANSYT 15

Version: 15.5.2.7994

For sales and distribution information, program advice and maintenance, contact TRL:
+44 (0)1344 379777 software@trl.co.uk www.trlsoftware.co.uk

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

Filename: Junction 1 2038 DN.t15
Path: C:\Users\shane.mcgivney\Desktop
Report generation date: 08/07/2019 13:52:02

File summary

File description

File title	2038 DN
Location	
Site number	
UTCRegion	
Driving side	Left
Date	11/06/2019
Version	
Status	(new file)
Identifier	
Client	
Jobnumber	
Enumerator	OCSC\shane.mcgivney
Description	

Model and Results

Enable controller offsets	Enable fuel consumption	Enable quick flares	Display journey time results	Display level of service results	Display blocking and starvation results	Display end of red and green queue results	Display excess queue results	Display separate uniform and random results	Display unweighted results	Display TRANSYT 12 style timings	Display effective greens in results	Display Red-With-Amber	Display End-Of-Green Amber

Units

Cost units	Speed units	Distance units	Fuel economy units	Fuel rate units	Mass units	Traffic units input	Traffic units results	Flow units	Average delay units	Total delay units	Rate of delay units
£	kph	m	mpg	l/h	kg	PCU	PCU	perHour	s	-Hour	perHour

Sorting

Show names instead of IDs	Sorting direction	Sorting type	Ignore prefixes when sorting	Analysis/demand set sorting	Link grouping	Source grouping	Colour Analysis/Demand Sets
	Ascending	Numerical		ID	Normal	Normal	✓

Network Diagrams

A1 - AM PEAK
D1 - AM PEAK*

Summary

Data Errors and Warnings

No errors or warnings

Run Summary

Analysis set used	Run start time	Run finish time	Modelling start time (HH:mm)	Network Cycle Time (s)	Performance Index (£ per hr)	Total network delay (PCU-hr/hr)	Highest DOS (%)	Item with highest DOS	Number of oversaturated items	Percentage of oversaturated items (%)	Item with worst signalised PRC	Item with worst unsignalised PRC	Ite wit wor over PR
1	08/07/2019 13:51:56	08/07/2019 13:51:56	08:00	100	149.60	9.45	47.89	4/1	0	0	2/1	4/1	4/

Analysis Set Details

Name	Description	Demand set	Include in report	Locked
AM PEAK		D1	✓	

Demand Set Details

Name	Description	Composite	Demand sets	Start time (HH:mm)	Locked
AM PEAK				08:00	

Network Options

Network timings

Network cycle time (s)	Restrict to SCOOT cycle times	Time segment length (min)	Number of time segments	Modelled time period (min)
100		60	1	60

Signals options

Start displacement (s)	End displacement (s)
2	3

Advanced

Phase minimum broken penalty (£)	Phase maximum broken penalty (£)	Intergreen broken penalty (£)	Starting Red-with-Amber (s)
10000.00	10000.00	10000.00	2

Traffic options

Traffic model	Vehicle flow scaling factor (%)	Pedestrian flow scaling factor (%)	Cruise times or speeds
Platoon Dispersion (PDM)	100	100	Cruise Speeds

Advanced

Resolution	DOS Threshold (%)	Cruise scaling factor (%)	Use link stop weightings	Use link delay weightings	Exclude pedestrians from results calculation	Random delay mode	Type of Vehicle-in-Service	Type of random parameter	PCU Length (m)	Calculate results for Path Segments	Generate PDM Profile Data
1	90	100	✓	✓		Complex	Uniform (TRANSYT)	Uniform (TRANSYT)	5.75		✓

Normal Traffic parameters

Dispersion type	Dispersion coefficient	Travel time coefficient
Default	35	80

Normal Traffic Types

Name	PCU Factor
Normal	1.00

Bus parameters

Name	PCU Factor	Dispersion type	Acceleration (ms^[-2])	Stationary time coefficient	Cruise time coefficient
Bus	1.00	Default	0.94	30	85

Tram parameters

Name	PCU Factor	Dispersion type	Acceleration (ms^[-2])	Stationary time coefficient	Cruise time coefficient
Tram	1.00	Default	0.94	100	100

Pedestrian parameters

Dispersion type
Default

Optimisation options

Enable optimisation	Auto redistribute	Optimisation level	Enable OUT Profile accuracy
	✓		✓

Advanced

Optimisation type	Hill climb increments	OUTProfile accuracy	Use enhanced optimisation	Auto optimisation order	Optimisation order	Master controller	Offsets relative to master controller	Master controller offset after each run
				✓				Do nothing

Economics

Vehicle Monetary Value Of Delay (£ per PCU-hr)	Vehicle Monetary Value Of Stops (£ per 100 stops)	Pedestrian monetary value of delay (£ per Ped-hr)
14.20	2.60	14.20

Arms and Traffic Streams

Arms

Arm	Name	Description	Traffic node
1			1
2			1
3			1
4			2
5			
6			
7			1
8			3
9			1
10			1
11			
12			1
13			1
14			1
15			4
16			
17			
18			1
19			
20			1

Traffic Streams

Arm	Traffic Stream	Name	Description	Auto length	Length (m)	Has Saturation Flow	Saturation flow source	Saturation flow (PCU/hr)	Auto-calculate cell saturation flow	Cell saturation flow (PCU/hr)	Is signal controlled	Is give way	Traffic type	Allow Nearside Turn On Red
1	1				100.00	✓	Sum of lanes	1791	✓	1800	✓		Normal	
2	1				40.00	✓	Sum of lanes	2080	✓	1800	✓		Normal	
3	1				40.00	✓	Sum of lanes	2080	✓	1800	✓		Normal	
4	1				50.00	✓	Sum of lanes	2080					Normal	
5	1			✓	115.49								Normal	
6	1			✓	115.59								Normal	
7	1				14.00	✓	Sum of lanes	1664	✓	1800		✓	Normal	
8	1				30.00	✓	Sum of lanes	1914					Normal	
9	1				35.00	✓	Sum of lanes	1554	✓	1800		✓	Normal	
10	1				35.00	✓	Sum of lanes	1885	✓	1800	✓		Normal	
11	1			✓	83.84								Normal	
12	1				100.00	✓	Sum of lanes	1814	✓	1800	✓		Normal	
13	1				35.00	✓	Sum of lanes	2080	✓	1800	✓		Normal	
14	1				35.00	✓	Sum of lanes	2027	✓	1800	✓		Normal	
15	1				50.00	✓	Sum of lanes	2080					Normal	
16	1			✓	118.42								Normal	
17	1			✓	121.12								Normal	
18	1				100.00	✓	Sum of lanes	1826			✓		Normal	
19	1				100.00								Normal	
20	1				14.00	✓	Sum of lanes	1664	✓	1800		✓	Normal	

Lanes

Arm	Traffic Stream	Lane	Name	Description	Use RR67	Surface condition	Site quality factor	Gradient (%)	Width (m)	Use connector turning radius	Proportion that turn (%)	Turning radius (m)	Nearside lane	Saturation flow (PCU/hr)
1	1	1	(untitled)		✓	N/A	N/A	0	3.25	✓	54	9.71	✓	1791
2	1	1	(untitled)		✓	N/A	N/A	0	3.25	✓	0	99999.00		2080
3	1	1	(untitled)		✓	N/A	N/A	0	3.25	✓	0	99999.00		2080
4	1	1	(untitled)		✓	N/A	N/A	0	3.25	✓	0	99999.00		2080
5	1	1	(untitled)											
6	1	1	(untitled)											
7	1	1	(untitled)		✓	N/A	N/A	0	3.25	✓	100	6.00		1664
8	1	1	(untitled)		✓	N/A	N/A	0	3.25	✓	60	66.82	✓	1914
9	1	1	(untitled)		✓	N/A	N/A	0	3.25	✓	100	6.05	✓	1554
10	1	1	(untitled)		✓	N/A	N/A	0	3.25	✓	42	21.54	✓	1885
11	1	1	(untitled)											
12	1	1	(untitled)		✓	N/A	N/A	0	3.25	✓	58	12.57	✓	1814
13	1	1	(untitled)		✓	N/A	N/A	0	3.25		0	100.00		2080
14	1	1	(untitled)		✓	N/A	N/A	0	3.25	✓	100	56.93		2027
15	1	1	(untitled)		✓	N/A	N/A	0	3.25	✓	0	99999.00		2080
16	1	1	(untitled)											
17	1	1	(untitled)											
18	1	1	(untitled)		✓	N/A	N/A	0	3.25	✓	68	16.38	✓	1826
19	1	1	(untitled)											
20	1	1	(untitled)		✓	N/A	N/A	0	3.25	✓	100	6.00		1664

Signals

Arm	Traffic Stream	Controller stream	Phase	Second phase enabled
1	1	1	A	
2	1	1	A	
3	1	1	A	
10	1	1	C	
12	1	1	B	
13	1	1	B	
14	1	1	B	
18	1	1	C	

Give Way Data

Arm	Traffic Stream	Opposed traffic	Use Step-wise Opposed Turn Model	Number of storage spaces	Use connector turning radius	Radius of turn (m)	Visibility restricted
7	1	Movement	✓	0	✓	6.00	
9	1	Movement	✓	0	✓	99999.00	
20	1	Movement	✓	0	✓	6.00	

Give Way Data - Movements

Arm	Traffic Stream	Movement	Destination traffic stream	Max Flow (Unopposed) (PCU/hr)	Percentage opposed (%)
7	1	1	11/1	1664	100
9	1	1	5/1	1554	100
		2	6/1	1554	100
20	1	1	19/1	1664	100

Give Way Data - Movements - Conflicts

Arm	Traffic Stream	Movement	Destination traffic stream	Description	Controlling type	Controlling from traffic stream	Controlling to traffic stream	Percentage opposing (%)	Upstream signals visible	Conflict shift	Conflict duration
7	1	1	11/1		TrafficStreamMovement	12/1	5/1	100		0	0
					TrafficStreamMovement	12/1	6/1	100		0	0
					TrafficStreamMovement	13/1	11/1	100		0	0
9	1	1	5/1		TrafficStreamMovement	18/1	5/1	100		0	0
					TrafficStreamMovement	13/1	5/1	100		0	0
		2	6/1		TrafficStreamMovement	18/1	6/1	100		0	0
					TrafficStreamMovement	12/1	6/1	100		0	0
20	1	1	19/1		TrafficStreamMovement	1/1	19/1	100		0	0
					TrafficStreamMovement	1/1	17/1	100		0	0
					TrafficStreamMovement	2/1	16/1	100		0	0

Signal Timings

Network Default: 100s cycle time; 100 steps

Interstage Matrix for Controller Stream 1

		To			
		1	2	3	4
From	1	0	0	5	0
	2	0	0	6	0
	3	6	6	0	0
	4	0	0	0	0

Resultant Stages

Controller stream	Resultant Stage	Is base stage	Library Stage ID	Phases in this stage	Stage start (s)	Stage end (s)	Stage duration (s)	User stage minimum (s)	Stage minimum (s)
1	1	✓	1	A	83	89	6	1	1
	2	✓	2	A,B	89	37	48	1	7
	3	✓	3	C	43	63	20	1	7
	4	✓	4	D	63	83	20	1	20

Final Prediction Table

Traffic Stream Results

			SIGNALS			FLOWS		PERFORMANCE				PER PCU			QUEUES	
Arm	Traffic Stream	Name	Traffic node	Controller stream	Phase	Calculated flow entering (PCU/hr)	Calculated sat flow (PCU/hr)	Actual green (s (per cycle))	Wasted time total (s (per cycle))	Degree of saturation (%)	Practical reserve capacity (%)	JourneyTime (s)	Mean Delay per Veh (s)	Mean stops per Veh (%)	Mean max queue (PCU)	D wei mu
1	1		1	1	A	285	1791	54	0.00	29	211	24.79	12.79	49.74	3.94	
2	1		1	1	A	518	2080	54	0.00	45	99	18.38	13.58	41.58	5.98	
3	1		1	1	A	324	2080	54	3.17	30	199	17.05	12.25	42.41	3.69	
4	1		2			842	2080	100	15.48	48	88	8.75	2.75	23.11	6.07	
5	1					179	Unrestricted	100	21.00	0	Unrestricted	13.86	0.00	0.00	0.00	
6	1					179	Unrestricted	100	21.00	0	Unrestricted	13.87	0.00	0.00	0.00	
7	1		1			324	1468	100	45.00	22	308	3.03	1.35	12.08	1.48	
8	1		3			265	1914	100	0.00	14	550	3.75	0.15	0.00	0.01	
9	1		1			106	1277	100	0.00	8	985	4.38	0.18	2.32	1.45	
10	1		1	1	C	159	1885	20	0.00	40	124	41.36	37.16	86.02	3.80	
11	1					506	Unrestricted	100	28.00	0	Unrestricted	10.06	0.00	0.00	0.00	
12	1		1	1	B	261	1814	48	0.00	29	207	28.04	16.04	55.84	4.05	
13	1		1	1	B	109	2080	48	0.00	11	742	18.15	13.95	53.18	1.61	
14	1		1	1	B	75	2027	48	0.22	8	1086	17.94	13.74	51.15	1.45	
15	1		4			184	2080	100	0.00	9	917	6.08	0.08	0.00	0.00	
16	1					584	Unrestricted	100	18.00	0	Unrestricted	14.21	0.00	0.00	0.00	
17	1					164	Unrestricted	100	24.00	0	Unrestricted	14.53	0.00	0.00	0.00	
18	1		1	1	C	96	1826	20	0.00	25	259	46.52	34.52	83.36	2.26	
19	1					321	Unrestricted	100	17.00	0	Unrestricted	12.00	0.00	0.00	0.00	
20	1		1			75	1015	100	51.00	7	1118	9.40	7.72	55.37	1.45	

Network Results

	Distance travelled (PCU-km/hr)	Time spent (PCU-hr/hr)	Mean journey speed (kph)	Total delay (PCU-hr/hr)	Weighted cost of delay (£ per hr)	Weighted cost of stops (£ per hr)	Excess queue penalty (£ per hr)	Performance Index (£ per hr)
Normal traffic	383.34	22.23	17.25	9.45	134.16	15.44	0.00	149.60
Bus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tram	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pedestrians								
TOTAL	383.34	22.23	17.25	9.45	134.16	15.44	0.00	149.60

- *< = adjusted flow warning (upstream links/traffic streams are over-saturated)*
- ** = Traffic Stream - Normal, Bus or Tram Stop or Delay weighting has been set to a value other than 100%*
- *^ = Traffic Stream - Normal, Bus or Tram Stop or Delay Path weighting has been set to a value other than 100%*
- *+ = average link/traffic stream excess queue is greater than 0*
- *P.I. = PERFORMANCE INDEX*

TRANSYT 15

Filename: Junction 1 2038 DN.t15
Path: C:\Users\shane.mcgivney\Desktop
Report generation date: 08/07/2019 13:52:56

File summary

File description

File title	2038 DN
Location	
Site number	
UTCRegion	
Driving side	Left
Date	11/06/2019
Version	
Status	(new file)
Identifier	
Client	
Jobnumber	
Enumerator	OCSC\shane.mcgivney
Description	

Model and Results

Enable controller offsets	Enable fuel consumption	Enable quick flares	Display journey time results	Display level of service results	Display blocking and starvation results	Display end of red and green queue results	Display excess queue results	Display separate uniform and random results	Display unweighted results	Display TRANSYT 12 style timings	Display effective greens in results	Display Red-With-Amber	Display End-Of-Green Amber

Units

Cost units	Speed units	Distance units	Fuel economy units	Fuel rate units	Mass units	Traffic units input	Traffic units results	Flow units	Average delay units	Total delay units	Rate of delay units
£	kph	m	mpg	l/h	kg	PCU	PCU	perHour	s	-Hour	perHour

Sorting

Show names instead of IDs	Sorting direction	Sorting type	Ignore prefixes when sorting	Analysis/demand set sorting	Link grouping	Source grouping	Colour Analysis/Demand Sets
	Ascending	Numerical		ID	Normal	Normal	✓

Generated on 08/07/2019 13:53:04 using TRANSYT 15 (15.5.2.7994)

Network Diagrams

Generated on 08/07/2019 13:53:04 using TRANSYT 15 (15.5.2.7994)

A2 - PM PEAK
D2 - PM PEAK*

Summary

Data Errors and Warnings

No errors or warnings

Run Summary

Analysis set used	Run start time	Run finish time	Modelling start time (HH:mm)	Network Cycle Time (s)	Performance Index (£ per hr)	Total network delay (PCU-hr/hr)	Highest DOS (%)	Item with highest DOS	Number of oversaturated items	Percentage of oversaturated items (%)	Item with worst signalised PRC	Item with worst unsignalised PRC	Ite wit wor over PR
2	08/07/2019 13:52:51	08/07/2019 13:52:52	08:00	100	167.53	10.83	75.38	18/1	0	0	18/1	8/1	18/

Analysis Set Details

Name	Description	Demand set	Include in report	Locked
PM PEAK		D2	✓	

Demand Set Details

Name	Description	Composite	Demand sets	Start time (HH:mm)	Locked
PM PEAK				08:00	

Network Options

Network timings

Network cycle time (s)	Restrict to SCOOT cycle times	Time segment length (min)	Number of time segments	Modelled time period (min)
100		60	1	60

Signals options

Start displacement (s)	End displacement (s)
2	3

Advanced

Phase minimum broken penalty (£)	Phase maximum broken penalty (£)	Intergreen broken penalty (£)	Starting Red-with-Amber (s)
10000.00	10000.00	10000.00	2

Traffic options

Traffic model	Vehicle flow scaling factor (%)	Pedestrian flow scaling factor (%)	Cruise times or speeds
Platoon Dispersion (PDM)	100	100	Cruise Speeds

Advanced

Resolution	DOS Threshold (%)	Cruise scaling factor (%)	Use link stop weightings	Use link delay weightings	Exclude pedestrians from results calculation	Random delay mode	Type of Vehicle-in-Service	Type of random parameter	PCU Length (m)	Calculate results for Path Segments	Generate PDM Profile Data
1	90	100	✓	✓		Complex	Uniform (TRANSYT)	Uniform (TRANSYT)	5.75		✓

Generated on 08/07/2019 13:53:04 using TRANSYT 15 (15.5.2.7994)

Normal Traffic parameters

Dispersion type	Dispersion coefficient	Travel time coefficient
Default	35	80

Normal Traffic Types

Name	PCU Factor
Normal	1.00

Bus parameters

Name	PCU Factor	Dispersion type	Acceleration (ms^[-2])	Stationary time coefficient	Cruise time coefficient
Bus	1.00	Default	0.94	30	85

Tram parameters

Name	PCU Factor	Dispersion type	Acceleration (ms^[-2])	Stationary time coefficient	Cruise time coefficient
Tram	1.00	Default	0.94	100	100

Pedestrian parameters

Dispersion type
Default

Optimisation options

Enable optimisation	Auto redistribute	Optimisation level	Enable OUT Profile accuracy
	✓		✓

Advanced

Optimisation type	Hill climb increments	OUTProfile accuracy	Use enhanced optimisation	Auto optimisation order	Optimisation order	Master controller	Offsets relative to master controller	Master controller offset after each run
				✓				Do nothing

Economics

Vehicle Monetary Value Of Delay (£ per PCU-hr)	Vehicle Monetary Value Of Stops (£ per 100 stops)	Pedestrian monetary value of delay (£ per Ped-hr)
14.20	2.60	14.20

Arms and Traffic Streams

Arms

Arm	Name	Description	Traffic node
1			1
2			1
3			1
4			2
5			
6			
7			1
8			3
9			1
10			1
11			
12			1
13			1
14			1
15			4
16			
17			
18			1
19			
20			1

Traffic Streams

Arm	Traffic Stream	Name	Description	Auto length	Length (m)	Has Saturation Flow	Saturation flow source	Saturation flow (PCU/hr)	Auto-calculate cell saturation flow	Cell saturation flow (PCU/hr)	Is signal controlled	Is give way	Traffic type	Allow Nearside Turn On Red
1	1				100.00	✓	Sum of lanes	1819	✓	1800	✓		Normal	
2	1				40.00	✓	Sum of lanes	2080	✓	1800	✓		Normal	
3	1				40.00	✓	Sum of lanes	2080	✓	1800	✓		Normal	
4	1				50.00	✓	Sum of lanes	2080					Normal	
5	1			✓	115.49								Normal	
6	1			✓	115.59								Normal	
7	1				14.00	✓	Sum of lanes	1664	✓	1800		✓	Normal	
8	1				30.00	✓	Sum of lanes	1924					Normal	
9	1				35.00	✓	Sum of lanes	1554	✓	1800		✓	Normal	
10	1				35.00	✓	Sum of lanes	1828	✓	1800	✓		Normal	
11	1			✓	83.84								Normal	
12	1				100.00	✓	Sum of lanes	1835	✓	1800	✓		Normal	
13	1				35.00	✓	Sum of lanes	2080	✓	1800	✓		Normal	
14	1				35.00	✓	Sum of lanes	2027	✓	1800	✓		Normal	
15	1				50.00	✓	Sum of lanes	2080					Normal	
16	1			✓	118.42								Normal	
17	1			✓	121.12								Normal	
18	1				100.00	✓	Sum of lanes	1794			✓		Normal	
19	1				100.00								Normal	
20	1				14.00	✓	Sum of lanes	1664	✓	1800		✓	Normal	

Lanes

Arm	Traffic Stream	Lane	Name	Description	Use RR67	Surface condition	Site quality factor	Gradient (%)	Width (m)	Use connector turning radius	Proportion that turn (%)	Turning radius (m)	Nearside lane	Saturation flow (PCU/hr)
1	1	1	(untitled)		✓	N/A	N/A	0	3.25	✓	43	9.71	✓	1819
2	1	1	(untitled)		✓	N/A	N/A	0	3.25	✓	0	99999.00		2080
3	1	1	(untitled)		✓	N/A	N/A	0	3.25	✓	0	99999.00		2080
4	1	1	(untitled)		✓	N/A	N/A	0	3.25	✓	0	99999.00		2080
5	1	1	(untitled)											
6	1	1	(untitled)											
7	1	1	(untitled)		✓	N/A	N/A	0	3.25	✓	100	6.00		1664
8	1	1	(untitled)		✓	N/A	N/A	0	3.25	✓	37	66.82	✓	1924
9	1	1	(untitled)		✓	N/A	N/A	0	3.25	✓	100	6.05	✓	1554
10	1	1	(untitled)		✓	N/A	N/A	0	3.25	✓	88	21.54	✓	1828
11	1	1	(untitled)											
12	1	1	(untitled)		✓	N/A	N/A	0	3.25	✓	48	12.57	✓	1835
13	1	1	(untitled)		✓	N/A	N/A	0	3.25		0	100.00		2080
14	1	1	(untitled)		✓	N/A	N/A	0	3.25	✓	100	56.93		2027
15	1	1	(untitled)		✓	N/A	N/A	0	3.25	✓	0	99999.00		2080
16	1	1	(untitled)											
17	1	1	(untitled)											
18	1	1	(untitled)		✓	N/A	N/A	0	3.25	✓	89	16.38	✓	1794
19	1	1	(untitled)											
20	1	1	(untitled)		✓	N/A	N/A	0	3.25	✓	100	6.00		1664

Signals

Arm	Traffic Stream	Controller stream	Phase	Second phase enabled
1	1	1	A	
2	1	1	A	
3	1	1	A	
10	1	1	C	
12	1	1	B	
13	1	1	B	
14	1	1	B	
18	1	1	C	

Give Way Data

Arm	Traffic Stream	Opposed traffic	Use Step-wise Opposed Turn Model	Number of storage spaces	Use connector turning radius	Radius of turn (m)	Visibility restricted
7	1	Movement	✓	0	✓	6.00	
9	1	Movement	✓	0	✓	99999.00	
20	1	Movement	✓	0	✓	6.00	

Give Way Data - Movements

Arm	Traffic Stream	Movement	Destination traffic stream	Max Flow (Unopposed) (PCU/hr)	Percentage opposed (%)
7	1	1	11/1	1664	100
9	1	1	5/1	1554	100
		2	6/1	1554	100
20	1	1	19/1	1664	100

Give Way Data - Movements - Conflicts

Arm	Traffic Stream	Movement	Destination traffic stream	Description	Controlling type	Controlling from traffic stream	Controlling to traffic stream	Percentage opposing (%)	Upstream signals visible	Conflict shift	Conflict duration
7	1	1	11/1		TrafficStreamMovement	12/1	5/1	100		0	0
					TrafficStreamMovement	12/1	6/1	100		0	0
					TrafficStreamMovement	13/1	11/1	100		0	0
9	1	1	5/1		TrafficStreamMovement	18/1	5/1	100		0	0
					TrafficStreamMovement	13/1	5/1	100		0	0
		2	6/1		TrafficStreamMovement	18/1	6/1	100		0	0
					TrafficStreamMovement	12/1	6/1	100		0	0
20	1	1	19/1		TrafficStreamMovement	1/1	19/1	100		0	0
					TrafficStreamMovement	1/1	17/1	100		0	0
					TrafficStreamMovement	2/1	16/1	100		0	0

Signal Timings

Network Default: 100s cycle time; 100 steps

Interstage Matrix for Controller Stream 1

		To			
		1	2	3	4
From	1	0	0	5	0
	2	0	0	6	0
	3	6	6	0	0
	4	0	0	0	0

Resultant Stages

Controller stream	Resultant Stage	Is base stage	Library Stage ID	Phases in this stage	Stage start (s)	Stage end (s)	Stage duration (s)	User stage minimum (s)	Stage minimum (s)
1	1	✓	1	A	83	89	6	1	1
	2	✓	2	A,B	89	37	48	1	7
	3	✓	3	C	43	63	20	1	7
	4	✓	4	D	63	83	20	1	20

Final Prediction Table

Traffic Stream Results

				SIGNALS		FLOWS		PERFORMANCE				PER PCU			QUEUES	
Arm	Traffic Stream	Name	Traffic node	Controller stream	Phase	Calculated flow entering (PCU/hr)	Calculated sat flow (PCU/hr)	Actual green (s (per cycle))	Wasted time total (s (per cycle))	Degree of saturation (%)	Practical reserve capacity (%)	JourneyTime (s)	Mean Delay per Veh (s)	Mean stops per Veh (%)	Mean max queue (PCU)	we m
1	1		1	1	A	131	1819	54	0.00	13	587	23.20	11.20	47.26	1.72	
2	1		1	1	A	301	2080	54	0.00	26	242	17.34	12.54	49.56	4.14	
3	1		1	1	A	136	2080	54	0.44	12	651	15.99	11.19	47.21	1.78	
4	1		2			437	2080	100	0.00	21	328	6.23	0.23	0.00	0.03	
5	1					383	Unrestricted	100	0.00	0	Unrestricted	13.86	0.00	0.00	0.00	
6	1					383	Unrestricted	100	0.00	0	Unrestricted	13.87	0.00	0.00	0.00	
7	1		1			136	1472	100	45.00	9	874	1.86	0.18	2.60	1.45	
8	1		3			667	1924	100	5.61	37	145	4.33	0.73	5.33	1.59	
9	1		1			418	1223	100	2.00	34	163	5.16	0.96	5.49	1.54	
10	1		1	1	C	249 <	1828	20	0.00	65	39	48.71	44.51	91.94	6.37 +	
11	1					270	Unrestricted	100	21.00	0	Unrestricted	10.06	0.00	0.00	0.00	
12	1		1	1	B	217	1835	48	0.00	24	273	27.39	15.39	55.63	3.35	
13	1		1	1	B	113	2080	48	0.00	11	712	18.18	13.98	53.21	1.67	
14	1		1	1	B	47	2027	48	47.11	5	1798	17.69	13.49	51.09	1.45	
15	1		4			160	2080	100	0.00	8	1070	6.07	0.07	0.00	0.00	
16	1					542	Unrestricted	100	10.00	0	Unrestricted	14.21	0.00	0.00	0.00	
17	1					184	Unrestricted	100	18.00	0	Unrestricted	14.53	0.00	0.00	0.00	
18	1		1	1	C	284	1794	20	0.00	75	19	63.14	51.14	105.31	8.45	
19	1					134	Unrestricted	100	24.00	0	Unrestricted	12.00	0.00	0.00	0.00	
20	1		1			47	1292	100	96.00	4	2373	2.79	1.11	46.03	1.45	

Network Results

	Distance travelled (PCU-km/hr)	Time spent (PCU-hr/hr)	Mean journey speed (kph)	Total delay (PCU-hr/hr)	Weighted cost of delay (£ per hr)	Weighted cost of stops (£ per hr)	Excess queue penalty (£ per hr)	Performance Index (£ per hr)
Normal traffic	373.06	23.27	16.03	10.83	153.84	13.69	0.00	167.53
Bus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tram	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pedestrians								
TOTAL	373.06	23.27	16.03	10.83	153.84	13.69	0.00	167.53

- *< = adjusted flow warning (upstream links/traffic streams are over-saturated)*
- ** = Traffic Stream - Normal, Bus or Tram Stop or Delay weighting has been set to a value other than 100%*
- *^ = Traffic Stream - Normal, Bus or Tram Stop or Delay Path weighting has been set to a value other than 100%*
- *+ = average link/traffic stream excess queue is greater than 0*
- ***P.I. = PERFORMANCE INDEX***

TRANSYT 15

Filename: Junction 1 2038 DS.t15
Path: C:\Users\shane.mcgivney\Desktop
Report generation date: 08/07/2019 13:54:44

File summary

File description

File title	2038 DS
Location	
Site number	
UTCRegion	
Driving side	Left
Date	11/06/2019
Version	
Status	(new file)
Identifier	
Client	
Jobnumber	
Enumerator	OCSC\shane.mcgivney
Description	

Model and Results

Enable controller offsets	Enable fuel consumption	Enable quick flares	Display journey time results	Display level of service results	Display blocking and starvation results	Display end of red and end of green queue results	Display excess queue results	Display separate uniform and random results	Display unweighted results	Display TRANSYT 12 style timings	Display effective greens in results	Display Red-With-Amber	Display End-Of-Green Amber

Units

Cost units	Speed units	Distance units	Fuel economy units	Fuel rate units	Mass units	Traffic units input	Traffic units results	Flow units	Average delay units	Total delay units	Rate of delay units
£	kph	m	mpg	l/h	kg	PCU	PCU	perHour	s	-Hour	perHour

Sorting

Show names instead of IDs	Sorting direction	Sorting type	Ignore prefixes when sorting	Analysis/demand set sorting	Link grouping	Source grouping	Colour Analysis/Demand Sets
	Ascending	Numerical		ID	Normal	Normal	✓

Network Diagrams

A1 - AM PEAK
D1 - AM PEAK*

Summary

Data Errors and Warnings

No errors or warnings

Run Summary

Analysis set used	Run start time	Run finish time	Modelling start time (HH:mm)	Network Cycle Time (s)	Performance Index (£ per hr)	Total network delay (PCU-hr/hr)	Highest DOS (%)	Item with highest DOS	Number of oversaturated items	Percentage of oversaturated items (%)	Item with worst signalised PRC	Item with worst unsignalised PRC	Ite wit wor over PR
1	08/07/2019 13:54:40	08/07/2019 13:54:40	08:00	100	156.19	9.88	48.34	4/1	0	0	10/1	4/1	4/

Analysis Set Details

Name	Description	Demand set	Include in report	Locked
AM PEAK		D1	✓	

Demand Set Details

Name	Description	Composite	Demand sets	Start time (HH:mm)	Locked
AM PEAK				08:00	

Network Options

Network timings

Network cycle time (s)	Restrict to SCOOT cycle times	Time segment length (min)	Number of time segments	Modelled time period (min)
100		60	1	60

Signals options

Start displacement (s)	End displacement (s)
2	3

Advanced

Phase minimum broken penalty (£)	Phase maximum broken penalty (£)	Intergreen broken penalty (£)	Starting Red-with-Amber (s)
10000.00	10000.00	10000.00	2

Traffic options

Traffic model	Vehicle flow scaling factor (%)	Pedestrian flow scaling factor (%)	Cruise times or speeds
Platoon Dispersion (PDM)	100	100	Cruise Speeds

Advanced

Resolution	DOS Threshold (%)	Cruise scaling factor (%)	Use link stop weightings	Use link delay weightings	Exclude pedestrians from results calculation	Random delay mode	Type of Vehicle-in-Service	Type of random parameter	PCU Length (m)	Calculate results for Path Segments	Generate PDM Profile Data
1	90	100	✓	✓		Complex	Uniform (TRANSYT)	Uniform (TRANSYT)	5.75		✓

Normal Traffic parameters

Dispersion type	Dispersion coefficient	Travel time coefficient
Default	35	80

Normal Traffic Types

Name	PCU Factor
Normal	1.00

Bus parameters

Name	PCU Factor	Dispersion type	Acceleration (ms^[-2])	Stationary time coefficient	Cruise time coefficient
Bus	1.00	Default	0.94	30	85

Tram parameters

Name	PCU Factor	Dispersion type	Acceleration (ms^[-2])	Stationary time coefficient	Cruise time coefficient
Tram	1.00	Default	0.94	100	100

Pedestrian parameters

Dispersion type
Default

Optimisation options

Enable optimisation	Auto redistribute	Optimisation level	Enable OUT Profile accuracy
	✓		✓

Advanced

Optimisation type	Hill climb increments	OUTProfile accuracy	Use enhanced optimisation	Auto optimisation order	Optimisation order	Master controller	Offsets relative to master controller	Master controller offset after each run
				✓				Do nothing

Economics

Vehicle Monetary Value Of Delay (£ per PCU-hr)	Vehicle Monetary Value Of Stops (£ per 100 stops)	Pedestrian monetary value of delay (£ per Ped-hr)
14.20	2.60	14.20

Arms and Traffic Streams

Arms

Arm	Name	Description	Traffic node
1			1
2			1
3			1
4			2
5			
6			
7			1
8			3
9			1
10			1
11			
12			1
13			1
14			1
15			4
16			
17			
18			1
19			
20			1

Traffic Streams

Arm	Traffic Stream	Name	Description	Auto length	Length (m)	Has Saturation Flow	Saturation flow source	Saturation flow (PCU/hr)	Auto-calculate cell saturation flow	Cell saturation flow (PCU/hr)	Is signal controlled	Is give way	Traffic type	Allow Nearside Turn On Red
1	1				100.00	✓	Sum of lanes	1791	✓	1800	✓		Normal	
2	1				40.00	✓	Sum of lanes	2080	✓	1800	✓		Normal	
3	1				40.00	✓	Sum of lanes	2080	✓	1800	✓		Normal	
4	1				50.00	✓	Sum of lanes	2080					Normal	
5	1			✓	115.49								Normal	
6	1			✓	115.59								Normal	
7	1				14.00	✓	Sum of lanes	1664	✓	1800		✓	Normal	
8	1				30.00	✓	Sum of lanes	1913					Normal	
9	1				35.00	✓	Sum of lanes	1554	✓	1800		✓	Normal	
10	1				35.00	✓	Sum of lanes	1880	✓	1800	✓		Normal	
11	1			✓	83.84								Normal	
12	1				100.00	✓	Sum of lanes	1812	✓	1800	✓		Normal	
13	1				35.00	✓	Sum of lanes	2080	✓	1800	✓		Normal	
14	1				35.00	✓	Sum of lanes	2027	✓	1800	✓		Normal	
15	1				50.00	✓	Sum of lanes	2080					Normal	
16	1			✓	118.42								Normal	
17	1			✓	121.12								Normal	
18	1				100.00	✓	Sum of lanes	1826			✓		Normal	
19	1				100.00								Normal	
20	1				14.00	✓	Sum of lanes	1664	✓	1800		✓	Normal	

Lanes

Arm	Traffic Stream	Lane	Name	Description	Use RR67	Surface condition	Site quality factor	Gradient (%)	Width (m)	Use connector turning radius	Proportion that turn (%)	Turning radius (m)	Nearside lane	Saturation flow (PCU/hr)
1	1	1	(untitled)		✓	N/A	N/A	0	3.25	✓	54	9.71	✓	1791
2	1	1	(untitled)		✓	N/A	N/A	0	3.25	✓	0	99999.00		2080
3	1	1	(untitled)		✓	N/A	N/A	0	3.25	✓	0	99999.00		2080
4	1	1	(untitled)		✓	N/A	N/A	0	3.25	✓	0	99999.00		2080
5	1	1	(untitled)											
6	1	1	(untitled)											
7	1	1	(untitled)		✓	N/A	N/A	0	3.25	✓	100	6.00		1664
8	1	1	(untitled)		✓	N/A	N/A	0	3.25	✓	62	66.82	✓	1913
9	1	1	(untitled)		✓	N/A	N/A	0	3.25	✓	100	6.05	✓	1554
10	1	1	(untitled)		✓	N/A	N/A	0	3.25	✓	46	21.54	✓	1880
11	1	1	(untitled)											
12	1	1	(untitled)		✓	N/A	N/A	0	3.25	✓	59	12.57	✓	1812
13	1	1	(untitled)		✓	N/A	N/A	0	3.25		0	100.00		2080
14	1	1	(untitled)		✓	N/A	N/A	0	3.25	✓	100	56.93		2027
15	1	1	(untitled)		✓	N/A	N/A	0	3.25	✓	0	99999.00		2080
16	1	1	(untitled)											
17	1	1	(untitled)											
18	1	1	(untitled)		✓	N/A	N/A	0	3.25	✓	68	16.38	✓	1826
19	1	1	(untitled)											
20	1	1	(untitled)		✓	N/A	N/A	0	3.25	✓	100	6.00		1664

Signals

Arm	Traffic Stream	Controller stream	Phase	Second phase enabled
1	1	1	A	
2	1	1	A	
3	1	1	A	
10	1	1	C	
12	1	1	B	
13	1	1	B	
14	1	1	B	
18	1	1	C	

Give Way Data

Arm	Traffic Stream	Opposed traffic	Use Step-wise Opposed Turn Model	Number of storage spaces	Use connector turning radius	Radius of turn (m)	Visibility restricted
7	1	Movement	✓	0	✓	6.00	
9	1	Movement	✓	0	✓	99999.00	
20	1	Movement	✓	0	✓	6.00	

Give Way Data - Movements

Arm	Traffic Stream	Movement	Destination traffic stream	Max Flow (Unopposed) (PCU/hr)	Percentage opposed (%)
7	1	1	11/1	1664	100
9	1	1	5/1	1554	100
		2	6/1	1554	100
20	1	1	19/1	1664	100

Give Way Data - Movements - Conflicts

Arm	Traffic Stream	Movement	Destination traffic stream	Description	Controlling type	Controlling from traffic stream	Controlling to traffic stream	Percentage opposing (%)	Upstream signals visible	Conflict shift	Conflict duration
7	1	1	11/1		TrafficStreamMovement	12/1	5/1	100		0	0
					TrafficStreamMovement	12/1	6/1	100		0	0
					TrafficStreamMovement	13/1	11/1	100		0	0
9	1	1	5/1		TrafficStreamMovement	18/1	5/1	100		0	0
					TrafficStreamMovement	13/1	5/1	100		0	0
		2	6/1		TrafficStreamMovement	18/1	6/1	100		0	0
					TrafficStreamMovement	12/1	6/1	100		0	0
20	1	1	19/1		TrafficStreamMovement	1/1	19/1	100		0	0
					TrafficStreamMovement	1/1	17/1	100		0	0
					TrafficStreamMovement	2/1	16/1	100		0	0

Signal Timings

Network Default: 100s cycle time; 100 steps

Interstage Matrix for Controller Stream 1

		To			
		1	2	3	4
From	1	0	0	5	0
	2	0	0	6	0
	3	6	6	0	0
	4	0	0	0	0

Resultant Stages

Controller stream	Resultant Stage	Is base stage	Library Stage ID	Phases in this stage	Stage start (s)	Stage end (s)	Stage duration (s)	User stage minimum (s)	Stage minimum (s)
1	1	✓	1	A	83	89	6	1	1
	2	✓	2	A,B	89	37	48	1	7
	3	✓	3	C	43	63	20	1	7
	4	✓	4	D	63	83	20	1	20

Final Prediction Table

Traffic Stream Results

				SIGNALS		FLOWS		PERFORMANCE				PER PCU			QUEUES
Arm	Traffic Stream	Name	Traffic node	Controller stream	Phase	Calculated flow entering (PCU/hr)	Calculated sat flow (PCU/hr)	Actual green (s (per cycle))	Wasted time total (s (per cycle))	Degree of saturation (%)	Practical reserve capacity (%)	JourneyTime (s)	Mean Delay per Veh (s)	Mean stops per Veh (%)	Mean max queue (PCU)
1	1		1	1	A	285	1791	54	0.00	29	211	24.79	12.79	49.74	3.94
2	1		1	1	A	518	2080	54	0.00	45	99	18.37	13.57	41.58	5.98
3	1		1	1	A	332	2080	54	4.89	32	183	17.21	12.41	43.52	3.79
4	1		2			850	2080	100	15.45	48	86	8.77	2.77	23.28	6.36
5	1					182	Unrestricted	100	17.00	0	Unrestricted	13.86	0.00	0.00	0.00
6	1					182	Unrestricted	100	17.00	0	Unrestricted	13.87	0.00	0.00	0.00
7	1		1			332	1469	100	45.00	23	298	3.10	1.42	11.81	1.48
8	1		3			299	1913	100	0.00	16	476	3.77	0.17	0.00	0.01
9	1		1			114	1278	100	0.00	9	909	4.39	0.19	2.26	1.45
10	1		1	1	C	185	1880	20	0.00	47	92	42.86	38.66	87.71	4.59
11	1					518	Unrestricted	100	28.00	0	Unrestricted	10.06	0.00	0.00	0.00
12	1		1	1	B	263	1812	48	0.00	30	204	28.07	16.07	55.85	4.08
13	1		1	1	B	108	2080	48	0.00	11	749	18.14	13.94	53.16	1.60
14	1		1	1	B	75	2027	48	0.22	8	1086	17.94	13.74	51.15	1.45
15	1		4			183	2080	100	0.00	9	923	6.08	0.08	0.00	0.00
16	1					593	Unrestricted	100	17.00	0	Unrestricted	14.21	0.00	0.00	0.00
17	1					173	Unrestricted	100	21.00	0	Unrestricted	14.53	0.00	0.00	0.00
18	1		1	1	C	97	1826	20	0.00	25	256	46.56	34.56	83.39	2.28
19	1					329	Unrestricted	100	16.00	0	Unrestricted	12.00	0.00	0.00	0.00
20	1		1			75	1014	100	51.00	7	1117	9.43	7.75	55.37	1.45

Network Results

	Distance travelled (PCU-km/hr)	Time spent (PCU-hr/hr)	Mean journey speed (kph)	Total delay (PCU-hr/hr)	Weighted cost of delay (£ per hr)	Weighted cost of stops (£ per hr)	Excess queue penalty (£ per hr)	Performance Index (£ per hr)
Normal traffic	391.25	22.92	17.07	9.88	140.28	15.91	0.00	156.19
Bus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tram	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pedestrians								
TOTAL	391.25	22.92	17.07	9.88	140.28	15.91	0.00	156.19

- *< = adjusted flow warning (upstream links/traffic streams are over-saturated)*
- ** = Traffic Stream - Normal, Bus or Tram Stop or Delay weighting has been set to a value other than 100%*
- *^ = Traffic Stream - Normal, Bus or Tram Stop or Delay Path weighting has been set to a value other than 100%*
- *+ = average link/traffic stream excess queue is greater than 0*
- ***P.I. = PERFORMANCE INDEX***

TRANSYT 15

Version: 15.5.2.7994

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+44 (0)1344 379777 software@trl.co.uk www.trlsoftware.co.uk

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

Filename: Junction 1 2038 DS.t15
Path: C:\Users\shane.mcgivney\Desktop
Report generation date: 08/07/2019 13:55:08

File summary

File description

File title	2038 DS
Location	
Site number	
UTCRegion	
Driving side	Left
Date	11/06/2019
Version	
Status	(new file)
Identifier	
Client	
Jobnumber	
Enumerator	OCSC\shane.mcgivney
Description	

Model and Results

Enable controller offsets	Enable fuel consumption	Enable quick flares	Display journey time results	Display level of service results	Display blocking and starvation results	Display end of red and green queue results	Display excess queue results	Display separate uniform and random results	Display unweighted results	Display TRANSYT 12 style timings	Display effective greens in results	Display Red-With-Amber	Display End-Of-Green Amber

Units

Cost units	Speed units	Distance units	Fuel economy units	Fuel rate units	Mass units	Traffic units input	Traffic units results	Flow units	Average delay units	Total delay units	Rate of delay units
£	kph	m	mpg	l/h	kg	PCU	PCU	perHour	s	-Hour	perHour

Sorting

Show names instead of IDs	Sorting direction	Sorting type	Ignore prefixes when sorting	Analysis/demand set sorting	Link grouping	Source grouping	Colour Analysis/Demand Sets
	Ascending	Numerical		ID	Normal	Normal	✓

Network Diagrams

A2 - PM PEAK
D2 - PM PEAK*

Summary

Data Errors and Warnings

No errors or warnings

Run Summary

Analysis set used	Run start time	Run finish time	Modelling start time (HH:mm)	Network Cycle Time (s)	Performance Index (£ per hr)	Total network delay (PCU-hr/hr)	Highest DOS (%)	Item with highest DOS	Number of oversaturated items	Percentage of oversaturated items (%)	Item with worst signalised PRC	Item with worst unsignalised PRC	Ite wit wor over PR
2	08/07/2019 13:55:04	08/07/2019 13:55:04	08:00	100	172.32	11.14	76.40	18/1	0	0	18/1	8/1	18/

Analysis Set Details

Name	Description	Demand set	Include in report	Locked
PM PEAK		D2	✓	

Demand Set Details

Name	Description	Composite	Demand sets	Start time (HH:mm)	Locked
PM PEAK				08:00	

Network Options

Network timings

Network cycle time (s)	Restrict to SCOOT cycle times	Time segment length (min)	Number of time segments	Modelled time period (min)
100		60	1	60

Signals options

Start displacement (s)	End displacement (s)
2	3

Advanced

Phase minimum broken penalty (£)	Phase maximum broken penalty (£)	Intergreen broken penalty (£)	Starting Red-with-Amber (s)
10000.00	10000.00	10000.00	2

Traffic options

Traffic model	Vehicle flow scaling factor (%)	Pedestrian flow scaling factor (%)	Cruise times or speeds
Platoon Dispersion (PDM)	100	100	Cruise Speeds

Advanced

Resolution	DOS Threshold (%)	Cruise scaling factor (%)	Use link stop weightings	Use link delay weightings	Exclude pedestrians from results calculation	Random delay mode	Type of Vehicle-in-Service	Type of random parameter	PCU Length (m)	Calculate results for Path Segments	Generate PDM Profile Data
1	90	100	✓	✓		Complex	Uniform (TRANSYT)	Uniform (TRANSYT)	5.75		✓

Normal Traffic parameters

Dispersion type	Dispersion coefficient	Travel time coefficient
Default	35	80

Normal Traffic Types

Name	PCU Factor
Normal	1.00

Bus parameters

Name	PCU Factor	Dispersion type	Acceleration (ms^[-2])	Stationary time coefficient	Cruise time coefficient
Bus	1.00	Default	0.94	30	85

Tram parameters

Name	PCU Factor	Dispersion type	Acceleration (ms^[-2])	Stationary time coefficient	Cruise time coefficient
Tram	1.00	Default	0.94	100	100

Pedestrian parameters

Dispersion type
Default

Optimisation options

Enable optimisation	Auto redistribute	Optimisation level	Enable OUT Profile accuracy
	✓		✓

Advanced

Optimisation type	Hill climb increments	OUTProfile accuracy	Use enhanced optimisation	Auto optimisation order	Optimisation order	Master controller	Offsets relative to master controller	Master controller offset after each run
				✓				Do nothing

Economics

Vehicle Monetary Value Of Delay (£ per PCU-hr)	Vehicle Monetary Value Of Stops (£ per 100 stops)	Pedestrian monetary value of delay (£ per Ped-hr)
14.20	2.60	14.20

Arms and Traffic Streams

Arms

Arm	Name	Description	Traffic node
1			1
2			1
3			1
4			2
5			
6			
7			1
8			3
9			1
10			1
11			
12			1
13			1
14			1
15			4
16			
17			
18			1
19			
20			1

Traffic Streams

Arm	Traffic Stream	Name	Description	Auto length	Length (m)	Has Saturation Flow	Saturation flow source	Saturation flow (PCU/hr)	Auto-calculate cell saturation flow	Cell saturation flow (PCU/hr)	Is signal controlled	Is give way	Traffic type	Allow Nearside Turn On Red
1	1				100.00	✓	Sum of lanes	1819	✓	1800	✓		Normal	
2	1				40.00	✓	Sum of lanes	2080	✓	1800	✓		Normal	
3	1				40.00	✓	Sum of lanes	2080	✓	1800	✓		Normal	
4	1				50.00	✓	Sum of lanes	2080					Normal	
5	1			✓	115.49								Normal	
6	1			✓	115.59								Normal	
7	1				14.00	✓	Sum of lanes	1664	✓	1800		✓	Normal	
8	1				30.00	✓	Sum of lanes	1924					Normal	
9	1				35.00	✓	Sum of lanes	1554	✓	1800		✓	Normal	
10	1				35.00	✓	Sum of lanes	1829	✓	1800	✓		Normal	
11	1			✓	83.84								Normal	
12	1				100.00	✓	Sum of lanes	1833	✓	1800	✓		Normal	
13	1				35.00	✓	Sum of lanes	2080	✓	1800	✓		Normal	
14	1				35.00	✓	Sum of lanes	2027	✓	1800	✓		Normal	
15	1				50.00	✓	Sum of lanes	2080					Normal	
16	1			✓	118.42								Normal	
17	1			✓	121.12								Normal	
18	1				100.00	✓	Sum of lanes	1795			✓		Normal	
19	1				100.00								Normal	
20	1				14.00	✓	Sum of lanes	1664	✓	1800		✓	Normal	

Lanes

Arm	Traffic Stream	Lane	Name	Description	Use RR67	Surface condition	Site quality factor	Gradient (%)	Width (m)	Use connector turning radius	Proportion that turn (%)	Turning radius (m)	Nearside lane	Saturation flow (PCU/hr)
1	1	1	(untitled)		✓	N/A	N/A	0	3.25	✓	43	9.71	✓	1819
2	1	1	(untitled)		✓	N/A	N/A	0	3.25	✓	0	99999.00		2080
3	1	1	(untitled)		✓	N/A	N/A	0	3.25	✓	0	99999.00		2080
4	1	1	(untitled)		✓	N/A	N/A	0	3.25	✓	0	99999.00		2080
5	1	1	(untitled)											
6	1	1	(untitled)											
7	1	1	(untitled)		✓	N/A	N/A	0	3.25	✓	100	6.00		1664
8	1	1	(untitled)		✓	N/A	N/A	0	3.25	✓	37	66.82	✓	1924
9	1	1	(untitled)		✓	N/A	N/A	0	3.25	✓	100	6.05	✓	1554
10	1	1	(untitled)		✓	N/A	N/A	0	3.25	✓	87	21.54	✓	1829
11	1	1	(untitled)											
12	1	1	(untitled)		✓	N/A	N/A	0	3.25	✓	49	12.57	✓	1833
13	1	1	(untitled)		✓	N/A	N/A	0	3.25		0	100.00		2080
14	1	1	(untitled)		✓	N/A	N/A	0	3.25	✓	100	56.93		2027
15	1	1	(untitled)		✓	N/A	N/A	0	3.25	✓	0	99999.00		2080
16	1	1	(untitled)											
17	1	1	(untitled)											
18	1	1	(untitled)		✓	N/A	N/A	0	3.25	✓	88	16.38	✓	1795
19	1	1	(untitled)											
20	1	1	(untitled)		✓	N/A	N/A	0	3.25	✓	100	6.00		1664

Signals

Arm	Traffic Stream	Controller stream	Phase	Second phase enabled
1	1	1	A	
2	1	1	A	
3	1	1	A	
10	1	1	C	
12	1	1	B	
13	1	1	B	
14	1	1	B	
18	1	1	C	

Give Way Data

Arm	Traffic Stream	Opposed traffic	Use Step-wise Opposed Turn Model	Number of storage spaces	Use connector turning radius	Radius of turn (m)	Visibility restricted
7	1	Movement	✓	0	✓	6.00	
9	1	Movement	✓	0	✓	99999.00	
20	1	Movement	✓	0	✓	6.00	

Give Way Data - Movements

Arm	Traffic Stream	Movement	Destination traffic stream	Max Flow (Unopposed) (PCU/hr)	Percentage opposed (%)
7	1	1	11/1	1664	100
9	1	1	5/1	1554	100
		2	6/1	1554	100
20	1	1	19/1	1664	100

Give Way Data - Movements - Conflicts

Arm	Traffic Stream	Movement	Destination traffic stream	Description	Controlling type	Controlling from traffic stream	Controlling to traffic stream	Percentage opposing (%)	Upstream signals visible	Conflict shift	Conflict duration
7	1	1	11/1		TrafficStreamMovement	12/1	5/1	100		0	0
					TrafficStreamMovement	12/1	6/1	100		0	0
					TrafficStreamMovement	13/1	11/1	100		0	0
9	1	1	5/1		TrafficStreamMovement	18/1	5/1	100		0	0
					TrafficStreamMovement	13/1	5/1	100		0	0
		2	6/1		TrafficStreamMovement	18/1	6/1	100		0	0
					TrafficStreamMovement	12/1	6/1	100		0	0
20	1	1	19/1		TrafficStreamMovement	1/1	19/1	100		0	0
					TrafficStreamMovement	1/1	17/1	100		0	0
					TrafficStreamMovement	2/1	16/1	100		0	0

Signal Timings

Network Default: 100s cycle time; 100 steps

Interstage Matrix for Controller Stream 1

		To			
		1	2	3	4
From	1	0	0	5	0
	2	0	0	6	0
	3	6	6	0	0
	4	0	0	0	0

Resultant Stages

Controller stream	Resultant Stage	Is base stage	Library Stage ID	Phases in this stage	Stage start (s)	Stage end (s)	Stage duration (s)	User stage minimum (s)	Stage minimum (s)
1	1	✓	1	A	83	89	6	1	1
	2	✓	2	A,B	89	37	48	1	7
	3	✓	3	C	43	63	20	1	7
	4	✓	4	D	63	83	20	1	20

Final Prediction Table

Traffic Stream Results

			SIGNALS			FLOWS		PERFORMANCE				PER PCU			QUEUES	
Arm	Traffic Stream	Name	Traffic node	Controller stream	Phase	Calculated flow entering (PCU/hr)	Calculated sat flow (PCU/hr)	Actual green (s (per cycle))	Wasted time total (s (per cycle))	Degree of saturation (%)	Practical reserve capacity (%)	JourneyTime (s)	Mean Delay per Veh (s)	Mean stops per Veh (%)	Mean max queue (PCU)	we m
1	1		1	1	A	131	1819	54	0.00	13	587	23.20	11.20	47.26	1.72	
2	1		1	1	A	301	2080	54	0.00	26	242	17.34	12.54	49.56	4.14	
3	1		1	1	A	143	2080	54	0.44	13	614	16.04	11.24	47.23	1.88	
4	1		2			444	2080	100	0.00	21	322	6.23	0.23	0.00	0.03	
5	1					386	Unrestricted	100	0.00	0	Unrestricted	13.86	0.00	0.00	0.00	
6	1					386	Unrestricted	100	0.00	0	Unrestricted	13.87	0.00	0.00	0.00	
7	1		1			143	1472	100	45.00	10	826	1.89	0.21	2.59	1.45	
8	1		3			678	1924	100	6.83	38	138	4.50	0.90	7.88	2.00	
9	1		1			424	1223	100	4.00	35	160	5.21	1.01	6.19	1.54	
10	1		1	1	C	254 <	1829	20	0.00	66	36	49.15	44.95	90.88	6.43 +	
11	1					285	Unrestricted	100	20.00	0	Unrestricted	10.06	0.00	0.00	0.00	
12	1		1	1	B	221	1833	48	0.00	25	266	27.44	15.44	55.65	3.42	
13	1		1	1	B	113	2080	48	0.00	11	712	18.18	13.98	53.21	1.67	
14	1		1	1	B	47	2027	48	47.11	5	1798	17.69	13.49	51.09	1.45	
15	1		4			160	2080	100	0.00	8	1070	6.07	0.07	0.00	0.00	
16	1					544	Unrestricted	100	10.00	0	Unrestricted	14.21	0.00	0.00	0.00	
17	1					186	Unrestricted	100	18.00	0	Unrestricted	14.53	0.00	0.00	0.00	
18	1		1	1	C	288	1795	20	0.00	76	18	63.98	51.98	106.33	8.71	
19	1					135	Unrestricted	100	23.00	0	Unrestricted	12.00	0.00	0.00	0.00	
20	1		1			47	1292	100	96.00	4	2373	2.79	1.11	46.03	1.45	

Network Results

	Distance travelled (PCU-km/hr)	Time spent (PCU-hr/hr)	Mean journey speed (kph)	Total delay (PCU-hr/hr)	Weighted cost of delay (£ per hr)	Weighted cost of stops (£ per hr)	Excess queue penalty (£ per hr)	Performance Index (£ per hr)
Normal traffic	377.83	23.73	15.92	11.14	158.18	14.14	0.00	172.32
Bus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tram	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pedestrians								
TOTAL	377.83	23.73	15.92	11.14	158.18	14.14	0.00	172.32

- *< = adjusted flow warning (upstream links/traffic streams are over-saturated)*
- ** = Traffic Stream - Normal, Bus or Tram Stop or Delay weighting has been set to a value other than 100%*
- *^ = Traffic Stream - Normal, Bus or Tram Stop or Delay Path weighting has been set to a value other than 100%*
- *+ = average link/traffic stream excess queue is greater than 0*
- ***P.I. = PERFORMANCE INDEX***

Junctions 9

PICADY 9 - Priority Intersection Module

Version: 9.5.0.6896

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Filename: Junction 2 2023 DM.j9
Path: N:\Projects\R-Jobs\R478\1.0 WIP\DESIGN\CIVIL\CALCS
Report generation date: 08/07/2019 14:01:57

»Junction 2 2023 DM - 2023, AM
»Junction 2 2023 DM - 2023, PM

Summary of junction performance

	AM				PM			
	Queue (PCU)	Delay (s)	RFC	LOS	Queue (PCU)	Delay (s)	RFC	LOS
	Junction 2 2023 DM - 2023							
Stream B-CD	0.2	8.07	0.17	A	0.5	9.53	0.31	A
Stream B-A	0.3	13.19	0.19	B	0.2	12.70	0.18	B
Stream AB-CD	0.0	5.47	0.01	A	0.0	4.75	0.01	A
Stream D-ABC	0.0	8.60	0.02	A	0.0	0.00	0.00	A
Stream CD-AB	0.7	7.94	0.30	A	0.2	7.78	0.12	A

Values shown are the highest values encountered over all time segments. Delay is the maximum value of average delay per arriving vehicle.

File summary

File Description

Title	Junction 2 2023 DM
Location	
Site number	
Date	12/06/2019
Version	
Status	(new file)
Identifier	
Client	
Jobnumber	
Enumerator	OCSC\shane.mcgivney
Description	

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

Analysis Options

Calculate Queue Percentiles	Calculate residual capacity	RFC Threshold	Average Delay threshold (s)	Queue threshold (PCU)
		0.85	36.00	20.00

Demand Set Summary

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)
D1	2023	AM	ONE HOUR	07:45	09:15	15
D2	2023	PM	ONE HOUR	16:00	17:30	15

Analysis Set Details

ID	Name	Network flow scaling factor (%)
A1	Junction 2 2023 DM	100.000

Junction 2 2023 DM - 2023, AM

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction type	Major road direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	untitled	Left-Right Stagger	Two-way		1.87	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Arms

Arms

Arm	Name	Description	Arm type
A	untitled		Major
B	untitled		Minor
C	untitled		Major
D	untitled		Minor

Major Arm Geometry

Arm	Width of carriageway (m)	Has kerbed central reserve	Has right turn bay	Visibility for right turn (m)	Blocks?	Blocking queue (PCU)
A	8.30			0.0	✓	0.00
C	8.30			0.0	✓	0.00

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)	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 plus flare		10.00	8.10	5.20	4.50	4.50	✓	3.00	75	75
D	One lane	3.00								75	75

Slope / Intercept / Capacity

Priority Intersection Slopes and Intercepts

Junction	Stream	Intercept (PCU/hr)	Slope for A-B	Slope for A-C	Slope for A-D	Slope for B-C	Slope for B-D	Slope for C-A	Slope for C-B	Slope for C-D	Slope for D-A	Slope for D-B
1	AB-D	574	-	-	-	-	-	0.200	0.200	0.200	-	-
1	B-A	531	0.087	0.220	0.220	-	-	0.139	0.315	-	0.139	0.315
1	B-CD	712	0.098	0.248	0.248	-	-	-	-	-	-	-
1	CD-B	574	0.200	0.200	0.200	-	-	-	-	-	-	-
1	D-AB	671	-	-	-	-	-	0.234	0.234	0.093	-	-
1	D-C	539	-	0.141	0.319	0.141	0.319	0.223	0.223	0.088	-	-

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 Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)
D1	2023	AM	ONE HOUR	07:45	09:15	15

Default vehicle mix	Vehicle mix source	PCU Factor for a HV (PCU)
✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
A		✓	352	100.000
B		✓	159	100.000
C		✓	381	100.000
D		✓	9	100.000

Origin-Destination Data

Demand (PCU/hr)

		To			
		A	B	C	D
From	A	0	52	299	1
	B	66	0	92	1
	C	270	110	0	1
	D	3	2	4	0

Vehicle Mix

Heavy Vehicle Percentages

		To			
		A	B	C	D
From	A	10	10	10	10
	B	10	10	10	10
	C	10	10	10	10
	D	10	10	10	10

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS
B-CD	0.17	8.07	0.2	A
B-A	0.19	13.19	0.3	B
A-B				
A-C				
A-D				
AB-CD	0.01	5.47	0.0	A
AB-C				
D-ABC	0.02	8.60	0.0	A
C-D				
C-A				
C-B				
CD-AB	0.30	7.94	0.7	A
CD-A				

Main Results for each time segment

07:45 - 08:00

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-CD	70	633	0.111	69	0.1	7.022	A
B-A	50	423	0.117	49	0.1	10.568	B
A-B	39			39			
A-C	225			225			
A-D	0.75			0.75			
AB-CD	3	726	0.003	3	0.0	5.472	A
AB-C	293			293			
D-ABC	7	514	0.013	7	0.0	7.802	A
C-D	0.75			0.75			
C-A	203			203			
C-B	83			83			
CD-AB	122	667	0.183	120	0.3	7.238	A
CD-A	168			168			

08:00 - 08:15

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-CD	84	616	0.136	83	0.2	7.428	A
B-A	59	402	0.148	59	0.2	11.542	B
A-B	47			47			
A-C	269			269			
A-D	0.90			0.90			
AB-CD	3	758	0.004	3	0.0	5.246	A
AB-C	350			350			
D-ABC	8	496	0.016	8	0.0	8.116	A
C-D	0.90			0.90			
C-A	243			243			
C-B	99			99			
CD-AB	157	687	0.229	157	0.5	7.479	A
CD-A	189			189			

08:15 - 08:30

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-CD	102	593	0.173	102	0.2	8.060	A
B-A	73	373	0.195	72	0.3	13.163	B
A-B	57			57			
A-C	329			329			
A-D	1			1			
AB-CD	5	803	0.006	5	0.0	4.959	A
AB-C	428			428			
D-ABC	10	471	0.021	10	0.0	8.596	A
C-D	1			1			
C-A	297			297			
C-B	121			121			
CD-AB	214	715	0.299	213	0.7	7.908	A
CD-A	210			210			

08:30 - 08:45

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-CD	102	593	0.173	102	0.2	8.070	A
B-A	73	373	0.195	73	0.3	13.195	B
A-B	57			57			
A-C	329			329			
A-D	1			1			
AB-CD	5	803	0.006	5	0.0	4.958	A
AB-C	428			428			
D-ABC	10	471	0.021	10	0.0	8.597	A
C-D	1			1			
C-A	297			297			
C-B	121			121			
CD-AB	214	715	0.300	214	0.7	7.937	A
CD-A	210			210			

08:45 - 09:00

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-CD	84	616	0.136	84	0.2	7.443	A
B-A	59	402	0.148	60	0.2	11.581	B
A-B	47			47			
A-C	269			269			
A-D	0.90			0.90			
AB-CD	3	758	0.004	3	0.0	5.244	A
AB-C	350			350			
D-ABC	8	496	0.016	8	0.0	8.118	A
C-D	0.90			0.90			
C-A	243			243			
C-B	99			99			
CD-AB	158	687	0.229	159	0.5	7.517	A
CD-A	188			188			

09:00 - 09:15

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-CD	70	632	0.111	70	0.1	7.045	A
B-A	50	423	0.117	50	0.1	10.618	B
A-B	39			39			
A-C	225			225			
A-D	0.75			0.75			
AB-CD	3	727	0.003	3	0.0	5.469	A
AB-C	293			293			
D-ABC	7	514	0.013	7	0.0	7.805	A
C-D	0.75			0.75			
C-A	203			203			
C-B	83			83			
CD-AB	122	667	0.183	123	0.4	7.289	A
CD-A	167			167			

Junction 2 2023 DM - 2023, PM

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction type	Major road direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	untitled	Left-Right Stagger	Two-way		1.93	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)
D2	2023	PM	ONE HOUR	16:00	17:30	15

Default vehicle mix	Vehicle mix source	PCU Factor for a HV (PCU)
✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
A		✓	398	100.000
B		✓	233	100.000
C		✓	169	100.000
D		✓	2	100.000

Origin-Destination Data

Demand (PCU/hr)

		To			
		A	B	C	D
From	A	0	14	382	2
	B	64	0	169	0
	C	117	50	0	2
	D	1	0	1	0

Vehicle Mix

Heavy Vehicle Percentages

		To			
		A	B	C	D
From	A	10	10	10	10
	B	10	10	10	10
	C	10	10	10	10
	D	10	10	10	10

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS
B-CD	0.31	9.53	0.5	A
B-A	0.18	12.70	0.2	B
A-B				
A-C				
A-D				
AB-CD	0.01	4.75	0.0	A
AB-C				
D-ABC	0.00	0.00	0.0	A
C-D				
C-A				
C-B				
CD-AB	0.12	7.78	0.2	A
CD-A				

Main Results for each time segment

16:00 - 16:15

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-CD	127	647	0.197	126	0.3	7.581	A
B-A	48	422	0.114	48	0.1	10.551	B
A-B	11			11			
A-C	288			288			
A-D	2			2			
AB-CD	3	836	0.004	3	0.0	4.752	A
AB-C	412			412			
D-ABC	0	531	0.000	0	0.0	0.000	A
C-D	2			2			
C-A	88			88			
C-B	38			38			
CD-AB	44	577	0.077	44	0.1	7.426	A
CD-A	81			81			

16:15 - 16:30

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-CD	152	628	0.242	152	0.3	8.301	A
B-A	58	406	0.142	57	0.2	11.364	B
A-B	13			13			
A-C	343			343			
A-D	2			2			
AB-CD	4	889	0.005	4	0.0	4.474	A
AB-C	493			493			
D-ABC	0	517	0.000	0	0.0	0.000	A
C-D	2			2			
C-A	105			105			
C-B	45			45			
CD-AB	55	578	0.095	55	0.1	7.567	A
CD-A	95			95			

16:30 - 16:45

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-CD	186	602	0.309	186	0.5	9.502	A
B-A	70	382	0.184	70	0.2	12.675	B
A-B	15			15			
A-C	421			421			
A-D	2			2			
AB-CD	6	962	0.006	6	0.0	4.141	A
AB-C	602			602			
D-ABC	0	498	0.000	0	0.0	0.000	A
C-D	2			2			
C-A	129			129			
C-B	55			55			
CD-AB	71	580	0.122	71	0.2	7.772	A
CD-A	113			113			

16:45 - 17:00

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-CD	186	602	0.309	186	0.5	9.529	A
B-A	70	382	0.184	70	0.2	12.697	B
A-B	15			15			
A-C	421			421			
A-D	2			2			
AB-CD	6	962	0.006	6	0.0	4.139	A
AB-C	603			603			
D-ABC	0	497	0.000	0	0.0	0.000	A
C-D	2			2			
C-A	129			129			
C-B	55			55			
CD-AB	71	580	0.122	71	0.2	7.777	A
CD-A	113			113			

17:00 - 17:15

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-CD	152	628	0.242	152	0.4	8.337	A
B-A	58	406	0.142	58	0.2	11.393	B
A-B	13			13			
A-C	343			343			
A-D	2			2			
AB-CD	4	890	0.005	4	0.0	4.472	A
AB-C	494			494			
D-ABC	0	517	0.000	0	0.0	0.000	A
C-D	2			2			
C-A	105			105			
C-B	45			45			
CD-AB	55	578	0.095	55	0.1	7.579	A
CD-A	95			95			

17:15 - 17:30

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-CD	127	647	0.197	128	0.3	7.627	A
B-A	48	422	0.114	48	0.1	10.593	B
A-B	11			11			
A-C	288			288			
A-D	2			2			
AB-CD	3	837	0.004	3	0.0	4.748	A
AB-C	414			414			
D-ABC	0	530	0.000	0	0.0	0.000	A
C-D	2			2			
C-A	88			88			
C-B	38			38			
CD-AB	45	577	0.077	45	0.1	7.441	A
CD-A	81			81			

Junctions 9

PICADY 9 - Priority Intersection Module

Version: 9.5.0.6896

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Filename: Junction 2 2023 DN.j9
Path: N:\Projects\R-Jobs\R478\1.0 WIP\DESIGN\CIVIL\CALCS
Report generation date: 08/07/2019 14:03:01

»2023 DN - 2023, AM
»2023 DN - 2023, PM

Summary of junction performance

	AM				PM			
	Queue (PCU)	Delay (s)	RFC	LOS	Queue (PCU)	Delay (s)	RFC	LOS
	2023 DN - 2023							
Stream B-C	0.2	7.29	0.16	A	0.5	9.00	0.30	A
Stream B-A	0.2	11.18	0.16	B	0.2	11.85	0.17	B
Stream C-AB	0.5	7.31	0.23	A	0.2	7.74	0.12	A

Values shown are the highest values encountered over all time segments. Delay is the maximum value of average delay per arriving vehicle.

File summary

File Description

Title	Junction 2 2023 DN
Location	
Site number	
Date	12/06/2019
Version	
Status	(new file)
Identifier	
Client	
Jobnumber	
Enumerator	OCSC\shane.mcgivney
Description	

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

Analysis Options

Calculate Queue Percentiles	Calculate residual capacity	RFC Threshold	Average Delay threshold (s)	Queue threshold (PCU)
		0.85	36.00	20.00

Demand Set Summary

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)
D1	2023	AM	ONE HOUR	08:00	09:30	15
D2	2023	PM	ONE HOUR	17:00	18:30	15

Analysis Set Details

ID	Name	Network flow scaling factor (%)
A1	2023 DN	100.000

2023 DN - 2023, AM

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction type	Major road direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	untitled	T-Junction	Two-way		3.54	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Arms

Arms

Arm	Name	Description	Arm type
A	Carmanhall Road E		Major
B	Corrig Road		Minor
C	Carmanhall Road W		Major

Major Arm Geometry

Arm	Width of carriageway (m)	Has kerbed central reserve	Has right turn bay	Visibility for right turn (m)	Blocks?	Blocking queue (PCU)
C	8.30			0.0	✓	0.00

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	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 plus flare	10.00	8.10	5.20	4.50	4.50	✓	3.00	75	75

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	526	0.086	0.218	0.137	0.312
1	B-C	718	0.099	0.250	-	-
1	C-B	574	0.200	0.200	-	-

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 Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)
D1	2023	AM	ONE HOUR	08:00	09:30	15

Default vehicle mix	Vehicle mix source	PCU Factor for a HV (PCU)
✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
A		✓	193	100.000
B		✓	152	100.000
C		✓	312	100.000

Origin-Destination Data

Demand (PCU/hr)

		To		
		A	B	C
From	A	0	38	155
	B	60	0	92
	C	218	94	0

Vehicle Mix

Heavy Vehicle Percentages

		To		
		A	B	C
From	A	10	10	10
	B	10	10	10
	C	10	10	10

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS
B-C	0.16	7.29	0.2	A
B-A	0.16	11.18	0.2	B
C-AB	0.23	7.31	0.5	A
C-A				
A-B				
A-C				

Main Results for each time segment

08:00 - 08:15

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	69	669	0.104	69	0.1	6.591	A
B-A	45	454	0.100	45	0.1	9.665	A
C-AB	94	659	0.143	93	0.2	6.990	A
C-A	141			141			
A-B	29			29			
A-C	117			117			

08:15 - 08:30

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	83	659	0.126	83	0.2	6.872	A
B-A	54	440	0.123	54	0.2	10.256	B
C-AB	119	677	0.176	119	0.3	7.103	A
C-A	161			161			
A-B	34			34			
A-C	139			139			

08:30 - 08:45

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	101	644	0.157	101	0.2	7.287	A
B-A	66	420	0.157	66	0.2	11.170	B
C-AB	158	701	0.225	157	0.4	7.292	A
C-A	186			186			
A-B	42			42			
A-C	171			171			

08:45 - 09:00

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	101	644	0.157	101	0.2	7.292	A
B-A	66	420	0.157	66	0.2	11.182	B
C-AB	158	701	0.225	158	0.5	7.305	A
C-A	185			185			
A-B	42			42			
A-C	171			171			

09:00 - 09:15

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	83	658	0.126	83	0.2	6.882	A
B-A	54	440	0.123	54	0.2	10.277	B
C-AB	119	677	0.176	120	0.3	7.124	A
C-A	161			161			
A-B	34			34			
A-C	139			139			

09:15 - 09:30

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	69	668	0.104	69	0.1	6.610	A
B-A	45	454	0.100	45	0.1	9.696	A
C-AB	95	660	0.143	95	0.2	7.023	A
C-A	140			140			
A-B	29			29			
A-C	117			117			

2023 DN - 2023, PM

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction type	Major road direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	untitled	T-Junction	Two-way		3.85	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)
D2	2023	PM	ONE HOUR	17:00	18:30	15

Default vehicle mix	Vehicle mix source	PCU Factor for a HV (PCU)
✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
A		✓	324	100.000
B		✓	229	100.000
C		✓	147	100.000

Origin-Destination Data

Demand (PCU/hr)

		To		
		A	B	C
From	A	0	9	315
	B	60	0	169
	C	97	50	0

Vehicle Mix

Heavy Vehicle Percentages

		To		
		A	B	C
From	A	10	10	10
	B	10	10	10
	C	10	10	10

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS
B-C	0.30	9.00	0.5	A
B-A	0.17	11.85	0.2	B
C-AB	0.12	7.74	0.2	A
C-A				
A-B				
A-C				

Main Results for each time segment

17:00 - 17:15

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	127	665	0.191	126	0.3	7.340	A
B-A	45	434	0.104	45	0.1	10.159	B
C-AB	43	577	0.075	43	0.1	7.409	A
C-A	68			68			
A-B	7			7			
A-C	237			237			

17:15 - 17:30

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	152	649	0.234	152	0.3	7.963	A
B-A	54	420	0.128	54	0.2	10.816	B
C-AB	53	578	0.092	53	0.1	7.542	A
C-A	79			79			
A-B	8			8			
A-C	283			283			

17:30 - 17:45

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	186	626	0.297	186	0.5	8.978	A
B-A	66	400	0.165	66	0.2	11.834	B
C-AB	68	580	0.117	67	0.2	7.733	A
C-A	94			94			
A-B	10			10			
A-C	347			347			

17:45 - 18:00

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	186	626	0.297	186	0.5	8.997	A
B-A	66	400	0.165	66	0.2	11.849	B
C-AB	68	580	0.117	68	0.2	7.739	A
C-A	94			94			
A-B	10			10			
A-C	347			347			

18:00 - 18:15

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	152	648	0.234	152	0.3	7.993	A
B-A	54	420	0.128	54	0.2	10.836	B
C-AB	53	578	0.092	53	0.1	7.553	A
C-A	79			79			
A-B	8			8			
A-C	283			283			

18:15 - 18:30

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	127	664	0.192	128	0.3	7.380	A
B-A	45	434	0.104	45	0.1	10.194	B
C-AB	43	577	0.075	43	0.1	7.423	A
C-A	68			68			
A-B	7			7			
A-C	237			237			

Junctions 9

PICADY 9 - Priority Intersection Module

Filename: Junction 2 2023 DS.j9
Path: N:\Projects\R-Jobs\R478\1.0 WIP\DESIGN\CIVIL\CALCS
Report generation date: 08/07/2019 14:03:53

»Junction 2 2023 DS - 2023, AM
»Junction 2 2023 DS - 2023, PM

Summary of junction performance

	AM				PM			
	Queue (PCU)	Delay (s)	RFC	LOS	Queue (PCU)	Delay (s)	RFC	LOS
	Junction 2 2023 DS - 2023							
Stream B-CD	0.2	7.52	0.16	A	0.5	9.13	0.30	A
Stream B-A	0.2	11.63	0.17	B	0.2	12.10	0.17	B
Stream AB-CD	0.0	5.90	0.01	A	0.0	4.93	0.01	A
Stream D-ABC	0.0	8.13	0.02	A	0.0	0.00	0.00	A
Stream CD-AB	0.5	7.40	0.24	A	0.2	7.66	0.12	A

Values shown are the highest values encountered over all time segments. Delay is the maximum value of average delay per arriving vehicle.

File summary

File Description

Title	Junction 2 2023 DS
Location	
Site number	
Date	12/06/2019
Version	
Status	(new file)
Identifier	
Client	
Jobnumber	
Enumerator	OCSC\shane.mcgivney
Description	

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

Analysis Options

Calculate Queue Percentiles	Calculate residual capacity	RFC Threshold	Average Delay threshold (s)	Queue threshold (PCU)
		0.85	36.00	20.00

Demand Set Summary

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)
D1	2023	AM	ONE HOUR	07:45	09:15	15
D2	2023	PM	ONE HOUR	16:00	17:30	15

Analysis Set Details

ID	Name	Network flow scaling factor (%)
A1	Junction 2 2023 DS	100.000

Junction 2 2023 DS - 2023, AM

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction type	Major road direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	untitled	Left-Right Stagger	Two-way		1.94	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Arms

Arms

Arm	Name	Description	Arm type
A	untitled		Major
B	untitled		Minor
C	untitled		Major
D	untitled		Minor

Major Arm Geometry

Arm	Width of carriageway (m)	Has kerbed central reserve	Has right turn bay	Visibility for right turn (m)	Blocks?	Blocking queue (PCU)
A	8.30			0.0	✓	0.00
C	8.30			0.0	✓	0.00

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)	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 plus flare		10.00	8.10	5.20	4.50	4.50	✓	3.00	75	75
D	One lane	3.00								75	75

Slope / Intercept / Capacity

Priority Intersection Slopes and Intercepts

Junction	Stream	Intercept (PCU/hr)	Slope for A-B	Slope for A-C	Slope for A-D	Slope for B-C	Slope for B-D	Slope for C-A	Slope for C-B	Slope for C-D	Slope for D-A	Slope for D-B
1	AB-D	574	-	-	-	-	-	0.200	0.200	0.200	-	-
1	B-A	530	0.087	0.219	0.219	-	-	0.138	0.313	-	0.138	0.313
1	B-CD	714	0.099	0.249	0.249	-	-	-	-	-	-	-
1	CD-B	574	0.200	0.200	0.200	-	-	-	-	-	-	-
1	D-AB	671	-	-	-	-	-	0.234	0.234	0.093	-	-
1	D-C	539	-	0.141	0.319	0.141	0.319	0.223	0.223	0.088	-	-

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 Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)
D1	2023	AM	ONE HOUR	07:45	09:15	15

Default vehicle mix	Vehicle mix source	PCU Factor for a HV (PCU)
✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
A		✓	237	100.000
B		✓	157	100.000
C		✓	323	100.000
D		✓	9	100.000

Origin-Destination Data

Demand (PCU/hr)

		To			
		A	B	C	D
From	A	0	50	186	1
	B	64	0	92	1
	C	228	94	0	1
	D	3	2	4	0

Vehicle Mix

Heavy Vehicle Percentages

		To			
		A	B	C	D
From	A	10	10	10	10
	B	10	10	10	10
	C	10	10	10	10
	D	10	10	10	10

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS
B-CD	0.16	7.52	0.2	A
B-A	0.17	11.63	0.2	B
A-B				
A-C				
A-D				
AB-CD	0.01	5.90	0.0	A
AB-C				
D-ABC	0.02	8.13	0.0	A
C-D				
C-A				
C-B				
CD-AB	0.24	7.40	0.5	A
CD-A				

Main Results for each time segment

07:45 - 08:00

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-CD	70	657	0.107	69	0.1	6.730	A
B-A	48	449	0.107	48	0.1	9.859	A
A-B	38			38			
A-C	140			140			
A-D	0.75			0.75			
AB-CD	2	673	0.003	2	0.0	5.901	A
AB-C	208			208			
D-ABC	7	532	0.013	7	0.0	7.541	A
C-D	0.75			0.75			
C-A	172			172			
C-B	71			71			
CD-AB	98	660	0.149	97	0.3	7.028	A
CD-A	148			148			

08:00 - 08:15

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-CD	84	645	0.130	83	0.2	7.045	A
B-A	58	433	0.133	57	0.2	10.536	B
A-B	45			45			
A-C	167			167			
A-D	0.90			0.90			
AB-CD	3	694	0.004	3	0.0	5.728	A
AB-C	249			249			
D-ABC	8	517	0.016	8	0.0	7.778	A
C-D	0.90			0.90			
C-A	205			205			
C-B	85			85			
CD-AB	125	678	0.184	124	0.3	7.162	A
CD-A	169			169			

08:15 - 08:30

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-CD	102	629	0.163	102	0.2	7.519	A
B-A	70	411	0.171	70	0.2	11.607	B
A-B	55			55			
A-C	205			205			
A-D	1			1			
AB-CD	4	723	0.005	4	0.0	5.503	A
AB-C	304			304			
D-ABC	10	497	0.020	10	0.0	8.130	A
C-D	1			1			
C-A	251			251			
C-B	103			103			
CD-AB	166	703	0.237	166	0.5	7.381	A
CD-A	194			194			

08:30 - 08:45

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-CD	102	629	0.163	102	0.2	7.523	A
B-A	70	411	0.171	70	0.2	11.626	B
A-B	55			55			
A-C	205			205			
A-D	1			1			
AB-CD	4	723	0.005	4	0.0	5.504	A
AB-C	304			304			
D-ABC	10	497	0.020	10	0.0	8.131	A
C-D	1			1			
C-A	251			251			
C-B	103			103			
CD-AB	166	703	0.237	166	0.5	7.396	A
CD-A	194			194			

08:45 - 09:00

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-CD	84	645	0.130	84	0.2	7.057	A
B-A	58	433	0.133	58	0.2	10.563	B
A-B	45			45			
A-C	167			167			
A-D	0.90			0.90			
AB-CD	3	694	0.004	3	0.0	5.726	A
AB-C	249			249			
D-ABC	8	517	0.016	8	0.0	7.780	A
C-D	0.90			0.90			
C-A	205			205			
C-B	85			85			
CD-AB	125	678	0.184	126	0.4	7.184	A
CD-A	169			169			

09:00 - 09:15

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-CD	70	657	0.107	70	0.1	6.750	A
B-A	48	449	0.107	48	0.1	9.897	A
A-B	38			38			
A-C	140			140			
A-D	0.75			0.75			
AB-CD	2	674	0.003	2	0.0	5.899	A
AB-C	209			209			
D-ABC	7	532	0.013	7	0.0	7.543	A
C-D	0.75			0.75			
C-A	172			172			
C-B	71			71			
CD-AB	98	660	0.149	99	0.3	7.061	A
CD-A	148			148			

Junction 2 2023 DS - 2023, PM

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction type	Major road direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	untitled	Left-Right Stagger	Two-way		2.01	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)
D2	2023	PM	ONE HOUR	16:00	17:30	15

Default vehicle mix	Vehicle mix source	PCU Factor for a HV (PCU)
✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
A		✓	339	100.000
B		✓	232	100.000
C		✓	162	100.000
D		✓	2	100.000

Origin-Destination Data

Demand (PCU/hr)

		To			
		A	B	C	D
From	A	0	13	324	2
	B	63	0	169	0
	C	110	50	0	2
	D	1	0	1	0

Vehicle Mix

Heavy Vehicle Percentages

		To			
		A	B	C	D
From	A	10	10	10	10
	B	10	10	10	10
	C	10	10	10	10
	D	10	10	10	10

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS
B-CD	0.30	9.13	0.5	A
B-A	0.17	12.10	0.2	B
A-B				
A-C				
A-D				
AB-CD	0.01	4.93	0.0	A
AB-C				
D-ABC	0.00	0.00	0.0	A
C-D				
C-A				
C-B				
CD-AB	0.12	7.66	0.2	A
CD-A				

Main Results for each time segment

16:00 - 16:15

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-CD	127	660	0.193	126	0.3	7.409	A
B-A	47	432	0.110	47	0.1	10.270	B
A-B	10			10			
A-C	244			244			
A-D	2			2			
AB-CD	3	807	0.003	3	0.0	4.925	A
AB-C	369			369			
D-ABC	0	536	0.000	0	0.0	0.000	A
C-D	2			2			
C-A	83			83			
C-B	38			38			
CD-AB	44	582	0.075	43	0.1	7.354	A
CD-A	77			77			

16:15 - 16:30

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-CD	152	643	0.236	152	0.3	8.055	A
B-A	57	417	0.136	56	0.2	10.973	B
A-B	12			12			
A-C	291			291			
A-D	2			2			
AB-CD	4	854	0.004	4	0.0	4.658	A
AB-C	441			441			
D-ABC	0	523	0.000	0	0.0	0.000	A
C-D	2			2			
C-A	99			99			
C-B	45			45			
CD-AB	54	584	0.093	54	0.1	7.477	A
CD-A	90			90			

16:30 - 16:45

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-CD	186	620	0.300	186	0.5	9.110	A
B-A	69	397	0.175	69	0.2	12.083	B
A-B	14			14			
A-C	357			357			
A-D	2			2			
AB-CD	5	918	0.006	5	0.0	4.336	A
AB-C	539			539			
D-ABC	0	506	0.000	0	0.0	0.000	A
C-D	2			2			
C-A	121			121			
C-B	55			55			
CD-AB	69	587	0.118	69	0.2	7.653	A
CD-A	107			107			

16:45 - 17:00

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-CD	186	620	0.300	186	0.5	9.134	A
B-A	69	397	0.175	69	0.2	12.102	B
A-B	14			14			
A-C	357			357			
A-D	2			2			
AB-CD	5	919	0.006	5	0.0	4.335	A
AB-C	540			540			
D-ABC	0	506	0.000	0	0.0	0.000	A
C-D	2			2			
C-A	121			121			
C-B	55			55			
CD-AB	70	587	0.118	70	0.2	7.660	A
CD-A	107			107			

17:00 - 17:15

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-CD	152	643	0.236	152	0.3	8.086	A
B-A	57	417	0.136	57	0.2	10.997	B
A-B	12			12			
A-C	291			291			
A-D	2			2			
AB-CD	4	854	0.004	4	0.0	4.657	A
AB-C	442			442			
D-ABC	0	523	0.000	0	0.0	0.000	A
C-D	2			2			
C-A	99			99			
C-B	45			45			
CD-AB	54	584	0.093	54	0.1	7.488	A
CD-A	90			90			

17:15 - 17:30

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-CD	127	659	0.193	128	0.3	7.450	A
B-A	47	432	0.110	48	0.1	10.309	B
A-B	10			10			
A-C	244			244			
A-D	2			2			
AB-CD	3	808	0.003	3	0.0	4.921	A
AB-C	370			370			
D-ABC	0	536	0.000	0	0.0	0.000	A
C-D	2			2			
C-A	83			83			
C-B	38			38			
CD-AB	44	582	0.076	44	0.1	7.371	A
CD-A	76			76			

Junctions 9

PICADY 9 - Priority Intersection Module

Version: 9.5.0.6896

For sales and distribution information, program advice and maintenance, contact TRL:
+44 (0)1344 379777 software@trl.co.uk www.trlsoftware.co.uk

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

Filename: Junction 2 2038 DM.j9
Path: N:\Projects\R-Jobs\R478\1.0 WIP\DESIGN\CIVIL\CALCS
Report generation date: 08/07/2019 14:05:44

»Junction 2 2038 DM - 2038, AM
»Junction 2 2038 DM - 2038, PM

Summary of junction performance

	AM				PM			
	Queue (PCU)	Delay (s)	RFC	LOS	Queue (PCU)	Delay (s)	RFC	LOS
	Junction 2 2038 DM - 2038							
Stream B-CD	0.3	8.55	0.20	A	0.6	10.62	0.36	B
Stream B-A	0.3	14.43	0.23	B	0.3	13.80	0.22	B
Stream AB-CD	0.0	5.36	0.01	A	0.0	4.58	0.01	A
Stream D-ABC	0.0	8.88	0.02	A	0.0	0.00	0.00	A
Stream CD-AB	0.9	8.29	0.35	A	0.2	7.95	0.14	A

Values shown are the highest values encountered over all time segments. Delay is the maximum value of average delay per arriving vehicle.

File summary

File Description

Title	Junction 2 2038 DM
Location	
Site number	
Date	12/06/2019
Version	
Status	(new file)
Identifier	
Client	
Jobnumber	
Enumerator	OCSC\shane.mcgivney
Description	

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

Analysis Options

Calculate Queue Percentiles	Calculate residual capacity	RFC Threshold	Average Delay threshold (s)	Queue threshold (PCU)
		0.85	36.00	20.00

Demand Set Summary

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)
D1	2038	AM	ONE HOUR	07:45	09:15	15
D2	2038	PM	ONE HOUR	16:00	17:30	15

Analysis Set Details

ID	Name	Network flow scaling factor (%)
A1	Junction 2 2038 DM	100.000

Junction 2 2038 DM - 2038, AM

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction type	Major road direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	untitled	Left-Right Stagger	Two-way		2.08	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Arms

Arms

Arm	Name	Description	Arm type
A	untitled		Major
B	untitled		Minor
C	untitled		Major
D	untitled		Minor

Major Arm Geometry

Arm	Width of carriageway (m)	Has kerbed central reserve	Has right turn bay	Visibility for right turn (m)	Blocks?	Blocking queue (PCU)
A	8.30			0.0	✓	0.00
C	8.30			0.0	✓	0.00

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)	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 plus flare		10.00	8.10	5.20	4.50	4.50	✓	3.00	75	75
D	One lane	3.00								75	75

Slope / Intercept / Capacity

Priority Intersection Slopes and Intercepts

Junction	Stream	Intercept (PCU/hr)	Slope for A-B	Slope for A-C	Slope for A-D	Slope for B-C	Slope for B-D	Slope for C-A	Slope for C-B	Slope for C-D	Slope for D-A	Slope for D-B
1	AB-D	574	-	-	-	-	-	0.200	0.200	0.200	-	-
1	B-A	530	0.087	0.220	0.220	-	-	0.138	0.314	-	0.138	0.314
1	B-CD	714	0.098	0.249	0.249	-	-	-	-	-	-	-
1	CD-B	574	0.200	0.200	0.200	-	-	-	-	-	-	-
1	D-AB	671	-	-	-	-	-	0.234	0.234	0.093	-	-
1	D-C	539	-	0.141	0.319	0.141	0.319	0.223	0.223	0.088	-	-

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 Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)
D1	2038	AM	ONE HOUR	07:45	09:15	15

Default vehicle mix	Vehicle mix source	PCU Factor for a HV (PCU)
✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
A		✓	379	100.000
B		✓	183	100.000
C		✓	423	100.000
D		✓	9	100.000

Origin-Destination Data

Demand (PCU/hr)

		To			
		A	B	C	D
From	A	0	57	321	1
	B	75	0	107	1
	C	299	123	0	1
	D	3	2	4	0

Vehicle Mix

Heavy Vehicle Percentages

		To			
		A	B	C	D
From	A	10	10	10	10
	B	10	10	10	10
	C	10	10	10	10
	D	10	10	10	10

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS
B-CD	0.20	8.55	0.3	A
B-A	0.23	14.43	0.3	B
A-B				
A-C				
A-D				
AB-CD	0.01	5.36	0.0	A
AB-C				
D-ABC	0.02	8.88	0.0	A
C-D				
C-A				
C-B				
CD-AB	0.35	8.29	0.9	A
CD-A				

Main Results for each time segment

07:45 - 08:00

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-CD	81	627	0.130	81	0.2	7.239	A
B-A	56	412	0.137	56	0.2	11.089	B
A-B	43			43			
A-C	242			242			
A-D	0.75			0.75			
AB-CD	3	741	0.004	3	0.0	5.365	A
AB-C	320			320			
D-ABC	7	504	0.013	7	0.0	7.956	A
C-D	0.75			0.75			
C-A	225			225			
C-B	93			93			
CD-AB	141	679	0.208	140	0.4	7.338	A
CD-A	180			180			

08:00 - 08:15

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-CD	97	608	0.160	97	0.2	7.740	A
B-A	67	389	0.173	67	0.2	12.296	B
A-B	51			51			
A-C	289			289			
A-D	0.90			0.90			
AB-CD	4	776	0.005	4	0.0	5.125	A
AB-C	383			383			
D-ABC	8	484	0.017	8	0.0	8.319	A
C-D	0.90			0.90			
C-A	269			269			
C-B	111			111			
CD-AB	184	701	0.262	183	0.6	7.659	A
CD-A	200			200			

08:15 - 08:30

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-CD	119	582	0.204	119	0.3	8.532	A
B-A	83	357	0.231	82	0.3	14.382	B
A-B	63			63			
A-C	353			353			
A-D	1			1			
AB-CD	5	826	0.006	5	0.0	4.824	A
AB-C	468			468			
D-ABC	10	456	0.022	10	0.0	8.882	A
C-D	1			1			
C-A	329			329			
C-B	135			135			
CD-AB	253	733	0.346	252	0.9	8.252	A
CD-A	217			217			

08:30 - 08:45

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-CD	119	582	0.204	119	0.3	8.548	A
B-A	83	357	0.231	83	0.3	14.431	B
A-B	63			63			
A-C	353			353			
A-D	1			1			
AB-CD	5	826	0.006	5	0.0	4.824	A
AB-C	468			468			
D-ABC	10	456	0.022	10	0.0	8.883	A
C-D	1			1			
C-A	329			329			
C-B	135			135			
CD-AB	254	734	0.346	254	0.9	8.295	A
CD-A	216			216			

08:45 - 09:00

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-CD	97	608	0.160	97	0.2	7.761	A
B-A	67	389	0.173	68	0.2	12.353	B
A-B	51			51			
A-C	289			289			
A-D	0.90			0.90			
AB-CD	4	776	0.005	4	0.0	5.123	A
AB-C	383			383			
D-ABC	8	484	0.017	8	0.0	8.322	A
C-D	0.90			0.90			
C-A	269			269			
C-B	111			111			
CD-AB	185	702	0.263	186	0.6	7.711	A
CD-A	199			199			

09:00 - 09:15

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-CD	81	626	0.130	81	0.2	7.276	A
B-A	56	412	0.137	57	0.2	11.157	B
A-B	43			43			
A-C	242			242			
A-D	0.75			0.75			
AB-CD	3	741	0.004	3	0.0	5.361	A
AB-C	321			321			
D-ABC	7	504	0.013	7	0.0	7.960	A
C-D	0.75			0.75			
C-A	225			225			
C-B	93			93			
CD-AB	142	680	0.209	143	0.4	7.403	A
CD-A	179			179			

Junction 2 2038 DM - 2038, PM

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction type	Major road direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	untitled	Left-Right Stagger	Two-way		2.14	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)
D2	2038	PM	ONE HOUR	16:00	17:30	15

Default vehicle mix	Vehicle mix source	PCU Factor for a HV (PCU)
✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
A		✓	442	100.000
B		✓	265	100.000
C		✓	189	100.000
D		✓	2	100.000

Origin-Destination Data

Demand (PCU/hr)

		To			
		A	B	C	D
From	A	0	16	424	2
	B	73	0	192	0
	C	130	57	0	2
	D	1	0	1	0

Vehicle Mix

Heavy Vehicle Percentages

		To			
		A	B	C	D
From	A	10	10	10	10
	B	10	10	10	10
	C	10	10	10	10
	D	10	10	10	10

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS
B-CD	0.36	10.62	0.6	B
B-A	0.22	13.80	0.3	B
A-B				
A-C				
A-D				
AB-CD	0.01	4.58	0.0	A
AB-C				
D-ABC	0.00	0.00	0.0	A
C-D				
C-A				
C-B				
CD-AB	0.14	7.95	0.2	A
CD-A				

Main Results for each time segment

16:00 - 16:15

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-CD	145	636	0.227	143	0.3	8.015	A
B-A	55	413	0.133	54	0.2	11.029	B
A-B	12			12			
A-C	319			319			
A-D	2			2			
AB-CD	3	868	0.004	3	0.0	4.579	A
AB-C	461			461			
D-ABC	0	522	0.000	0	0.0	0.000	A
C-D	2			2			
C-A	98			98			
C-B	43			43			
CD-AB	52	578	0.089	51	0.1	7.516	A
CD-A	89			89			

16:15 - 16:30

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-CD	173	614	0.281	172	0.4	8.945	A
B-A	66	394	0.167	65	0.2	12.045	B
A-B	14			14			
A-C	381			381			
A-D	2			2			
AB-CD	4	927	0.005	4	0.0	4.290	A
AB-C	551			551			
D-ABC	0	507	0.000	0	0.0	0.000	A
C-D	2			2			
C-A	117			117			
C-B	51			51			
CD-AB	64	579	0.111	64	0.2	7.689	A
CD-A	104			104			

16:30 - 16:45

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-CD	211	584	0.362	211	0.6	10.571	B
B-A	80	367	0.219	80	0.3	13.765	B
A-B	18			18			
A-C	467			467			
A-D	2			2			
AB-CD	7	1009	0.007	7	0.0	3.948	A
AB-C	673			673			
D-ABC	0	485	0.000	0	0.0	0.000	A
C-D	2			2			
C-A	143			143			
C-B	63			63			
CD-AB	83	582	0.143	83	0.2	7.943	A
CD-A	122			122			

16:45 - 17:00

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-CD	211	584	0.362	211	0.6	10.617	B
B-A	80	367	0.219	80	0.3	13.801	B
A-B	18			18			
A-C	467			467			
A-D	2			2			
AB-CD	7	1010	0.007	7	0.0	3.946	A
AB-C	674			674			
D-ABC	0	485	0.000	0	0.0	0.000	A
C-D	2			2			
C-A	143			143			
C-B	63			63			
CD-AB	83	582	0.143	83	0.2	7.952	A
CD-A	122			122			

17:00 - 17:15

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-CD	173	614	0.281	173	0.4	8.997	A
B-A	66	394	0.167	66	0.2	12.089	B
A-B	14			14			
A-C	381			381			
A-D	2			2			
AB-CD	4	928	0.005	4	0.0	4.288	A
AB-C	552			552			
D-ABC	0	507	0.000	0	0.0	0.000	A
C-D	2			2			
C-A	117			117			
C-B	51			51			
CD-AB	64	579	0.111	65	0.2	7.701	A
CD-A	104			104			

17:15 - 17:30

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-CD	145	636	0.227	145	0.3	8.079	A
B-A	55	413	0.133	55	0.2	11.086	B
A-B	12			12			
A-C	319			319			
A-D	2			2			
AB-CD	3	869	0.004	3	0.0	4.573	A
AB-C	462			462			
D-ABC	0	522	0.000	0	0.0	0.000	A
C-D	2			2			
C-A	98			98			
C-B	43			43			
CD-AB	52	578	0.090	52	0.1	7.535	A
CD-A	89			89			

Junctions 9

PICADY 9 - Priority Intersection Module

Version: 9.5.0.6896

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Filename: Junction 2 2038 DN.j9
Path: N:\Projects\R-Jobs\R478\1.0 WIP\DESIGN\CIVIL\CALCS
Report generation date: 08/07/2019 14:06:28

»2038 DN - 2038, AM
»2038 DN - 2038, PM

Summary of junction performance

	AM				PM			
	Queue (PCU)	Delay (s)	RFC	LOS	Queue (PCU)	Delay (s)	RFC	LOS
	2038 DN - 2038							
Stream B-C	0.3	7.70	0.19	A	0.6	9.94	0.35	A
Stream B-A	0.3	12.05	0.19	B	0.3	12.76	0.19	B
Stream C-AB	0.6	7.52	0.27	A	0.2	7.90	0.14	A

Values shown are the highest values encountered over all time segments. Delay is the maximum value of average delay per arriving vehicle.

File summary

File Description

Title	Junction 2 2038 DN
Location	
Site number	
Date	12/06/2019
Version	
Status	(new file)
Identifier	
Client	
Jobnumber	
Enumerator	OCSC\shane.mcgivney
Description	

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

Analysis Options

Calculate Queue Percentiles	Calculate residual capacity	RFC Threshold	Average Delay threshold (s)	Queue threshold (PCU)
		0.85	36.00	20.00

Demand Set Summary

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)
D1	2038	AM	ONE HOUR	08:00	09:30	15
D2	2038	PM	ONE HOUR	17:00	18:30	15

Analysis Set Details

ID	Name	Network flow scaling factor (%)
A1	2038 DN	100.000

2038 DN - 2038, AM

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction type	Major road direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	untitled	T-Junction	Two-way		3.84	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Arms

Arms

Arm	Name	Description	Arm type
A	Carmanhall Road E		Major
B	Corrig Road		Minor
C	Carmanhall Road W		Major

Major Arm Geometry

Arm	Width of carriageway (m)	Has kerbed central reserve	Has right turn bay	Visibility for right turn (m)	Blocks?	Blocking queue (PCU)
C	8.30			0.0	✓	0.00

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	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 plus flare	10.00	8.10	5.20	4.50	4.50	✓	3.00	75	75

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	527	0.086	0.218	0.137	0.312
1	B-C	718	0.099	0.250	-	-
1	C-B	574	0.200	0.200	-	-

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 Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)
D1	2038	AM	ONE HOUR	08:00	09:30	15

Default vehicle mix	Vehicle mix source	PCU Factor for a HV (PCU)
✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
A		✓	220	100.000
B		✓	177	100.000
C		✓	354	100.000

Origin-Destination Data

Demand (PCU/hr)

		To		
		A	B	C
From	A	0	43	177
	B	70	0	107
	C	247	107	0

Vehicle Mix

Heavy Vehicle Percentages

		To		
		A	B	C
From	A	10	10	10
	B	10	10	10
	C	10	10	10

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS
B-C	0.19	7.70	0.3	A
B-A	0.19	12.05	0.3	B
C-AB	0.27	7.52	0.6	A
C-A				
A-B				
A-C				

Main Results for each time segment

08:00 - 08:15

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	81	661	0.122	80	0.2	6.806	A
B-A	53	444	0.119	52	0.1	10.086	B
C-AB	111	671	0.166	110	0.3	7.058	A
C-A	155			155			
A-B	32			32			
A-C	133			133			

08:15 - 08:30

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	96	649	0.148	96	0.2	7.159	A
B-A	63	428	0.147	63	0.2	10.839	B
C-AB	142	691	0.206	142	0.4	7.221	A
C-A	176			176			
A-B	39			39			
A-C	159			159			

08:30 - 08:45

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	118	632	0.186	118	0.2	7.691	A
B-A	77	406	0.190	77	0.3	12.032	B
C-AB	190	718	0.265	190	0.6	7.497	A
C-A	199			199			
A-B	47			47			
A-C	195			195			

08:45 - 09:00

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	118	632	0.186	118	0.3	7.700	A
B-A	77	406	0.190	77	0.3	12.054	B
C-AB	191	719	0.265	191	0.6	7.515	A
C-A	199			199			
A-B	47			47			
A-C	195			195			

09:00 - 09:15

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	96	649	0.148	96	0.2	7.175	A
B-A	63	428	0.147	63	0.2	10.867	B
C-AB	142	691	0.206	143	0.4	7.246	A
C-A	176			176			
A-B	39			39			
A-C	159			159			

09:15 - 09:30

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	81	661	0.122	81	0.2	6.833	A
B-A	53	444	0.119	53	0.1	10.129	B
C-AB	112	671	0.167	112	0.3	7.099	A
C-A	155			155			
A-B	32			32			
A-C	133			133			

2038 DN - 2038, PM

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction type	Major road direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	untitled	T-Junction	Two-way		4.18	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)
D2	2038	PM	ONE HOUR	17:00	18:30	15

Default vehicle mix	Vehicle mix source	PCU Factor for a HV (PCU)
✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
A		✓	368	100.000
B		✓	260	100.000
C		✓	167	100.000

Origin-Destination Data

Demand (PCU/hr)

		To		
		A	B	C
From	A	0	11	357
	B	68	0	192
	C	110	57	0

Vehicle Mix

Heavy Vehicle Percentages

		To		
		A	B	C
From	A	10	10	10
	B	10	10	10
	C	10	10	10

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS
B-C	0.35	9.94	0.6	A
B-A	0.19	12.76	0.3	B
C-AB	0.14	7.90	0.2	A
C-A				
A-B				
A-C				

Main Results for each time segment

17:00 - 17:15

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	145	654	0.221	143	0.3	7.738	A
B-A	51	424	0.121	51	0.1	10.583	B
C-AB	50	577	0.087	50	0.1	7.503	A
C-A	76			76			
A-B	8			8			
A-C	269			269			

17:15 - 17:30

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	173	635	0.272	172	0.4	8.543	A
B-A	61	408	0.150	61	0.2	11.401	B
C-AB	62	579	0.107	62	0.2	7.659	A
C-A	88			88			
A-B	10			10			
A-C	321			321			

17:30 - 17:45

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	211	610	0.347	211	0.6	9.905	A
B-A	75	385	0.194	75	0.3	12.732	B
C-AB	79	581	0.137	79	0.2	7.894	A
C-A	104			104			
A-B	12			12			
A-C	393			393			

17:45 - 18:00

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	211	610	0.347	211	0.6	9.942	A
B-A	75	385	0.194	75	0.3	12.757	B
C-AB	79	581	0.137	79	0.2	7.903	A
C-A	104			104			
A-B	12			12			
A-C	393			393			

18:00 - 18:15

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	173	635	0.272	173	0.4	8.586	A
B-A	61	408	0.150	61	0.2	11.433	B
C-AB	62	579	0.107	62	0.2	7.672	A
C-A	88			88			
A-B	10			10			
A-C	321			321			

18:15 - 18:30

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	145	653	0.221	145	0.3	7.794	A
B-A	51	424	0.121	51	0.2	10.629	B
C-AB	50	578	0.087	50	0.1	7.517	A
C-A	76			76			
A-B	8			8			
A-C	269			269			

Junctions 9

PICADY 9 - Priority Intersection Module

Filename: Junction 2 2038 DS.j9
Path: N:\Projects\R-Jobs\R478\1.0 WIP\DESIGN\CIVIL\CALCS
Report generation date: 08/07/2019 14:08:25

Summary of junction performance

	AM				PM			
	Queue (PCU)	Delay (s)	RFC	LOS	Queue (PCU)	Delay (s)	RFC	LOS
	Junction 2 2038 DS - 2038							
Stream B-CD	0.3	7.95	0.19	A	0.6	10.10	0.35	B
Stream B-A	0.3	12.59	0.21	B	0.3	13.06	0.20	B
Stream AB-CD	0.0	5.78	0.01	A	0.0	4.74	0.01	A
Stream D-ABC	0.0	8.39	0.02	A	0.0	0.00	0.00	A
Stream CD-AB	0.6	7.63	0.28	A	0.2	7.82	0.14	A

Values shown are the highest values encountered over all time segments. Delay is the maximum value of average delay per arriving vehicle.

File summary

File Description

Title	Junction 2 2038 DS
Location	
Site number	
Date	12/06/2019
Version	
Status	(new file)
Identifier	
Client	
Jobnumber	
Enumerator	OCSC\shane.mcgivney
Description	

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

Analysis Options

Calculate Queue Percentiles	Calculate residual capacity	RFC Threshold	Average Delay threshold (s)	Queue threshold (PCU)
		0.85	36.00	20.00

Demand Set Summary

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)
D1	2038	AM	ONE HOUR	07:45	09:15	15
D2	2038	PM	ONE HOUR	16:00	17:30	15

Analysis Set Details

ID	Name	Network flow scaling factor (%)
A1	Junction 2 2038 DS	100.000

Junction 2 2038 DS - 2038, AM

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction type	Major road direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	untitled	Left-Right Stagger	Two-way		2.11	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Arms

Arms

Arm	Name	Description	Arm type
A	untitled		Major
B	untitled		Minor
C	untitled		Major
D	untitled		Minor

Major Arm Geometry

Arm	Width of carriageway (m)	Has kerbed central reserve	Has right turn bay	Visibility for right turn (m)	Blocks?	Blocking queue (PCU)
A	8.30			0.0	✓	0.00
C	8.30			0.0	✓	0.00

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)	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 plus flare		10.00	8.10	5.20	4.50	4.50	✓	3.00	75	75
D	One lane	3.00								75	75

Slope / Intercept / Capacity

Priority Intersection Slopes and Intercepts

Junction	Stream	Intercept (PCU/hr)	Slope for A-B	Slope for A-C	Slope for A-D	Slope for B-C	Slope for B-D	Slope for C-A	Slope for C-B	Slope for C-D	Slope for D-A	Slope for D-B
1	AB-D	574	-	-	-	-	-	0.200	0.200	0.200	-	-
1	B-A	529	0.087	0.219	0.219	-	-	0.138	0.313	-	0.138	0.313
1	B-CD	715	0.099	0.249	0.249	-	-	-	-	-	-	-
1	CD-B	574	0.200	0.200	0.200	-	-	-	-	-	-	-
1	D-AB	671	-	-	-	-	-	0.234	0.234	0.093	-	-
1	D-C	539	-	0.141	0.319	0.141	0.319	0.223	0.223	0.088	-	-

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 Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)
D1	2038	AM	ONE HOUR	07:45	09:15	15

Default vehicle mix	Vehicle mix source	PCU Factor for a HV (PCU)
✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
A		✓	264	100.000
B		✓	182	100.000
C		✓	366	100.000
D		✓	9	100.000

Origin-Destination Data

Demand (PCU/hr)

		To			
		A	B	C	D
From	A	0	55	208	1
	B	74	0	107	1
	C	258	107	0	1
	D	3	2	4	0

Vehicle Mix

Heavy Vehicle Percentages

		To			
		A	B	C	D
From	A	10	10	10	10
	B	10	10	10	10
	C	10	10	10	10
	D	10	10	10	10

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS
B-CD	0.19	7.95	0.3	A
B-A	0.21	12.59	0.3	B
A-B				
A-C				
A-D				
AB-CD	0.01	5.78	0.0	A
AB-C				
D-ABC	0.02	8.39	0.0	A
C-D				
C-A				
C-B				
CD-AB	0.28	7.63	0.6	A
CD-A				

Main Results for each time segment

07:45 - 08:00

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-CD	81	650	0.125	81	0.2	6.949	A
B-A	56	438	0.127	55	0.2	10.314	B
A-B	41			41			
A-C	157			157			
A-D	0.75			0.75			
AB-CD	2	687	0.003	2	0.0	5.781	A
AB-C	236			236			
D-ABC	7	522	0.013	7	0.0	7.686	A
C-D	0.75			0.75			
C-A	194			194			
C-B	81			81			
CD-AB	116	672	0.172	115	0.3	7.093	A
CD-A	163			163			

08:00 - 08:15

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-CD	97	636	0.153	97	0.2	7.341	A
B-A	67	421	0.158	66	0.2	11.174	B
A-B	49			49			
A-C	187			187			
A-D	0.90			0.90			
AB-CD	3	711	0.004	3	0.0	5.590	A
AB-C	282			282			
D-ABC	8	505	0.016	8	0.0	7.965	A
C-D	0.90			0.90			
C-A	232			232			
C-B	96			96			
CD-AB	149	693	0.215	148	0.4	7.281	A
CD-A	184			184			

08:15 - 08:30

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-CD	119	617	0.193	119	0.3	7.941	A
B-A	81	396	0.206	81	0.3	12.565	B
A-B	61			61			
A-C	229			229			
A-D	1			1			
AB-CD	4	745	0.006	4	0.0	5.345	A
AB-C	345			345			
D-ABC	10	482	0.021	10	0.0	8.385	A
C-D	1			1			
C-A	284			284			
C-B	118			118			
CD-AB	200	721	0.278	200	0.6	7.601	A
CD-A	207			207			

08:30 - 08:45

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-CD	119	617	0.193	119	0.3	7.953	A
B-A	81	396	0.206	81	0.3	12.594	B
A-B	61			61			
A-C	229			229			
A-D	1			1			
AB-CD	4	745	0.006	4	0.0	5.345	A
AB-C	345			345			
D-ABC	10	482	0.021	10	0.0	8.385	A
C-D	1			1			
C-A	284			284			
C-B	118			118			
CD-AB	201	722	0.278	201	0.6	7.625	A
CD-A	207			207			

08:45 - 09:00

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-CD	97	636	0.153	97	0.2	7.359	A
B-A	67	420	0.158	67	0.2	11.210	B
A-B	49			49			
A-C	187			187			
A-D	0.90			0.90			
AB-CD	3	712	0.004	3	0.0	5.588	A
AB-C	282			282			
D-ABC	8	505	0.016	8	0.0	7.966	A
C-D	0.90			0.90			
C-A	232			232			
C-B	96			96			
CD-AB	149	693	0.215	150	0.4	7.309	A
CD-A	184			184			

09:00 - 09:15

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-CD	81	649	0.125	81	0.2	6.975	A
B-A	56	438	0.127	56	0.2	10.362	B
A-B	41			41			
A-C	157			157			
A-D	0.75			0.75			
AB-CD	2	688	0.003	2	0.0	5.776	A
AB-C	237			237			
D-ABC	7	522	0.013	7	0.0	7.689	A
C-D	0.75			0.75			
C-A	194			194			
C-B	81			81			
CD-AB	116	673	0.173	117	0.3	7.140	A
CD-A	162			162			

Junction 2 2038 DS - 2038, PM

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction type	Major road direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	untitled	Left-Right Stagger	Two-way		2.20	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)
D2	2038	PM	ONE HOUR	16:00	17:30	15

Default vehicle mix	Vehicle mix source	PCU Factor for a HV (PCU)
✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
A		✓	382	100.000
B		✓	263	100.000
C		✓	182	100.000
D		✓	2	100.000

Origin-Destination Data

Demand (PCU/hr)

		To			
		A	B	C	D
From	A	0	14	366	2
	B	71	0	192	0
	C	123	57	0	2
	D	1	0	1	0

Vehicle Mix

Heavy Vehicle Percentages

		To			
		A	B	C	D
From	A	10	10	10	10
	B	10	10	10	10
	C	10	10	10	10
	D	10	10	10	10

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS
B-CD	0.35	10.10	0.6	B
B-A	0.20	13.06	0.3	B
A-B				
A-C				
A-D				
AB-CD	0.01	4.74	0.0	A
AB-C				
D-ABC	0.00	0.00	0.0	A
C-D				
C-A				
C-B				
CD-AB	0.14	7.82	0.2	A
CD-A				

Main Results for each time segment

16:00 - 16:15

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-CD	145	649	0.223	143	0.3	7.810	A
B-A	53	422	0.127	53	0.2	10.707	B
A-B	11			11			
A-C	276			276			
A-D	2			2			
AB-CD	3	838	0.004	3	0.0	4.740	A
AB-C	417			417			
D-ABC	0	528	0.000	0	0.0	0.000	A
C-D	2			2			
C-A	93			93			
C-B	43			43			
CD-AB	51	582	0.088	51	0.1	7.446	A
CD-A	84			84			

16:15 - 16:30

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-CD	173	630	0.274	172	0.4	8.642	A
B-A	64	405	0.157	64	0.2	11.585	B
A-B	13			13			
A-C	329			329			
A-D	2			2			
AB-CD	4	892	0.005	4	0.0	4.460	A
AB-C	499			499			
D-ABC	0	513	0.000	0	0.0	0.000	A
C-D	2			2			
C-A	111			111			
C-B	51			51			
CD-AB	63	585	0.108	63	0.2	7.591	A
CD-A	99			99			

16:30 - 16:45

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-CD	211	603	0.350	211	0.6	10.064	B
B-A	78	382	0.205	78	0.3	13.026	B
A-B	15			15			
A-C	403			403			
A-D	2			2			
AB-CD	6	966	0.006	6	0.0	4.126	A
AB-C	610			610			
D-ABC	0	493	0.000	0	0.0	0.000	A
C-D	2			2			
C-A	135			135			
C-B	63			63			
CD-AB	82	588	0.139	81	0.2	7.813	A
CD-A	116			116			

16:45 - 17:00

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-CD	211	603	0.350	211	0.6	10.102	B
B-A	78	381	0.205	78	0.3	13.055	B
A-B	15			15			
A-C	403			403			
A-D	2			2			
AB-CD	6	966	0.006	6	0.0	4.124	A
AB-C	610			610			
D-ABC	0	493	0.000	0	0.0	0.000	A
C-D	2			2			
C-A	135			135			
C-B	63			63			
CD-AB	82	589	0.139	82	0.2	7.821	A
CD-A	116			116			

17:00 - 17:15

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-CD	173	630	0.274	173	0.4	8.689	A
B-A	64	405	0.158	64	0.2	11.621	B
A-B	13			13			
A-C	329			329			
A-D	2			2			
AB-CD	4	892	0.005	4	0.0	4.459	A
AB-C	500			500			
D-ABC	0	513	0.000	0	0.0	0.000	A
C-D	2			2			
C-A	111			111			
C-B	51			51			
CD-AB	63	585	0.108	64	0.2	7.602	A
CD-A	98			98			

17:15 - 17:30

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-CD	145	649	0.223	145	0.3	7.867	A
B-A	53	422	0.127	54	0.2	10.759	B
A-B	11			11			
A-C	276			276			
A-D	2			2			
AB-CD	3	839	0.004	3	0.0	4.734	A
AB-C	419			419			
D-ABC	0	528	0.000	0	0.0	0.000	A
C-D	2			2			
C-A	93			93			
C-B	43			43			
CD-AB	51	583	0.088	51	0.1	7.461	A
CD-A	84			84			

Junctions 9

PICADY 9 - Priority Intersection Module

Version: 9.5.0.6896

For sales and distribution information, program advice and maintenance, contact TRL:
+44 (0)1344 379777 software@trl.co.uk www.trlsoftware.co.uk

Filename: Junction 3 2023 DM.j9
Path: N:\Projects\R-Jobs\R478\1.0 WIP\DESIGN\CIVIL\CALCS
Report generation date: 08/07/2019 14:09:26

»Junction 3 - 2023 DM, AM
»Junction 3 - 2023 DM, PM

Summary of junction performance

	AM				PM			
	Queue (PCU)	Delay (s)	RFC	LOS	Queue (PCU)	Delay (s)	RFC	LOS
	Junction 3 - 2023 DM							
Stream B-C	1.5	21.80	0.58	C	171.8	1570.52	1.94	F
Stream B-A	0.1	33.53	0.10	D	24.2	1664.36	1.86	F
Stream C-AB	2.0	13.73	0.47	B	0.4	15.40	0.21	C

Values shown are the highest values encountered over all time segments. Delay is the maximum value of average delay per arriving vehicle.

File summary

File Description

Title	Junction 3
Location	
Site number	
Date	12/06/2019
Version	
Status	(new file)
Identifier	
Client	
Jobnumber	
Enumerator	OCSC\shane.mcgivney
Description	

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

Analysis Options

Calculate Queue Percentiles	Calculate residual capacity	RFC Threshold	Average Delay threshold (s)	Queue threshold (PCU)
		0.85	36.00	20.00

Demand Set Summary

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)
D1	2023 DM	AM	ONE HOUR	07:45	09:15	15
D2	2023 DM	PM	ONE HOUR	16:00	17:30	15

Analysis Set Details

ID	Name	Network flow scaling factor (%)
A1	Junction 3	100.000

Junction 3 - 2023 DM, AM

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction type	Major road direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	untitled	T-Junction	Two-way		3.89	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Arms

Arms

Arm	Name	Description	Arm type
A	Blackthorn Road S		Major
B	Carmanhall Road		Minor
C	Blackthorn Road N		Major

Major Arm Geometry

Arm	Width of carriageway (m)	Has kerbed central reserve	Has right turn bay	Visibility for right turn (m)	Blocks?	Blocking queue (PCU)
C	7.00			0.0	✓	0.00

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	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 plus flare	6.80	4.29	4.00	4.00	4.00		1.00	75	75

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	475	0.083	0.209	0.131	0.299
1	B-C	756	0.111	0.280	-	-
1	C-B	574	0.213	0.213	-	-

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 Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)
D1	2023 DM	AM	ONE HOUR	07:45	09:15	15

Default vehicle mix	Vehicle mix source	PCU Factor for a HV (PCU)
✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
A		✓	1400	100.000
B		✓	236	100.000
C		✓	405	100.000

Origin-Destination Data

Demand (PCU/hr)

		To		
		A	B	C
From	A	0	617	783
	B	12	0	224
	C	322	83	0

Vehicle Mix

Heavy Vehicle Percentages

		To		
		A	B	C
From	A	10	10	10
	B	10	10	10
	C	10	10	10

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS
B-C	0.58	21.80	1.5	C
B-A	0.10	33.53	0.1	D
C-AB	0.47	13.73	2.0	B
C-A				
A-B				
A-C				

Main Results for each time segment

07:45 - 08:00

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	169	534	0.316	167	0.5	10.716	B
B-A	9	254	0.036	9	0.0	16.144	C
C-AB	113	545	0.206	111	0.5	9.108	A
C-A	192			192			
A-B	465			465			
A-C	589			589			

08:00 - 08:15

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	201	490	0.411	200	0.7	13.609	B
B-A	11	205	0.053	11	0.1	20.353	C
C-AB	160	547	0.292	159	0.8	10.229	B
C-A	204			204			
A-B	555			555			
A-C	704			704			

08:15 - 08:30

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	247	428	0.576	244	1.4	21.200	C
B-A	13	133	0.099	13	0.1	32.963	D
C-AB	258	554	0.466	254	1.9	13.358	B
C-A	188			188			
A-B	679			679			
A-C	862			862			

08:30 - 08:45

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	247	428	0.577	246	1.5	21.799	C
B-A	13	131	0.101	13	0.1	33.526	D
C-AB	261	556	0.469	261	2.0	13.731	B
C-A	185			185			
A-B	679			679			
A-C	862			862			

08:45 - 09:00

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	201	490	0.411	204	0.8	13.969	B
B-A	11	203	0.053	11	0.1	20.618	C
C-AB	162	551	0.294	167	0.9	10.513	B
C-A	202			202			
A-B	555			555			
A-C	704			704			

09:00 - 09:15

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	169	534	0.316	170	0.5	10.902	B
B-A	9	253	0.036	9	0.0	16.256	C
C-AB	114	547	0.208	115	0.5	9.252	A
C-A	191			191			
A-B	465			465			
A-C	589			589			

Junction 3 - 2023 DM, PM

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction type	Major road direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	untitled	T-Junction	Two-way		428.55	F

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)
D2	2023 DM	PM	ONE HOUR	16:00	17:30	15

Default vehicle mix	Vehicle mix source	PCU Factor for a HV (PCU)
✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
A		✓	1378	100.000
B		✓	557	100.000
C		✓	123	100.000

Origin-Destination Data

Demand (PCU/hr)

		To		
		A	B	C
From	A	0	197	1181
	B	67	0	490
	C	78	45	0

Vehicle Mix

Heavy Vehicle Percentages

		To		
		A	B	C
From	A	10	10	10
	B	10	10	10
	C	10	10	10

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS
B-C	1.94	1570.52	171.8	F
B-A	1.86	1664.36	24.2	F
C-AB	0.21	15.40	0.4	C
C-A				
A-B				
A-C				

Main Results for each time segment

16:00 - 16:15

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	369	452	0.817	353	3.9	35.953	E
B-A	50	141	0.357	48	0.6	41.637	E
C-AB	40	400	0.099	39	0.1	10.947	B
C-A	53			53			
A-B	148			148			
A-C	889			889			

16:15 - 16:30

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	440	384	1.147	372	21.0	152.308	F
B-A	60	53	1.145	44	4.7	308.061	F
C-AB	50	369	0.136	50	0.2	12.426	B
C-A	60			60			
A-B	177			177			
A-C	1062			1062			

16:30 - 16:45

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	540	292	1.847	292	83.0	677.480	F
B-A	74	43	1.705	42	12.6	875.815	F
C-AB	68	325	0.208	67	0.4	15.333	C
C-A	68			68			
A-B	217			217			
A-C	1300			1300			

16:45 - 17:00

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	540	278	1.941	278	148.4	1517.067	F
B-A	74	40	1.864	39	21.2	1660.412	F
C-AB	68	325	0.208	68	0.4	15.403	C
C-A	68			68			
A-B	217			217			
A-C	1300			1300			

17:00 - 17:15

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	440	347	1.269	347	171.8	1570.519	F
B-A	60	49	1.237	48	24.2	1664.358	F
C-AB	50	369	0.136	51	0.2	12.494	B
C-A	60			60			
A-B	177			177			
A-C	1062			1062			

17:15 - 17:30

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	369	401	0.920	399	164.4	1518.422	F
B-A	50	56	0.902	53	23.4	1604.204	F
C-AB	40	401	0.099	40	0.1	11.001	B
C-A	53			53			
A-B	148			148			
A-C	889			889			

Junctions 9

PICADY 9 - Priority Intersection Module

Version: 9.5.0.6896

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Filename: Junction 3 2023 DN.j9
Path: N:\Projects\R-Jobs\R478\1.0 WIP\DESIGN\CIVIL\CALCS
Report generation date: 08/07/2019 14:09:55

Summary of junction performance

	AM				PM			
	Queue (PCU)	Delay (s)	RFC	LOS	Queue (PCU)	Delay (s)	RFC	LOS
	Junction 3 - 2023 DN							
Stream B-C	0.7	14.04	0.40	B	5.5	56.55	0.86	F
Stream B-A	0.0	19.37	0.02	C	0.2	69.92	0.15	F
Stream C-AB	0.6	15.01	0.32	C	0.2	13.55	0.16	B

Values shown are the highest values encountered over all time segments. Delay is the maximum value of average delay per arriving vehicle.

File summary

File Description

Title	Junction 3
Location	
Site number	
Date	12/06/2019
Version	
Status	(new file)
Identifier	
Client	
Jobnumber	
Enumerator	OCSC\shane.mcgivney
Description	

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

Analysis Options

Calculate Queue Percentiles	Calculate residual capacity	RFC Threshold	Average Delay threshold (s)	Queue threshold (PCU)
		0.85	36.00	20.00

Demand Set Summary

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)
D1	2023 DN	AM	ONE HOUR	07:45	09:15	15
D2	2023 DN	PM	ONE HOUR	16:00	17:30	15

Analysis Set Details

ID	Name	Network flow scaling factor (%)
A1	Junction 3	100.000

Junction 3 - 2023 DN, AM

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction type	Major road direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	untitled	T-Junction	Two-way		2.68	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Arms

Arms

Arm	Name	Description	Arm type
A	Blackthorn Road N		Major
B	Carmanhall Road		Minor
C	Blackthorn Road S		Major

Major Arm Geometry

Arm	Width of carriageway (m)	Has kerbed central reserve	Has right turn bay	Visibility for right turn (m)	Blocks?	Blocking queue (PCU)
C	7.00			0.0	✓	0.00

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	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 plus flare	6.80	4.29	4.00	4.00	4.00		1.00	75	75

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	475	0.083	0.209	0.131	0.299
1	B-C	756	0.111	0.280	-	-
1	C-B	574	0.213	0.213	-	-

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 Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)
D1	2023 DN	AM	ONE HOUR	07:45	09:15	15

Default vehicle mix	Vehicle mix source	PCU Factor for a HV (PCU)
✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
A		✓	1168	100.000
B		✓	178	100.000
C		✓	175	100.000

Origin-Destination Data

Demand (PCU/hr)

		To		
		A	B	C
From	A	0	432	736
	B	4	0	174
	C	94	81	0

Vehicle Mix

Heavy Vehicle Percentages

		To		
		A	B	C
From	A	10	10	10
	B	10	10	10
	C	10	10	10

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS
B-C	0.40	14.04	0.7	B
B-A	0.02	19.37	0.0	C
C-AB	0.32	15.01	0.6	C
C-A				
A-B				
A-C				

Main Results for each time segment

07:45 - 08:00

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	131	563	0.233	130	0.3	9.111	A
B-A	3	300	0.010	3	0.0	13.321	B
C-AB	73	442	0.164	72	0.3	10.657	B
C-A	59			59			
A-B	325			325			
A-C	554			554			

08:00 - 08:15

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	156	526	0.298	156	0.5	10.698	B
B-A	4	263	0.014	4	0.0	15.250	C
C-AB	91	419	0.218	91	0.4	12.082	B
C-A	66			66			
A-B	388			388			
A-C	662			662			

08:15 - 08:30

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	192	474	0.405	190	0.7	13.934	B
B-A	4	209	0.021	4	0.0	19.316	C
C-AB	122	387	0.316	121	0.6	14.902	B
C-A	70			70			
A-B	476			476			
A-C	810			810			

08:30 - 08:45

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	192	474	0.405	192	0.7	14.037	B
B-A	4	209	0.021	4	0.0	19.369	C
C-AB	122	387	0.316	122	0.6	15.010	C
C-A	70			70			
A-B	476			476			
A-C	810			810			

08:45 - 09:00

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	156	526	0.298	157	0.5	10.791	B
B-A	4	263	0.014	4	0.0	15.293	C
C-AB	92	419	0.219	93	0.4	12.187	B
C-A	66			66			
A-B	388			388			
A-C	662			662			

09:00 - 09:15

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	131	563	0.233	132	0.3	9.190	A
B-A	3	300	0.010	3	0.0	13.354	B
C-AB	73	443	0.164	73	0.3	10.745	B
C-A	59			59			
A-B	325			325			
A-C	554			554			

Junction 3 - 2023 DN, PM

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction type	Major road direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	untitled	T-Junction	Two-way		13.53	B

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)
D2	2023 DN	PM	ONE HOUR	16:00	17:30	15

Default vehicle mix	Vehicle mix source	PCU Factor for a HV (PCU)
✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
A		✓	1099	100.000
B		✓	352	100.000
C		✓	77	100.000

Origin-Destination Data

Demand (PCU/hr)

		To		
		A	B	C
From	A	0	159	940
	B	9	0	343
	C	33	44	0

Vehicle Mix

Heavy Vehicle Percentages

		To		
		A	B	C
From	A	10	10	10
	B	10	10	10
	C	10	10	10

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS
B-C	0.86	56.55	5.5	F
B-A	0.15	69.92	0.2	F
C-AB	0.16	13.55	0.2	B
C-A				
A-B				
A-C				

Main Results for each time segment

16:00 - 16:15

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	258	541	0.477	254	1.0	13.638	B
B-A	7	270	0.025	7	0.0	15.045	C
C-AB	35	417	0.084	35	0.1	10.343	B
C-A	23			23			
A-B	120			120			
A-C	708			708			

16:15 - 16:30

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	308	499	0.618	306	1.7	20.167	C
B-A	8	204	0.040	8	0.0	20.185	C
C-AB	43	388	0.111	43	0.1	11.483	B
C-A	26			26			
A-B	143			143			
A-C	845			845			

16:30 - 16:45

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	378	440	0.857	365	4.9	46.196	E
B-A	10	81	0.123	10	0.1	55.329	F
C-AB	54	347	0.156	54	0.2	13.524	B
C-A	31			31			
A-B	175			175			
A-C	1035			1035			

16:45 - 17:00

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	378	440	0.858	375	5.5	56.548	F
B-A	10	66	0.150	10	0.2	69.920	F
C-AB	54	347	0.156	54	0.2	13.549	B
C-A	31			31			
A-B	175			175			
A-C	1035			1035			

17:00 - 17:15

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	308	499	0.618	323	1.9	24.128	C
B-A	8	192	0.042	9	0.0	21.634	C
C-AB	43	388	0.111	43	0.2	11.514	B
C-A	26			26			
A-B	143			143			
A-C	845			845			

17:15 - 17:30

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	258	541	0.477	262	1.0	14.345	B
B-A	7	267	0.025	7	0.0	15.251	C
C-AB	35	417	0.084	35	0.1	10.373	B
C-A	23			23			
A-B	120			120			
A-C	708			708			

Junctions 9

PICADY 9 - Priority Intersection Module

Version: 9.5.0.6896

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Filename: Junction 3 2023 DS.j9
Path: N:\Projects\R-Jobs\R478\1.0 WIP\DESIGN\CIVIL\CALCS
Report generation date: 08/07/2019 14:11:38

Summary of junction performance

	AM				PM			
	Queue (PCU)	Delay (s)	RFC	LOS	Queue (PCU)	Delay (s)	RFC	LOS
	Junction 3 - 2023 DS							
Stream B-C	1.0	15.82	0.47	C	6.6	66.04	0.89	F
Stream B-A	0.0	20.65	0.04	C	0.3	104.87	0.23	F
Stream C-AB	0.7	15.24	0.32	C	0.2	13.78	0.16	B

Values shown are the highest values encountered over all time segments. Delay is the maximum value of average delay per arriving vehicle.

File summary

File Description

Title	Junction 3
Location	
Site number	
Date	12/06/2019
Version	
Status	(new file)
Identifier	
Client	
Jobnumber	
Enumerator	OCSC\shane.mcgivney
Description	

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

Analysis Options

Calculate Queue Percentiles	Calculate residual capacity	RFC Threshold	Average Delay threshold (s)	Queue threshold (PCU)
		0.85	36.00	20.00

Demand Set Summary

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)
D1	2023 DS	AM	ONE HOUR	07:45	09:15	15
D2	2023 DS	PM	ONE HOUR	16:00	17:30	15

Analysis Set Details

ID	Name	Network flow scaling factor (%)
A1	Junction 3	100.000

Junction 3 - 2023 DS, AM

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction type	Major road direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	untitled	T-Junction	Two-way		3.15	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Arms

Arms

Arm	Name	Description	Arm type
A	Blackthorn Road S		Major
B	Carmanhall Road		Minor
C	Blackthorn Road N		Major

Major Arm Geometry

Arm	Width of carriageway (m)	Has kerbed central reserve	Has right turn bay	Visibility for right turn (m)	Blocks?	Blocking queue (PCU)
C	7.00			0.0	✓	0.00

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	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 plus flare	6.80	4.29	4.00	4.00	4.00		1.00	75	75

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	475	0.083	0.209	0.131	0.299
1	B-C	756	0.111	0.280	-	-
1	C-B	574	0.213	0.213	-	-

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 Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)
D1	2023 DS	AM	ONE HOUR	07:45	09:15	15

Default vehicle mix	Vehicle mix source	PCU Factor for a HV (PCU)
✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
A		✓	1178	100.000
B		✓	207	100.000
C		✓	176	100.000

Origin-Destination Data

Demand (PCU/hr)

		To		
		A	B	C
From	A	0	442	736
	B	7	0	200
	C	94	82	0

Vehicle Mix

Heavy Vehicle Percentages

		To		
		A	B	C
From	A	10	10	10
	B	10	10	10
	C	10	10	10

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS
B-C	0.47	15.82	1.0	C
B-A	0.04	20.65	0.0	C
C-AB	0.32	15.24	0.7	C
C-A				
A-B				
A-C				

Main Results for each time segment

07:45 - 08:00

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	151	561	0.268	149	0.4	9.573	A
B-A	5	297	0.018	5	0.0	13.554	B
C-AB	74	441	0.167	73	0.3	10.729	B
C-A	59			59			
A-B	333			333			
A-C	554			554			

08:00 - 08:15

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	180	523	0.344	179	0.6	11.488	B
B-A	6	258	0.024	6	0.0	15.707	C
C-AB	93	417	0.222	92	0.4	12.196	B
C-A	66			66			
A-B	397			397			
A-C	662			662			

08:15 - 08:30

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	220	470	0.468	219	0.9	15.642	C
B-A	8	200	0.039	8	0.0	20.564	C
C-AB	124	385	0.322	123	0.7	15.126	C
C-A	70			70			
A-B	487			487			
A-C	810			810			

08:30 - 08:45

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	220	470	0.468	220	1.0	15.820	C
B-A	8	199	0.039	8	0.0	20.652	C
C-AB	124	385	0.323	124	0.7	15.241	C
C-A	70			70			
A-B	487			487			
A-C	810			810			

08:45 - 09:00

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	180	523	0.344	181	0.6	11.636	B
B-A	6	258	0.024	6	0.0	15.768	C
C-AB	93	417	0.223	94	0.4	12.308	B
C-A	65			65			
A-B	397			397			
A-C	662			662			

09:00 - 09:15

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	151	561	0.268	151	0.4	9.679	A
B-A	5	297	0.018	5	0.0	13.595	B
C-AB	74	441	0.167	74	0.3	10.817	B
C-A	59			59			
A-B	333			333			
A-C	554			554			

Junction 3 - 2023 DS, PM

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction type	Major road direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	untitled	T-Junction	Two-way		16.07	C

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)
D2	2023 DS	PM	ONE HOUR	16:00	17:30	15

Default vehicle mix	Vehicle mix source	PCU Factor for a HV (PCU)
✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
A		✓	1114	100.000
B		✓	362	100.000
C		✓	78	100.000

Origin-Destination Data

Demand (PCU/hr)

		To		
		A	B	C
From	A	0	174	940
	B	10	0	352
	C	33	45	0

Vehicle Mix

Heavy Vehicle Percentages

		To		
		A	B	C
From	A	10	10	10
	B	10	10	10
	C	10	10	10

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS
B-C	0.89	66.04	6.6	F
B-A	0.23	104.87	0.3	F
C-AB	0.16	13.78	0.2	B
C-A				
A-B				
A-C				

Main Results for each time segment

16:00 - 16:15

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	265	539	0.491	261	1.0	14.023	B
B-A	8	266	0.028	7	0.0	15.315	C
C-AB	36	415	0.087	36	0.1	10.427	B
C-A	23			23			
A-B	131			131			
A-C	708			708			

16:15 - 16:30

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	316	497	0.637	313	1.8	21.190	C
B-A	9	197	0.046	9	0.1	21.015	C
C-AB	44	385	0.114	44	0.2	11.611	B
C-A	26			26			
A-B	156			156			
A-C	845			845			

16:30 - 16:45

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	388	438	0.885	372	5.6	51.469	F
B-A	11	67	0.165	10	0.2	69.911	F
C-AB	55	343	0.162	55	0.2	13.744	B
C-A	30			30			
A-B	192			192			
A-C	1035			1035			

16:45 - 17:00

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	388	437	0.886	384	6.6	66.041	F
B-A	11	48	0.229	11	0.3	104.874	F
C-AB	56	343	0.162	56	0.2	13.775	B
C-A	30			30			
A-B	192			192			
A-C	1035			1035			

17:00 - 17:15

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	316	496	0.638	335	2.1	26.765	D
B-A	9	182	0.049	10	0.1	23.177	C
C-AB	44	385	0.114	44	0.2	11.644	B
C-A	26			26			
A-B	156			156			
A-C	845			845			

17:15 - 17:30

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	265	539	0.491	269	1.1	14.845	B
B-A	8	262	0.029	8	0.0	15.557	C
C-AB	36	415	0.087	36	0.1	10.463	B
C-A	23			23			
A-B	131			131			
A-C	708			708			

Junctions 9

PICADY 9 - Priority Intersection Module

Version: 9.5.0.6896

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Filename: Junction 3 2038 DM.j9
Path: N:\Projects\R-Jobs\R478\1.0 WIP\DESIGN\CIVIL\CALCS
Report generation date: 08/07/2019 14:12:19

Summary of junction performance

	AM				PM			
	Queue (PCU)	Delay (s)	RFC	LOS	Queue (PCU)	Delay (s)	RFC	LOS
	Junction 3 - 2038 DM							
Stream B-C	2.7	37.40	0.73	E	287.2	2905.84	2.61	F
Stream B-A	0.2	63.88	0.19	F	37.5	2999.94	2.54	F
Stream C-AB	4.3	22.36	0.65	C	0.6	18.80	0.28	C

Values shown are the highest values encountered over all time segments. Delay is the maximum value of average delay per arriving vehicle.

File summary

File Description

Title	Junction 3
Location	
Site number	
Date	12/06/2019
Version	
Status	(new file)
Identifier	
Client	
Jobnumber	
Enumerator	OCSC\shane.mcgivney
Description	

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

Analysis Options

Calculate Queue Percentiles	Calculate residual capacity	RFC Threshold	Average Delay threshold (s)	Queue threshold (PCU)
		0.85	36.00	20.00

Demand Set Summary

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)
D1	2038 DM	AM	ONE HOUR	07:45	09:15	15
D2	2038 DM	PM	ONE HOUR	16:00	17:30	15

Analysis Set Details

ID	Name	Network flow scaling factor (%)
A1	Junction 3	100.000

Junction 3 - 2038 DM, AM

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction type	Major road direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	untitled	T-Junction	Two-way		6.94	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Arms

Arms

Arm	Name	Description	Arm type
A	untitled		Major
B	untitled		Minor
C	untitled		Major

Major Arm Geometry

Arm	Width of carriageway (m)	Has kerbed central reserve	Has right turn bay	Visibility for right turn (m)	Blocks?	Blocking queue (PCU)
C	7.00			0.0	✓	0.00

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	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 plus flare	6.80	4.29	4.00	4.00	4.00		1.00	75	75

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	475	0.083	0.209	0.131	0.299
1	B-C	756	0.111	0.280	-	-
1	C-B	574	0.213	0.213	-	-

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 Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)
D1	2038 DM	AM	ONE HOUR	07:45	09:15	15

Default vehicle mix	Vehicle mix source	PCU Factor for a HV (PCU)
✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
A		✓	1577	100.000
B		✓	263	100.000
C		✓	430	100.000

Origin-Destination Data

Demand (PCU/hr)

		To		
		A	B	C
From	A	0	678	899
	B	13	0	250
	C	336	94	0

Vehicle Mix

Heavy Vehicle Percentages

		To		
		A	B	C
From	A	10	10	10
	B	10	10	10
	C	10	10	10

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS
B-C	0.73	37.40	2.7	E
B-A	0.19	63.88	0.2	F
C-AB	0.65	22.36	4.3	C
C-A				
A-B				
A-C				

Main Results for each time segment

07:45 - 08:00

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	188	504	0.374	186	0.6	12.346	B
B-A	10	224	0.044	10	0.0	18.442	C
C-AB	136	529	0.256	133	0.6	9.987	A
C-A	188			188			
A-B	510			510			
A-C	677			677			

08:00 - 08:15

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	225	454	0.496	223	1.0	17.064	C
B-A	12	167	0.070	12	0.1	25.531	D
C-AB	199	530	0.376	197	1.2	11.968	B
C-A	188			188			
A-B	610			610			
A-C	808			808			

08:15 - 08:30

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	275	380	0.724	269	2.6	34.028	D
B-A	14	80	0.178	14	0.2	59.045	F
C-AB	344	535	0.643	333	4.0	20.180	C
C-A	129			129			
A-B	746			746			
A-C	990			990			

08:30 - 08:45

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	275	379	0.727	275	2.7	37.396	E
B-A	14	76	0.188	14	0.2	63.884	F
C-AB	352	542	0.649	350	4.3	22.358	C
C-A	122			122			
A-B	746			746			
A-C	990			990			

08:45 - 09:00

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	225	453	0.496	231	1.1	18.339	C
B-A	12	162	0.072	12	0.1	26.596	D
C-AB	205	539	0.380	216	1.4	12.913	B
C-A	182			182			
A-B	610			610			
A-C	808			808			

09:00 - 09:15

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	188	504	0.374	190	0.7	12.697	B
B-A	10	222	0.044	10	0.1	18.668	C
C-AB	138	532	0.259	140	0.7	10.245	B
C-A	186			186			
A-B	510			510			
A-C	677			677			

Junction 3 - 2038 DM, PM

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction type	Major road direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	untitled	T-Junction	Two-way		775.07	F

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)
D2	2038 DM	PM	ONE HOUR	16:00	17:30	15

Default vehicle mix	Vehicle mix source	PCU Factor for a HV (PCU)
✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
A		✓	1542	100.000
B		✓	606	100.000
C		✓	134	100.000

Origin-Destination Data

Demand (PCU/hr)

		To		
		A	B	C
From	A	0	220	1322
	B	69	0	537
	C	83	51	0

Vehicle Mix

Heavy Vehicle Percentages

		To		
		A	B	C
From	A	10	10	10
	B	10	10	10
	C	10	10	10

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS
B-C	2.61	2905.84	287.2	F
B-A	2.54	2999.94	37.5	F
C-AB	0.28	18.80	0.6	C
C-A				
A-B				
A-C				

Main Results for each time segment

16:00 - 16:15

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	404	412	0.980	368	9.1	66.101	F
B-A	52	62	0.842	42	2.4	166.368	F
C-AB	46	378	0.122	45	0.2	11.879	B
C-A	55			55			
A-B	166			166			
A-C	995			995			

16:15 - 16:30

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	483	340	1.418	338	45.3	355.655	F
B-A	62	47	1.321	43	7.1	565.729	F
C-AB	59	342	0.172	58	0.3	13.953	B
C-A	62			62			
A-B	198			198			
A-C	1188			1188			

16:30 - 16:45

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	591	236	2.508	236	134.1	1355.467	F
B-A	76	32	2.387	31	18.2	1580.578	F
C-AB	82	294	0.279	81	0.6	18.614	C
C-A	66			66			
A-B	242			242			
A-C	1456			1456			

16:45 - 17:00

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	591	227	2.607	227	225.3	2333.175	F
B-A	76	30	2.540	30	29.7	2455.951	F
C-AB	82	294	0.280	82	0.6	18.795	C
C-A	65			65			
A-B	242			242			
A-C	1456			1456			

17:00 - 17:15

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	483	291	1.661	291	273.3	2736.289	F
B-A	62	38	1.632	38	35.8	2842.788	F
C-AB	59	343	0.172	60	0.3	14.095	B
C-A	61			61			
A-B	198			198			
A-C	1188			1188			

17:15 - 17:30

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	404	349	1.159	349	287.2	2905.835	F
B-A	52	45	1.144	45	37.5	2999.939	F
C-AB	46	378	0.122	47	0.2	11.961	B
C-A	55			55			
A-B	166			166			
A-C	995			995			

Junctions 9

PICADY 9 - Priority Intersection Module

Version: 9.5.0.6896

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Filename: Junction 3 2038 DN.j9
Path: N:\Projects\R-Jobs\R478\1.0 WIP\DESIGN\CIVIL\CALCS
Report generation date: 08/07/2019 14:14:53

Summary of junction performance

	AM				PM			
	Queue (PCU)	Delay (s)	RFC	LOS	Queue (PCU)	Delay (s)	RFC	LOS
	Junction 3 - 2038 DN							
Stream B-C	1.1	19.04	0.52	C	28.8	230.67	1.11	F
Stream B-A	0.0	25.78	0.03	D	1.9	713.95	1.10	F
Stream C-AB	1.1	19.08	0.42	C	0.3	15.82	0.20	C

Values shown are the highest values encountered over all time segments. Delay is the maximum value of average delay per arriving vehicle.

File summary

File Description

Title	Junction 3
Location	
Site number	
Date	12/06/2019
Version	
Status	(new file)
Identifier	
Client	
Jobnumber	
Enumerator	OCSC\shane.mcgivney
Description	

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

Analysis Options

Calculate Queue Percentiles	Calculate residual capacity	RFC Threshold	Average Delay threshold (s)	Queue threshold (PCU)
		0.85	36.00	20.00

Demand Set Summary

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)
D1	2038 DN	AM	ONE HOUR	07:45	09:15	15
D2	2038 DN	PM	ONE HOUR	16:00	17:30	15

Analysis Set Details

ID	Name	Network flow scaling factor (%)
A1	Junction 3	100.000

Junction 3 - 2038 DN, AM

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction type	Major road direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	untitled	T-Junction	Two-way		3.64	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Arms

Arms

Arm	Name	Description	Arm type
A	Blackthorn Road S		Major
B	Carmanhall Road		Minor
C	Blackthorn Road N		Major

Major Arm Geometry

Arm	Width of carriageway (m)	Has kerbed central reserve	Has right turn bay	Visibility for right turn (m)	Blocks?	Blocking queue (PCU)
C	7.00			0.0	✓	0.00

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	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 plus flare	6.80	4.29	4.00	4.00	4.00		1.00	75	75

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	475	0.083	0.209	0.131	0.299
1	B-C	756	0.111	0.280	-	-
1	C-B	574	0.213	0.213	-	-

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 Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)
D1	2038 DN	AM	ONE HOUR	07:45	09:15	15

Default vehicle mix	Vehicle mix source	PCU Factor for a HV (PCU)
✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
A		✓	1346	100.000
B		✓	206	100.000
C		✓	200	100.000

Origin-Destination Data

Demand (PCU/hr)

		To		
		A	B	C
From	A	0	493	853
	B	5	0	201
	C	108	92	0

Vehicle Mix

Heavy Vehicle Percentages

		To		
		A	B	C
From	A	10	10	10
	B	10	10	10
	C	10	10	10

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS
B-C	0.52	19.04	1.1	C
B-A	0.03	25.78	0.0	D
C-AB	0.42	19.08	1.1	C
C-A				
A-B				
A-C				

Main Results for each time segment

07:45 - 08:00

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	151	533	0.284	150	0.4	10.289	B
B-A	4	271	0.014	4	0.0	14.784	B
C-AB	86	424	0.202	84	0.3	11.648	B
C-A	65			65			
A-B	371			371			
A-C	642			642			

08:00 - 08:15

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	181	489	0.369	180	0.6	12.759	B
B-A	4	227	0.020	4	0.0	17.802	C
C-AB	110	397	0.277	109	0.5	13.774	B
C-A	70			70			
A-B	443			443			
A-C	767			767			

08:15 - 08:30

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	221	429	0.516	219	1.1	18.703	C
B-A	6	160	0.034	5	0.0	25.575	D
C-AB	152	361	0.421	150	1.0	18.753	C
C-A	68			68			
A-B	543			543			
A-C	939			939			

08:30 - 08:45

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	221	429	0.516	221	1.1	19.038	C
B-A	6	159	0.035	6	0.0	25.778	D
C-AB	153	362	0.422	152	1.1	19.084	C
C-A	68			68			
A-B	543			543			
A-C	939			939			

08:45 - 09:00

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	181	489	0.369	183	0.7	12.991	B
B-A	4	226	0.020	5	0.0	17.917	C
C-AB	110	398	0.278	112	0.6	14.021	B
C-A	69			69			
A-B	443			443			
A-C	767			767			

09:00 - 09:15

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	151	533	0.284	152	0.4	10.428	B
B-A	4	271	0.014	4	0.0	14.843	B
C-AB	86	424	0.203	87	0.3	11.795	B
C-A	64			64			
A-B	371			371			
A-C	642			642			

Junction 3 - 2038 DN, PM

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction type	Major road direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	untitled	T-Junction	Two-way		56.49	F

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)
D2	2038 DN	PM	ONE HOUR	16:00	17:30	15

Default vehicle mix	Vehicle mix source	PCU Factor for a HV (PCU)
✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
A		✓	1263	100.000
B		✓	402	100.000
C		✓	86	100.000

Origin-Destination Data

Demand (PCU/hr)

		To		
		A	B	C
From	A	0	182	1081
	B	11	0	391
	C	37	49	0

Vehicle Mix

Heavy Vehicle Percentages

		To		
		A	B	C
From	A	10	10	10
	B	10	10	10
	C	10	10	10

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS
B-C	1.11	230.67	28.8	F
B-A	1.10	713.95	1.9	F
C-AB	0.20	15.82	0.3	C
C-A				
A-B				
A-C				

Main Results for each time segment

16:00 - 16:15

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	294	508	0.579	289	1.4	17.589	C
B-A	8	224	0.037	8	0.0	18.311	C
C-AB	40	394	0.101	39	0.1	11.153	B
C-A	25			25			
A-B	137			137			
A-C	814			814			

16:15 - 16:30

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	352	460	0.765	345	3.1	32.660	D
B-A	10	131	0.076	10	0.1	32.729	D
C-AB	49	360	0.135	48	0.2	12.719	B
C-A	29			29			
A-B	164			164			
A-C	972			972			

16:30 - 16:45

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	430	392	1.099	375	17.0	120.919	F
B-A	12	11	1.099	7	1.5	621.306	F
C-AB	62	313	0.199	62	0.3	15.765	C
C-A	33			33			
A-B	200			200			
A-C	1190			1190			

16:45 - 17:00

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	430	388	1.110	383	28.8	230.665	F
B-A	12	14	0.862	10	1.9	713.949	F
C-AB	62	313	0.199	62	0.3	15.819	C
C-A	32			32			
A-B	200			200			
A-C	1190			1190			

17:00 - 17:15

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	352	454	0.774	438	7.1	159.667	F
B-A	10	17	0.576	10	1.9	438.333	F
C-AB	49	360	0.135	49	0.2	12.775	B
C-A	29			29			
A-B	164			164			
A-C	972			972			

17:15 - 17:30

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	294	504	0.584	316	1.6	23.235	C
B-A	8	208	0.040	16	0.0	21.343	C
C-AB	40	394	0.101	40	0.1	11.201	B
C-A	25			25			
A-B	137			137			
A-C	814			814			

Junctions 9

PICADY 9 - Priority Intersection Module

Version: 9.5.0.6896

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Filename: Junction 3 2038 DS.j9
Path: N:\Projects\R-Jobs\R478\1.0 WIP\DESIGN\CIVIL\CALCS
Report generation date: 08/07/2019 14:15:36

Summary of junction performance

	AM				PM			
	Queue (PCU)	Delay (s)	RFC	LOS	Queue (PCU)	Delay (s)	RFC	LOS
	Junction 3 - 2038 DS							
Stream B-C	1.5	22.37	0.59	C	33.8	263.60	1.14	F
Stream B-A	0.1	28.85	0.06	D	2.0	753.53	1.13	F
Stream C-AB	1.1	19.65	0.43	C	0.3	16.11	0.21	C

Values shown are the highest values encountered over all time segments. Delay is the maximum value of average delay per arriving vehicle.

File summary

File Description

Title	Junction 3
Location	
Site number	
Date	12/06/2019
Version	
Status	(new file)
Identifier	
Client	
Jobnumber	
Enumerator	OCSC\shane.mcgivney
Description	

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

Analysis Options

Calculate Queue Percentiles	Calculate residual capacity	RFC Threshold	Average Delay threshold (s)	Queue threshold (PCU)
		0.85	36.00	20.00

Demand Set Summary

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)
D1	2038 DS	AM	ONE HOUR	07:45	09:15	15
D2	2038 DS	PM	ONE HOUR	16:00	17:30	15

Analysis Set Details

ID	Name	Network flow scaling factor (%)
A1	Junction 3	100.000

Junction 3 - 2038 DS, AM

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction type	Major road direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	untitled	T-Junction	Two-way		4.37	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Arms

Arms

Arm	Name	Description	Arm type
A	Blackthorn Road S		Major
B	Carmanhall Road		Minor
C	Blackthorn Road N		Major

Major Arm Geometry

Arm	Width of carriageway (m)	Has kerbed central reserve	Has right turn bay	Visibility for right turn (m)	Blocks?	Blocking queue (PCU)
C	7.00			0.0	✓	0.00

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	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 plus flare	6.80	4.29	4.00	4.00	4.00		1.00	75	75

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	475	0.083	0.209	0.131	0.299
1	B-C	756	0.111	0.280	-	-
1	C-B	574	0.213	0.213	-	-

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 Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)
D1	2038 DS	AM	ONE HOUR	07:45	09:15	15

Default vehicle mix	Vehicle mix source	PCU Factor for a HV (PCU)
✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
A		✓	1356	100.000
B		✓	234	100.000
C		✓	202	100.000

Origin-Destination Data

Demand (PCU/hr)

		To		
		A	B	C
From	A	0	503	853
	B	8	0	226
	C	108	94	0

Vehicle Mix

Heavy Vehicle Percentages

		To		
		A	B	C
From	A	10	10	10
	B	10	10	10
	C	10	10	10

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS
B-C	0.59	22.37	1.5	C
B-A	0.06	28.85	0.1	D
C-AB	0.43	19.65	1.1	C
C-A				
A-B				
A-C				

Main Results for each time segment

07:45 - 08:00

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	170	531	0.321	168	0.5	10.857	B
B-A	6	268	0.023	6	0.0	15.123	C
C-AB	88	422	0.208	86	0.3	11.768	B
C-A	64			64			
A-B	379			379			
A-C	642			642			

08:00 - 08:15

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	203	487	0.417	202	0.8	13.858	B
B-A	7	220	0.033	7	0.0	18.568	C
C-AB	112	395	0.285	112	0.5	13.980	B
C-A	69			69			
A-B	452			452			
A-C	767			767			

08:15 - 08:30

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	249	425	0.585	246	1.5	21.740	C
B-A	9	148	0.060	9	0.1	28.463	D
C-AB	156	359	0.434	154	1.1	19.280	C
C-A	67			67			
A-B	554			554			
A-C	939			939			

08:30 - 08:45

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	249	425	0.585	249	1.5	22.370	C
B-A	9	146	0.060	9	0.1	28.851	D
C-AB	156	360	0.435	156	1.1	19.654	C
C-A	66			66			
A-B	554			554			
A-C	939			939			

08:45 - 09:00

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	203	487	0.417	206	0.8	14.239	B
B-A	7	219	0.033	7	0.0	18.747	C
C-AB	113	396	0.285	115	0.6	14.252	B
C-A	69			69			
A-B	452			452			
A-C	767			767			

09:00 - 09:15

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	170	531	0.321	171	0.5	11.050	B
B-A	6	267	0.023	6	0.0	15.205	C
C-AB	88	422	0.208	89	0.4	11.921	B
C-A	64			64			
A-B	379			379			
A-C	642			642			

Junction 3 - 2038 DS, PM

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction type	Major road direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	untitled	T-Junction	Two-way		64.58	F

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)
D2	2038 DS	PM	ONE HOUR	16:00	17:30	15

Default vehicle mix	Vehicle mix source	PCU Factor for a HV (PCU)
✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
A		✓	1277	100.000
B		✓	411	100.000
C		✓	87	100.000

Origin-Destination Data

Demand (PCU/hr)

		To		
		A	B	C
From	A	0	196	1081
	B	11	0	400
	C	37	50	0

Vehicle Mix

Heavy Vehicle Percentages

		To		
		A	B	C
From	A	10	10	10
	B	10	10	10
	C	10	10	10

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS
B-C	1.14	263.60	33.8	F
B-A	1.13	753.53	2.0	F
C-AB	0.21	16.11	0.3	C
C-A				
A-B				
A-C				

Main Results for each time segment

16:00 - 16:15

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	301	507	0.594	295	1.5	18.182	C
B-A	8	219	0.038	8	0.0	18.731	C
C-AB	41	392	0.103	40	0.1	11.248	B
C-A	25			25			
A-B	148			148			
A-C	814			814			

16:15 - 16:30

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	360	458	0.785	352	3.4	34.958	D
B-A	10	121	0.082	10	0.1	35.508	E
C-AB	50	357	0.139	49	0.2	12.870	B
C-A	29			29			
A-B	176			176			
A-C	972			972			

16:30 - 16:45

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	440	390	1.129	376	19.5	133.982	F
B-A	12	11	1.129	6	1.5	643.896	F
C-AB	64	309	0.205	63	0.3	16.055	C
C-A	32			32			
A-B	216			216			
A-C	1190			1190			

16:45 - 17:00

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	440	386	1.140	383	33.8	263.597	F
B-A	12	14	0.893	10	2.0	753.533	F
C-AB	64	310	0.205	64	0.3	16.115	C
C-A	32			32			
A-B	216			216			
A-C	1190			1190			

17:00 - 17:15

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	360	453	0.794	438	14.1	203.447	F
B-A	10	16	0.601	10	2.0	455.531	F
C-AB	50	357	0.139	50	0.2	12.930	B
C-A	29			29			
A-B	176			176			
A-C	972			972			

17:15 - 17:30

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	301	502	0.599	351	1.8	33.769	D
B-A	8	181	0.046	16	0.1	25.012	D
C-AB	41	392	0.104	41	0.1	11.297	B
C-A	25			25			
A-B	148			148			
A-C	814			814			

Junctions 9

PICADY 9 - Priority Intersection Module

Filename: Junction 4 2019 Base.j9
Path: N:\Projects\R-Jobs\R478\1.0 WIP\DESIGN\CIVIL\CALCS
Report generation date: 08/07/2019 14:16:01

Summary of junction performance

	AM				PM			
	Queue (PCU)	Delay (s)	RFC	LOS	Queue (PCU)	Delay (s)	RFC	LOS
	Junction 4 - 2019 Base							
Stream B-C	0.1	7.41	0.08	A	0.1	7.14	0.06	A
Stream B-A	0.2	10.91	0.16	B	0.3	9.87	0.19	A
Stream C-AB	0.8	6.99	0.29	A	0.4	5.86	0.17	A

Values shown are the highest values encountered over all time segments. Delay is the maximum value of average delay per arriving vehicle.

File summary

File Description

Title	Junction 4
Location	
Site number	
Date	12/06/2019
Version	
Status	(new file)
Identifier	
Client	
Jobnumber	
Enumerator	OCSC\shane.mcgivney
Description	

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

Analysis Options

Calculate Queue Percentiles	Calculate residual capacity	RFC Threshold	Average Delay threshold (s)	Queue threshold (PCU)
		0.85	36.00	20.00

Demand Set Summary

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)
D1	2019 Base	AM	ONE HOUR	07:45	09:15	15
D2	2019 Base	PM	ONE HOUR	16:00	17:30	15

Analysis Set Details

ID	Name	Network flow scaling factor (%)
A1	Junction 4	100.000

Junction 4 - 2019 Base, AM

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction type	Major road direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	untitled	T-Junction	Two-way		2.03	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Arms

Arms

Arm	Name	Description	Arm type
A	Blackthorn Road W		Major
B	Corrig Road		Minor
C	Blackthorn Road E		Major

Major Arm Geometry

Arm	Width of carriageway (m)	Has kerbed central reserve	Has right turn bay	Visibility for right turn (m)	Blocks?	Blocking queue (PCU)
C	13.00			0.0	✓	0.00

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	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 plus flare	9.50	5.50	4.20	4.00	4.00	✓	1.00	75	75

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	604	0.076	0.193	0.122	0.276
1	B-C	692	0.074	0.186	-	-
1	C-B	574	0.155	0.155	-	-

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 Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)
D1	2019 Base	AM	ONE HOUR	07:45	09:15	15

Default vehicle mix	Vehicle mix source	PCU Factor for a HV (PCU)
✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
A		✓	537	100.000
B		✓	104	100.000
C		✓	485	100.000

Origin-Destination Data

Demand (PCU/hr)

		To		
		A	B	C
From	A	0	201	336
	B	64	0	40
	C	390	95	0

Vehicle Mix

Heavy Vehicle Percentages

		To		
		A	B	C
From	A	10	10	10
	B	10	10	10
	C	10	10	10

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS
B-C	0.08	7.41	0.1	A
B-A	0.16	10.91	0.2	B
C-AB	0.29	6.99	0.8	A
C-A				
A-B				
A-C				

Main Results for each time segment

07:45 - 08:00

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	30	617	0.049	30	0.1	6.741	A
B-A	48	488	0.099	48	0.1	8.991	A
C-AB	121	722	0.167	119	0.4	6.569	A
C-A	245			245			
A-B	151			151			
A-C	253			253			

08:00 - 08:15

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	36	601	0.060	36	0.1	7.002	A
B-A	58	465	0.124	57	0.2	9.715	A
C-AB	161	753	0.213	160	0.5	6.690	A
C-A	275			275			
A-B	181			181			
A-C	302			302			

08:15 - 08:30

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	44	579	0.076	44	0.1	7.403	A
B-A	70	433	0.163	70	0.2	10.896	B
C-AB	228	797	0.286	227	0.8	6.962	A
C-A	306			306			
A-B	221			221			
A-C	370			370			

08:30 - 08:45

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	44	579	0.076	44	0.1	7.406	A
B-A	70	433	0.163	70	0.2	10.914	B
C-AB	229	798	0.287	229	0.8	6.988	A
C-A	305			305			
A-B	221			221			
A-C	370			370			

08:45 - 09:00

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	36	601	0.060	36	0.1	7.010	A
B-A	58	465	0.124	58	0.2	9.739	A
C-AB	161	754	0.214	162	0.5	6.726	A
C-A	275			275			
A-B	181			181			
A-C	302			302			

09:00 - 09:15

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	30	617	0.049	30	0.1	6.752	A
B-A	48	487	0.099	48	0.1	9.022	A
C-AB	121	722	0.168	122	0.4	6.616	A
C-A	244			244			
A-B	151			151			
A-C	253			253			

Junction 4 - 2019 Base, PM

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction type	Major road direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	untitled	T-Junction	Two-way		2.02	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)
D2	2019 Base	PM	ONE HOUR	16:00	17:30	15

Default vehicle mix	Vehicle mix source	PCU Factor for a HV (PCU)
✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
A		✓	290	100.000
B		✓	118	100.000
C		✓	463	100.000

Origin-Destination Data

Demand (PCU/hr)

		To		
		A	B	C
From	A	0	104	186
	B	88	0	30
	C	403	60	0

Vehicle Mix

Heavy Vehicle Percentages

		To		
		A	B	C
From	A	10	10	10
	B	10	10	10
	C	10	10	10

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS
B-C	0.06	7.14	0.1	A
B-A	0.19	9.87	0.3	A
C-AB	0.17	5.86	0.4	A
C-A				
A-B				
A-C				

Main Results for each time segment

16:00 - 16:15

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	23	616	0.037	22	0.0	6.668	A
B-A	66	538	0.123	66	0.2	8.372	A
C-AB	76	753	0.101	75	0.2	5.843	A
C-A	273			273			
A-B	78			78			
A-C	140			140			

16:15 - 16:30

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	27	605	0.045	27	0.1	6.855	A
B-A	79	521	0.152	79	0.2	8.953	A
C-AB	100	789	0.127	100	0.3	5.756	A
C-A	316			316			
A-B	93			93			
A-C	167			167			

16:30 - 16:45

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	33	588	0.056	33	0.1	7.140	A
B-A	97	498	0.194	97	0.3	9.853	A
C-AB	141	839	0.168	140	0.4	5.675	A
C-A	369			369			
A-B	115			115			
A-C	205			205			

16:45 - 17:00

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	33	587	0.056	33	0.1	7.142	A
B-A	97	498	0.195	97	0.3	9.868	A
C-AB	141	840	0.168	141	0.4	5.681	A
C-A	369			369			
A-B	115			115			
A-C	205			205			

17:00 - 17:15

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	27	604	0.045	27	0.1	6.862	A
B-A	79	521	0.152	79	0.2	8.968	A
C-AB	100	789	0.127	101	0.3	5.769	A
C-A	316			316			
A-B	93			93			
A-C	167			167			

17:15 - 17:30

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	23	616	0.037	23	0.0	6.678	A
B-A	66	538	0.123	66	0.2	8.403	A
C-AB	76	753	0.101	76	0.2	5.862	A
C-A	272			272			
A-B	78			78			
A-C	140			140			

Junctions 9

PICADY 9 - Priority Intersection Module

Version: 9.5.0.6896

For sales and distribution information, program advice and maintenance, contact TRL:
+44 (0)1344 379777   software@trl.co.uk   www.trlsoftware.co.uk

Filename: Junction 4 2023 DM.j9
Path: N:\Projects\R-Jobs\R478\1.0 WIP\DESIGN\CIVIL\CALCS
Report generation date: 08/07/2019 14:16:28

Summary of junction performance

	AM				PM			
	Queue (PCU)	Delay (s)	RFC	LOS	Queue (PCU)	Delay (s)	RFC	LOS
	Junction 4 - 2023 DM							
Stream B-C	0.1	7.75	0.08	A	0.1	7.28	0.06	A
Stream B-A	0.3	11.70	0.21	B	0.3	10.26	0.22	B
Stream C-AB	0.9	7.12	0.31	A	0.5	5.83	0.18	A

Values shown are the highest values encountered over all time segments. Delay is the maximum value of average delay per arriving vehicle.

File summary

File Description

Title	Junction 4
Location	
Site number	
Date	12/06/2019
Version	
Status	(new file)
Identifier	
Client	
Jobnumber	
Enumerator	OCSC\shane.mcgivney
Description	

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

Analysis Options

Calculate Queue Percentiles	Calculate residual capacity	RFC Threshold	Average Delay threshold (s)	Queue threshold (PCU)
		0.85	36.00	20.00

Demand Set Summary

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)
D1	2023 DM	AM	ONE HOUR	07:45	09:15	15
D2	2023 DM	PM	ONE HOUR	16:00	17:30	15

Analysis Set Details

ID	Name	Network flow scaling factor (%)
A1	Junction 4	100.000

Junction 4 - 2023 DM, AM

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction type	Major road direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	untitled	T-Junction	Two-way		2.25	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Arms

Arms

Arm	Name	Description	Arm type
A	Blackthorn Road W		Major
B	Corrig Road		Minor
C	Blackthorn Road E		Major

Major Arm Geometry

Arm	Width of carriageway (m)	Has kerbed central reserve	Has right turn bay	Visibility for right turn (m)	Blocks?	Blocking queue (PCU)
C	13.00			0.0	✓	0.00

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	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 plus flare	9.50	5.50	4.20	4.00	4.00	✓	1.00	75	75

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	610	0.077	0.195	0.123	0.279
1	B-C	684	0.073	0.184	-	-
1	C-B	574	0.155	0.155	-	-

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 Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)
D1	2023 DM	AM	ONE HOUR	07:45	09:15	15

Default vehicle mix	Vehicle mix source	PCU Factor for a HV (PCU)
✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
A		✓	572	100.000
B		✓	123	100.000
C		✓	512	100.000

Origin-Destination Data

Demand (PCU/hr)

		To		
		A	B	C
From	A	0	217	355
	B	81	0	42
	C	412	100	0

Vehicle Mix

Heavy Vehicle Percentages

		To		
		A	B	C
From	A	10	10	10
	B	10	10	10
	C	10	10	10

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS
B-C	0.08	7.75	0.1	A
B-A	0.21	11.70	0.3	B
C-AB	0.31	7.12	0.9	A
C-A				
A-B				
A-C				

Main Results for each time segment

07:45 - 08:00

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	32	602	0.053	31	0.1	6.938	A
B-A	61	486	0.125	60	0.2	9.290	A
C-AB	131	730	0.179	129	0.4	6.578	A
C-A	255			255			
A-B	163			163			
A-C	267			267			

08:00 - 08:15

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	38	584	0.065	38	0.1	7.249	A
B-A	73	462	0.158	73	0.2	10.176	B
C-AB	176	764	0.230	175	0.6	6.741	A
C-A	285			285			
A-B	195			195			
A-C	319			319			

08:15 - 08:30

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	46	558	0.083	46	0.1	7.741	A
B-A	89	428	0.208	89	0.3	11.670	B
C-AB	252	811	0.310	250	0.9	7.090	A
C-A	312			312			
A-B	239			239			
A-C	391			391			

08:30 - 08:45

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	46	557	0.083	46	0.1	7.746	A
B-A	89	428	0.209	89	0.3	11.699	B
C-AB	252	812	0.311	252	0.9	7.119	A
C-A	311			311			
A-B	239			239			
A-C	391			391			

08:45 - 09:00

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	38	584	0.065	38	0.1	7.259	A
B-A	73	461	0.158	73	0.2	10.212	B
C-AB	176	765	0.231	178	0.6	6.781	A
C-A	284			284			
A-B	195			195			
A-C	319			319			

09:00 - 09:15

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	32	601	0.053	32	0.1	6.950	A
B-A	61	486	0.126	61	0.2	9.332	A
C-AB	132	731	0.180	133	0.4	6.640	A
C-A	254			254			
A-B	163			163			
A-C	267			267			

Junction 4 - 2023 DM, PM

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction type	Major road direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	untitled	T-Junction	Two-way		2.11	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)
D2	2023 DM	PM	ONE HOUR	16:00	17:30	15

Default vehicle mix	Vehicle mix source	PCU Factor for a HV (PCU)
✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
A		✓	310	100.000
B		✓	128	100.000
C		✓	488	100.000

Origin-Destination Data

Demand (PCU/hr)

		To		
		A	B	C
From	A	0	114	196
	B	96	0	32
	C	425	63	0

Vehicle Mix

Heavy Vehicle Percentages

		To		
		A	B	C
From	A	10	10	10
	B	10	10	10
	C	10	10	10

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS
B-C	0.06	7.28	0.1	A
B-A	0.22	10.26	0.3	B
C-AB	0.18	5.83	0.5	A
C-A				
A-B				
A-C				

Main Results for each time segment

16:00 - 16:15

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	24	611	0.039	24	0.0	6.741	A
B-A	72	534	0.135	72	0.2	8.558	A
C-AB	82	762	0.107	81	0.2	5.811	A
C-A	286			286			
A-B	86			86			
A-C	148			148			

16:15 - 16:30

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	29	598	0.048	29	0.1	6.950	A
B-A	86	516	0.167	86	0.2	9.209	A
C-AB	109	801	0.136	109	0.3	5.728	A
C-A	330			330			
A-B	102			102			
A-C	176			176			

16:30 - 16:45

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	35	580	0.061	35	0.1	7.274	A
B-A	106	492	0.215	105	0.3	10.246	B
C-AB	154	854	0.181	154	0.5	5.665	A
C-A	383			383			
A-B	126			126			
A-C	216			216			

16:45 - 17:00

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	35	579	0.061	35	0.1	7.277	A
B-A	106	491	0.215	106	0.3	10.265	B
C-AB	155	854	0.181	155	0.5	5.674	A
C-A	383			383			
A-B	126			126			
A-C	216			216			

17:00 - 17:15

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	29	598	0.048	29	0.1	6.955	A
B-A	86	516	0.167	87	0.2	9.233	A
C-AB	109	801	0.136	110	0.3	5.745	A
C-A	330			330			
A-B	102			102			
A-C	176			176			

17:15 - 17:30

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	24	611	0.039	24	0.0	6.752	A
B-A	72	533	0.135	72	0.2	8.593	A
C-AB	82	763	0.108	83	0.2	5.832	A
C-A	285			285			
A-B	86			86			
A-C	148			148			

Junctions 9

PICADY 9 - Priority Intersection Module

Version: 9.5.0.6896

Filename: Junction 4 2023 DN.j9
Path: N:\Projects\R-Jobs\R478\1.0 WIP\DESIGN\CIVIL\CALCS
Report generation date: 08/07/2019 14:16:53

Summary of junction performance

	AM				PM			
	Queue (PCU)	Delay (s)	RFC	LOS	Queue (PCU)	Delay (s)	RFC	LOS
	Junction 4 - 2023 DN							
Stream B-C	0.1	7.55	0.08	A	0.1	7.24	0.06	A
Stream B-A	0.2	11.34	0.18	B	0.3	10.19	0.21	B
Stream C-AB	0.9	7.11	0.31	A	0.5	5.83	0.18	A

Values shown are the highest values encountered over all time segments. Delay is the maximum value of average delay per arriving vehicle.

File summary

File Description

Title	Junction 4
Location	
Site number	
Date	12/06/2019
Version	
Status	(new file)
Identifier	
Client	
Jobnumber	
Enumerator	OCSC\shane.mcgivney
Description	

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

Analysis Options

Calculate Queue Percentiles	Calculate residual capacity	RFC Threshold	Average Delay threshold (s)	Queue threshold (PCU)
		0.85	36.00	20.00

Demand Set Summary

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)
D1	2023 DN	AM	ONE HOUR	07:45	09:15	15
D2	2023 DN	PM	ONE HOUR	16:00	17:30	15

Analysis Set Details

ID	Name	Network flow scaling factor (%)
A1	Junction 4	100.000

Junction 4 - 2023 DN, AM

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction type	Major road direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	untitled	T-Junction	Two-way		2.13	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Arms

Arms

Arm	Name	Description	Arm type
A	Blackthorn Road W		Major
B	Corrig Road		Minor
C	Blackthorn Road E		Major

Major Arm Geometry

Arm	Width of carriageway (m)	Has kerbed central reserve	Has right turn bay	Visibility for right turn (m)	Blocks?	Blocking queue (PCU)
C	13.00			0.0	✓	0.00

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	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 plus flare	9.50	5.50	4.20	4.00	4.00	✓	1.00	75	75

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	604	0.077	0.193	0.122	0.276
1	B-C	691	0.074	0.186	-	-
1	C-B	574	0.155	0.155	-	-

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 Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)
D1	2023 DN	AM	ONE HOUR	07:45	09:15	15

Default vehicle mix	Vehicle mix source	PCU Factor for a HV (PCU)
✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
A		✓	567	100.000
B		✓	110	100.000
C		✓	512	100.000

Origin-Destination Data

Demand (PCU/hr)

		To		
		A	B	C
From	A	0	212	355
	B	68	0	42
	C	412	100	0

Vehicle Mix

Heavy Vehicle Percentages

		To		
		A	B	C
From	A	10	10	10
	B	10	10	10
	C	10	10	10

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS
B-C	0.08	7.55	0.1	A
B-A	0.18	11.34	0.2	B
C-AB	0.31	7.11	0.9	A
C-A				
A-B				
A-C				

Main Results for each time segment

07:45 - 08:00

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	32	612	0.052	31	0.1	6.814	A
B-A	51	482	0.106	51	0.1	9.178	A
C-AB	131	731	0.179	129	0.4	6.572	A
C-A	255			255			
A-B	160			160			
A-C	267			267			

08:00 - 08:15

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	38	595	0.063	38	0.1	7.101	A
B-A	61	457	0.134	61	0.2	9.981	A
C-AB	175	764	0.230	175	0.6	6.731	A
C-A	285			285			
A-B	191			191			
A-C	319			319			

08:15 - 08:30

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	46	571	0.081	46	0.1	7.545	A
B-A	75	424	0.177	75	0.2	11.321	B
C-AB	252	812	0.310	250	0.9	7.079	A
C-A	312			312			
A-B	233			233			
A-C	391			391			

08:30 - 08:45

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	46	571	0.081	46	0.1	7.548	A
B-A	75	424	0.177	75	0.2	11.342	B
C-AB	252	812	0.310	252	0.9	7.107	A
C-A	312			312			
A-B	233			233			
A-C	391			391			

08:45 - 09:00

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	38	595	0.063	38	0.1	7.107	A
B-A	61	457	0.134	61	0.2	10.013	B
C-AB	176	765	0.230	177	0.6	6.773	A
C-A	284			284			
A-B	191			191			
A-C	319			319			

09:00 - 09:15

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	32	612	0.052	32	0.1	6.829	A
B-A	51	481	0.106	51	0.1	9.214	A
C-AB	132	731	0.180	132	0.4	6.634	A
C-A	254			254			
A-B	160			160			
A-C	267			267			

Junction 4 - 2023 DN, PM

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction type	Major road direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	untitled	T-Junction	Two-way		2.08	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)
D2	2023 DN	PM	ONE HOUR	16:00	17:30	15

Default vehicle mix	Vehicle mix source	PCU Factor for a HV (PCU)
✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
A		✓	306	100.000
B		✓	125	100.000
C		✓	488	100.000

Origin-Destination Data

Demand (PCU/hr)

		To		
		A	B	C
From	A	0	110	196
	B	93	0	32
	C	425	63	0

Vehicle Mix

Heavy Vehicle Percentages

		To		
		A	B	C
From	A	10	10	10
	B	10	10	10
	C	10	10	10

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS
B-C	0.06	7.24	0.1	A
B-A	0.21	10.19	0.3	B
C-AB	0.18	5.83	0.5	A
C-A				
A-B				
A-C				

Main Results for each time segment

16:00 - 16:15

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	24	613	0.039	24	0.0	6.718	A
B-A	70	533	0.131	69	0.2	8.526	A
C-AB	82	763	0.107	81	0.2	5.808	A
C-A	286			286			
A-B	83			83			
A-C	148			148			

16:15 - 16:30

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	29	601	0.048	29	0.1	6.922	A
B-A	84	516	0.162	83	0.2	9.161	A
C-AB	109	801	0.136	108	0.3	5.724	A
C-A	330			330			
A-B	99			99			
A-C	176			176			

16:30 - 16:45

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	35	582	0.061	35	0.1	7.237	A
B-A	102	491	0.208	102	0.3	10.168	B
C-AB	154	855	0.180	154	0.5	5.658	A
C-A	383			383			
A-B	121			121			
A-C	216			216			

16:45 - 17:00

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	35	582	0.061	35	0.1	7.239	A
B-A	102	491	0.208	102	0.3	10.186	B
C-AB	154	855	0.181	154	0.5	5.669	A
C-A	383			383			
A-B	121			121			
A-C	216			216			

17:00 - 17:15

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	29	600	0.048	29	0.1	6.929	A
B-A	84	515	0.162	84	0.2	9.184	A
C-AB	109	801	0.136	110	0.3	5.741	A
C-A	330			330			
A-B	99			99			
A-C	176			176			

17:15 - 17:30

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	24	613	0.039	24	0.0	6.729	A
B-A	70	533	0.131	70	0.2	8.562	A
C-AB	82	763	0.108	83	0.2	5.831	A
C-A	285			285			
A-B	83			83			
A-C	148			148			

Junctions 9

PICADY 9 - Priority Intersection Module

Version: 9.5.0.6896

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Filename: Junction 4 2023 DS.j9
Path: N:\Projects\R-Jobs\R478\1.0 WIP\DESIGN\CIVIL\CALCS
Report generation date: 08/07/2019 14:17:22

Summary of junction performance

	AM				PM			
	Queue (PCU)	Delay (s)	RFC	LOS	Queue (PCU)	Delay (s)	RFC	LOS
	Junction 4 - 2023 DS							
Stream B-C	0.1	7.75	0.08	A	0.1	7.28	0.06	A
Stream B-A	0.3	11.70	0.21	B	0.3	10.26	0.22	B
Stream C-AB	0.9	7.12	0.31	A	0.5	5.83	0.18	A

Values shown are the highest values encountered over all time segments. Delay is the maximum value of average delay per arriving vehicle.

File summary

File Description

Title	Junction 4
Location	
Site number	
Date	12/06/2019
Version	
Status	(new file)
Identifier	
Client	
Jobnumber	
Enumerator	OCSC\shane.mcgivney
Description	

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

Analysis Options

Calculate Queue Percentiles	Calculate residual capacity	RFC Threshold	Average Delay threshold (s)	Queue threshold (PCU)
		0.85	36.00	20.00

Demand Set Summary

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)
D1	2023 DS	AM	ONE HOUR	07:45	09:15	15
D2	2023 DS	PM	ONE HOUR	16:00	17:30	15

Analysis Set Details

ID	Name	Network flow scaling factor (%)
A1	Junction 4	100.000

Junction 4 - 2023 DS, AM

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction type	Major road direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	untitled	T-Junction	Two-way		2.25	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Arms

Arms

Arm	Name	Description	Arm type
A	Blackthorn Road W		Major
B	Corrig Road		Minor
C	Blackthorn Road E		Major

Major Arm Geometry

Arm	Width of carriageway (m)	Has kerbed central reserve	Has right turn bay	Visibility for right turn (m)	Blocks?	Blocking queue (PCU)
C	13.00			0.0	✓	0.00

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	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 plus flare	9.50	5.50	4.20	4.00	4.00	✓	1.00	75	75

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	610	0.077	0.195	0.123	0.279
1	B-C	684	0.073	0.184	-	-
1	C-B	574	0.155	0.155	-	-

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 Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)
D1	2023 DS	AM	ONE HOUR	07:45	09:15	15

Default vehicle mix	Vehicle mix source	PCU Factor for a HV (PCU)
✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
A		✓	572	100.000
B		✓	123	100.000
C		✓	512	100.000

Origin-Destination Data

Demand (PCU/hr)

		To		
		A	B	C
From	A	0	217	355
	B	81	0	42
	C	412	100	0

Vehicle Mix

Heavy Vehicle Percentages

		To		
		A	B	C
From	A	10	10	10
	B	10	10	10
	C	10	10	10

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS
B-C	0.08	7.75	0.1	A
B-A	0.21	11.70	0.3	B
C-AB	0.31	7.12	0.9	A
C-A				
A-B				
A-C				

Main Results for each time segment

07:45 - 08:00

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	32	602	0.053	31	0.1	6.938	A
B-A	61	486	0.125	60	0.2	9.290	A
C-AB	131	730	0.179	129	0.4	6.578	A
C-A	255			255			
A-B	163			163			
A-C	267			267			

08:00 - 08:15

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	38	584	0.065	38	0.1	7.249	A
B-A	73	462	0.158	73	0.2	10.176	B
C-AB	176	764	0.230	175	0.6	6.741	A
C-A	285			285			
A-B	195			195			
A-C	319			319			

08:15 - 08:30

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	46	558	0.083	46	0.1	7.741	A
B-A	89	428	0.208	89	0.3	11.670	B
C-AB	252	811	0.310	250	0.9	7.090	A
C-A	312			312			
A-B	239			239			
A-C	391			391			

08:30 - 08:45

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	46	557	0.083	46	0.1	7.746	A
B-A	89	428	0.209	89	0.3	11.699	B
C-AB	252	812	0.311	252	0.9	7.119	A
C-A	311			311			
A-B	239			239			
A-C	391			391			

08:45 - 09:00

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	38	584	0.065	38	0.1	7.259	A
B-A	73	461	0.158	73	0.2	10.212	B
C-AB	176	765	0.231	178	0.6	6.781	A
C-A	284			284			
A-B	195			195			
A-C	319			319			

09:00 - 09:15

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	32	601	0.053	32	0.1	6.950	A
B-A	61	486	0.126	61	0.2	9.332	A
C-AB	132	731	0.180	133	0.4	6.640	A
C-A	254			254			
A-B	163			163			
A-C	267			267			

Junction 4 - 2023 DS, PM

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction type	Major road direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	untitled	T-Junction	Two-way		2.11	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)
D2	2023 DS	PM	ONE HOUR	16:00	17:30	15

Default vehicle mix	Vehicle mix source	PCU Factor for a HV (PCU)
✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
A		✓	310	100.000
B		✓	128	100.000
C		✓	488	100.000

Origin-Destination Data

Demand (PCU/hr)

		To		
		A	B	C
From	A	0	114	196
	B	96	0	32
	C	425	63	0

Vehicle Mix

Heavy Vehicle Percentages

		To		
		A	B	C
From	A	10	10	10
	B	10	10	10
	C	10	10	10

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS
B-C	0.06	7.28	0.1	A
B-A	0.22	10.26	0.3	B
C-AB	0.18	5.83	0.5	A
C-A				
A-B				
A-C				

Main Results for each time segment

16:00 - 16:15

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	24	611	0.039	24	0.0	6.741	A
B-A	72	534	0.135	72	0.2	8.558	A
C-AB	82	762	0.107	81	0.2	5.811	A
C-A	286			286			
A-B	86			86			
A-C	148			148			

16:15 - 16:30

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	29	598	0.048	29	0.1	6.950	A
B-A	86	516	0.167	86	0.2	9.209	A
C-AB	109	801	0.136	109	0.3	5.728	A
C-A	330			330			
A-B	102			102			
A-C	176			176			

16:30 - 16:45

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	35	580	0.061	35	0.1	7.274	A
B-A	106	492	0.215	105	0.3	10.246	B
C-AB	154	854	0.181	154	0.5	5.665	A
C-A	383			383			
A-B	126			126			
A-C	216			216			

16:45 - 17:00

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	35	579	0.061	35	0.1	7.277	A
B-A	106	491	0.215	106	0.3	10.265	B
C-AB	155	854	0.181	155	0.5	5.674	A
C-A	383			383			
A-B	126			126			
A-C	216			216			

17:00 - 17:15

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	29	598	0.048	29	0.1	6.955	A
B-A	86	516	0.167	87	0.2	9.233	A
C-AB	109	801	0.136	110	0.3	5.745	A
C-A	330			330			
A-B	102			102			
A-C	176			176			

17:15 - 17:30

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	24	611	0.039	24	0.0	6.752	A
B-A	72	533	0.135	72	0.2	8.593	A
C-AB	82	763	0.108	83	0.2	5.832	A
C-A	285			285			
A-B	86			86			
A-C	148			148			

Junctions 9

PICADY 9 - Priority Intersection Module

Version: 9.5.0.6896

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Filename: Junction 4 2038 DM.j9
Path: N:\Projects\R-Jobs\R478\1.0 WIP\DESIGN\CIVIL\CALCS
Report generation date: 08/07/2019 14:17:49

Summary of junction performance

	AM				PM			
	Queue (PCU)	Delay (s)	RFC	LOS	Queue (PCU)	Delay (s)	RFC	LOS
	Junction 4 - 2038 DM							
Stream B-C	0.1	8.20	0.10	A	0.1	7.56	0.07	A
Stream B-A	0.4	13.19	0.25	B	0.4	11.19	0.25	B
Stream C-AB	1.3	7.62	0.38	A	0.6	5.78	0.22	A

Values shown are the highest values encountered over all time segments. Delay is the maximum value of average delay per arriving vehicle.

File summary

File Description

Title	Junction 4
Location	
Site number	
Date	12/06/2019
Version	
Status	(new file)
Identifier	
Client	
Jobnumber	
Enumerator	OCSC\shane.mcgivney
Description	

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

Analysis Options

Calculate Queue Percentiles	Calculate residual capacity	RFC Threshold	Average Delay threshold (s)	Queue threshold (PCU)
		0.85	36.00	20.00

Demand Set Summary

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)
D1	2038 DM	AM	ONE HOUR	07:45	09:15	15
D2	2038 DM	PM	ONE HOUR	16:00	17:30	15

Analysis Set Details

ID	Name	Network flow scaling factor (%)
A1	Junction 4	100.000

Junction 4 - 2038 DM, AM

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction type	Major road direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	untitled	T-Junction	Two-way		2.60	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Arms

Arms

Arm	Name	Description	Arm type
A	Blackthorn Road W		Major
B	Corrig Road		Minor
C	Blackthorn Road E		Major

Major Arm Geometry

Arm	Width of carriageway (m)	Has kerbed central reserve	Has right turn bay	Visibility for right turn (m)	Blocks?	Blocking queue (PCU)
C	13.00			0.0	✓	0.00

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	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 plus flare	9.50	5.50	4.20	4.00	4.00	✓	1.00	75	75

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	608	0.077	0.195	0.123	0.278
1	B-C	686	0.073	0.185	-	-
1	C-B	574	0.155	0.155	-	-

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 Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)
D1	2038 DM	AM	ONE HOUR	07:45	09:15	15

Default vehicle mix	Vehicle mix source	PCU Factor for a HV (PCU)
✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
A		✓	650	100.000
B		✓	141	100.000
C		✓	585	100.000

Origin-Destination Data

Demand (PCU/hr)

		To		
		A	B	C
From	A	0	246	404
	B	91	0	50
	C	471	114	0

Vehicle Mix

Heavy Vehicle Percentages

		To		
		A	B	C
From	A	10	10	10
	B	10	10	10
	C	10	10	10

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS
B-C	0.10	8.20	0.1	A
B-A	0.25	13.19	0.4	B
C-AB	0.38	7.62	1.3	A
C-A				
A-B				
A-C				

Main Results for each time segment

07:45 - 08:00

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	38	592	0.064	37	0.1	7.138	A
B-A	69	467	0.147	68	0.2	9.898	A
C-AB	162	755	0.215	160	0.5	6.652	A
C-A	279			279			
A-B	185			185			
A-C	304			304			

08:00 - 08:15

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	45	571	0.079	45	0.1	7.533	A
B-A	82	439	0.186	82	0.2	11.065	B
C-AB	221	794	0.279	220	0.7	6.919	A
C-A	305			305			
A-B	221			221			
A-C	363			363			

08:15 - 08:30

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	55	538	0.102	55	0.1	8.191	A
B-A	100	401	0.250	100	0.4	13.140	B
C-AB	325	850	0.383	323	1.3	7.561	A
C-A	319			319			
A-B	271			271			
A-C	445			445			

08:30 - 08:45

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	55	538	0.102	55	0.1	8.201	A
B-A	100	400	0.250	100	0.4	13.192	B
C-AB	326	851	0.384	326	1.3	7.616	A
C-A	318			318			
A-B	271			271			
A-C	445			445			

08:45 - 09:00

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	45	570	0.079	45	0.1	7.547	A
B-A	82	439	0.186	82	0.3	11.120	B
C-AB	222	796	0.279	224	0.8	6.991	A
C-A	304			304			
A-B	221			221			
A-C	363			363			

09:00 - 09:15

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	38	591	0.064	38	0.1	7.157	A
B-A	69	467	0.147	69	0.2	9.959	A
C-AB	163	756	0.216	164	0.5	6.723	A
C-A	277			277			
A-B	185			185			
A-C	304			304			

Junction 4 - 2038 DM, PM

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction type	Major road direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	untitled	T-Junction	Two-way		2.29	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)
D2	2038 DM	PM	ONE HOUR	16:00	17:30	15

Default vehicle mix	Vehicle mix source	PCU Factor for a HV (PCU)
✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
A		✓	350	100.000
B		✓	145	100.000
C		✓	553	100.000

Origin-Destination Data

Demand (PCU/hr)

		To		
		A	B	C
From	A	0	128	222
	B	109	0	36
	C	481	72	0

Vehicle Mix

Heavy Vehicle Percentages

		To		
		A	B	C
From	A	10	10	10
	B	10	10	10
	C	10	10	10

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS
B-C	0.07	7.56	0.1	A
B-A	0.25	11.19	0.4	B
C-AB	0.22	5.78	0.6	A
C-A				
A-B				
A-C				

Main Results for each time segment

16:00 - 16:15

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	27	603	0.045	27	0.1	6.878	A
B-A	82	522	0.157	81	0.2	8.971	A
C-AB	100	788	0.127	99	0.3	5.748	A
C-A	316			316			
A-B	96			96			
A-C	167			167			

16:15 - 16:30

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	32	587	0.055	32	0.1	7.136	A
B-A	98	502	0.195	98	0.3	9.796	A
C-AB	136	832	0.163	135	0.4	5.693	A
C-A	362			362			
A-B	115			115			
A-C	200			200			

16:30 - 16:45

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	40	564	0.070	40	0.1	7.552	A
B-A	120	474	0.253	120	0.4	11.161	B
C-AB	196	893	0.220	195	0.6	5.685	A
C-A	413			413			
A-B	141			141			
A-C	244			244			

16:45 - 17:00

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	40	564	0.070	40	0.1	7.556	A
B-A	120	474	0.253	120	0.4	11.191	B
C-AB	196	894	0.220	196	0.6	5.699	A
C-A	412			412			
A-B	141			141			
A-C	244			244			

17:00 - 17:15

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	32	587	0.055	32	0.1	7.145	A
B-A	98	502	0.195	98	0.3	9.833	A
C-AB	136	833	0.163	137	0.4	5.712	A
C-A	361			361			
A-B	115			115			
A-C	200			200			

17:15 - 17:30

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	27	602	0.045	27	0.1	6.888	A
B-A	82	522	0.157	82	0.2	9.019	A
C-AB	101	789	0.128	101	0.3	5.777	A
C-A	315			315			
A-B	96			96			
A-C	167			167			

Junctions 9

PICADY 9 - Priority Intersection Module

Version: 9.5.0.6896

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Filename: Junction 4 2038 DN.j9
Path: N:\Projects\R-Jobs\R478\1.0 WIP\DESIGN\CIVIL\CALCS
Report generation date: 08/07/2019 14:18:47

Summary of junction performance

	AM				PM			
	Queue (PCU)	Delay (s)	RFC	LOS	Queue (PCU)	Delay (s)	RFC	LOS
	Junction 4 - 2038 DN							
Stream B-C	0.1	7.96	0.10	A	0.1	7.50	0.07	A
Stream B-A	0.3	12.68	0.21	B	0.4	11.07	0.24	B
Stream C-AB	1.3	7.60	0.38	A	0.6	5.77	0.22	A

Values shown are the highest values encountered over all time segments. Delay is the maximum value of average delay per arriving vehicle.

File summary

File Description

Title	Junction 4
Location	
Site number	
Date	12/06/2019
Version	
Status	(new file)
Identifier	
Client	
Jobnumber	
Enumerator	OCSC\shane.mcgivney
Description	

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

Analysis Options

Calculate Queue Percentiles	Calculate residual capacity	RFC Threshold	Average Delay threshold (s)	Queue threshold (PCU)
		0.85	36.00	20.00

Demand Set Summary

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)
D1	2038 DN	AM	ONE HOUR	07:45	09:15	15
D2	2038 DN	PM	ONE HOUR	16:00	17:30	15

Analysis Set Details

ID	Name	Network flow scaling factor (%)
A1	Junction 4	100.000

Junction 4 - 2038 DN, AM

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction type	Major road direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	untitled	T-Junction	Two-way		2.46	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Arms

Arms

Arm	Name	Description	Arm type
A	Blackthorn Road W		Major
B	Corrig Road		Minor
C	Blackthorn Road E		Major

Major Arm Geometry

Arm	Width of carriageway (m)	Has kerbed central reserve	Has right turn bay	Visibility for right turn (m)	Blocks?	Blocking queue (PCU)
C	13.00			0.0	✓	0.00

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	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 plus flare	9.50	5.50	4.20	4.00	4.00	✓	1.00	75	75

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	602	0.076	0.193	0.121	0.276
1	B-C	694	0.074	0.187	-	-
1	C-B	574	0.155	0.155	-	-

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 Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)
D1	2038 DN	AM	ONE HOUR	07:45	09:15	15

Default vehicle mix	Vehicle mix source	PCU Factor for a HV (PCU)
✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
A		✓	645	100.000
B		✓	127	100.000
C		✓	585	100.000

Origin-Destination Data

Demand (PCU/hr)

		To		
		A	B	C
From	A	0	241	404
	B	77	0	50
	C	471	114	0

Vehicle Mix

Heavy Vehicle Percentages

		To		
		A	B	C
From	A	10	10	10
	B	10	10	10
	C	10	10	10

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS
B-C	0.10	7.96	0.1	A
B-A	0.21	12.68	0.3	B
C-AB	0.38	7.60	1.3	A
C-A				
A-B				
A-C				

Main Results for each time segment

07:45 - 08:00

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	38	602	0.062	37	0.1	7.005	A
B-A	58	463	0.125	57	0.2	9.747	A
C-AB	162	755	0.214	160	0.5	6.646	A
C-A	279			279			
A-B	181			181			
A-C	304			304			

08:00 - 08:15

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	45	582	0.077	45	0.1	7.366	A
B-A	69	435	0.159	69	0.2	10.802	B
C-AB	221	794	0.278	220	0.7	6.910	A
C-A	305			305			
A-B	217			217			
A-C	363			363			

08:15 - 08:30

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	55	553	0.100	55	0.1	7.948	A
B-A	85	397	0.213	84	0.3	12.637	B
C-AB	325	850	0.382	323	1.3	7.547	A
C-A	319			319			
A-B	265			265			
A-C	445			445			

08:30 - 08:45

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	55	553	0.100	55	0.1	7.956	A
B-A	85	397	0.213	85	0.3	12.676	B
C-AB	326	851	0.383	326	1.3	7.605	A
C-A	318			318			
A-B	265			265			
A-C	445			445			

08:45 - 09:00

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	45	582	0.077	45	0.1	7.378	A
B-A	69	435	0.159	70	0.2	10.845	B
C-AB	222	796	0.279	224	0.8	6.982	A
C-A	304			304			
A-B	217			217			
A-C	363			363			

09:00 - 09:15

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	38	602	0.063	38	0.1	7.019	A
B-A	58	463	0.125	58	0.2	9.800	A
C-AB	163	756	0.216	164	0.5	6.719	A
C-A	277			277			
A-B	181			181			
A-C	304			304			

Junction 4 - 2038 DN, PM

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction type	Major road direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	untitled	T-Junction	Two-way		2.25	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)
D2	2038 DN	PM	ONE HOUR	16:00	17:30	15

Default vehicle mix	Vehicle mix source	PCU Factor for a HV (PCU)
✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
A		✓	346	100.000
B		✓	141	100.000
C		✓	553	100.000

Origin-Destination Data

Demand (PCU/hr)

		To		
		A	B	C
From	A	0	124	222
	B	105	0	36
	C	481	72	0

Vehicle Mix

Heavy Vehicle Percentages

		To		
		A	B	C
From	A	10	10	10
	B	10	10	10
	C	10	10	10

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS
B-C	0.07	7.50	0.1	A
B-A	0.24	11.07	0.4	B
C-AB	0.22	5.77	0.6	A
C-A				
A-B				
A-C				

Main Results for each time segment

16:00 - 16:15

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	27	605	0.045	27	0.1	6.848	A
B-A	79	521	0.152	78	0.2	8.925	A
C-AB	100	788	0.127	99	0.3	5.744	A
C-A	316			316			
A-B	93			93			
A-C	167			167			

16:15 - 16:30

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	32	590	0.055	32	0.1	7.098	A
B-A	94	501	0.188	94	0.3	9.725	A
C-AB	135	832	0.163	135	0.4	5.686	A
C-A	362			362			
A-B	111			111			
A-C	200			200			

16:30 - 16:45

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	40	568	0.070	40	0.1	7.498	A
B-A	116	474	0.244	115	0.3	11.039	B
C-AB	196	894	0.219	195	0.6	5.680	A
C-A	413			413			
A-B	137			137			
A-C	244			244			

16:45 - 17:00

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	40	567	0.070	40	0.1	7.502	A
B-A	116	473	0.244	116	0.4	11.066	B
C-AB	196	894	0.220	196	0.6	5.695	A
C-A	413			413			
A-B	137			137			
A-C	244			244			

17:00 - 17:15

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	32	590	0.055	32	0.1	7.107	A
B-A	94	501	0.188	95	0.3	9.758	A
C-AB	136	833	0.163	137	0.4	5.708	A
C-A	361			361			
A-B	111			111			
A-C	200			200			

17:15 - 17:30

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	27	605	0.045	27	0.1	6.858	A
B-A	79	521	0.152	79	0.2	8.970	A
C-AB	101	789	0.128	101	0.3	5.773	A
C-A	315			315			
A-B	93			93			
A-C	167			167			

Junctions 9

PICADY 9 - Priority Intersection Module

Version: 9.5.0.6896

Filename: Junction 4 2038 DS.j9
Path: N:\Projects\R-Jobs\R478\1.0 WIP\DESIGN\CIVIL\CALCS
Report generation date: 08/07/2019 14:19:14

Summary of junction performance

	AM				PM			
	Queue (PCU)	Delay (s)	RFC	LOS	Queue (PCU)	Delay (s)	RFC	LOS
	Junction 4 - 2038 DS							
Stream B-C	0.1	8.20	0.10	A	0.1	7.56	0.07	A
Stream B-A	0.4	13.19	0.25	B	0.4	11.19	0.25	B
Stream C-AB	1.3	7.62	0.38	A	0.6	5.78	0.22	A

Values shown are the highest values encountered over all time segments. Delay is the maximum value of average delay per arriving vehicle.

File summary

File Description

Title	Junction 4
Location	
Site number	
Date	12/06/2019
Version	
Status	(new file)
Identifier	
Client	
Jobnumber	
Enumerator	OCSC\shane.mcgivney
Description	

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

Analysis Options

Calculate Queue Percentiles	Calculate residual capacity	RFC Threshold	Average Delay threshold (s)	Queue threshold (PCU)
		0.85	36.00	20.00

Demand Set Summary

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)
D1	2038 DS	AM	ONE HOUR	07:45	09:15	15
D2	2038 DS	PM	ONE HOUR	16:00	17:30	15

Analysis Set Details

ID	Name	Network flow scaling factor (%)
A1	Junction 4	100.000

Junction 4 - 2038 DS, AM

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction type	Major road direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	untitled	T-Junction	Two-way		2.60	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Arms

Arms

Arm	Name	Description	Arm type
A	Blackthorn Road W		Major
B	Corrig Road		Minor
C	Blackthorn Road E		Major

Major Arm Geometry

Arm	Width of carriageway (m)	Has kerbed central reserve	Has right turn bay	Visibility for right turn (m)	Blocks?	Blocking queue (PCU)
C	13.00			0.0	✓	0.00

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	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 plus flare	9.50	5.50	4.20	4.00	4.00	✓	1.00	75	75

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	608	0.077	0.195	0.123	0.278
1	B-C	686	0.073	0.185	-	-
1	C-B	574	0.155	0.155	-	-

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 Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)
D1	2038 DS	AM	ONE HOUR	07:45	09:15	15

Default vehicle mix	Vehicle mix source	PCU Factor for a HV (PCU)
✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
A		✓	650	100.000
B		✓	141	100.000
C		✓	585	100.000

Origin-Destination Data

Demand (PCU/hr)

		To		
		A	B	C
From	A	0	246	404
	B	91	0	50
	C	471	114	0

Vehicle Mix

Heavy Vehicle Percentages

		To		
		A	B	C
From	A	10	10	10
	B	10	10	10
	C	10	10	10

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS
B-C	0.10	8.20	0.1	A
B-A	0.25	13.19	0.4	B
C-AB	0.38	7.62	1.3	A
C-A				
A-B				
A-C				

Main Results for each time segment

07:45 - 08:00

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	38	592	0.064	37	0.1	7.138	A
B-A	69	467	0.147	68	0.2	9.898	A
C-AB	162	755	0.215	160	0.5	6.652	A
C-A	279			279			
A-B	185			185			
A-C	304			304			

08:00 - 08:15

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	45	571	0.079	45	0.1	7.533	A
B-A	82	439	0.186	82	0.2	11.065	B
C-AB	221	794	0.279	220	0.7	6.919	A
C-A	305			305			
A-B	221			221			
A-C	363			363			

08:15 - 08:30

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	55	538	0.102	55	0.1	8.191	A
B-A	100	401	0.250	100	0.4	13.140	B
C-AB	325	850	0.383	323	1.3	7.561	A
C-A	319			319			
A-B	271			271			
A-C	445			445			

08:30 - 08:45

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	55	538	0.102	55	0.1	8.201	A
B-A	100	400	0.250	100	0.4	13.192	B
C-AB	326	851	0.384	326	1.3	7.616	A
C-A	318			318			
A-B	271			271			
A-C	445			445			

08:45 - 09:00

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	45	570	0.079	45	0.1	7.547	A
B-A	82	439	0.186	82	0.3	11.120	B
C-AB	222	796	0.279	224	0.8	6.991	A
C-A	304			304			
A-B	221			221			
A-C	363			363			

09:00 - 09:15

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	38	591	0.064	38	0.1	7.157	A
B-A	69	467	0.147	69	0.2	9.959	A
C-AB	163	756	0.216	164	0.5	6.723	A
C-A	277			277			
A-B	185			185			
A-C	304			304			

Junction 4 - 2038 DS, PM

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction type	Major road direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	untitled	T-Junction	Two-way		2.29	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)
D2	2038 DS	PM	ONE HOUR	16:00	17:30	15

Default vehicle mix	Vehicle mix source	PCU Factor for a HV (PCU)
✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Use O-D data	Average Demand (PCU/hr)	Scaling Factor (%)
A		✓	350	100.000
B		✓	145	100.000
C		✓	553	100.000

Origin-Destination Data

Demand (PCU/hr)

		To		
		A	B	C
From	A	0	128	222
	B	109	0	36
	C	481	72	0

Vehicle Mix

Heavy Vehicle Percentages

		To		
		A	B	C
From	A	10	10	10
	B	10	10	10
	C	10	10	10

Generated on 08/07/2019 14:19:23 using Junctions 9 (9.5.0.6896)

Results

Results Summary for whole modelled period

Stream	Max RFC	Max Delay (s)	Max Queue (PCU)	Max LOS
B-C	0.07	7.56	0.1	A
B-A	0.25	11.19	0.4	B
C-AB	0.22	5.78	0.6	A
C-A				
A-B				
A-C				

Main Results for each time segment

16:00 - 16:15

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	27	603	0.045	27	0.1	6.878	A
B-A	82	522	0.157	81	0.2	8.971	A
C-AB	100	788	0.127	99	0.3	5.748	A
C-A	316			316			
A-B	96			96			
A-C	167			167			

16:15 - 16:30

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	32	587	0.055	32	0.1	7.136	A
B-A	98	502	0.195	98	0.3	9.796	A
C-AB	136	832	0.163	135	0.4	5.693	A
C-A	362			362			
A-B	115			115			
A-C	200			200			

16:30 - 16:45

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	40	564	0.070	40	0.1	7.552	A
B-A	120	474	0.253	120	0.4	11.161	B
C-AB	196	893	0.220	195	0.6	5.685	A
C-A	413			413			
A-B	141			141			
A-C	244			244			

16:45 - 17:00

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	40	564	0.070	40	0.1	7.556	A
B-A	120	474	0.253	120	0.4	11.191	B
C-AB	196	894	0.220	196	0.6	5.699	A
C-A	412			412			
A-B	141			141			
A-C	244			244			

Generated on 08/07/2019 14:19:23 using Junctions 9 (9.5.0.6896)

17:00 - 17:15

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	32	587	0.055	32	0.1	7.145	A
B-A	98	502	0.195	98	0.3	9.833	A
C-AB	136	833	0.163	137	0.4	5.712	A
C-A	361			361			
A-B	115			115			
A-C	200			200			

17:15 - 17:30

Stream	Total Demand (PCU/hr)	Capacity (PCU/hr)	RFC	Throughput (PCU/hr)	End queue (PCU)	Delay (s)	Unsignalised level of service
B-C	27	602	0.045	27	0.1	6.888	A
B-A	82	522	0.157	82	0.2	9.019	A
C-AB	101	789	0.128	101	0.3	5.777	A
C-A	315			315			
A-B	96			96			
A-C	167			167			

Appendix 15.1

Construction and Demolition Waste Management Plan

The Tecpro Building,
Clonshaugh Business & Technology Park,
Dublin 17, Ireland.

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CONSTRUCTION & DEMOLITION WASTE MANAGEMENT PLAN FOR A PROPOSED RESIDENTIAL DEVELOPMENT

"FORMER ALDI SITE, CARMANHALL ROAD SANDYFORD INDUSTRIAL ESTATE, DUBLIN 18"

Appendix 15.1

Report Prepared For

Sandyford GP Limited

Report Prepared By

Chonaill Bradley Senior Environmental Consultant

Our Reference

CB/19/10656WMR01

Date of Issue

04 November 2019

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Document History

Document Reference		Original Issue Date	
CB/19/10656WMR01		04 November 2019	
Revision Level	Revision Date	Description	Sections Affected

Record of Approval

Details	Written by	Approved by
Signature		Elaine Neary
Name	Chonaill Bradley	Elaine Neary
Title	Senior Environmental Consultant	Associate
Date	04 November 2019	04 November 2019

CONTENTS

1.0 INTRODUCTION

AWN Consulting Ltd. (AWN) has prepared this Construction & Demolition Waste Management Plan (C&D WMP) on behalf of Sandyford GP Limited. The proposed development will consist of residential dwellings, a café unit, crèche and all associated and ancillary site development and infrastructural works, hard and soft landscaping and boundary treatment works at the former Aldi Site, Carmanhall Road, Sandyford Business District, Dublin 18.

The purpose of this plan is to provide information necessary to ensure that the management of construction and demolition (C&D) waste at the site is undertaken in accordance with current legal and industry standards including the *Waste Management Acts 1996 - 2011* and associated Regulations [1], *Protection of the Environment Act 2003* as amended with EPA Acts 1992 to 2013 [2], *Litter Pollution Act 1997* as amended [3] and the *Eastern-Midlands Region Waste Management Plan 2015 – 2021* [4]. In particular, this plan aims to ensure maximum recycling, reuse and recovery of waste with diversion from landfill, wherever possible. It also seeks to provide guidance on the appropriate collection and transport of waste from the site to prevent issues associated with litter or more serious environmental pollution (e.g. contamination of soil and/or water).

This C&D WMP includes information on the legal and policy framework for C&D waste management in Ireland, estimates of the type and quantity of C&D waste to be generated by the proposed development and makes recommendations for management of different waste streams.

2.0 CONSTRUCTION & DEMOLITION WASTE MANAGEMENT IN IRELAND

2.1 National Level

The Irish Government issued a policy statement in September 1998 known as *'Changing Our Ways'* [5], which identified objectives for the prevention, minimisation, reuse, recycling, recovery and disposal of waste in Ireland. The target for C&D waste in this report was to recycle at least 50% of C&D waste within a five year period (by 2003), with a progressive increase to at least 85% over fifteen years (i.e. 2013).

In response to the *Changing Our Ways* report, a task force (Task Force B4) representing the waste sector of the already established Forum for the Construction Industry, released a report entitled '*Recycling of Construction and Demolition Waste'* [6] concerning the development and implementation of a voluntary construction industry programme to meet the Government's objectives for the recovery of C&D waste.

The most recent national policy document was published in July 2012, entitled '*A Resource Opportunity - Waste Management Policy in Ireland'* [7]. This document stresses the environmental and economic benefits of better waste management, particularly in relation to waste prevention. The document sets out a number of actions in relation to C&D waste and commits to undertake a review of specific producer responsibility requirements for C&D projects over a certain threshold.

The National Construction and Demolition Waste Council (NCDWC) was launched in June 2002, as one of the recommendations of the Forum for the Construction Industry, in the Task Force B4 final report. The NCDWC subsequently produced '*Best Practice Guidelines for the Preparation of Waste Management Plans for Construction and Demolition Projects'* [8] in July 2006 in conjunction with the then Department of the Environment, Heritage and Local Government (DoEHLG). The guidelines outline the issues that need to be addressed at the pre-planning stage of a development all the way through to its completion. These guidelines have been followed in the preparation of this document and include the following elements:

- Predicted C&D wastes and procedures to prevent, minimise, recycle and reuse wastes;
- Waste disposal/recycling of C&D wastes at the site;
- Provision of training for waste manager and site crew;
- Details of proposed record keeping system;
- Details of waste audit procedures and plan; and
- Details of consultation with relevant bodies i.e. waste recycling companies, Dún Laoghaire–Rathdown County Council etc.

Section 3 of the Guidelines identifies thresholds above which there is a requirement for the preparation of a C&D Waste Management Plan for developments. This development requires a C&D WMP under the following criterion:

- New residential developments of 10 houses or more;

Other guidelines followed in the preparation of this report include *'Construction and Demolition Waste Management – a handbook for Contractors and Site Managers'* [9] published by FÁS and the Construction Industry Federation in 2002.

These guidance documents are considered to define best practice for C&D projects in Ireland and describe how C&D projects are to be undertaken such that environmental impacts and risks are minimised and maximum levels of waste recycling are achieved.

2.2 Regional Level

The proposed development is located in the Local Authority area of Dún Laoghaire–Rathdown County Council (DLRCC).

The *Eastern-Midlands Region Waste Management Plan 2015 – 2021* is the regional waste management plan for the DLRCC area published in May 2015.

The Regional Plan sets out the strategic targets for waste management in the region and sets a specific target for C&D waste of *"70% preparing for reuse, recycling and other recovery of construction and demolition waste" (excluding natural soils and stones and hazardous wastes)* to be achieved by 2020.

The DLRCC *County Development Plan 2016 – 2022* (2016) [10] sets out a number of objectives for Dún Laoghaire–Rathdown County Council in line with the objectives of the regional waste management plan.

Waste policies with a particular relevance to this proposed development are:

Policy:

- **Policy EI12**: Waste Management Strategy: It is Council policy to conform to the European Union and National Waste Management Hierarchy as follows:
    - Waste prevention
    - Minimisation
    - Re-use
    - Waste recycling
    - Energy recovery and
    - Disposal

  subject to economic and technical feasibility and Environmental Assessment.
- **Policy EI13**: Waste Plans: It is Council policy to publish plans for the collection, treatment, handling and disposal of waste in accordance with the provisions of

the Waste Management Acts 1996 (as amended) and Protection of the Environment Act 2003 (as amended).

- **Policy EI14**: Private Waste Companies: It is Council policy to ensure that all waste that is disposed of by private waste companies is done so in compliance with the requirements of the Environmental Protection Agency and the Waste Management Legislation and in accordance with the Planning Code.
- **Policy EI16:** Waste Re-use and Recycling: It is Council policy to promote the increased re-use and re-cycling of materials from all waste streams. The Council will co-operate with other agencies in viable schemes for the extraction of useful materials from refuse for re-use or re-cycling and will adopt the National targets as stated in the 'Dublin Regional Waste Management Plan 2005-2010'

With regard to C&D waste specifically the Development Plan requires that the 'Construction and Demolition Waste Management Plan, as a minimum, should include provision for the management of all construction and demolition waste arising on site, and make provision for the reuse of said material and / or the recovery or disposal of this waste to authorised facilities by authorised collectors.' It also requires that where appropriate, excavated material from development sites should be reused on the subject site.

2.3 Legislative Requirements

The primary legislative instruments that govern waste management in Ireland and applicable to the project are:

- Waste Management Act 1996 (No. 10 of 1996) as amended. Sub-ordinate legislation includes:
  - European Communities (Waste Directive) Regulations 2011 (SI 126 of 2011) as amended
  - Waste Management (Collection Permit) Regulations (S.I No. 820 of 2007) as amended
  - Waste Management (Facility Permit and Registration) Regulations 2007, (S.I No. 821 of 2007) as amended
  - Waste Management (Licensing) Regulations 2004 (S.I. No. 395 of 2004) as amended
  - Waste Management (Packaging) Regulations 2014 (S.I. 282 of 2014) as amended
  - Waste Management (Planning) Regulations 1997 (S.I. No. 137 of 1997)
  - Waste Management (Landfill Levy) Regulations 2015 (S.I. No. 189 of 2015)
  - European Union (Waste Electrical and Electronic Equipment) Regulations 2014 (S.I. No. 149 of 2014)
  - European Union (Batteries and Accumulators) Regulations 2014 (S.I. No. 283 of 2014) as amended
  - Waste Management (Food Waste) Regulations 2009 (S.I. 508 of 2009), as amended
  - European Union (Household Food Waste and Bio-waste) Regulation 2015 (S.I. No. 191 of 2015)
  - Waste Management (Hazardous Waste) Regulations, 1998 (S.I. No. 163 of 1998) as amended
  - Waste Management (Shipments of Waste) Regulations, 2007 (S.I. No. 419 of 2007) as amended
  - Waste Management (Movement of Hazardous Waste) Regulations, 1998 (S.I. No. 147 of 1998)
  - European Communities (Transfrontier Shipment of Waste) Regulations 1994 (SI 121 of 1994)
  - European Union (Properties of Waste which Render it Hazardous) Regulations 2015 (S.I. No. 233 of 2015) as amended

- Environmental Protection Act 1992 (No. 7 of 1992) as amended.
- Litter Pollution Act 1997 (No. 12 of 1997) as amended.
- Planning and Development Act 2000 (No. 30 of 2000) as amended [11].

One of the guiding principles of European waste legislation, which has in turn been incorporated into the *Waste Management Act 1996 - 2001* and subsequent Irish legislation, is the principle of *"Duty of Care"*. This implies that the waste producer is responsible for waste from the time it is generated through until its legal recycling, recovery or disposal (including its method of disposal). As it is not practical in most cases for the waste producer to physically transfer all waste from where it is produced to the final destination, waste contractors will be employed to physically transport waste to the final destination. Following on from this is the concept of *"Polluter Pays"* whereby the waste producer is liable to be prosecuted for pollution incidents, which may arise from the incorrect management of waste produced, including the actions of any contractors engaged (e.g. for transportation and disposal/recovery/recycling of waste).

It is therefore imperative that the client ensures that the waste contractors engaged by construction contractors are legally compliant with respect to waste transportation, recycling, recovery and disposal. This includes the requirement that a contractor handle, transport and recycle/recover/dispose of waste in a manner that ensures that no adverse environmental impacts occur as a result of any of these activities.

A collection permit to transport waste must be held by each waste contractor which is issued by the National Waste Collection Permit Office (NWCPO). Waste receiving facilities must also be appropriately permitted or licensed. Operators of such facilities cannot receive any waste, unless in possession of a Certificate of Registration (COR) or waste permit granted by the relevant Local Authority under the *Waste Management (Facility Permit & Registration) Regulations 2007 and Amendments* or a waste or IE licence granted by the EPA. The COR/permit/licence held will specify the type and quantity of waste able to be received, stored, sorted, recycled, recovered and/or disposed of at the specified site.

3.0 DESCRIPTION OF THE PROJECT

3.1 Location, Size and Scale of the Development

Sandyford GP Limited (acting in its capacity as general partner for the Sandyford Central Partnership) intend to apply to An Bord Pleanála for permission for a strategic housing development at a 1.54 ha site at the former Aldi Site, Carmanhall Road, Sandyford Business District, Dublin 18.

The development, which will have a Gross Floor Area of 49,342 sq m will principally consist of: the demolition of the existing structures on site and the provision of a Build-to-Rent residential development comprising 564 No. apartments (46 No. studio apartments, 205 No. one bed apartments, 295 No. two bed apartments and 18 No. three bed apartments) in 6 No. blocks as follows: Block A (144 No. apartments) is part 10 to part 11 No. storeys over basement; Block B (68 No. apartments) is 8 No. storeys over basement; Block C (33 No. apartments) is 5 No. storeys over lower ground; Block D (103 No. apartments) is part 16 to part 17 No. storeys over lower ground; Block E (48 No. apartments) is 10 No. storeys over semi-basement; and Block F (168 No. apartments) is 14 No. storeys over semi basement.

The development provides resident amenity spaces (1,095 sq m) in Blocks A, C and D including concierge, gymnasium, lounges, games room and a panoramic function room at Roof Level of Block D; a creche (354 sq m); café (141 sq m); a pedestrian thoroughfare from Carmanhall Road to Blackthorn Drive also connecting into the boulevard at Rockbrook to the west; principal vehicular access off Carmanhall Road with servicing and bicycle access also provided off Blackthorn Drive; 285 No. car parking spaces (254 No. at basement level and 31 No. at ground level); 21 No. motorcycle spaces; set-down areas; bicycle parking; bin storage; boundary treatments; hard and soft landscaping; lighting; plant; ESB substations and switchrooms; sedum roofs; and all other associated site works above and below ground.

3.2 Details of the Non-Hazardous Wastes to be produced

There will be waste materials generated from the demolition of the buildings on the site, the ground level carpark, along with materials that have been dumped or stored onsite including concrete slabs, scrap metal and general waste. The volume of waste generated from demolition phase will be more difficult to segregate than waste generated from the construction phase, as many of the building materials will be bonded together or integrated i.e. plasterboard on timber ceiling joists, steel embedded in concrete etc.

There will also be soil, stone, gravel clay and rock excavated to facilitate construction of building foundations, installation of services and general site levelling. The volume of material to be excavated has been estimated by the KSN Construction Consultants (KSN) at approximately 10,100m^3. Any suitable excavated material will be reused on site, where possible, however it is anticipated that currently all of the 10,100m^3 of material will be required to be exported offsite for appropriate reuse, recycling and/or disposal.

During the construction phase there may be a surplus of building materials, such as timber off-cuts, broken concrete blocks, cladding, plastics, metals and tiles generated. There may also be excess concrete during construction which will need to be disposed of. Plastic and cardboard waste from packaging and supply of materials will also be generated.

Waste will also be generated from construction workers e.g. organic/food waste, dry mixed recyclables (waste paper, newspaper, plastic bottles, packaging, aluminium cans, tins and Tetra Pak cartons), mixed non-recyclables and potentially sewage sludge from temporary welfare facilities provided onsite during the construction phase. Waste printer/toner cartridges, waste electrical and electronic equipment (WEEE) and waste batteries may also be generated infrequently from site offices.

3.3 Potential Hazardous Wastes to be produced

3.3.1 Contaminated Soil

Soil investigations were completed February 2019 by Ground Investigations Ireland (GII). The samples collected were analysed for a suite of parameters which allows for the assessment of the soils in terms of total pollutant content for classification of materials as hazardous or non-hazardous (RILTA Suite). The suite also allows for the assessment of the soils in terms of suitability for placement at licenced landfills (inert, stable non-reactive, hazardous etc.). The parameter list for the RILTA suite includes analysis of the solid samples for arsenic, barium, cadmium, chromium, copper, cyanide, lead, nickel, mercury, zinc, speciated aliphatic and aromatic petroleum hydrocarbons, pH, sulphate, sulphide, moisture content, soil organic matter and an asbestos screen.

The RILTA suite also includes those parameters specified in the EC Council Decision establishing criteria for the acceptance of waste at Landfills (Council Decision 2003/33/EC)[12], which for the solid samples are pH, total organic carbon (TOC), speciated aliphatic and aromatic petroleum hydrocarbons, BTEX, phenol, polychlorinated biphenyls (PCB) and PAH.

Any potentially contaminated material encountered, will need to be segregated from clean/inert material, tested and classified as either non-hazardous or hazardous in accordance with the EPA publication entitled *'Waste Classification: List of Waste & Determining if Waste is Hazardous or Non-Hazardous'*[13] using the *HazWasteOnline* application (or similar approved classification method). The material will then need to be classified as clean, inert, non-hazardous or hazardous in accordance with the *EC Council Decision 2003/33/EC*, which establishes the criteria for the acceptance of waste at landfills.

Any firm engaged to transport waste material from site and the operator of any waste facility that may accept material excavated from this site, should be furnished with, at a minimum, copies of the full unabridged laboratory reports and HazWasteOnLine™ report for all samples.

3.3.2 Fuel/Oils

As fuels and oils are classed as hazardous materials, any on-site storage of fuel/oil, all storage tanks and all draw-off points will be bunded (or stored in double-skinned tanks) and located in a dedicated, secure area of the site. Provided that these requirements are adhered to and site crew are trained in the appropriate refuelling techniques, it is not expected that there will be any fuel/oil wastage at the site.

3.3.3 Japanese Knot Weed and Other Invasive Plant Species

Openfield Ecology (OE) have undertaken a site assessment/survey February 2019, searching directly for evidence of Japanese Knotweed and other third schedule invasive species on this site. This included walkover surveys of the entire site and the perimeter.

OE has concluded that there is no evidence of Japanese Knotweed (*Fallopia japonica*) or any other third schedule species.

Japanese Knotweed is an alien invasive species listed under *schedule 3 of Regulations SI No. 477 2011*. Under legislation there is an onus on the developer to prevent its spread.

3.3.4 Asbestos

Phoenix Environmental Safety Ltd. undertook an asbestos survey at the Sandyford Central Site, Carmanhall Road, Sandyford, Dublin 18. The aim of the survey was to locate and identify the presence of asbestos containing materials (ACM's) or suspected ACM's.

This particular survey comprised of a Refurbishment / Demolition Survey, carried out in accordance with S.I. No. 386 of 2006 Safety, Health and Welfare at Work (Exposure to Asbestos) Regulations 2006, the Health and Safety Executive's (UK) guidance document HSG 264 (Asbestos: The Survey Guide) and HSG 227 (A Comprehensive Guide to managing Asbestos in Premises).

During the asbestos survey at the Sandyford Central Site, no asbestos containing materials were identified.

If asbestos is identified during demoltion, removal of asbestos or ACMs will be carried out by a suitably qualified contractor and ACM's will only be removed from site by a suitably permitted/licenced waste contractor. All material will be taken to a suitably licensed or permitted facility.

3.3.5 Other known Hazardous Substances

Paints, glues, adhesives and other known hazardous substances will be stored in designated areas. They will generally be present in small volumes only and associated waste volumes generated will be kept to a minimum. Wastes will be stored in appropriate receptacles pending collection by an authorised waste contractor.

In addition, WEEE (containing hazardous components), printer toner/cartridges, batteries (Lead, Ni-Cd or Mercury) and/or fluorescent tubes and other mercury containing waste may be generated from during C&D activities or temporary site offices. These wastes (if encountered) will be stored in appropriate receptacles in designated areas of the site pending collection by an authorised waste contractor.

3.4 Main C&D Waste Categories

The main non-hazardous and hazardous waste streams that could be generated by the construction activities at a typical site are shown in Table 3.1. The List of Waste (LoW) code (as effected from 1 June 2015) (also referred to as the European Waste Code or EWC) for each waste stream is also shown.

Waste Material	LoW/EWC Code
Concrete, bricks, tiles, ceramics	17 01 01-03 & 07
Wood, glass and plastic	17 02 01-03
Treated wood, glass, plastic, containing hazardous substances	17-02-04*
Bituminous mixtures, coal tar and tarred products	17 03 01*, 02 & 03*
Metals (including their alloys) and cable	17 04 01-11
Soil and stones	17 05 03* & 04
Gypsum-based construction material	17 08 01* & 02
Paper and cardboard	20 01 01
Mixed C&D waste	17 09 04
Green waste	20 02 01
Electrical and electronic components	20 01 35 & 36
Batteries and accumulators	20 01 33 & 34
Liquid fuels	13 07 01-10
Chemicals (solvents, pesticides, paints, adhesives, detergents etc.)	20 01 13, 19, 27-30
Insulation materials	17 06 04
Organic (food) waste	20 01 08
Mixed Municipal Waste	20 03 01

Table 3.1 *Typical waste types generated and LoW codes (individual* waste types may contain hazardous substances)

4.0 WASTE MANAGEMENT

4.1 Demolition Waste Generation

Demolition works at the site will involve the demolition of the existing buildings on site and the large hard standing carpark area. Demolition figures published by the EPA *National Waste Reports, the GMIT*[15] and data from previous projects have been used to estimate the approximate break-down for indicative reuse (onsite and/or offsite), recycling and disposal targets of demolition waste. Demolition areas and were calculated by the project engineers. This breakdown is shown in Table 4.1

Waste Type	Tonnes	Reuse/Recovery		Recycle		Disposal	
		%	Tonnes	%	Tonnes	%	Tonnes
Concrete, Bricks, Tiles, Ceramics	6590	30	1977	65	4284	5	330
Plasterboard	9	0	0	80	7	20	2
Metal	265	5	13	80	212	15	40
Timber	6	20	1	40	2	50	3
Other	1	10	0	20	0	60	1
Total	**6871**		**1991**		**4505**		**375**

Table 4.1 *Estimated on and off-site reuse, recycle and disposal rates for demolition waste*

The appointed demolition contractor will be required to prepare a demolition management plan prior to work commencing which should refine the above estimated waste figures.

4.2 Construction Waste Generation

Table 4.1 shows the breakdown of C&D waste types produced on a typical site based on data from the EPA *National Waste Reports, the GMIT* [15] and other research reports.

Waste Types	%
Mixed C&D	33
Timber	28
Plasterboard	10
Metals	8
Concrete	6
Other	15
Total	**100**

Table 4.1 *Waste materials generated on a typical Irish construction site*

Table 4.2 shows the predicted construction waste generation for the proposed development based on the information available to date along with the targets for management of the waste streams. The predicted waste amounts are based on an average largescale development waste generation rate per m^2, using the waste breakdown rates shown in Table 4.1 and the schedule of areas supplied by the project architects (Henry J Lyons).

Waste Type	Tonnes	Reuse		Recycle/Recovery		Disposal	
		%	Tonnes	%	Tonnes	%	Tonnes
Mixed C&D	1157.1	10	115.7	80	925.7	10	115.7
Timber	981.8	40	392.7	55	540.0	5	49.1
Plasterboard	350.6	30	105.2	60	210.4	10	35.1
Metals	280.5	5	14.0	90	252.5	5	14.0
Concrete	210.4	30	63.1	65	136.7	5	10.5
Other	525.9	20	105.2	60	315.6	20	105.2
Total	**3506.3**		**795.9**		**2380.8**		**329.6**

Table 4.2 *Estimated off-site reuse, recycle and disposal rates for construction waste*

In addition to the information in Table 4.3, the quantity of soil and stone generated is expected to be around 10,100m^3 as advised by the project engineers, as the site will require leveling, excavation for foundations & basement, landscaping and services. Any suitable excavated material will be temporarily stockpiled for reuse in landscaping and site levelling where possible. Preliminary figures calculated by the project KSN indicate that all excavated material will be required to be exported offsite for appropriate reuse, recycling and/or disposal.

It should be noted that until final materials and detailed construction methodologies have been confirmed, it is difficult to predict with a high level of accuracy the construction waste that will be generated from the proposed works as the exact materials and quantities may be subject to some degree of change and variation during the construction process.

4.3 Proposed Waste Management Options

Waste materials generated will be segregated on site, where it is practical. Where the on-site segregation of certain wastes types is not practical, off-site segregation will be carried out. There will be skips and receptacles provided to facilitate segregation at source where feasible. All waste receptacles leaving site will be covered or enclosed. The appointed waste contractor will collect and transfer the wastes as receptacles are filled. There are numerous waste contractors in the DLRCC Region that provide this service.

All waste arising's will be handled by an approved waste contractor holding a current waste collection permit. All waste arising's requiring disposal off-site will be reused, recycled, recovered or disposed of at a facility holding the appropriate registration, permit or licence, as required.

Written records will be maintained by the contractor(s) detailing the waste arising throughout the C&D phases, the classification of each waste type, waste collection permits for all waste contactors who collect waste from the site and COR/permit or licence for the receiving waste facility for all waste removed off site for appropriate reuse, recycling, recovery and/or disposal

Dedicated bunded storage containers will be provided for hazardous wastes which may arise such as batteries, paints, oils, chemicals etc, if required.

The management of the main waste streams is outlined as follows:

<u>Soil, Stone, Gravel, Clay & Rock</u>
The Waste Management Hierarchy states that the preferred option for waste management is prevention and minimisation of waste, followed by preparing for reuse and recycling/recovery, energy recovery (i.e. incineration) and, least favoured of all, disposal. The excavations are required to facilitate construction works so the preferred option (prevention and minimisation) cannot be accommodated for the excavation phase.

It is anticipated that 10,100 m^3 of excavated material will be taken off site. When material is removed off-site it could be reused as a by-product (and not as a waste), if this is done, it will be done in accordance with Article 27 of the *European Communities (Waste Directive) Regulations 2011*. Article 27 requires that certain conditions are met and that by-product notifications are made to the EPA via their online notification form. Excavated material should not be removed from site until approval from the EPA has been received.

The next option (beneficial reuse) may be appropriate for the excavated material pending environmental testing to classify the material as hazardous or non-hazardous in accordance with the EPA *Waste Classification – List of Waste & Determining if*

Waste is Hazardous or Non-Hazardous publication. Clean inert material may be used as fill material in other construction projects or engineering fill for waste licensed sites. Beneficial reuse of surplus excavation material as engineering fill may be subject to further testing to determine if materials meet the specific engineering standards for their proposed end-use.

If any soils/stones are imported onto the site from another construction site as a by-product, this will also be done in accordance with Article 27. It is not envisaged that article 27 will be used to import material onto this site.

If the material is deemed to be a waste, then removal and reuse/recovery/disposal of the material will be carried out in accordance with the *Waste Management Acts 1996 – 2011* as amended, the *Waste Management (Collection Permit) Regulations 2007* as amended and the *Waste Management (Facility Permit & Registration) Regulations 2007* as amended. Once all available beneficial reuse options have been exhausted, the options of recycling and recovery at waste permitted and licensed sites will be considered.

In the event that contaminated material is encountered and subsequently classified as hazardous, this material will be stored separately to any non-hazardous material. It will require off-site treatment at a suitable facility or disposal abroad via Transfrontier Shipment of Wastes (TFS).

<u>Bedrock</u>
It is anticipated that some volume of rock will be required to be excavated and removed from site as part of the bulk excavations.

<u>Silt & Sludge</u>
During the construction phase, silt and petrochemical interception should be carried out on runoff and pumped water from site works, where required. Sludge and silt will then be collected by a suitably licensed contractor and removed offsite.

<u>Concrete Blocks, Bricks, Tiles & Ceramics</u>
The majority of concrete blocks, bricks, tiles and ceramics generated as part of the construction works are expected to be clean, inert material and should be recycled, where possible.

<u>Hard Plastic</u>
As hard plastic is a highly recyclable material, much of the plastic generated will be primarily from material off-cuts. All recyclable plastic will be segregated and recycled, where possible.

<u>Timber</u>
Timber that is uncontaminated, i.e. free from paints, preservatives, glues etc., will be disposed of in a separate skip and recycled off-site.

<u>Metal</u>
Metals will be segregated where practical and stored in skips. Metal is highly recyclable and there are numerous companies that will accept these materials.

<u>Plasterboard</u>
There are currently a number of recycling services for plasterboard in Ireland. Plasterboard from the construction phases will be stored in a separate skip, pending collection for recycling. The site manager will ensure that oversupply of new plasterboard is carefully monitored to minimise waste.

<u>Glass</u>
Glass materials will be segregated for recycling, where possible.

Waste Electrical and Electronic Equipment (WEEE)
Any WEEE will be stored in dedicated covered cages/receptacles/pallets pending collection for recycling.

Other Recyclables
Where any other recyclable wastes such as cardboard and soft plastic are generated, these will be segregated at source into dedicated skips and removed off-site.

Non-Recyclable Waste
C&D waste which is not suitable for reuse or recovery, such as polystyrene, some plastics and some cardboards, will be placed in separate skips or other receptacles. Prior to removal from site, the non-recyclable waste skip/receptacle will be examined by a member of the waste team (see Section 7.0) to determine if recyclable materials have been placed in there by mistake. If this is the case, efforts will be made to determine the cause of the waste not being segregated correctly and recyclable waste will be removed and placed into the appropriate receptacle.

Other Hazardous Wastes
On-site storage of any hazardous wastes produced (i.e. contaminated soil if encountered and/or waste fuels) will be kept to a minimum, with removal off-site organised on a regular basis. Storage of all hazardous wastes on-site will be undertaken so as to minimise exposure to on-site personnel and the public and to also minimise potential for environmental impacts. Hazardous wastes will be recovered, wherever possible, and failing this, disposed of appropriately.

It should be noted that until a construction contractor is appointed it is not possible to provide information on the specific destinations of each construction waste stream. Prior to commencement of construction and removal of any construction waste offsite, details of the proposed destination of each waste stream will be provided to DLRCC by the project team.

4.4 Tracking and Documentation Procedures for Off-Site Waste

All waste will be documented prior to leaving the site. Waste will be weighed by the contractor, either by weighing mechanism on the truck or at the receiving facility. These waste records will be maintained on site by the nominated project Waste Manager (see Section 7.0).

All movement of waste and the use of waste contractors will be undertaken in accordance with the *Waste Management Acts 1996 - 2011*, *Waste Management (Collection Permit) Regulations 2007* as amended and *Waste Management (Facility Permit & Registration) Regulations 2007* and amended. This includes the requirement for all waste contractors to have a waste collection permit issued by the NWCPO. The nominated project waste manager (see Section 6.0) will maintain a copy of all waste collection permits on-site.

If the waste is being transported to another site, a copy of the Local Authority waste COR/permit or EPA Waste/IE Licence for that site will be provided to the nominated project waste manager (see Section 7.0). If the waste is being shipped abroad, a copy of the Transfrontier Shipping (TFS) notification document will be obtained from DCC (as the relevant authority on behalf of all local authorities in Ireland) and kept on-site along with details of the final destination (COR, permits, licences etc.). A receipt from the final destination of the material will be kept as part of the on-site waste management records.

All information will be entered in a waste management recording system to be maintained on site.

5.0 ESTIMATED COST OF WASTE MANAGEMENT

An outline of the costs associated with different aspects of waste management is provided below.

The total cost of C&D waste management will be measured and will take into account handling costs, storage costs, transportation costs, revenue from rebates and disposal costs.

5.1 Reuse

By reusing materials on site, there will be a reduction in the transport and recycle/recovery/disposal costs associated with the requirement for a waste contractor to take the material off-site.

Clean and inert soils, gravel, stones etc. which cannot be reused on site may be used as access roads or capping material for landfill sites etc. This material is often taken free of charge or a reduced fee for such purposes, reducing final waste disposal costs.

5.2 Recycling

Salvageable metals will earn a rebate which can be offset against the costs of collection and transportation of the skips.

Clean uncontaminated cardboard and certain hard plastics can also be recycled. Waste contractors will charge considerably less to take segregated wastes, such as recyclable waste, from a site than mixed waste.

Timber can be recycled as chipboard. Again, waste contractors will charge considerably less to take segregated wastes such as timber from a site than mixed waste.

5.3 Disposal

Landfill charges are currently at around €130 - €150 per tonne which includes a €75 per tonne landfill levy specified in the *Waste Management (Landfill Levy) Regulations 2015*. In addition to disposal costs, waste contractors will also charge a collection fee for skips.

Collection of segregated C&D waste usually costs less than municipal waste. Specific C&D waste contractors take the waste off-site to a licensed or permitted facility and, where possible, remove salvageable items from the waste stream before disposing of the remainder to landfill. Clean soil, rubble, etc. is also used as fill/capping material, wherever possible.

6.0 DEMOLITION PROCEDURES

The demolition stage will involve the removal of the existing buildings onsite and the large hard standing area. A formal demolition plan should be prepared for the site; however, in general, the following sequence of works should be followed during the demolition stage.

6.1 Check for Hazards

Prior to commencing works, buildings and structures to be demolished will be checked for any likely hazards including electric power lines or cables, gas reticulation systems, telecommunications, unsafe structures and fire and explosion hazards, e.g. combustible dust, chemical hazards, oil, fuels and contamination.

6.2 Removal of Components

All hazardous materials will be removed first. All components from within the buildings that can be salvaged will be removed next. This will primarily include metal however may also include timbers, doors, windows, wiring and metal ducting, etc.

6.3 Removal of Roofing

Steel roof supports, beams etc. will be dismantled and taken away for recycling/salvage.

6.4 Excavation of Services, Demolition of Walls and Concrete

Services will be removed from the ground and the breakdown of walls will be carried out once all salvageable or reusable materials have been taken from the buildings. Finally, any existing foundations will be excavated.

7.0 TRAINING PROVISIONS

A member of the construction team will be appointed as the project waste manager to ensure commitment, operational efficiency and accountability during the C&D phases of the project.

7.1 Waste Manager Training and Responsibilities

The nominated waste manager will be given responsibility and authority to select a waste team if required, i.e. members of the site crew that will aid them in the organisation, operation and recording of the waste management system implemented on site. The waste manager will have overall responsibility to oversee, record and provide feedback to the client on everyday waste management at the site. Authority will be given to the waste manager to delegate responsibility to sub-contractors, where necessary, and to coordinate with suppliers, service providers and sub-contractors to prioritise waste prevention and material salvage.

The waste manager will be trained in how to set up and maintain a record keeping system, how to perform an audit and how to establish targets for waste management on site. The waste manager will also be trained in the best methods for segregation and storage of recyclable materials, have information on the materials that can be reused on site and be knowledgeable in how to implement this C&D WMP.

7.2 Site Crew Training

Training of site crew is the responsibility of the waste manager and, as such, a waste training program should be organised. A basic awareness course will be held for all site crew to outline the C&D WMP and to detail the segregation of waste materials at source. This may be incorporated with other site training needs such as general site induction, health and safety awareness and manual handling.

This basic course will describe the materials to be segregated, the storage methods and the location of the Waste Storage Areas (WSAs). A sub-section on hazardous wastes will be incorporated into the training program and the particular dangers of each hazardous waste will be explained.

8.0 RECORD KEEPING

Records should be kept for all waste material which leaves the site, either for reuse on another site, recycling or disposal. A recording system will be put in place to record the waste arising’s on site.

A waste tracking log should be used to track each waste movement from the site. On exit from the site the waste collection vehicle driver should stop at the site office and sign out as a visitor and provide the security personnel or waste manager with a waste docket (or WTF for hazardous waste) for the waste load collected. At this time, the security personnel should complete and sign the Waste Tracking Register with the following information:

- Date
- Time
- Waste Contractor
- Company waste contractor appointed by e.g. Contractor or subcontractor name
- Collection Permit No.
- Vehicle Reg.
- Driver Name
- Docket No.
- Waste Type
- EWC/LoW

The waste transfer dockets will be transferred to the site waste manager on a weekly basis and can be placed in the Waste Tracking Log file. This information will be forwarded onto the DLRCC Waste Regulation Unit on a monthly basis

Alternatively, each subcontractor that has engaged their own waste contractor will be required to maintain a similar waste tracking log with the waste dockets/WTF maintained on file and available for inspection on site by the main contractor as required.

A copy of the Waste Collection Permits, CORs, Waste Facility Permits and Waste Licences will be maintained on site at all times. Subcontractors who have engaged their own waste contractors, should provide the main contractor with a copy of the waste collection permits and COR/permit/licence for the receiving waste facilities and maintain a copy on file available for inspection on site as required.

9.0 OUTLINE WASTE AUDIT PROCEDURE

9.1 Responsibility for Waste Audit

The appointed waste manager will be responsible for conducting a waste audit at the site during the C&D phase of the development.

9.2 Review of Records and Identification of Corrective Actions

A review of all the records for the waste generated and transported off-site should be undertaken mid-way through the project. If waste movements are not accounted for, the reasons for this should be established in order to see if and why the record keeping system has not been maintained. The waste records will be compared with the established recovery/reuse/recycling targets for the site.

Each material type will be examined, in order to see where the largest percentage waste generation is occurring. The waste management methods for each material type will be reviewed in order to highlight how the targets can be achieved.

Waste management costs will also be reviewed.

Upon completion of the C&D phase, a final report will be prepared, summarising the outcomes of waste management processes adopted and the total recycling/reuse/recovery figures for the development.

10.0 CONSULTATION WITH RELEVANT BODIES

10.1 Local Authority

Once construction contractors have been appointed and prior to removal of any C&D waste materials offsite, details of the proposed destination of each waste stream will be provided to DLRCC.

DLRCC will also be consulted, as required, throughout the excavation and construction phases in order to ensure that all available waste reduction, reuse and recycling opportunities are identified and utilised and that compliant waste management practices are carried out.

10.2 Recycling/Salvage Companies

Companies that specialise in C&D waste management will be contacted to determine their suitability for engagement. Where a waste contractor is engaged, each company will be audited in order to ensure that relevant and up-to-date waste collection permits and facility COR/permits/licences are held. In addition, information regarding individual construction materials will be obtained, including the feasibility of recycling each material, the costs of recycling/reclamation and the means by which the wastes will be collected and transported off-site, and the recycling/reclamation process each material will undergo off site.

11.0 REFERENCES

1. Waste Management Act 1996 (No. 10 of 1996) as amended. Sub-ordinate and associated legislation includes:
    - European Communities (Waste Directive) Regulations 2011 (S.I. No. 126 of 2011) as amended.
    - Waste Management (Collection Permit) Regulations 2007 (S.I. No. 820 of 2007) as amended.
    - Waste Management (Facility Permit and Registration) Regulations 2007 (S.I No. 821 of 2007) as amended.
    - Waste Management (Licensing) Regulations 2000 (S.I No. 185 of 2000) as amended.
    - European Union (Packaging) Regulations 2014 (S.I. No. 282 of 2014) as amended.
    - Waste Management (Planning) Regulations 1997 (S.I. No. 137 of 1997) as amended.
    - Waste Management (Landfill Levy) Regulations 2015 (S.I. No. 189 of 2015)
    - European Union (Waste Electrical and Electronic Equipment) Regulations 2014 (S.I. No. 149 of 2014)
    - European Union (Batteries and Accumulators) Regulations 2014 (S.I. No. 283 of 2014) as amended.
    - Waste Management (Food Waste) Regulations 2009 (S.I. No. 508 of 2009) as amended.
    - European Union (Household Food Waste and Bio-waste) Regulations 2015 (S.I. No. 191 of 2015)
    - Waste Management (Hazardous Waste) Regulations 1998 (S.I. No. 163 of 1998) as amended.
    - Waste Management (Shipments of Waste) Regulations 2007 (S.I. No. 419 of 2007) as amended.
    - The European Communities (Transfrontier Shipment of Hazardous Waste) Regulations 1988 (S.I. No. 248 of 1988)
    - European Communities (Shipments of Hazardous Waste exclusively within Ireland) Regulations 2011 (S.I. No. 324 of 2011)
    - European Union (Properties of Waste which Render it Hazardous) Regulations 2015 (S.I. No. 233 of 2015) as amended
2. Protection of the Environment Act 2003, (No. 27 of 2003) as amended.
3. Litter Pollution Act 1997 (S.I. No. 12 of 1997) as amended
4. Eastern-Midlands Region Waste Management Plan 2015 – 2021 (2015).
5. Department of Environment and Local Government (DoELG) *Waste Management – Changing Our Ways, A Policy Statement* (1998).
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8. Department of Environment, Heritage and Local Government, *Best Practice Guidelines on the Preparation of Waste Management Plans for Construction and Demolition Projects* (2006).
9. FÁS and the Construction Industry Federation (CIF), *Construction and Demolition Waste Management – a handbook for Contractors and Site Managers* (2002).
10. Dún Laoghaire–Rathdown County Council - *County Development Plan 2016 – 2022* (2016)
11. Planning and Development Act 2000 (S.I. No. 30 of 2000) as amended
12. EPA, *Waste Classification – List of Waste & Determining if Waste is Hazardous or Non-Hazardous* (2015)

13. Council Decision 2003/33/EC, establishing criteria and procedures for the acceptance of waste at landfills pursuant to Article 16 of and Annex II to Directive 1999/31/EC.

14. Environmental Protection Agency (EPA), *National Waste Database Reports 1998 – 2012*.

15. EPA and Galway-Mayo Institute of Technology (GMIT), *EPA Research Report 146 – A Review of Design and Construction Waste Management Practices in Selected Case Studies – Lessons Learned* (2015).

Appendix 15.2

Operational Waste Management Plan

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OPERATIONAL WASTE MANAGEMENT PLAN FOR A PROPOSED STRATEGIC HOUSING DEVELOPMENT AT THE FORMER ALDI SITE, CARMANHALL ROAD, SANDYFORD BUSINESS DISTRICT, DUBLIN 18.

Appendix 15.2

Report Prepared For

Sandyford GP Limited

Report Prepared By

Chonaill Bradley Senior Environmental Consultant

Our Reference

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CONTENTS

1.0 INTRODUCTION

AWN Consulting Ltd. (AWN) has prepared this Operational Waste Management Plan (OWMP) on behalf of Sandyford GP Limited. The proposed development will consist of residential dwellings, a café unit, crèche and all associated and ancillary site development and infrastructural works, hard and soft landscaping and boundary treatment works at the former Aldi Site, Carmanhall Road, Sandyford Business District, Dublin 18.

This OWMP has been prepared to ensure that the management of waste during the operational phase of the proposed development is undertaken in accordance with current legal and industry standards including, the *Waste Management Act 1996 – 2011* as amended and associated Regulations [1], *Protection of the Environment Act 2003* as amended with EPA Acts 1992 to 2013 [2], *Litter Pollution Act 2003* as amended [3], the *'Eastern-Midlands Region (EMR) Waste Management Plan 2015 – 2021'* [4], Dún Laoghaire Rathdown County Council *Bye-Laws for the Storage, Presentation and Collection of Household and Commercial Waste (2009)* [5]*, the DLR Refuse and Recycling Storage Guidelines (2017)* [6] *and* the draft DLRCC '*DLR (Storage, Presentation and Segregation of Household and Commercial Waste) Bye-Laws' (2019)* [7]*.* In particular, this OWMP aims to provide a robust strategy for storing, handling, collection and transport of the wastes generated at site.

This OWMP aims to ensure maximum recycling, reuse and recovery of waste with diversion from landfill, wherever possible. The OWMP also seeks to provide guidance on the appropriate collection and transport of waste to prevent issues associated with litter or more serious environmental pollution (e.g. contamination of soil or water resources). The plan estimates the type and quantity of waste to be generated from the proposed development during the operational phase and provides a strategy for managing the different waste streams.

At present, there are no specific guidelines in Ireland for the preparation of OWMPs. Therefore, in preparing this document, consideration has been given to the requirements of national and regional waste policy, legislation and other guidelines.

2.0 OVERVIEW OF WASTE MANAGEMENT IN IRELAND

2.1 National Level

The Government issued a policy statement in September 1998 titled as *'Changing Our Ways'* [8] which identified objectives for the prevention, minimisation, reuse, recycling, recovery and disposal of waste in Ireland. A heavy emphasis was placed on reducing reliance on landfill and finding alternative methods for managing waste. Amongst other things, Changing Our Ways stated a target of at least 35% recycling of municipal (i.e. household, commercial and non-process industrial) waste.

A further policy document *'Preventing and Recycling Waste – Delivering Change'* was published in 2002 [9]. This document proposed a number of programmes to increase recycling of waste and allow diversion from landfill. The need for waste minimisation at source was considered a priority.

This view was also supported by a review of sustainable development policy in Ireland and achievements to date, which was conducted in 2002, entitled *'Making Irelands Development Sustainable – Review, Assessment and Future Action'* [10]. This document also stressed the need to break the link between economic growth and waste generation, again through waste minimisation and reuse of discarded material.

In order to establish the progress of the Government policy document *Changing Our Ways*, a review document was published in April 2004 entitled *'Taking Stock and*

Moving Forward' [11]. Covering the period 1998 – 2003, the aim of this document was to assess progress to date with regard to waste management in Ireland, to consider developments since the policy framework and the local authority waste management plans were put in place, and to identify measures that could be undertaken to further support progress towards the objectives outlined in *Changing Our Ways*.

In particular, *Taking Stock and Moving Forward* noted a significant increase in the amount of waste being brought to local authority landfills. The report noted that one of the significant challenges in the coming years was the extension of the dry recyclable collection services.

The most recent policy document was published in July 2012 titled *'A Resource Opportunity'* [12]. The policy document stresses the environmental and economic benefits of better waste management, particularly in relation to waste prevention. The document sets out a number of actions, including the following:

- A move away from landfill and replacement through prevention, reuse, recycling and recovery.
- A Brown Bin roll-out diverting 'organic waste' towards more productive uses.
- Introducing a new regulatory regime for the existing side-by-side competition model within the household waste collection market.
- New Service Standards to ensure that consumers receive higher customer service standards from their operator.
- Placing responsibility on householders to prove they use an authorised waste collection service.
- The establishment of a team of Waste Enforcement Officers for cases relating to serious criminal activity will be prioritised.
- Reducing red tape for industry to identify and reduce any unnecessary administrative burdens on the waste management industry.
- A review of the producer responsibility model will be initiated to assess and evaluate the operation of the model in Ireland.
- Significant reduction of Waste Management Planning Regions from ten to three.

While *A Resource Opportunity* covers the period to 2020, it is subject to a mid-term review in 2016 to ensure that the measures are set out properly and to provide an opportunity for additional measures to be adopted in the event of inadequate performance. In early 2016, the Department of the Environment, Community and Local Government invited comments from interested parties on the discussion paper 'Exporting a Resource Opportunity'. While the EPA have issued a response to the consultation, an updated policy document has not yet been published.

Since 1998, the Environmental Protection Agency (EPA) has produced periodic *'National Waste (Database) Reports'* [13] detailing among other things estimates for household and commercial (municipal) waste generation in Ireland and the level of recycling, recovery and disposal of these materials. The 2016 National Waste Statistics, which is the most recent study published, reported the following key statistics for 2016:

- **Generated –** Ireland produced 2,763,166 t of municipal waste in 2016, this is a six percent increase since 2014. This means that each person living in Ireland generated 580kg of municipal waste in 2016
- **Managed –** Waste collected and treated by the waste industry. In 2016, a total of 2,718,298 t of municipal waste was managed
- **Unmanaged –**Waste that is not collected or brought to a waste facility and is therefore likely to cause pollution in the environment because it is burned, buried or dumped. The EPA estimates that 44,868 t was unmanaged in 2016

- **Recovered –** the amount of waste recycled, used as a fuel in incinerators, or used to cover landfilled waste. In 2016, almost three quarters (74%) of municipal waste was recovered, this is a decrease from 79% in 2014
- **Recycled –** the waste broken down and used to make new items. Recycling also includes the breakdown of food and garden waste to make compost. The recycling rate in 2016 was 41%, the same as 2014
- **Disposed –** the waste landfilled or burned in incinerators without energy recovery. Just over a quarter (26%) of municipal waste was landfilled in 2016.

2.2 Regional Level

The proposed development is located in the Local Authority area of Dun Laoghaire Rathdown County Council (DLRCC).

The *EMR Waste Management Plan 2015 – 2021* is the regional waste management plan for the DLRCC area which was published in May 2015.

The regional plan sets out the following strategic targets for waste management in the region that are relevant to the proposed development:

- Achieve a recycling rate of 50% of managed municipal waste by 2020; and
- Reduce to 0% the direct disposal of unprocessed residual municipal waste to landfill (from 2016 onwards) in favour of higher value pre-treatment processes and indigenous recovery practices.

Municipal landfill charges in Ireland are based on the weight of waste disposed. In the Leinster Region, charges are approximately €130 - €150 per tonne of waste which includes a €75 per tonne landfill levy introduced under the *Waste Management (Landfill Levy) (Amendment) Regulations 2013.*

The *Dún Laoghaire-Rathdown County Development Plan 2016 – 2022* [14] sets out a number of policies for the Dún Laoghaire-Rathdown area in line with the objectives of the waste management plan.

Waste policies with a particular relevance to the proposed development are as follows:

Policy EI12: Waste Management Strategy
It is Council policy to conform to the European Union and National waste management hierarchy as follows:
- *waste prevention*
- *minimisation*
- *re-use*
- *waste recycling*
- *energy recovery and*
- *disposal*

subject to economic and technical feasibility and Environmental Assessment.

Policy EI13: Waste Plans
It is Council policy to publish plans for the collection, treatment, handling and disposal of waste in accordance with the provisions of the Waste Management Act 1996 (as amended) and Protection of the Environment Act 2003 (as amended).

Policy EI14: Private Waste Companies
It is Council policy to ensure that all waste that is disposed of by private waste companies is done so in compliance with the requirements of the Environmental Protection Agency and the Waste Management Legislation and in accordance with the Planning Code.

Policy EI15: Waste Prevention and Reduction
It is Council policy to promote the prevention and reduction of waste and to co-operate with industry and other agencies in viable schemes to achieve this.

Policy EI16: Waste Re-use and Re-cycling
It is Council policy to promote the increased re-use and re-cycling of materials from all waste streams. The Council will co-operate with other agencies in viable schemes for the extraction of useful materials from refuse for re-use or re-cycling and will adopt the National targets as stated in the 'Dublin Regional Waste Management Plan 2005-2010'. (Note: the EMR Waste Management Plan 2015 - 2021 was published in 2015. It is assumed this objective is relevant to the EMR Waste Management Plan and not the Dublin Regional Waste Management Plan which is no longer valid)..

2.3 Legislative Requirements

The primary legislative instruments that govern waste management in Ireland and applicable to the project are:

- Waste Management Act 1996 (No. 10 of 1996) as amended 2001 (No. 36 of 2001), 2003 (No. 27 of 2003) and 2011 (No 20 of 2011). Sub-ordinate and associated legislation includes:
  - European Communities (Waste Directive) Regulations 2011 (S.I. No. 126 of 2011) as amended
  - Waste Management (Collection Permit) Regulations 2007 (S.I. No. 820 of 2007) as amended
  - Waste Management (Facility Permit and Registration) Regulation 2007 (S.I No. 821 of 2007) as amended
  - Waste Management (Licensing) Regulations 2000 (S.I No. 185 of 2000) as amended
  - European Union (Packaging) Regulations 2014 (S.I. No. 282 of 2014) as amended.
  - Waste Management (Planning) Regulations 1997 (S.I. No. 137 of 1997) as amended
  - Waste Management (Landfill Levy) Regulations 2015 (S.I. No. 189 of 2015)
  - European Communities (Waste Electrical and Electronic Equipment) Regulations 2014 (S.I. No. 149 of 2014)
  - Waste Management (Batteries and Accumulators) Regulations 2014 (S.I. No. 283 of 2014) as amended
  - Waste Management (Food Waste) Regulations 2009 (S.I. No. 508 of 2009) as amended
  - European Union (Household Food Waste and Bio-waste) Regulations 2015 (S.I. No. 191 of 2015)
  - Waste Management (Hazardous Waste) Regulations 1998 (S.I. No. 163 of 1998) as amended
  - Waste Management (Shipments of Waste) Regulations 2007 (S.I. No. 419 of 2007) as amended
  - *European Communities (Transfrontier Shipment of Waste) Regulations 1994 (SI 121 of 1994)*
  - European Union (Properties of Waste Which Render it Hazardous) Regulations 2015 (S.I. No. 233 of 2015) as amended
- Environmental Protection Act 1992 (S.I. No. 7 of 1992) as amended;
- Litter Pollution Act 1997 (Act No. 12 of 1997) as amended; and
- Planning and Development Act 2000 (S.I. No. 30 of 2000) as amended [15]

These Acts and subordinate Regulations enable the transposition of relevant European Union Policy and Directives into Irish law.

One of the guiding principles of European waste legislation, which has in turn been incorporated into the *Waste Management Act 1996 - 2011* and subsequent Irish legislation, is the principle of *"Duty of Care"*. This implies that the waste producer is responsible for waste from the time it is generated through until its legal disposal (including its method of disposal.) As it is not practical in most cases for the waste producer to physically transfer all waste from where it is produced to the final disposal area, waste contractors will be employed to physically transport waste to the final waste disposal site.

It is therefore imperative that the residents, commercial tenants and the proposed building management company(s) undertake on-site management of waste in accordance with all legal requirements and employ suitably permitted/licenced contractors to undertake off-site management of their waste in accordance with all legal requirements. This includes the requirement that a waste contactor handle, transport and reuse/recover/recycle/dispose of waste in a manner that ensures that no adverse environmental impacts occur as a result of any of these activities.

A collection permit to transport waste must be held by each waste contractor which is issued by the National Waste Collection Permit Office (NWCPO). Waste receiving facilities must also be appropriately permitted or licensed. Operators of such facilities cannot receive any waste, unless in possession of a Certificate of Registration (COR) or waste permit granted by the relevant Local Authority under the *Waste Management (Facility Permit & Registration) Regulations 2007* as amended or a waste or IE (Industrial Emissions) licence granted by the EPA. The COR/permit/licence held will specify the type and quantity of waste able to be received, stored, sorted, recycled, recovered and/or disposed of at the specified site.

2.3.1 Dún Laoghaire-Rathdown County Council Waste Bye-Laws

Bye-Laws for the Storage, Presentation and Collection of Household and Commercial Waste were brought into force by DLRCC in 2009. The *Waste Bye-Laws* set a number of enforceable requirements on waste holders and collectors with regard to storage, separation, presentation and collection of waste within the DLRCC functional area. Key requirements under these Bye-Laws are:

- A holder shall not cause or permit the storage of waste to endanger health, create a risk of injury to pedestrians or traffic, harm the environment or create a nuisance through noise, odours or litter;
- A service provider shall not collect overloaded waste containers;
- A holder shall ensure that the lid of an appropriate waste container is firmly closed when that container is presented for collection; and
- A holder shall not present waste for collection before 6 p.m. on the day before the approved time

The full text of the Waste Bye-Laws is available from the DLRCC website.

2.3.2 Dún Laoghaire-Rathdown County Council Draft Waste Bye-Laws

The DLRCC "Draft DLR (Storage, Presentation and Segregation of Household and Commercial Waste) Bye-Laws (2019)" were released for consultation on the 10th of July 2019. These Bye-laws will repeal the current '*Bye-Laws for the Storage, Presentation and Collection of Household and Commercial Waste'*. The Draft Bye-Laws set a number of enforceable requirements on waste holders with regard to storage, separation and presentation of waste within the DLRCC functional area. Key requirements under these Draft Bye-Laws of relevance to the proposed development include the following

- Kerbside waste presented for collection shall not be presented for collection earlier than 6:00 pm on the day immediately preceding the designated waste collection day;
- All containers used for the presentation of kerbside waste and any uncollected waste shall be removed from any roadway, footway, footpath or any other public place no later than 10:00am on the day following the designated waste collection day, unless an alternative arrangement has been approved in accordance with bye-law 4;
- Documentation, including receipts, is obtained and retained for a period of no less than one year to provide proof that any waste removed from the premises has been managed in a manner that conforms to these bye-laws, to the Waste Management Act and, where such legislation is applicable to that person, to the European Union (Household Food Waste and Bio-Waste) Regulations 2015; and
- Adequate access and egress onto and from the premises by waste collection vehicles is maintained.

The full text of the Draft Waste Bye-Laws is available from the DLRCC website.

2.4 Local Authority Guidelines

DLRCC's Waste Management Division have issued *Refuse and Recycling Storage Guidelines* (dated November 2017) which provide good practice guidance for the storage and collection of waste for new build high density developments. The guidelines include a form which is designed to be completed by (or on behalf of) the applicant for new large developments. The objective of the guidelines and completion of the form is to allow developers to demonstrate to local planning and waste management authorities that they have considered how the design and the operation of waste management services will enable the occupiers and managing agents to effectively manage their wastes arisings.

The ultimate goal of the guidelines is that the implemented waste strategy will achieve a 70% reuse and recovery target in accordance with the European Commission's proposal to introduce 70% reuse and recycling targets for municipal waste by 2030 and while also providing sufficient flexibility to support future targets and legislative requirements.

This OWMP has been prepared to demonstrate exactly that and aims to do that in a comprehensive manner.

The guidelines and form are available on the DLRCC website.

2.5 Regional Waste Management Service Providers and Facilities

Various contractors offer waste collection services for the in the DLRCC region. Details of waste collection permits (granted, pending and withdrawn) for the region are available from the NWCPO.

As outlined in the regional waste management plan, there is a decreasing number of landfills available in the region. Only three municipal solid waste landfills remain operational and are all operated by the private sector. There are a number of other licensed and permitted facilities in operation in the region including waste transfer stations, hazardous waste facilities and integrated waste management facilities. There are two existing thermal treatment facilities, one in Duleek, Co. Meath and a second facility in Poolbeg in Dublin.

The closest bring centre to the development is located about 3 km to the south east at Ballyogan Recycling Park and there are bottle banks located a short distance away at on Arkle Road (0.2km) and Braken Road(0.4km).

A copy of all CORs and waste permits issued by the Local Authorities are available from the NWCPO website and all waste/IE licenses issued are available from the EPA.

3.0 DESCRIPTION OF THE PROJECT

3.1 Location, Size and Scale of the Development

Sandyford GP Limited (acting in its capacity as general partner for the Sandyford Central Partnership) intend to apply to An Bord Pleanála for permission for a strategic housing development at a 1.54 ha site at the former Aldi Site, Carmanhall Road, Sandyford Business District, Dublin 18.

The development, which will have a Gross Floor Area of 49,342 sq m will principally consist of: the demolition of the existing structures on site and the provision of a Build-to-Rent residential development comprising 564 No. apartments (46 No. studio apartments, 205 No. one bed apartments, 295 No. two bed apartments and 18 No. three bed apartments) in 6 No. blocks as follows: Block A (144 No. apartments) is part 10 to part 11 No. storeys over basement; Block B (68 No. apartments) is 8 No. storeys over basement; Block C (33 No. apartments) is 5 No. storeys over lower ground; Block D (103 No. apartments) is part 16 to part 17 No. storeys over lower ground; Block E (48 No. apartments) is 10 No. storeys over semi-basement; and Block F (168 No. apartments) is 14 No. storeys over semi basement.

The development provides resident amenity spaces (1,095 sq m) in Blocks A, C and D including concierge, gymnasium, lounges, games room and a panoramic function room at Roof Level of Block D; a creche (354 sq m); café (141 sq m); a pedestrian thoroughfare from Carmanhall Road to Blackthorn Drive also connecting into the boulevard at Rockbrook to the west; principal vehicular access off Carmanhall Road with servicing and bicycle access also provided off Blackthorn Drive; 285 No. car parking spaces (254 No. at basement level and 31 No. at ground level); 21 No. motorcycle spaces; set-down areas; bicycle parking; bin storage; boundary treatments; hard and soft landscaping; lighting; plant; ESB substations and switchrooms; sedum roofs; and all other associated site works above and below ground.

3.2 Typical Waste Categories

The typical non-hazardous and hazardous wastes that will be generated at the proposed development will include the following:

- Dry Mixed Recyclables (DMR) - includes waste paper (including newspapers, magazines, brochures, catalogues, leaflets), cardboard and plastic packaging, metal cans, plastic bottles, aluminium cans, tins and Tetra Pak cartons;
- Organic waste – food waste and green waste generated from plants/flowers;
- Glass; and
- Mixed Non-Recyclable (MNR)/General Waste.

In addition to the typical waste materials that will be generated at the development on a daily basis, there will be some additional waste types generated in small quantities which will need to be managed separately including:

- Green/garden waste may be generated from gardens, internal plants and external landscaping;

- Batteries (both hazardous and non-hazardous);
- Waste electrical and electronic equipment (WEEE) (both hazardous and non-hazardous);
- Printer cartridges/toners;
- Chemicals (paints, adhesives, resins, detergents, etc.);
- Light bulbs;
- Textiles (rags);
- Waste cooking oil (if any generated by the residents or the commercial tenants); and
- Furniture (and from time to time other bulky wastes).

Wastes should be segregated into the above waste types to ensure compliance with waste legislation and guidance while maximising the re-use, recycling and recovery of waste with diversion from landfill wherever possible.

3.3 European Waste Codes

In 1994, the *European Waste Catalogue* [16] and *Hazardous Waste List* [17] were published by the European Commission. In 2002, the EPA published a document titled the *European Waste Catalogue and Hazardous Waste List* [18], which was a condensed version of the original two documents and their subsequent amendments. This document has recently been replaced by the EPA '*Waste Classification – List of Waste & Determining if Waste is Hazardous or Non-Hazardous'* [19] which became valid from the 1st June 2015. This waste classification system applies across the EU and is the basis for all national and international waste reporting, such as those associated with waste collection permits, COR's, permits and licences and EPA National Waste Database.

Under the classification system, different types of wastes are fully defined by a code. The List of Waste (LoW) code (also referred to as European Waste Code or EWC) for typical waste materials expected to be generated during the operation of the proposed development are provided in Table 3.1 below.

Waste Material	LoW/EWC Code
Paper and Cardboard	20 01 01
Plastics	20 01 39
Metals	20 01 40
Mixed Non-Recyclable Waste	20 03 01
Glass	20 01 02
Biodegradable Kitchen Waste	20 01 08
Oils and Fats	20 01 25
Textiles	20 01 11
Batteries and Accumulators*	20 01 33* - 34
Printer Toner/Cartridges*	20 01 27* - 28
Green Waste	20 02 01
WEEE*	20 01 35*-36
Chemicals (solvents, pesticides, paints & adhesives, detergents, etc.)*	20 01 13*/19*/27*/28/29*30
Fluorescent tubes and other mercury containing waste*	20 01 21*
Bulky Wastes	20 03 07

* *Individual waste type may contain hazardous materials*

Table 3.1 Typical Waste Types Generated and LoW Codes

4.0 ESTIMATED WASTE ARISINGS

A waste generation model (WGM) developed by AWN, has been used to predict waste types, weights and volumes arising from operations within the proposed development. The WGM incorporates building area and use and combines these with other data including Irish and US EPA waste generation rates.

Waste estimates for the residential apartments are based upon the predicated occupancy rates. While the café and crèche waste generation estimates are based on floor area and expected occupancy rates.

The estimated waste generation for the residential units, café and crèche unit for the main waste types are presented in Tables 4.1 and is based on the Schedule of Areas issued by the project architects (October 2019).

Waste Type	m^3 per week		
	Residential Units	Café	Crèche
Organic Waste	8.26	0.02	0.04
DMR	56.50	0.33	1.39
Glass	1.60	0.01	0.01
MNR	37.58	0.43	0.62
Total	**99.21**	**0.79**	**2.05**

Table 4.1 *Estimated waste generation for residential units*

The DLR Pre-Planning Waste Management Form recommends calculating residential waste using Section 4.7 of *BS5906:2005 Waste Management in Buildings – Code of Practice* [20]. The predicted total waste generated from the residential units based on the Code of Practice is c. 79.57m^3 per week. Whereas the AWN waste generation model estimates c. 103.94m^3 per week from the residential units. AWN's modelling methodology is based on data from recent published data and data from numerous other similar developments in Ireland and based on AWN' experience it is a more representative estimate of the likely waste arisings from the development.

5.0 WASTE STORAGE AND COLLECTION

This section provides information on how waste generated within the development will be stored and how the waste will be collected from the development. This has been prepared with due consideration of the proposed site layout as well as best practice standards, local and national waste management requirements including those of DLRCC. In particular, consideration has been given to the following documents:

- BS 5906:2005 Waste Management in Buildings – Code of Practice;
- DLR Refuse and Recycling Storage Guidelines;
- DLRCC *Bye-Laws for the Storage, Presentation and Collection of Household and Commercial Waste;*
- *Draft DLR (Storage, Presentation and Segregation of Household and Commercial Waste) Bye-Laws' (2019);*
- EMR Waste Management Plan 2015 – 2021; and
- DoEHLG, Sustainable Urban Housing: Design Standards for New Apartments, Guidelines for Planning Authorities (2018) [21].

Dedicated waste storage areas (WSA) have been allocated at ground level 0 and Level 1 for use by the residents, café and crèche operator. Commercial tenants have separate WSA to the residential tenants. It is proposed to install compaction equipment for the residents, for mixed non-recyclable (MNR) and dry mixed recyclable (DMR) waste types. Other main waste types café and crèche waste will be stored in traditional wheelie bins as detailed Using the predicted waste generation volumes presented in Table 4.1 waste receptacle requirements have been established for the WSAs. This is presented below in Table 5.1 and 5.2

Area/Use	Bins Required				
	Compactor	Compacted Waste containers (circa $2m^3$ each) MNR[1]	Compacted Waste containers (circa $3m^3$ each) DMR[2]	Organic	Glass
Residential Bin Store 1	1 no. for MNR[1] 1 no. for DMR[2]	1	1	12 x 240L	4 x 240L
Residential Bin Store 2	1 no. for MNR[1] 1 no. for DMR[2]	1	1	12 x 240L	4 x 240L
Main Building Management Waste Store	-	4	4	12 x 240L	4 x 240L

Note: [1] *= Mixed Non-Recyclables (BM Model)*
[2] *= Dry Mixed Recyclables (HD Model)*

Table 5.1 *Residential waste storage requirements for the proposed development*

Area/Use	Bins Required			
	MNR[1]	DMR[2]	Organic	Glass
Café	2 x 240L	2 x 240L	1 x 120L	1 x 120L
Crèche	3 x 240L	6 x 240L	1 x 120L	1 x 120L

Note: [1] *= Mixed Non-Recyclables*
[2] *= Dry Mixed Recyclables*

Table 5.2 *Waste storage requirements for the proposed development*

The waste receptacle requirements have been established from distribution of the total weekly waste generation estimate into the holding capacity of each receptacle type.

Waste storage receptacles as per Table 5.1 & 5.2 above (or similar appropriate approved containers) will be provided by the building management company in the WSAs.

The types of bins used will vary in size, design and colour dependent on the appointed waste contractor. However, examples of typical receptacles to be provided in the WSAs are shown in Figure 5.1. All waste receptacles used will comply with the IS EN 840 2012 standard for performance requirements of mobile waste containers, where appropriate.

It is proposed that building management will avail of a commercially available mini compactors for the DMR and MNR waste streams in the residential WSAs–referred to as an Epac Lodestone compactor. The commercial tenants will not have the use of these compactors.

This option will significantly reduce the volume of waste and as such the number of bins stored on site and the number of bins that will need to be transported to the curb for collection. The Epac Lodestone compactor option will take up slightly more space. It compresses/compacts the waste into 2 and $3m^3$ bags. These will require storage pending collection, so this adds to the storage space required but this compactor option results in a lower collection frequency than the alternative compactor.

Alternative options can be considered in future by the building management company, as technologies are developed. Solely for the purpose of ensuring the WSA is sufficiently sized, this plan assumes that the Epac option will be used. If required, sufficient space in the has been allocated in the WSAs so that bins can be used for the storage of waste with a weekly waste collection.

Figure 5.1 *Typical waste receptacles of varying size (240L and 1100L)*

The Epac Lodestone compactor referred to in the list of bins/equipment in the residential basement WSA is a compactor that compresses/compacts the waste into 2 and $3m^3$ skip bags (also called Flexible Intermediate Bulk Containers or FIBCs). A photo of the Epac Lodestone compactor is provided as Figure 5.2.

Figure 5.2 Photo of Epac Lodestone Compactor (*Source:* AES Bord na Móna Website)

5.1 Waste Storage – Apartment Blocks

Residents will be required to segregate waste within their own units into the following main waste streams:

- DMR;
- Glass;
- Organic waste; and
- MNR.

As required, the residents will need to bring these segregated waste materials from their apartments/unit via the lifts to the dedicated waste storage areas located on ground level 0. The apartment blocks will share 2 centralised WSAs that are located on the eastern and western sides of the ground level carpark. There will also be a WSA for storage of full compactor bags and full/empty organic and glass waste bins. Additionally residents in block A will have a temporary waste store located adjacent to the level 1 carpark. This waste store will have bins rotated out with the main waste store as required by facilities management.

All bins/containers/compactors will be clearly labelled and colour coded to avoid cross contamination of the different waste streams. Signage will be posted on or above the bins and compactors to show which wastes can be put in each receptacle. Residents will be informed by the management company where they are required to deposit their waste and fobs/keys for access to their dedicated storage areas will be provided.

It is proposed to use compactors to compress DMR and MNR waste into suitable containers. This equipment will be clearly labelled to identify which types of waste can be placed inside and the equipment will be suitable for use by all persons. It is intended that the equipment will be provided with an access control system to track equipment use and weights, where appropriate.

Full compacted waste bags and organic bins will be moved by building management as required to the main building management WSA located on the north-east side of the carpark, ground level 0.

240L bins will be provided for storage of organic and glass waste. Empty bins will be moved from the main building management WSA and switched with full bins from residential WSA by building management.

Access to the WSAs will be restricted to residents, building management and waste contractors by means of a key or electronic fob access. Access to the main building management WSA room will be restricted to building management and the waste contractor.

Other waste materials such as batteries and WEEE will be generated less frequently. Space will have to be allowed for in the tenants unit for storage of these waste types as required. Other waste types will be collected on an as required basis. Collection may be arranged by facilities management or the tenant depending on the agreement.

It is anticipated that compacted DMR, MNR and organic bins will need to be collected on a weekly basis.

5.2 Waste Storage – Café Unit

The tenants will be required to segregate waste within their unit, into the following main waste types:

- DMR;
- MNR;
- Organic waste; and
- Glass.

Tenants will take their waste to their allocated café waste store, at ground level on the eastern side of the carpark, ground level 0. Alternatively, space has been allocated within main waste store for the storage of commercial waste, separate from residential waste.

Suppliers for the tenants should be requested by the tenants to make deliveries in reusable containers, minimize packaging or to remove any packaging after delivery where possible, to reduce waste generated by the development.

If any kitchens/food preparation areas are allocated in unit areas, this will contribute a significant portion of the volume of waste generated on a daily basis, and as such it is important that adequate provision is made for the storage and transfer of waste from these areas to the WSAs.

If kitchens are required it is anticipated that waste will be generated in kitchens throughout the day, primarily at the following locations:

- Food Storage Areas (i.e. cold stores, dry store, freezer stores and stores for decanting of deliveries);
- Meat Preparation Area;
- Vegetable Preparation Area;
- Cooking Area;

Small bins will be placed adjacent to each of these areas for temporary storage of waste generated during the day. Waste will then be transferred from each of these areas to the appropriate retail/commercial WSA.

All bins/containers in the tenant’s areas as well as in the WSAs will be clearly labelled and colour coded to avoid cross contamination of the different waste streams. Signage will be posted above or on the bins to show exactly which wastes can be put in each.

Based on the recommended bin requirements in Table 5.1, DMR, MNR and organic bins will be collected on a weekly basis and the glass bin will be collected fortnightly or as required.

Other waste materials such as batteries and WEEE will be generated less frequently. Space will have to be allowed for in the tenants unit for storage of these waste types as required. Other waste types will be collected on an as required basis. Collection may be arranged by facilities management or the tenant depending on the agreement.

5.3 Waste Storage – Crèche

The crèche unit will be required to segregate their waste into the following waste categories within their own unit:

- DMR;
- MNR;
- Organic waste; and
- Glass.

Tenants will take their waste to their allocated café waste store, at ground level on the eastern side of the carpark, ground level 0. Alternatively, space has been allocated within main waste store for the storage of commercial waste, separate from residential waste.

The crèche unit will be required to store waste temporarily in their unit and will then transport it on a daily basis or when required to the WSA.

Each bin/container in the WSA will be clearly labelled and colour coded to avoid cross contamination of the different waste streams. Signage will be posted above or on the bins to show exactly which waste types can be placed in each bin.

Access to the WSA will be restricted to authorised crèche staff, building management and the waste contractor by means of a key or electronic fob access.

Based on the recommended bin requirements in Table 5.1, DMR, MNR and organic bins will be collected on a weekly basis and the glass bin will be collected fortnightly or as required.

Other waste materials such as batteries and WEEE will be generated less frequently. Space will have to be allowed for in the tenants unit for storage of these waste types as required. Other waste types will be collected on an as required basis. Collection may be arranged by facilities management or the tenant depending on the agreement.

5.4 Waste Collection

There are numerous private contractors that provide waste collection services in the DLRCC area. All waste contractors servicing the proposed development must hold a valid waste collection permit for the specific waste types collected. All waste collected must be transported to registered/permitted/licensed facilities only.

Space has been allocated for a temporary waste collection area near the entrance to the carpark entry ramp on Blackthorn Drive, for temporary storage of filled waste containers and for the parking of the waste collection vehicle. The building management company in conjunction with the waste contractor will be responsible for conveying the bins and compactor containers to the loading bay for collection/emptying. A trolley/tug or suitable vehicle may be required to convey the bins and compactor containers to/from the marshalling area.

Residents, café and crèche tenants should be made aware of the waste collection arrangements and all waste receptacles must be clearly identified as required by waste legislation and the requirements of the DLRCC *Waste Bye-Laws*. Waste will be presented for collection in a manner that will not endanger health, create a risk to traffic, harm the environment or create a nuisance through odours or litter.

5.5 Additional Waste Materials

In addition to the typical waste materials that are generated on a daily basis, there will be some additional waste types generated from time to time that will need to be managed separately. A non-exhaustive list is presented below.

<u>Green/garden waste</u>
Green/garden waste may be generated from gardens, external landscaping and internal plants/flowers. Green/garden waste generated from landscaping of external areas will be removed by the external landscape contractor. Green waste generated from gardens and internal plants/flowers can be placed in the organic waste bins in the WSAs.

<u>Batteries</u>
A take-back service for waste batteries and accumulators (e.g. rechargeable batteries) is in place to in order to comply with the *European Union (Batteries and Accumulators) Regulations 2014*. A system for the free take-back of waste batteries from the household waste stream is well established through retail outlets and recycling centres. Alternativly, residents can bring betteries to recycling centres. The commercial tenant can make use of the take back system or will temporarily store batteries within their units and arrange for collection by an authorised waste contractor.

<u>Waste Electrical and Electronic Equipment (WEEE)</u>
The *WEEE Directive 2002/96/EC* and associated *European Union (WEEE) Regulations 2014* have been enacted to ensure a high level of recycling of electronic

and electrical equipment. It is the manufacturers' responsibility to take back the WEEE, regardless of whether a replacement product is purchased or not and retailers are required to take back WEEE where a similar product is purchased. Residents can use the one-for-one return scheme at any EEE retailer or bring WEEE waste to their local recycling centre. The ccommercial tenants can make use of the take back system or will be required to temporarily store WEEE within their unit and arrange for collection by an authorised waste contractor.

Printer Cartridge/Toners
Waste printer cartridge/toners generated by residents can usually be returned to the supplier free of charge.

Chemicals (solvents, pesticides, paints, adhesives, resins, detergents, etc)
Waste chemicals (such as solvents, pesticides, paints, etc) are largely generated from building maintenance works. Such works are usually completed by external contractors who are responsible for the off-site removal and appropriate recovery/recycling/disposal of any waste materials generated.

Any waste cleaning products or waste packaging from cleaning products that are classed as hazardous (if they arise) generated by the residents should be brought to a recycling centre.

The crèche tenant will be required to temporarily store waste chemicals within their unit and arrange for collection by an authorised waste contractor.

Light Bulbs
Waste light bulbs will be generated by external electrical/maintenance contractors servicing the public areas of the development. Where waste light bulbs are generated, it is anticipated that maintenance contractors will be responsible for the off-site removal and appropriate recovery/disposal of these wastes.

Light bulbs generated by residents should be taken to the nearest recycling centre for appropriate storage and recovery/disposal. The crèche tenant will be required to temporarily store lightbulbs within their unit and arrange for collection by an authorised waste contractor.

Textiles
Where possible, waste textiles should be recycled or donated to a charity organisation for reuse. Recycling centres (including the bring centre at the Goat Bar & Grill) provide for collection of waste clothes and other textiles.

Waste Cooking Oil
If the residents generated waste cooking oil, this can be brought to a recycling centre. If the crèche tenant is to produce any waste oil they will need to arrange for collection by a suitably licensed waste contractor.

Furniture (and other bulky wastes)
Furniture and other bulky waste items (such as carpet etc.) may occasionally be generated by the residents. If residents wish to dispose of furniture, this can be brought a recycling centre. The collection of bulky waste from the crèche unit will be arranged with a suitable waste contractor as required.

5.6 Waste Storage Area Design

The WSAs should be designed and fitted-out to meet the requirements of relevant design Standards, including:

- Be fitted with a non-slip floor surface;
- Provide ventilation to reduce the potential for generation of odours with a recommended 6-10 air changes per hour for a mechanical system for internal WSAs;
- Provide suitable lighting – a minimum Lux rating of 220 is recommended;
- Be easily accessible for people with limited mobility;
- Be restricted to access by nominated personnel;
- Be supplied with hot or cold water for disinfection and washing of bins;
- Be fitted with suitable power supply for power washers;
- Have a sloped floor to a central foul drain for bins washing run-off;
- Have appropriate signage placed above and on bins indicating correct use;
- Have access for potential control of vermin, if required; and
- Be fitted with CCTV for monitoring.

The facilities management company, residents and tenants will be required to maintain WSAs and the bins used in good condition in accordance with the requirements of the DLRCC *Waste Bye-Laws and draft Waste Bye-Laws*.

6.0 CONCLUSIONS

In summary, this OWMP presents a waste strategy that complies with all legal requirements, waste policies and best practice guidelines and demonstrates that the required storage areas have been incorporated into the design of the development.

Implementation of this OWMP will ensure a high level of recycling, reuse and recovery at the development. All recyclable materials will be segregated at source to reduce waste contractor costs and ensure maximum diversion of materials from landfill, thus achieving the targets set out in the *EMR Waste Management Plan 2015 – 2021*.

Adherence to this plan will also ensure that waste management at the development is carried out in accordance with the requirements of The DLR Guidance Notes for Waste Management Planning, the *DLRCC Waste Bye-Laws* and draft *Waste Bye-Laws*

The waste strategy presented in this document will provide sufficient storage capacity for the estimated quantity of segregated waste. The designated area for waste storage will provide sufficient room for the required receptacles in accordance with the details of this strategy.

7.0 REFERENCES

1. Waste Management Act 1996 (S.I. No. 10 of 1996) as amended 2001 (S.I. No. 36 of 2001), 2003 (S.I. No. 27 of 2003) and 2011 (S.I. No. 20 of 2011). Sub-ordinate and associated legislation includes:
    - European Communities (Waste Directive) Regulations 2011 (S.I. No. 126 of 2011) as amended
    - Waste Management (Collection Permit) Regulations 2007 (S.I. No. 820 of 2007) as amended
    - Waste Management (Facility Permit and Registration) Regulations 2007 (S.I No. 821 of 2007) as amended
    - Waste Management (Licensing) Regulations 2000 (S.I No. 185 of 2000) as amended
    - European Union (Packaging) Regulations 2014 (S.I. No. 282 of 2014)
    - Waste Management (Planning) Regulations 1997 (S.I. No. 137 of 1997)
    - Waste Management (Landfill Levy) Regulations 2015 (S.I. No. 189 of 2015)
    - European Communities (Waste Electrical and Electronic Equipment) Regulations 2014 (S.I. No. 149 of 2014)
    - Waste Management (Batteries and Accumulators) Regulations 2014 (S.I. No. 283 of 2014) as amended
    - Waste Management (Food Waste) Regulations 2009 (S.I. No. 508 of 2009) as amended 2015 (S.I. No. 190 of 2015)
    - European Union (Household Food Waste and Bio-waste) Regulations 2015 (S.I. No. 191 of 2015)
    - Waste Management (Hazardous Waste) Regulations 1998 (S.I. No. 163 of 1998) as amended 2000 (S.I. No. 73 of 2000)
    - Waste Management (Shipments of Waste) Regulations 2007 (S.I. No. 419 of 2007) as amended
    - *European Communities (Transfrontier Shipment of Waste) Regulations 1994 (SI 121 of 1994)*
    - European Union (Properties of Waste which Render it Hazardous) Regulations 2015 (S.I. No. 233 of 2015)
2. Environmental Protection Act 1992 (Act No. 7 of 1992) as amended;
3. Litter Pollution Act 1997 (Act No. 12 of 1997) as amended;
4. Eastern-Midlands Waste Region, *Eastern-Midlands Region (EMR) Waste Management Plan 2015 – 2021* (2015)
5. Dún Laoghaire Rathdown County Council (DLRCC), *Presentation and Collection of Household and Commercial Waste Bye-Laws* (2009)
6. DLRCC, Refuse and Recycling Storage Guidelines (2017).
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8. Department of Environment and Local Government (DoELG) *Waste Management – Changing Our Ways, A Policy Statement* (1998)
9. Departmnt of Environment, Heritage and Local Government (DoEHLG) *Preventing and Recycling Waste - Delivering Change* (2002)
10. DoELG, *Making Ireland's Development Sustainable – Review, Assessment and Future Action (World Summit on Sustainable Development)* (2002)
11. DoEHLG, *Taking Stock and Moving Forward* (2004)
12. DoECLG, *A Resource Opportunity - Waste Management Policy in Ireland* (2012)
13. Environmental Protection Agency (EPA), *National Waste Database Reports 1998 – 2012*.
14. Planning and Development Act 2000 (S.I. No. 30 of 2000) as amended 2010 (S.I. No. 30 of 2010) and 2015 (S.I. No. 310 of 2015).
15. DLRCC, *Dún Laoghaire Rathdown County Council Development Plan 2016 – 2022.*

16. European Waste Catalogue - Council Decision 94/3/EC (as per Council Directive 75/442/EC).
17. Hazardous Waste List - Council Decision 94/904/EC (as per Council Directive 91/689/EEC).
18. EPA, *European Waste Catalogue and Hazardous Waste List* (2002)
19. EPA, *Waste Classification – List of Waste & Determining if Waste is Hazardous or Non-Hazardous* (2015)
20. BS 5906:2005 Waste Management in Buildings – Code of Practice.
21. DoEHLG, Sustainable Urban Housing: Design Standards for New Apartments, Guidelines for Planning Authorities (2018).

Appendix 16.1

Conceptual Site Model

APPENDIX 16.1 CONCEPTUAL SITE MODEL

Constraint		Impact Assessment							
Activity/ Source	**Construction Element**	**Impact Description**	**Quality**	**Significance**	**Extent**	**Likelih.**	**Duration**	**Mitigation**	**Residual Impact**
Earthworks	• Site Clearance • Basement Excavation • Basement Construction	Excavation of Natural Soils and Subsoil for basements, attenuation tanks, drainage etc.	Negative	Moderate	Local	Certain	Permanent	The minimum amount of space to construct the project has been designed for. Material will be reused on site where possible.	Moderate Negative
		Change of landuse from Brownfield to Residential	Neutral	Moderate	Local	Certain	Permanent	Change of landuse from playing field to residential will reduce amenity locally. The related development of the sports campus will offset this impact	Imperceptible
		Reuse of suitable material off site	Positive	Slight	Local (potentially a number of sites)	Likely	Long-term	Spoil generated on site is a resource and shall be re-used on site where possible. Where material must be exported offsite it will be reused where possible in line with relevant Waste and Planning Legislation. Art. 27 declarations will be made to the EPA where required to classify the material as a by-product where required.	Slight Positive
		Soil erosion causing airborne dust and/or nuisance dust on public roads and neighbouring properties	Negative	Slight	Local	Unlikely	Short-term	Dust suppression measures will be implemented to minimise dust generation during extended dry periods. Dust monitoring will be conducted through the excavation period. Vehicle wheel wash facilities will be installed at site exits and a road sweeping programme will be implemented	Imperceptible
		A degree of fill will be required during the works which will included imported fill and aggregates	Negative	Slight - Moderate	Local (potentially a number of quarry sites)	Likely	Long-term	Contract and Procurement Procedures will ensure that all aggregates and fill material required for the construction are sourced from reputable suppliers. Declarations of conformity/compliance certificates will be required to ensure all aggregates supplied meet the specified engineering specifications.	Imperceptible
Altering Groundwater/Surface water	• Basement Excavation • Basement Construction • Replacing open green areas with hard standing	Altering existing local groundwater regime	Neutral	Slight	Local	Unlikely	Long-term	The basement will be founded within the low permeability/impermeable boulder clay so there will no impact on shallow groundwater flows which are contained within the bedrock. The replacement of open green space (currently available for limited recharge) with hard standing (no recharge possible) will prevent a small amount of water reaching the aquifer. The relative site area is small. The site is adjacent to St. Anne's park. Therefore the combined impact will be imperceptible.	Imperceptible
Storage of potentially polluting materials	• Site Clearance • Basement Excavation • Installation of Retaining Walls • Basement Construction	Potential leak or spillage from construction related liquids on site	Negative	Significant	Local	Unlikely	Short-term	Good housekeeping on all project sites and proper handling, storage and disposal of any potentially polluting substances can prevent soil and/or water contamination. Designated and bunded storage areas will be maintained. Further details are included in the CMP	Imperceptible
Discharge to Groundwater	• Basement Excavation and Construction • General Construction	Potential contaminated run-off percolating to ground and the underlying aquifer	Negative	Significant	Local	Unlikely	Short-term	There will be no direct discharge to groundwater during construction. However indirect discharges to the underlying bedrock aquifer may occur and the aquifer vulnerability will increase, albeit not significantly given the thickness of Boulder Clay beneath the site, as the subsoil is removed from site. Protection of groundwater from potentially polluting substances will be dealt with through a number of measures including correct handling and storage of potentially polluting substances.	Imperceptible

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