HAYES HIGGINS PARTNERSHIP
CHARTERED ENGINEERS • PROJECT MANAGERS

Civil Engineering Services Report (S179A)

For

Development at Mullavalley, Louth Village

Louth County Council

Comhairle Contae Lú
Louth County Council

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Contents

DOCUMENT CONTROL SHEET

	Client	Louth County Council							
	Project Title	Development at c. 58 No. Social Housing Homes, Community Facilities & Associated Works via Modern Methods of Construction							
	Project Ref.	23D048							
	Document Title	S179A							
	Document No.	23D048-PR 01							
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Revision	Status	Author	Reviewed By	Approved By	Issue Dates
P	S 179 A	RM	LM	DH	APRIL 2024

1. Introduction

Hayes Higgins Partnership has been commissioned to prepare a Civil Engineering Services Report for the proposed development at Mullavalley, Louth Village, County Louth.

This report was compiled after reviewing the available information on drainage and water supply, reviewing the OPW flood maps and other available information. It contains information on the design of the surface water and wastewater systems to be constructed for the proposed development. (The compilation of information on the existing public mains, wastewater and surface water lines.) A survey has been completed to confirm levels, sizes and other information necessary for a more detailed design.

The design of both the surface water and wastewater systems has been carried out in accordance with the following:

- The Greater Dublin Regional Code of Practice for Drainage Works
- Technical Guidance Document H of the Building Regulations
- The Greater Dublin Strategic Drainage Study (GDSDS)
- DOE Recommendations for Site Development Works for Housing Areas
- BS 8301:1985, Code of practice for Building Drainage
- BS EN 752 External building drainage
- OPW The Planning System and Flood Risk Management
- Irish Water Code of Practice and Standard Details (Water & Wastewater)
- DMURS– Design Manual for Urban Roads and Streets
- Louth County Council codes of practice

The wastewater system for the proposed development is a gravity feed system within the site connecting to the existing wastewater network located on the R171 road The proposed surface water drainage system is a gravity feed drainage system to an existing surface water network via an attenuation tank on site. The surface water system is designed to take the runoff generated by a 1 in 100 year storm event (+20% for climate change). The outfall from the surface water system is detailed below.

2. Site

The site in question is located at Mullavalley, Louth Village, County Louth. The existing site is a greenfield site which is zoned A2 New Residential Phase 1 in the Louth County Development Plan. The site is bound by residential units to the south and north. There is a roadway, R171 separating the site from the houses to the north of the site. The site is bound by greenfield site to the east. There are hedges & vegetation around the

site perimeter, there are a number of residential units and housing development to the south/west. The topography of the site shows a general downward slope from south-east to north-west. Proposed on the site is the construction of 58no. houses including 8no. 2-bed bungalows, 20no. two storey 2-bed houses, 24no. two storey 3-bed houses, 5no. two storey 4-bed houses, and 1no. 5-bed bungalow, on a site of c. 3.54 hectares in the townland of Mullavally, Louth Village, Co. Louth.

The development will also include the construction of a new entrance onto the R171; provision of new cycleway, footpath, and public lighting along the boundary with the R171; new estate roads and homezones within the site; 109no. car parking spaces including both on-street and in-curtilage parking; cycle parking; hard and soft landscaping including public open spaces, roads, playground, and private gardens; boundary treatments; ESB substation; lighting; laying of underground sewers, mains and pipes; underground attenuation tank; and all associated works. A copy of the site survey drawing is included in Appendix C. The development will be accessed from an entrance on R171, this entrance is located in the north-west corner.

3. Surface Water Drainage

Local Authorities require that all developments must include a Sustainable urban Drainage System, SuDS. A site investigation was undertaken to establish the permeability of the site. The site investigation advises the site does not have any available infiltration and as such permeable surfaces and natural infiltration are not viable, refer to appendix F. Reference to the attached SUDS / Green Infrastructure Checklist Appendix J. As the conditions on site are not favourable to infiltration a modular attenuation system connected to the existing surface drainage network, via a hydrobrake limiting discharge to 2 l/s/ha, is to be used to channel surface water from the developed site.

A gravity feed surface water system will serve run off from the hardstanding on site. The main surface water network in the proposed development are to consist of 225mm diameter uPVC pipes with fall 1/200. The attenuation system will be located in the site.

The required storage volume to retain the on-site runoff for is 655m^3. A modular type attenuation system will be provided. To alleviate any possible risk of flood the storage is designed for a 1 in 100 year storm (+20%). A 20% increase in runoff due to climate change is included as per "Greater Dublin Regional Code of Practice for Drainage Works" and the "GDSDS".

The surface water drains have been designed in accordance with BS EN 752, Code of Practice for Drainage Outside Buildings. Details of the proposed surface water drainage system are shown in Hayes Higgins Partnership drawing within Appendix A and calculations within Appendix D.

4. Wastewater Drainage

The wastewater system has been designed in accordance with Irish Water Code of Practice and Standard Details for Wastewater, BS 8301:1985, Code of Practice for Building Drainage and the current Building Regulations.

The wastewater system for the development is a gravity feed system connecting to an existing wastewater network on the north of the site. The development will not result in a significant increase in foul discharge from the site on the public sewer and we do not anticipate any capacity problems. Refer to attached, Confirmation of Feasibility from Irish Water, Appendix G. The wastewater network in the proposed development will consist of 225mm diameter uPVC pipes with required fall designed throughout to suit. A roughness coefficient (ks) of 0.6mm is applied to the design of all pipes.

A Pre-Connection Enquiry form was submitted to Irish Water and Confirmation of Feasibility received. Refer to Appendix G. The drawings included with the S179A proposal show the proposed wastewater layout. Details of the proposed wastewater system are shown in Hayes Higgins Partnership drawing within Appendix A. Final designs are subject to agreement with Irish Water at Connection Application Stage.

5. Water Supply System

There is an existing 100mm diameter UPVC located along R171 Road at the site entrance to the north west. The proposed 100mm HDPE looped watermain on site will connect into this main line.

In accordance with requirements air valves and scour valves will be provided around the site as necessary. Hydrants will be provided as required by Technical Guidance Document B of the Building Regulations 2006. Water saving devices including aerated taps and low water usage appliances will be used in the proposed development in accordance with best practice. The water supply system has been designed and will be installed in accordance with Irish Water Code of Practice and Standard Details for Water.

A Pre-Connection Enquiry form was submitted to Irish Water and Confirmation of Feasibility received. Refer to appendix G. The proposed watermain layout and details are shown on Hayes Higgins Partnership drawing within Appendix B.

6. Flood Risk Assessment

A flood risk assessment was undertaken to identify possible sources of flooding and the risk posed to the development, and separately the risk posed to surrounding areas as a result of the development. The site is noted as not being in a flood zone for either coastal or fluvial flooding.

External Sources

Flood maps website, www.floodmaps.ie has been reviewed. This shows that the site has not been subjected to flooding during previously reported flooding events. As such it is reasonable to assume there is no risk to the proposed development resulting from flooding off-site.

Internal sources

It is intended that all surface water run off generated by the 1in100 year storm will be dealt with via an attenuation tank. An allowance has been made for a 20% increase in runoff due to climate change, as per the "Greater Dublin Strategic Drainage Study" recommendations.

7. Site Layout

This development has been designed in accordance with the Design Manual for Urban Roads and Streets (DMURS), refer to road layout drawing, minimum footpath widths and junction radii have been provided to comply with DMURS. A swept path analysis has been carried out for a fire truck as shown on drawings attached, refer to appendix E. A Road Safety Audit and Traffic Impact Assessment have been completed by Roadplan. Please refer to Appendix H and I.

8. DMURS Statement of Consistency

The proposed site layout is confirmed to abide by the guidelines as set out in the Design Manual for Urban Roads and Streets DMURS. Refer to attached Appendix K – DMURS Statement of Consistency

9. Services Design Summary

The proposed surface water drainage system has been designed so as to ensure that adequate self-cleansing velocities are obtained, in accordance with the Building Regulations, and comply in full with the Greater Dublin Regional Code of Practice for Drainage Works. Similarly, the proposed wastewater system has been designed so as to ensure that adequate self-cleansing velocities are obtained for partial flows

under design loading, in accordance with the Building Regulations and Irish Water Code of Practice and Standard Details for Water & Wastewater.

Local roads & streets are designed in accordance with DMURS & the objectives of the Louth County Development Plan to be safe, attractive & comfortable for all users. The design encourages the use of sustainable modes of transport with facilities for pedestrians/cyclists including the provision bicycle parking. There is also provision for electric vehicle charge points but on street & in-curtilage.

Appendix A – Proposed Drainage Layout

(See accompanying drawings listed below)

DRAWING / DOCUMENT REGISTER AND ISSUE SHEET

Sheet No. 1

Project No.	23D048
Project Name	MULLAVALLEY HOUSING
Day	11
Month	04
Year	24

Drg No.	Drawing / Document Name	Format	R.C. Sched. Sheets	Drawing Revisions
01	Proposed Site Levels Layout	A1		P
02	Proposed Drainage Layout	A1		P
03	Proposed Watermain Layout	A1		P
04A	Irish Water Foul & Surface Drainage Details - Sheet 1	A1		P
04B	Irish Water Foul & Surface Drainage Details - Sheet 2	A1		P
04C	Irish Water Foul & Surface Drainage Details - Sheet 3	A1		P
04D	Irish Water Foul & Surface Drainage Details - Sheet 4	A1		P
05A	Irish Water Watermain Details - Sheet 1	A1		P
05B	Irish Water Watermain Details - Sheet 2	A1		P
05C	Irish Water Watermain Details - Sheet 3	A1		P
05D	Irish Water Watermain Details - Sheet 4	A1		P
06	Proposed Cycling & Pedestrian Crossing Layout	A1		P
07	Proposed Swept Path Analysis Layout	A1		P

Distribution		Initials	Name	No. of copies
Client			L.C.C.	1
Architect			EML Architects	1
Project Manager				
Quantity Surveyor				
Main Contractor	Head Office			
	Site			
Mech. / Elec. Engineer				
Structural Engineer			H.H.P	1
Planning Authority			L.C.C.	1
Irish Water				
Fire Authority				
Construction Manager				
Tank Copy				

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DOCUMENT TYPE	UP
R.C SCHEDULE	

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Symbols Key

Issued For						Document Type			
Preliminary	A	Planning	P	Measurement	M	Prints	PR	Email	EM
Information	I	Tender	T	Construction	C	Disks	CD	Upload Share Drive	UP

Appendix B – Proposed Watermain Layout

(See accompanying drawings listed below)

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Mech. / Elec. Engineer				
Structural Engineer			H.H.P	1
Planning Authority			L.C.C.	1
Irish Water				
Fire Authority				
Construction Manager				
Tank Copy				

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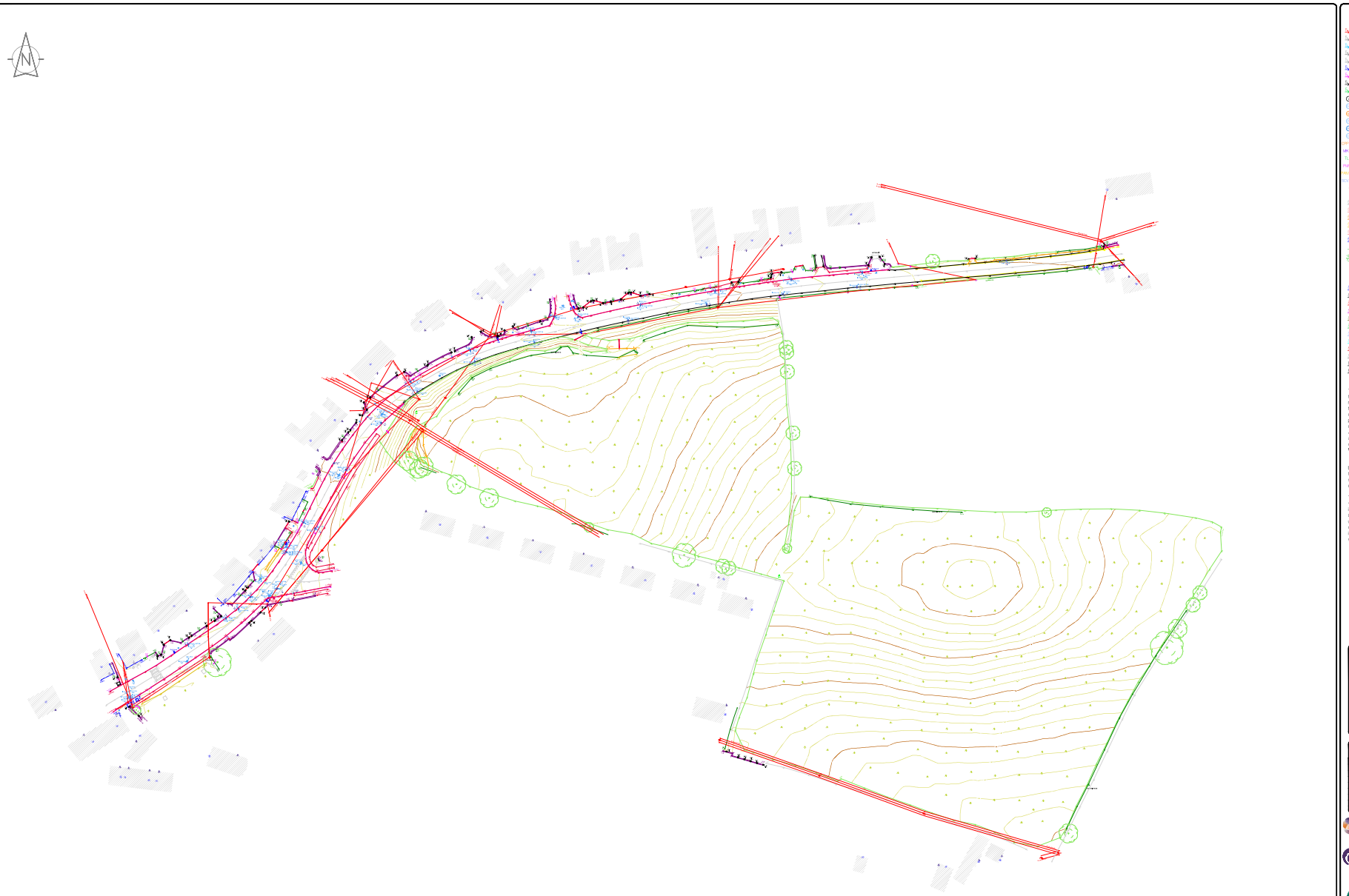
Preliminary	A	Planning	P	Measurement	M	Prints	PR	Email	EM
Information	I	Tender	T	Construction	C	Disks	CD	Upload Share Drive	UP

Appendix C – Site Survey



LEGEND

Street furniture & Services

Natural Features

Golf

Other

Built Features

Roads & Road Markings

Murphy Surveys Ltd. Disclaimer

The user or recipient of this survey data understands and acknowledges this data may be inaccurate or contain errors or omissions and the user or recipient assumes full responsibility for any risks or damages resulting from, arising from, or in connection with any use of or reliance upon data displayed herein. Although significant care has been exercised to produce surveys that satisfy survey accuracy standards, these surveys are only as accurate as the source data from which they were compiled. Although all reasonable steps have been taken to locate all features visible at the time of the survey, there is no guarantee that all will be shown on the drawing, as some above ground features may have obstructed the survey. Wherever possible, areas unable to be surveyed will be labelled as "UTS".

The Company shall not be liable for any inaccuracy of the data provided beyond the specified scale or accuracy, or for any matters resulting from their use for purposes other than that stated in the Contract. Neither shall attach to the Surveyor in respect of any consequential loss or damages suffered by the Client.

The client must promptly notify the Company of any errors in mapping of which it becomes aware. If misleading, inaccurate or otherwise inappropriate information is brought to the Company's attention or the Company itself identifies any such imprecision or error in a survey, it shall use its reasonable endeavours to fix or remove it and if necessary in certain instances, the Company being on notice of any such misleading, inaccurate or otherwise inappropriate information, it will re-conduct the survey and reproduce the data to within the specified scale or accuracy.

North

Site Locator

Map Sheet Layout

Surveyed by: MC	Date: May 2023	Datum: Malin Head
Drawn by: MC	Date: June 2023	Grid System: ITM / National Grid
Checked by: PF	Date: 07/06/2023	

Revisions

No.	Date	Description
A	07/06/2023	First Drawing

Kildare Cork Dublin Belfast Glasgow Manchester London

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Global House
Kilcullen Business Campus
Kilcullen Co, Kildare, Ireland

Phone: (+353) 045 484040
Fax: (+353) 045 484004
Email: info@murphygs.ie

Client :	Louth County Council
Project :	Multiple Sites in Co. Louth
Date : 07.06.2023	**Scale :** NTS@A1
Description :	Topographical Survey of site: LH-0006 Mullavalley, Louth Village
Drawing Number :	MGS52437_T06_ITM_RevA-00

Appendix D – Surface Water Calculations

Extreme Rainfall Return Periods

Location: Mullavalley, Louth

Average Annual Rainfall:

Maximum rainfall (mm) of indicated duration expected in the indicated return period.

Duration		Return Period (years)											
		1/2	1	2	3	4	5	10	20	30	50	75	100
5 min	**5**	2.6	3.5	4.0	4.7	5.2	5.6	6.7	8.1	8.9	10.1	11.2	12.0
10 min	**10**	3.6	4.9	5.6	6.6	7.2	7.7	9.4	11.2	12.4	14.1	15.5	16.7
15 min	**15**	4.2	5.7	6.5	7.7	8.5	9.1	11.1	13.2	14.6	16.6	18.3	19.6
30 min	**30**	5.6	7.5	8.5	9.9	10.9	11.6	14.0	16.6	18.3	20.6	22.7	24.2
60 min	**60**	7.4	9.8	11.0	12.8	14.0	14.9	17.8	20.9	22.9	25.7	28.1	30.0
2 hour	**120**	9.7	12.7	14.3	16.5	17.9	19.0	22.5	26.3	28.7	32.0	34.9	37.1
3 hour	**180**	11.5	14.9	16.6	19.1	20.7	22.0	25.9	30.1	32.8	36.4	39.6	42.0
4 hour	**240**	12.9	16.6	18.5	21.2	23.0	24.3	28.5	33.1	36.0	39.9	43.3	45.8
6 hour	**360**	15.2	19.4	21.5	24.6	26.6	28.1	32.8	37.8	41.0	45.3	49.1	51.9
9 hour	**540**	17.9	22.7	25.1	28.5	30.7	32.4	37.7	43.3	46.8	51.6	55.6	58.7
12 hour	**720**	20.1	25.3	27.9	31.7	34.1	35.9	41.6	47.6	51.4	56.5	60.8	64.1
18 hour	**1080**	23.6	29.6	32.5	36.7	39.4	41.4	47.7	54.4	58.6	64.2	69.0	72.6
24 hour	**1440**	26.5	33.0	36.2	40.8	43.7	45.9	52.7	59.8	64.3	70.3	75.4	79.3
48 hour	**2880**	32.8	40.3	43.9	49.0	52.2	54.7	62.2	70.0	74.8	81.3	86.8	90.9

	1in5 mm/hr	1in30 mm/hr	1in100 mm/hr	
21.5	23.40	25.10	N/A	,
29.9	32.70	35.00	N/A	,
35.2	38.40	41.10	N/A	,
43.4	47.20	50.40	N/A	,
53.4	58.00	61.70	N/A	,
65.8	71.20	75.60	N/A	,
74.3	80.30	85.20	N/A	,
81.1	87.40	92.60	N/A	,
91.6	98.60	104.30	N/A	,
103.4	111.10	117.50	N/A	,
112.8	121.00	127.80	N/A	,
127.4	136.50	143.90	N/A	,
138.9	148.60	156.60	184.20	
153.7	163.50	171.50	199.10	

Notes: Larger margins of error for 1, 2 ,5 and 10 minute values and for 100 year return periods

M560: 12.8 M52d: 49 M560/m52d: 0.26

Rainfall Intensities increased by 20% to allow for Global Warming

Duration		Return Period (years)											
		1/2	1	2	3	4	5	10	20	30	50	75	100
5 min	**5**	3.1	4.2	4.8	5.6	6.2	6.7	8.0	9.7	10.7	12.1	13.4	14.4
10 min	**10**	4.3	5.9	6.7	7.9	8.6	9.2	11.3	13.4	14.9	16.9	18.6	20.0
15 min	**15**	5.0	6.8	7.8	9.2	10.2	10.9	13.3	15.8	17.5	19.9	22.0	23.5
30 min	**30**	6.7	9.0	10.2	11.9	13.1	13.9	16.8	19.9	22.0	24.7	27.2	29.0
60 min	**60**	8.9	11.8	13.2	15.4	16.8	17.9	21.4	25.1	27.5	30.8	33.7	36.0
2 hour	**120**	11.6	15.2	17.2	19.8	21.5	22.8	27.0	31.6	34.4	38.4	41.9	44.5
3 hour	**180**	13.8	17.9	19.9	22.9	24.8	26.4	31.1	36.1	39.4	43.7	47.5	50.4
4 hour	**240**	15.5	19.9	22.2	25.4	27.6	29.2	34.2	39.7	43.2	47.9	52.0	55.0
6 hour	**360**	18.2	23.3	25.8	29.5	31.9	33.7	39.4	45.4	49.2	54.4	58.9	62.3
9 hour	**540**	21.5	27.2	30.1	34.2	36.8	38.9	45.2	52.0	56.2	61.9	66.7	70.4
12 hour	**720**	24.1	30.4	33.5	38.0	40.9	43.1	49.9	57.1	61.7	67.8	73.0	76.9
18 hour	**1080**	28.3	35.5	39.0	44.0	47.3	49.7	57.2	65.3	70.3	77.0	82.8	87.1
24 hour	**1440**	31.8	39.6	43.4	49.0	52.4	55.1	63.2	71.8	77.2	84.4	90.5	95.2
48 hour	**2880**	39.4	48.4	52.7	58.8	62.6	65.6	74.6	84.0	89.8	97.6	104.2	109.1

1in5 mm/hr	1in30 mm/hr	1in100 mm/hr
80.64	128.16	172.80
55.44	89.28	120.24
43.68	70.08	94.08
27.84	43.92	58.08
17.88	27.48	36.00
11.40	17.22	22.26
8.80	13.12	16.80
7.29	10.80	13.74
5.62	8.20	10.38
4.32	6.24	7.83
3.59	5.14	6.41
2.76	3.91	4.84
2.30	3.22	3.97
1.37	1.87	2.27

23D048 - Surface Water Attenutation Calculation 1-100 + 20%

Time (mins)	1 *Storm Frequency & Duration*	2 *Rainfall (mm)*	3 *Rainfall Intensity (mm/hr)*	4 *Potential Run-off From Developed Site (l/s)*	5 *Allowable Run-off From Developed Site (l/s)*	6 *Storage Requirement (m3)*
5	M100-5 min	14.40	172.80	535.52	2.0	160.1
10	M100-10 min	20.04	120.24	372.63	2.0	222.4
15	M100-15 min	23.52	94.08	291.56	2.0	260.6
30	M100-30 min	29.04	58.08	179.99	2.0	320.4
60	M100-60 min	36.00	36.00	111.57	2.0	394.4
120	M100-2 hr	44.52	22.26	68.99	2.0	482.3
180	M100-3 hr	50.40	16.80	52.06	2.0	540.7
240	M100 - 4hr	54.96	13.74	42.58	2.0	584.4
360	**M100-6 hr**	**62.28**	**10.38**	**32.17**	**2.0**	**651.6**
540	M100-9 hr	70.44	7.83	24.26	2.0	721.1
720	M100-12 hr	76.92	6.41	19.87	2.0	771.8
1080	M100-18 hr	87.12	4.84	15.00	2.0	842.4
1440	M100-24 hr	95.16	3.97	12.29	2.0	888.9
2880	M100-2day	109.08	2.27	7.04	2.0	871.4

Allowable Run-off 2 l/s

	Area	Factor	Total	
Paving	7319	1	7319	m^2
Roof	3838	1	3838	m^2
Total Area			**11157**	**m^2**

STORMTECH Stormwater Management System Design Tool

ver: Aug15

PROJECT REF:	23D046
LOCATION:	mullavalley
DATE:	01.12.23
CREATED BY:	

SYSTEM PARAMETERS

Required Total Storage	**655**	m^3
Stormtech chamber model	**MC4500**	
Filtration Permeable Geo or Impermeable Geo	Filter geo	
Number of Isolator Rows (IR)	1	

SITE PARAMETERS

Stone Porosity	40%		
Excavation Batter Angle (degrees)	60	°	*Minimum Requirement*
Stone Above Chambers	0.3	m	*0.30*
Stone Below Chambers	0.23	m	*0.23*
In-between Row Spacing	0.30	m	*0.23*
Additional Storage outside Excavation. E.g manholes, Header Pipe	0	m^3	

HEADER PIPE

Is Header pipe required within excavation	No	
Orientation of Header Pipe	Parrallel to IR	
Diameter of Header Pipe	0.225	m
Length of Header Pipe	0	m

CHAMBER SYSTEM DIMENSIONS

	Calculated	Adopted	
Number of Rows		15	ea
Number of units per Row		10	ea
System Installed Storage Depth (effective storage depth)	2.055		m
Tank overall installed Width at base	42.90	45	m
Tank overall installed Length at Base	14.46	15	m
Total Effective System Storage	**868.2**	**915.7**	m^3

STORMTECH SYSTEM DETAIL

StormTech Chamber Model	MC4500	
Unit Width	2.54	m
Unit Length	1.23	m
Unit Height	1.525	m
Min Cover Over System	0.3	m
Max Cover Over Chamber	2.1	m
Chamber Internal Storage Vol.	3.01	m^3
Header Pipe Internal Storage Vol in Excavation	0.0	m^3

STONE AND EXCAVATION DETAIL

Volume of Dig for System	1539	m^3
Width at base	45.00	m
Width at top	47.37	m
Length at base	15.00	m
Length at top	17.37	m
Depth Of System	2.06	m
Area of Dig at Base of System	675	m^2
Area of Dig at Top of System	823	m^2
Void Ratio	59%	
Stone Requirement - m3	1055	m^3
Stone Requirement - tonne	1729	tonne

Appendix E – Swept Path Analysis

(See accompanying drawings listed below)

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04C	Irish Water Foul & Surface Drainage Details - Sheet 3	A1		P
04D	Irish Water Foul & Surface Drainage Details - Sheet 4	A1		P
05A	Irish Water Watermain Details - Sheet 1	A1		P
05B	Irish Water Watermain Details - Sheet 2	A1		P
05C	Irish Water Watermain Details - Sheet 3	A1		P
05D	Irish Water Watermain Details - Sheet 4	A1		P
06	Proposed Cycling & Pedestrian Crossing Layout	A1		P
07	Proposed Swept Path Analysis Layout	A1		P

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Symbols Key

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Information	I	Tender	T	Construction	C	Disks	CD	Upload Share Drive	UP

Appendix F – Site Investigation Report

S.I. Ltd Contract No: 6179

Client:	Louth County Council
Engineer:	Doherty Finegan Kelly
Contractor:	Site Investigations Ltd

Mulla Valley,
Louth Village, Co. Louth
Site Investigation

Prepared by:

.....

Stephen Letch

Issue Date:	24/11/2023
Status	Final
Revision	0

Contents:

Appendices:

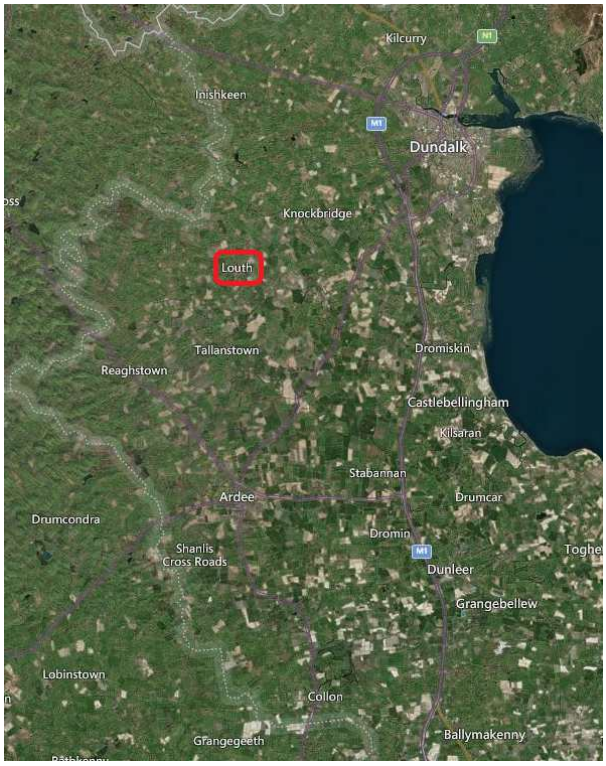
1. Introduction

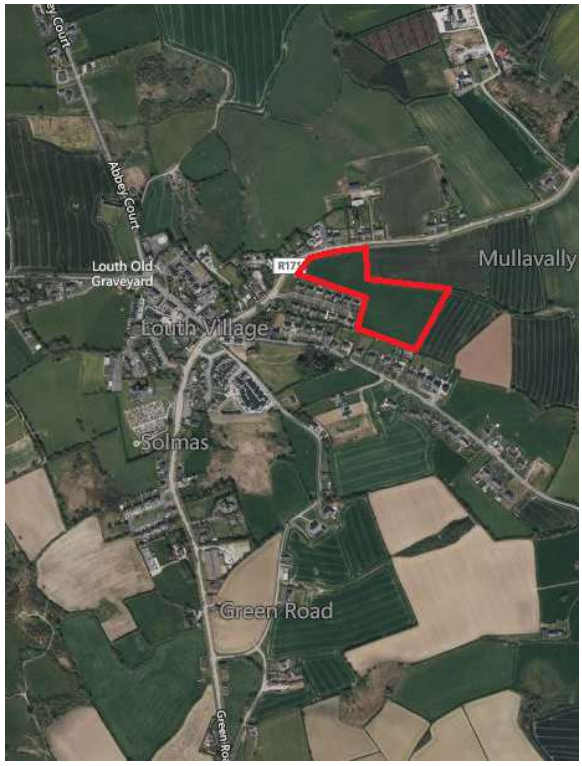
On the instructions of Doherty Finegan Kelly, Site Investigations Ltd (SIL) were appointed to complete a site investigation at Mulla Valley, Louth Village, Co. Louth. The investigation was for a residential development on the site and was completed on behalf of the Client, Louth County Council. The investigation was completed in September 2023.

This report presents the factual geotechnical data obtained from the field and laboratory testing with interpretation of the ground conditions discussed.

2. Site Location

Mulla Valley is located to the east of Louth Village in west Co. Louth. The map on the left shows the location of Lough Village in west Co. Louth, to the south west of Dundalk and the second map shows the site location in the village.





3. Fieldwork

All fieldwork was carried out in accordance with BS 5930:2015, Engineers Ireland GI Specification and Related Document 2nd Edition 2016, Eurocode 7: Geotechnical Design and BRE Special Digest 365. The fieldworks comprised the following:

- 2 No. cable percussive boreholes

- 18 No. trial pits with Dynamic Probes
- 15 No. California Bearing Ratio tests
- 2 No. soakaway tests
- 2 No. slit trenches

3.1. Cable Percussive Boreholes

Cable percussion boring was undertaken at 2 No. locations using a Dando 150 rig and constructed 200mm diameter boreholes. The boreholes terminated at similar depths of 4.50mbgl and 4.20mbgl after an hour and a half chiselling was completed and no further progress was made. It was not possible to collect undisturbed samples due to the granular soils encountered so bulk disturbed samples were recovered at regular intervals.

To test the strength of the stratum, Standard Penetration Tests (SPT's) were performed at 1.00m intervals in accordance with BS 1377 (1990). In soils with high gravel and cobble content it is appropriate to use a solid cone (60°) (CPT) instead of the split spoon and this was used throughout the testing. The test is completed over 450mm and the cone is driven 150mm into the stratum to ensure that the test is conducted over an undisturbed zone. The cone is then driven the remaining 300mm and the blows recorded to report the N-Value. The report shows the N-Value with the 75mm incremental blows listed in brackets (e.g., BH01 at 1.00mbgl where N=8-(1,1/2,2,2,2)). Where refusal of 50 blows across the test zone was encountered was achieved during testing, the penetration depth is also reported (e.g., BH01 at 4.00mbgl where N=50-(3,8/50 for 180mm)).

At BH01, a groundwater standpipe was installed in the borehole to allow for long term monitoring of the water table. This consists of a slotted pipe with a gravel surround response zone to allow for the water the equalise in the standpipe.

The cable percussive borehole logs are presented in Appendix 1.

3.2. Trial Pits with Dynamic Probes

18 No. trial pits were excavated using a tracked excavator. The strata were logged and photographed by SIL geotechnical engineer and groundwater ingresses and pit wall stability was also recorded. Representative disturbed bulk samples were recovered as the pits were excavated, which were returned to the laboratory for geotechnical testing.

Adjacent to the trial pits, dynamic probes were completed using a track mounted Competitor 130 machine. The testing complies with the requirements of BS1377: Part 9 (1990) and Eurocode 7: Part 3. The configuration utilised standard DPH (Heavy) probing method comprising a 50kg weight, 500mm drop height and a 50mm diameter (90°) cone. The number of blows required to drive the cone each 100mm increment into the sub soil is recorded in

accordance with the standards. The dynamic probe provides no information regarding soil type or groundwater conditions.

The dynamic probe results can be used to analyse the strength of the soil strata encountered by the probe. 'Proceedings of the Trinity College Dublin Symposium of Field and Laboratory Testing of Soils for Foundations and Embankments' presents a paper by Foirbart that is most relevant to Irish soil conditions and within this paper the following equations were included:

Granular Soils: DPH N_{100} x 2.5 = SPT N value

Cohesive Soils: C_u = 15 x DPH N_{100} + 30 kN/m^2

These equations present a relationship between the probe N_{100} value and the SPT N value for granular soils and the undrained shear strength of cohesive soils.

The trial pit and dynamic probe logs and photographs are presented in Appendix 2

3.3. California Bearing Ratio tests

At 0.50mbgl in 15 No. trial pits, undisturbed cylindrical mould samples were taken to complete a California Bearing Ratio test in the laboratory. The result facilitates the designing of the access roads and associated areas. These tests were completed to BS1377: 1990: Part 4, Clause 7 ‘Determination of California Bearing Ratio’.

The CBR test results are presented in Appendix 3.

3.4. Soakaway Tests

At 2 No. locations, soakaway tests were completed and logged by SIL geotechnical engineer. BRE Special Digest 365 stipulates that the pit should be filled three times and that the final cycle is used to provide the infiltration rate. The time taken for the water level to fall from 75% volume to 25% volume is required to calculate the rate of infiltration. However, if the water level does not fall at a steady rate, then the test is deemed to have failed and the area is unsuitable for storm water drainage.

The soakaway test results and photographs are presented in Appendix 4.

3.5. Slit Trenches

Slit trenching was completed at 2 No. locations and was completed by hand digging with machine assistance.

The slit trench logs with photographs are presented in Appendix 5.

3.6. Groundwater Monitoring

Following the completion of the fieldworks, a set of groundwater measurements were completed. The measurements were completed using a dip tape with a sensor at the end, which was lowered into the standpipe and set off a buzzer when the groundwater was encountered.

The groundwater readings are presented in Appendix 6.

3.5. Surveying

Following completion of all the fieldworks, a survey of the exploratory hole locations was completed using a GeoMax GPS Rover. The data is supplied on each individual log and along with a site plan in Appendix 10.

4. Laboratory Testing

Geotechnical laboratory testing was completed on representative soil samples in accordance with BS 1377 (1990). Testing included:

- 5 No. Moisture contents
- 5 No. Atterberg limits
- 5 No. Particle size gradings with 3 No. hydrometers
- 5 No. pH and sulphate content

Environmental testing was completed by ALS Environmental Ltd. and consists of the following:

- 4 No. Suite I analysis

The geotechnical laboratory test results are presented in Appendix 7 with the environmental tests reported in Appendix 8 and a Waste Classification Report in Appendix 9.

5. Ground Conditions

5.1. Overburden

The natural ground conditions are dominated by cohesive firm becoming stiff brown slightly sandy gravelly silty CLAY with high cobble and low boulder content.

The boreholes recorded similar SPT N-values of 8 and 9 at 1.00mbgl, 12 and 16 at 2.00mbgl and 20 and 16 at 3.00mbgl.

5.2. Groundwater

No groundwater was recorded in the boreholes or the trial pits during the fieldworks period.

6. Recommendations and Conclusions

Please note the following caveats:

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 the exploratory hole locations or below the final level of excavation, this is for guidance only and no liability can be accepted for its accuracy. No responsibility can be accepted for adjacent unexpected conditions that have not been revealed by the exploratory holes. It is further recommended that all bearing surfaces when excavated should be inspected by a suitably qualified Engineer to verify the information given in this report.

Excavated surfaces in clay strata should be kept dry to avoid softening prior to foundation placement. Foundations should always be taken to a minimum depth of 0.50mBGL to avoid the effects of frost action and possible seasonal shrinkage/swelling.

If it is intended that on-site materials are to be used as fill, then the necessary laboratory testing should be specified by the Client to confirm the suitability. Also, relevant lab testing should be specified where stability of side slopes to excavations is a concern, or where contamination may be an issue.

6.1. Shallow Foundations

Due to the unknown depth of foundation and no longer-term groundwater information, this analysis assumes the groundwater will not influence the construction or performance of these foundations.

The boreholes encountered firm becoming stiff brown slightly sandy gravelly silty CLAY with high cobble and low boulder content at 1.00mbgl and the SPT N-values at these locations range from 8 to 9. Using a correlation proposed by Stroud and Butler between SPT N-values and plasticity indices, the SPT N-value can be used to calculate the undrained shear strength. With the low plasticity indexes recorded in the laboratory for the soils, this correlation is C_u=6N. Therefore, using the lower value of 8, this indicates that the undrained shear strength of the CLAY is 48kN/m^2. This can be used to calculate the ultimate bearing capacity, and this has been calculated to be 263kN/m^2. Finally, a factor of safety is applied and with a factor of 3, an allowable bearing capacity of 88kN/m^2 would be anticipated using the lowest SPT value.

The SPTs increase to 12 to 16 at 2.00mbgl and this indicates an undrained shear strength of 72kN/m^2, ultimate bearing capacity of 403kN/m^2 and an allowable bearing capacity of 135kN/m^2.

For analysis of bearing capacities from the dynamic probes, the N_{100} values are used as follows in cohesive soils. The undrained shear strength (C_u) is calculated using the N_{100} value as per

the equation in Section 3.2. This can then be used in calculations to work out the ultimate bearing capacity (ULS) and when a factor of safety of 3 is applied, the allowable bearing capacity (ABC) can be provided. The table below shows the allowable bearing capacities for N_{100} values 1 to 10 at 1.00mbgl.

N_{100} Value	Cohesive Soils		
	C_u	ULS	ABC
1	45	248	83
2	60	330	110
3	75	400	135
4	90	480	160
5	105	555	185
6	120	630	210
7	135	705	235
8	150	780	260
9	165	855	285
10	180	930	310

All capacities shown are in kN/m^2.

The following assumptions were made as part of these analyses. If any of these assumptions are not in accordance with detailed design or observations made during construction these recommendations should be re-evaluated.

- Foundations are to be constructed on a level formation of uniform material type (described above).
- All man-made or filled material is to be removed prior to construction.
- The bulk unit weight of the material in this stratum has a minimum density of $19kN/m^3$.
- All bearing capacity calculations allow for a settlement of 25mm.
- Based on groundwater observations this analysis assumes the groundwater will not influence the construction or performance of these foundations.

The trial pit walls remained stable during excavation; however, it would be recommended that all excavations should be checked immediately and battered back accordingly. Regular inspection of temporary excavations should be completed during construction to ensure that all slopes are stable. Temporary support should be used on any excavation that will be left open for an extended period.

6.2. Groundwater

The caveats below relating to interpretation of groundwater levels should be noted:
There is always considerable uncertainty as to the likely rates of water ingress into excavations in clayey soil sites due to the possibility of localised unforeseen sand and gravel lenses acting as permeable conduits for unknown volumes of water.

Furthermore, water levels noted on the borehole and trial pit logs do not generally give an accurate indication of the actual groundwater conditions as the borehole or trial pit is rarely left open for sufficient time for the water level to reach equilibrium.

Also, during boring procedures, a permeable stratum may have been sealed off by the borehole casing, or water may have been added to aid drilling. Therefore, an extended period of groundwater monitoring using any constructed standpipes is required to provide more accurate information regarding groundwater conditions. Finally, groundwater levels vary with time of year, rainfall and possible nearby construction sites.

Pumping tests would be required to determine likely seepage rates and persistence into excavations taken below the groundwater level. Deep trial pits also aid estimation of seepage rates.

As discussed previously, no groundwater was recorded in the boreholes or trial pits during the fieldworks.

There is always considerable uncertainty as to the likely rates of water ingress into excavations in cohesive soil sites due to the possibility of localised unforeseen sand and gravel lenses acting as permeable conduits for unknown volumes of water. Based on this information at the exploratory hole locations to date, it is considered likely that any shallow ingress (less than 2.00mbgl) into excavations of the CLAY will be slow. If granular soils are encountered in shallow excavations, then the possibility of water ingressing into an excavation increase.

If groundwater is encountered during excavations then mechanical pumps will be required to remove the groundwater from sumps. Sumps should be carefully located and constructed to ensure that groundwater is efficiently removed from excavations and trenches.

6.3. Pavement Design

The CBR test results in Appendix 3 indicate a CBR value of 4.8% to 16.8%.

The CBR samples tests were recovered at 0.50mbgl and inspection of the formation strata should be completed prior to construction of the pavement. Once the exact formation levels are

finalised then additional in-situ testing could be completed to assist with the detailed pavement design.

6.4. Soakaway Tests

The soakaway tests failed as the water level did not fall sufficiently enough to complete the test. The BRE Digest stipulates that the pit should half empty within 24hrs, and extrapolation indicates this condition would not be satisfied. The test was terminated at the end of the first (of a possible three) fill/empty cycle since further testing would give even slower fall rates due to increased soil saturation. The unsuitability of the soils for soakaways is further suggested by the soil descriptions of the materials in this area of the site where the soakaway was completed, i.e., well compacted clay soils.

6.5. Contamination

Environmental testing was carried out on four samples from the investigation and the results are shown in Appendix 8. For material to be removed from site, Suite I testing was carried out to determine if the material is hazardous or non-hazardous and then the leachate results were compared with the published waste acceptance limits of BS EN 12457-2 to determine whether the material on the site could be accepted as 'inert material' by an Irish landfill.

The Waste Classification report created using HazWasteOnline™ software shows that the material tested can be classified as non-hazardous material.

Following this analysis of the solid test results, the leachate disposal suite results indicate that the soils tested would generally be able to be treated as Inert Waste. The sample from TP01 did record Total Organic Carbon above the inert thresholds but this could be from natural sources and therefore may not be as a result of any contamination.

Four samples were tested for analysis but it cannot be discounted that any localised contamination may have been missed. Any MADE GROUND excavated on site should be stockpiled separately to natural soils to avoid any potential cross contamination of the soils. Additional testing of these soils may be requested by the individual landfill before acceptance and a testing regime designed by an environmental engineer would be recommended to satisfy the landfill.

6.6. Aggressive Ground Conditions

The chemical test results in Appendix 7 indicate a general pH value between 8.55 and 8.79, which is close to neutral and below the level of 9, therefore no special precautions are required.

The maximum value obtained for water soluble sulphate was 124mg/l as SO_3. The BRE Special Digest 1:2005 – '*Concrete in Aggressive Ground*' guidelines require SO_4 values and after

conversion ($SO_4 = SO_3 \times 1.2$), the maximum value of 149mg/l shows Class 1 conditions and no special precautions are required.

6.7. Radon Gas

The Environmental Protection Agency (EPA) has updated the Radon gas exposure map and this is available to view on the EPA website. This shows the possible exposure to radon gas with the bedrock geology, subsoil geology, soil permeability and aquifer type analysed to produce the map. The map is based on residential homes and shows that the site falls within the medium level of 1 in 10 homes have a possibility of high radon exposure. Measures should be taken in the form of radon protection barriers to protect from radon exposure in the new structure.

EPA map identifying possible Radon exposure.
https://gis.epa.ie/EPAMaps/Radon?&lid=EPA:RadonRiskMapofIreland

Appendix 1

Cable Percussive Borehole Logs

Contract No: 6179	**Cable Percussion Borehole Log**				Borehole No: **BH01**
Contract:	Mulla Valley	Easting:	696064.202	Date Started:	18/09/2023
Location:	Louth Village, Co. Louth	Northing:	801324.283	Date Completed:	18/09/2023
Client:	Louth County Council	Elevation:	39.48	Drilled By:	G. Macken
Engineer:	Doherty Finegan Kelly	Borehole Diameter:	200mm	Status:	FINAL

Depth (m) Scale	Depth	Stratum Description	Legend	Level (mOD) Scale	Depth	Samples and Insitu Tests Depth	Type	Result	Water Strike	Backfill
		TOPSOIL.			39.28					
	0.20	Firm becoming stiff brown slightly sandy slightly gravelly silty CLAY with high cobble content.		39.0						
0.5										
1.0				38.5		1.00 1.00	B C	GM01 N=8 (1,1/2,2,2,2)		
1.5				38.0						
2.0				37.5		2.00 2.00	B C	GM02 N=12 (1,1/2,3,3,4)		
2.5				37.0						
3.0				36.5		3.00 3.00	B C	GM03 N=20 (2,3/4,4,6,6)		
3.5				36.0						
4.0				35.5		4.00 4.00	B C	GM04 50 (3,8/50 for 180mm)		
	4.40	Obstruction - possible boulders.			35.08					
4.5	4.50	End of Borehole at 4.50m		35.0	34.98	4.50	C	50 (25 for 5mm/50 for 5mm)		

Chiselling: From:	To:	Time:	Water Strikes: Strike:	Rose:	Depth Sealed	Water Details: Date:	Hole Depth:	Water Depth:	Installation: From:	To:	Pipe:	Backfill: From:	To:	Type:	Remarks:
2.60	2.80	01:00				18/09	4.50	Dry	0.00	1.50	Solid	0.00	1.00	Bentonite	Borehole terminated due to obstruction.
4.40	4.50	01:30							1.50	4.50	Slotted	1.00	4.50	Gravel	

Legend:
B: Bulk
D: Disturbed
U: Undisturbed
ES: Environmental
W: Water
C: Cone SPT
S: Split spoon SPT

Contract No: 6179	**Cable Percussion Borehole Log**				Borehole No: **BH02**
Contract:	Mulla Valley	Easting:	696204.153	Date Started:	19/09/2023
Location:	Louth Village, Co. Louth	Northing:	801253.276	Date Completed:	19/09/2023
Client:	Louth County Council	Elevation:	50.09	Drilled By:	G. Macken
Engineer:	Doherty Finegan Kelly	Borehole Diameter:	200mm	Status:	FINAL

Depth (m) Scale	Depth	Stratum Description	Legend	Level (mOD) Scale	Depth	Samples and Insitu Tests Depth	Type	Result	Water Strike	Backfill
		TOPSOIL.		50.0						
	0.20	Firm becoming stiff brown slightly sandy slightly gravelly silty CLAY with high cobble content.			49.89					
0.5				49.5						
1.0						1.00	B	GM05		
				49.0		1.00	C	N=9 (1,1/2,2,3,2)		
1.5				48.5						
2.0						2.00	B	GM06		
				48.0		2.00	C	N=16 (1,2/3,4,5,4)		
2.5				47.5						
3.0						3.00	B	GM07		
				47.0		3.00	C	N=16 (2,4/4,5,3,4)		
3.5				46.5						
4.0						4.00	B	GM08		
	4.10	Obstruction - possible boulders.		46.0	45.99	4.00	C	50 (25 for 95mm/50 for 15mm)		
	4.20	End of Borehole at 4.20m			45.89	4.20	C	50 (25 for 5mm/50 for 5mm)		
4.5				45.5						

Chiselling: From:	To:	Time:	Water Strikes: Strike:	Rose:	Depth Sealed	Water Details: Date:	Hole Depth:	Water Depth:	Installation: From:	To:	Pipe:	Backfill: From:	To:	Type:	Remarks:
1.80	1.90	01:00				19/09	4.20	Dry				0.00	4.20	Arisings	Borehole terminated due to obstruction.
4.10	4.20	01:30													

Legend:
B: Bulk
D: Disturbed
U: Undisturbed
ES: Environmental
W: Water
C: Cone SPT
S: Split spoon SPT

Appendix 2

Trial Pit and Dynamic Probe Logs and Photographs

Contract No: 6179	**Trial Pit and Dynamic Probe Log**				Trial Pit No: **TP01**
Contract:	Mulla Valley	Easting:	696088.503	Date:	19/09/2023
Location:	Louth Village, Co. Louth	Northing:	801324.251	Excavator:	3T Tracked Excavator
Client:	Louth County Council	Elevation:	41.14	Logged By:	P. McGonagle
Engineer:	Doherty Finegan Kelly	Dimensions (LxWxD) (m):	3.80 x 0.50 x 3.50	Scale:	1:25

Level (mbgl) Scale:	Depth	Stratum Description	Legend	Level (mOD) Scale:	Depth:	Samples Depth	Type	Probe	Water Strike
0		TOPSOIL.		41.0	40.84			0 0 1 2 3	
0.5	0.30	Firm becoming stiff brown slightly sandy gravelly silty CLAY with high cobble and medium boulder content. Sand is fine to coarse. Gravel is fine to coarse, angular to subangular of limestone. Cobbles and boulders are angular to subangular of limestone (up to 300mm diameter).		40.5		0.50 0.50	CBR ES	3 4 3 5	
1.0						1.00	B	5 6 5 4	
1.5				40.0				5 6 7	
2.0				39.5				10 11 9 7	
2.5				39.0				10 9 8 5 4	
3.0				38.5		2.50	B	3 8 35	
3.5	3.50	**Pit terminated at 3.50m**		38.0	37.64				
4.0				37.5					
4.5				37.0					
				36.5					

Termination:	Pit Wall Stability:	Groundwater Rate:	Remarks:	Key:
Scheduled depth.	Pit walls stable.	Dry	-	B = Bulk disturbed D = Small disturbed CBR = Undisturbed CBR ES = Environmental

Contract No: 6179	**Trial Pit and Dynamic Probe Log**				Trial Pit No: **TP02**
Contract:	Mulla Valley	Easting:	696123.085	Date:	19/09/2023
Location:	Louth Village, Co. Louth	Northing:	801324.277	Excavator:	3T Tracked Excavator
Client:	Louth County Council	Elevation:	42.38	Logged By:	P. McGonagle
Engineer:	Doherty Finegan Kelly	Dimensions (LxWxD) (m):	3.60 x 0.50 x 3.10	Scale:	1:25

Level (mbgl) Scale:	Depth	Stratum Description	Legend	Level (mOD) Scale:	Depth:	Samples Depth	Type	Probe	Water Strike
0.5	0.30	TOPSOIL.		42.0	42.08			0 0 1 3 4 3 5 6 8	
1.0		Firm becoming stiff brown slightly sandy gravelly silty CLAY with high cobble and medium boulder content. Sand is fine to coarse. Gravel is fine to coarse, angular to subangular of limestone. Cobbles and boulders are angular to subangular of limestone (up to 300mm diameter).		41.5		1.00	B	6 5 5 6 8	
1.5				41.0				11 5 6 4	
2.0				40.5				3 4 3 5 6	
2.5				40.0		2.50	B	7 7 7 8 9	
3.0	3.10	Obstruction - boulders. **Pit terminated at 3.10m**		39.5	39.28			35	
3.5				39.0					
4.0				38.5					
4.5				38.0					
				37.5					

Termination:	Pit Wall Stability:	Groundwater Rate:	Remarks:	Key:
Obstruction - boulders.	Pit walls stable.	Dry	-	B = Bulk disturbed D = Small disturbed CBR = Undisturbed CBR ES = Environmental

Contract No: 6179	**Trial Pit and Dynamic Probe Log**				Trial Pit No: **TP03**
Contract:	Mulla Valley	Easting:	696031.593	Date:	19/09/2023
Location:	Louth Village, Co. Louth	Northing:	801318.243	Excavator:	3T Tracked Excavator
Client:	Louth County Council	Elevation:	39.59	Logged By:	P. McGonagle
Engineer:	Doherty Finegan Kelly	Dimensions (LxWxD) (m):	3.70 x 0.50 x 2.90	Scale:	1:25

Level (mbgl) Scale:	Depth	Stratum Description	Legend	Level (mOD) Scale:	Depth:	Samples Depth	Type	Probe	Water Strike
0.5	0.40	TOPSOIL.		39.5	39.19	0.50	CBR	0 0 1 1 3 5 4 6 7 6	
1.0		Firm becoming stiff brown slightly sandy gravelly silty CLAY with high cobble and medium boulder content. Sand is fine to coarse. Gravel is fine to coarse, angular to subangular of limestone. Cobbles and boulders are angular to subangular of limestone (up to 300mm diameter).		39.0 38.5		1.00	B	3 6 4 4 4 5 5 5 6 4	
1.5 2.0 2.5				38.0 37.5		2.50	B	4 6 7 4 3 3 4 19 35	
3.0	2.90	Obstruction - boulders. **Pit terminated at 2.90m**		37.0	36.69				
3.5 4.0 4.5				36.5 36.0 35.5 35.0					

Termination:	Pit Wall Stability:	Groundwater Rate:	Remarks:	Key:
Obstruction - boulders.	Pit walls stable.	Dry	-	B = Bulk disturbed D = Small disturbed CBR = Undisturbed CBR ES = Environmental

Contract No: 6179	**Trial Pit and Dynamic Probe Log**				Trial Pit No: **TP04**
Contract:	Mulla Valley	Easting:	696085.570	Date:	19/09/2023
Location:	Louth Village, Co. Louth	Northing:	801288.459	Excavator:	3T Tracked Excavator
Client:	Louth County Council	Elevation:	41.96	Logged By:	P. McGonagle
Engineer:	Doherty Finegan Kelly	Dimensions (LxWxD) (m):	3.30 x 0.50 x 3.00	Scale:	1:25

Level (mbgl) Scale:	Depth	Stratum Description	Legend	Level (mOD) Scale:	Depth:	Samples Depth	Type	Probe	Water Strike
0.5	0.20	TOPSOIL.		41.5	41.76	0.50	CBR	0 1 2 3 2 2 3 6 6 8 4 11 8 5 8 5 4 5 5 5 12 15 35	
		Firm becoming stiff brown slightly sandy gravelly silty CLAY with high cobble and medium boulder content. Sand is fine to coarse. Gravel is fine to coarse, angular to subangular of limestone. Cobbles and boulders are angular to subangular of limestone (up to 300mm diameter).							
1.0				41.0		1.00	B		
1.5				40.5					
2.0				40.0					
2.5				39.5		2.50	B		
3.0	3.00	Obstruction - boulders. **Pit terminated at 3.00m**		39.0	38.96				
3.5				38.5					
4.0				38.0					
4.5				37.5					
				37.0					

Termination:	Pit Wall Stability:	Groundwater Rate:	Remarks:	Key:
Obstruction - boulders.	Pit walls stable.	Dry	-	B = Bulk disturbed D = Small disturbed CBR = Undisturbed CBR ES = Environmental

Contract No: 6179	**Trial Pit and Dynamic Probe Log**				Trial Pit No: **TP05**
Contract:	Mulla Valley	Easting:	696120.210	Date:	19/09/2023
Location:	Louth Village, Co. Louth	Northing:	801274.035	Excavator:	3T Tracked Excavator
Client:	Louth County Council	Elevation:	45.63	Logged By:	P. McGonagle
Engineer:	Doherty Finegan Kelly	Dimensions (LxWxD) (m):	3.80 x 0.50 x 3.50	Scale:	1:25

Level (mbgl) Scale:	Depth	Stratum Description	Legend	Level (mOD) Scale:	Depth:	Samples Depth	Type	Probe	Water Strike
		TOPSOIL.		45.5				0	
	0.40				45.23			1	
0.5		Firm becoming stiff brown slightly sandy gravelly silty CLAY with high cobble and medium boulder content. Sand is fine to coarse. Gravel is fine to coarse, angular to subangular of limestone. Cobbles and boulders are angular to subangular of limestone (up to 300mm diameter).				0.50	CBR	2	
				45.0				1	
								2	
								4	
								7	
								7	
								7	
1.0						1.00	B	7	
								5	
				44.5				10	
								13	
								18	
1.5								4	
								3	
				44.0				4	
								3	
2.0								5	
								6	
								5	
				43.5				8	
								9	
								35	
2.5						2.50	B		
				43.0					
3.0									
				42.5					
3.5	3.50	**Pit terminated at 3.50m**			42.13				
				42.0					
4.0									
				41.5					
4.5									
				41.0					

Termination:	Pit Wall Stability:	Groundwater Rate:	Remarks:	Key:
Scheduled depth.	Pit walls stable.	Dry	-	B = Bulk disturbed D = Small disturbed CBR = Undisturbed CBR ES = Environmental

Contract No: 6179	**Trial Pit and Dynamic Probe Log**				Trial Pit No: **TP06**
Contract:	Mulla Valley	Easting:	696019.315	Date:	19/09/2023
Location:	Louth Village, Co. Louth	Northing:	801292.535	Excavator:	3T Tracked Excavator
Client:	Louth County Council	Elevation:	40.98	Logged By:	P. McGonagle
Engineer:	Doherty Finegan Kelly	Dimensions (LxWxD) (m):	3.60 x 0.50 x 3.10	Scale:	1:25

Level (mbgl) Scale:	Depth	Stratum Description	Legend	Level (mOD) Scale:	Depth:	Samples Depth	Type	Probe	Water Strike
		TOPSOIL.			40.78			0 0 3 2 5 8 6 9 6 6 10 8 6 8 5 13 10 13 11 9 6 6 11 11 8 9 8 10 6 10 10 12 14 35	
	0.20	Firm becoming stiff brown slightly sandy gravelly silty CLAY with high cobble and medium boulder content. Sand is fine to coarse. Gravel is fine to coarse, angular to subangular of limestone. Cobbles and boulders are angular to subangular of limestone (up to 300mm diameter).		40.5		0.50	CBR		
				40.0		1.00	B		
				39.5					
				39.0					
				38.5		2.50	B		
	3.10	Obstruction - boulders.		38.0	37.88				
		Pit terminated at 3.10m		37.5					
				37.0					
				36.5					

0.5 1.0 1.5 2.0 2.5 3.0 3.5 4.0 4.5

Termination:	Pit Wall Stability:	Groundwater Rate:	Remarks:	Key:
Obstruction - boulders.	Pit walls stable.	Dry	-	B = Bulk disturbed D = Small disturbed CBR = Undisturbed CBR ES = Environmental

Contract No: 6179	**Trial Pit and Dynamic Probe Log**				Trial Pit No: **TP07**
Contract:	Mulla Valley	Easting:	696058.657	Date:	19/09/2023
Location:	Louth Village, Co. Louth	Northing:	801269.095	Excavator:	3T Tracked Excavator
Client:	Louth County Council	Elevation:	41.11	Logged By:	P. McGonagle
Engineer:	Doherty Finegan Kelly	Dimensions (LxWxD) (m):	4.00 x 0.50 x 3.50	Scale:	1:25

Level (mbgl) Scale:	Depth	Stratum Description	Legend	Level (mOD) Scale:	Depth:	Samples Depth	Type	Probe	Water Strike
0.5	0.40	TOPSOIL.		41.0	40.71	0.50	CBR	0 1 1 2 3 1 2 1 1	
1.0		Firm becoming stiff brown slightly sandy gravelly silty CLAY with high cobble and medium boulder content. Sand is fine to coarse. Gravel is fine to coarse, angular to subangular of limestone. Cobbles and boulders are angular to subangular of limestone (up to 300mm diameter).		40.5		1.00	B	3 5 6 7 7 5 4 5 4 4	
1.5				40.0					
2.0				39.5					
2.5				39.0		2.50	B	9 9 17 8 3 3 5 5 8 8	
3.0				38.5					
3.5	3.50	**Pit terminated at 3.50m**		38.0	37.61			15 20 35	
4.0				37.5					
4.5				37.0					
				36.5					

Termination:	Pit Wall Stability:	Groundwater Rate:	Remarks:	Key:
Scheduled depth.	Pit walls stable.	Dry	-	B = Bulk disturbed D = Small disturbed CBR = Undisturbed CBR ES = Environmental

Contract No: 6179	**Trial Pit and Dynamic Probe Log**				Trial Pit No: **TP08**
Contract:	Mulla Valley	Easting:	696092.464	Date:	18/09/2023
Location:	Louth Village, Co. Louth	Northing:	801256.779	Excavator:	3T Tracked Excavator
Client:	Louth County Council	Elevation:	44.04	Logged By:	P. McGonagle
Engineer:	Doherty Finegan Kelly	Dimensions (LxWxD) (m):	3.90 x 0.50 x 3.50	Scale:	1:25

Level (mbgl) Scale:	Depth	Stratum Description	Legend	Level (mOD) Scale:	Depth:	Samples Depth	Type	Probe	Water Strike
0		TOPSOIL.		44.0				1	
								1	
								1	
	0.40				43.64			3	
0.5		Firm becoming stiff brown slightly sandy gravelly silty CLAY with high cobble and medium boulder content. Sand is fine to coarse. Gravel is fine to coarse, angular to subangular of limestone. Cobbles and boulders are angular to subangular of limestone (up to 300mm diameter).		43.5		0.50 0.50	CBR ES	4 3	
								2	
								3	
								3	
1.0				43.0		1.00	B	4	
								4	
								3	
								3	
								2	
1.5				42.5				3	
								5	
								20	
								35	
2.0				42.0					
2.5				41.5		2.50	B		
3.0				41.0					
3.5	3.50	**Pit terminated at 3.50m**		40.5	40.54				
4.0				40.0					
4.5				39.5					

Termination:	Pit Wall Stability:	Groundwater Rate:	Remarks:	Key:
Scheduled depth.	Pit walls stable.	Dry	-	B = Bulk disturbed D = Small disturbed CBR = Undisturbed CBR ES = Environmental

Contract No: 6179	**Trial Pit and Dynamic Probe Log**				Trial Pit No: **TP09**
Contract:	Mulla Valley	Easting:	696125.400	Date:	18/09/2023
Location:	Louth Village, Co. Louth	Northing:	801247.881	Excavator:	3T Tracked Excavator
Client:	Louth County Council	Elevation:	47.62	Logged By:	P. McGonagle
Engineer:	Doherty Finegan Kelly	Dimensions (LxWxD) (m):	3.60 x 0.50 x 3.20	Scale:	1:25

Level (mbgl) Scale:	Depth	Stratum Description	Legend	Level (mOD) Scale:	Depth:	Samples Depth	Type	Probe	Water Strike
0.5	0.40	TOPSOIL.		47.5	47.22			0 1 1 3 5 8 7 7 6 7 4 9 13 7 3 3 6 5 6 7 3 4 4 15 20 35	
1.0		Firm becoming stiff brown slightly sandy gravelly silty CLAY with high cobble and medium boulder content. Sand is fine to coarse. Gravel is fine to coarse, angular to subangular of limestone. Cobbles and boulders are angular to subangular of limestone (up to 300mm diameter).		47.0		1.00	B		
1.5				46.5					
2.0				46.0					
2.5				45.5		2.50	B		
3.0				45.0					
3.5	3.20	Obstruction - boulders. **Pit terminated at 3.20m**		44.5	44.42				
4.0				44.0					
4.5				43.5					
				43.0					

Termination:	Pit Wall Stability:	Groundwater Rate:	Remarks:	Key:
Obstruction - boulders.	Pit walls stable.	Dry	-	B = Bulk disturbed D = Small disturbed CBR = Undisturbed CBR ES = Environmental

Contract No: 6179	**Trial Pit and Dynamic Probe Log**				Trial Pit No: **TP10**
Contract:	Mulla Valley	Easting:	696155.502	Date:	18/09/2023
Location:	Louth Village, Co. Louth	Northing:	801257.519	Excavator:	3T Tracked Excavator
Client:	Louth County Council	Elevation:	48.76	Logged By:	P. McGonagle
Engineer:	Doherty Finegan Kelly	Dimensions (LxWxD) (m):	3.00 x 0.50 x 2.20	Scale:	1:25

Level (mbgl) Scale:	Depth	Stratum Description	Legend	Level (mOD) Scale:	Depth:	Samples Depth	Type	Probe	Water Strike
0.5	0.40	TOPSOIL.		48.5	48.36	0.50	CBR	0 0 2 1 2 4 4 6 7 7	
1.0		Firm becoming stiff brown slightly sandy gravelly silty CLAY with high cobble and medium boulder content. Sand is fine to coarse. Gravel is fine to coarse, angular to subangular of limestone. Cobbles and boulders are angular to subangular of limestone (up to 300mm diameter).		48.0		1.00	B	3 4 3 4 4 3 4	
1.5				47.5					
2.0				47.0		2.00	B	12 12 10 5 4 4 5 5 6	
2.5	2.20	Obstruction - boulders. **Pit terminated at 2.20m**		46.5	46.56			13 25 35	
3.0				46.0					
3.5				45.5					
4.0				45.0					
4.5				44.5					
				44.0					

Termination:	Pit Wall Stability:	Groundwater Rate:	Remarks:	Key:
Obstruction - boulders.	Pit walls stable.	Dry	-	B = Bulk disturbed D = Small disturbed CBR = Undisturbed CBR ES = Environmental

Contract No: 6179	**Trial Pit and Dynamic Probe Log**				Trial Pit No: **TP11**
Contract:	Mulla Valley	Easting:	696227.991	Date:	18/09/2023
Location:	Louth Village, Co. Louth	Northing:	801257.507	Excavator:	3T Tracked Excavator
Client:	Louth County Council	Elevation:	49.67	Logged By:	P. McGonagle
Engineer:	Doherty Finegan Kelly	Dimensions (LxWxD) (m):	3.50 x 0.50 x 3.20	Scale:	1:25

Level (mbgl) Scale:	Depth	Stratum Description	Legend	Level (mOD) Scale:	Depth:	Samples Depth	Type	Probe	Water Strike
0		TOPSOIL.		49.5				0	
	0.40				49.27			0	
0.5		Firm becoming stiff brown slightly sandy gravelly silty CLAY with high cobble and medium boulder content. Sand is fine to coarse. Gravel is fine to coarse, angular to subangular of limestone. Cobbles and boulders are angular to subangular of limestone (up to 300mm diameter).		49.0		0.50	CBR	1	
						0.50	ES	2	
								6	
1.0						1.00	B	5	
				48.5				7	
								7	
								7	
1.5				48.0				6	
								6	
								10	
2.0				47.5				6	
								11	
								6	
2.5						2.50	B	5	
								4	
								3	
3.0				47.0				3	
								5	
								3	
3.5				46.5				4	
								4	
								3	
4.0				46.0				3	
								4	
								14	
4.5				45.5				25	
	3.20	Obstruction - boulders.			46.47			35	
		Pit terminated at 3.20m		45.0					

Termination:	Pit Wall Stability:	Groundwater Rate:	Remarks:	Key:
Obstruction - boulders.	Pit walls stable.	Dry	-	B = Bulk disturbed D = Small disturbed CBR = Undisturbed CBR ES = Environmental

Contract No: 6179	**Trial Pit and Dynamic Probe Log**				Trial Pit No: **TP12**
Contract:	Mulla Valley	Easting:	696285.131	Date:	18/09/2023
Location:	Louth Village, Co. Louth	Northing:	801259.407	Excavator:	3T Tracked Excavator
Client:	Louth County Council	Elevation:	46.80	Logged By:	P. McGonagle
Engineer:	Doherty Finegan Kelly	Dimensions (LxWxD) (m):	4.10 x 0.50 x 3.50	Scale:	1:25

Level (mbgl) Scale:	Depth	Stratum Description	Legend	Level (mOD) Scale:	Depth:	Samples Depth	Type	Probe	Water Strike
0.5	0.40	TOPSOIL.		46.5	46.40	0.50	CBR	0 0 2 3 2 6 11 9 6	
1.0		Firm becoming stiff brown slightly sandy gravelly silty CLAY with high cobble and medium boulder content. Sand is fine to coarse. Gravel is fine to coarse, angular to subangular of limestone. Cobbles and boulders are angular to subangular of limestone (up to 300mm diameter).		46.0		1.00	B	5 5 5 4 6 4 3 4 6 10 5 6 4 3 3 4 7 11 20 35	
1.5				45.5					
2.0				45.0					
2.5				44.5		2.50	B		
3.0				44.0					
3.5	3.50	**Pit terminated at 3.50m**		43.5	43.30				
4.0				43.0					
4.5				42.5					
				42.0					

Termination:	Pit Wall Stability:	Groundwater Rate:	Remarks:	Key:
Scheduled depth.	Pit walls stable.	Dry	-	B = Bulk disturbed D = Small disturbed CBR = Undisturbed CBR ES = Environmental

Contract No: 6179	**Trial Pit and Dynamic Probe Log**				Trial Pit No: **TP13**
Contract:	Mulla Valley	Easting:	696147.232	Date:	18/09/2023
Location:	Louth Village, Co. Louth	Northing:	801227.985	Excavator:	3T Tracked Excavator
Client:	Louth County Council	Elevation:	48.68	Logged By:	P. McGonagle
Engineer:	Doherty Finegan Kelly	Dimensions (LxWxD) (m):	3.40 x 0.50 x 2.70	Scale:	1:25

Level (mbgl) Scale:	Depth	Stratum Description	Legend	Level (mOD) Scale:	Depth:	Samples Depth	Type	Probe	Water Strike
0.5	0.40	TOPSOIL.		48.5	48.28	0.50	CBR	0 0 5 3 7 7 6 5 5 6 6 3 3 5 6 6 5 5 7 8 6 11 16 18 18 19 35	
1.0		Firm becoming stiff brown slightly sandy gravelly silty CLAY with high cobble and medium boulder content. Sand is fine to coarse. Gravel is fine to coarse, angular to subangular of limestone. Cobbles and boulders are angular to subangular of limestone (up to 300mm diameter).		48.0		1.00	B		
1.5				47.5					
2.0				47.0					
2.5				46.5		2.50	B		
3.0	2.70	Obstruction - boulders. **Pit terminated at 2.70m**		46.0	45.98				
3.5				45.5					
4.0				45.0					
4.5				44.5					
				44.0					

Termination:	Pit Wall Stability:	Groundwater Rate:	Remarks:	Key:
Obstruction - boulders.	Pit walls stable.	Dry	-	B = Bulk disturbed D = Small disturbed CBR = Undisturbed CBR ES = Environmental

Contract No: 6179	**Trial Pit and Dynamic Probe Log**				Trial Pit No: **TP14**
Contract:	Mulla Valley	Easting:	696207.768	Date:	18/09/2023
Location:	Louth Village, Co. Louth	Northing:	801204.286	Excavator:	3T Tracked Excavator
Client:	Louth County Council	Elevation:	47.58	Logged By:	P. McGonagle
Engineer:	Doherty Finegan Kelly	Dimensions (LxWxD) (m):	3.30 x 0.50 x 2.80	Scale:	1:25

Level (mbgl) Scale:	Depth	Stratum Description	Legend	Level (mOD) Scale:	Depth:	Samples Depth	Type	Probe	Water Strike
0.5	0.40	TOPSOIL.		47.5	47.18	0.50	CBR	0 1 5 4 5 6 4 9 11	
1.0		Firm becoming stiff brown slightly sandy gravelly silty CLAY with high cobble and medium boulder content. Sand is fine to coarse. Gravel is fine to coarse, angular to subangular of limestone. Cobbles and boulders are angular to subangular of limestone (up to 300mm diameter).		47.0		1.00	B	7 8 7 6 5 6 7 8 10 11 9 8 13 25 35	
1.5				46.5					
2.0				46.0					
2.5				45.5		2.50	B		
3.0	2.80	Obstruction - boulders. **Pit terminated at 2.80m**		45.0	44.78				
3.5				44.5					
4.0				44.0					
4.5				43.5					
				43.0					

Termination:	Pit Wall Stability:	Groundwater Rate:	Remarks:	Key:
Obstruction - boulders.	Pit walls stable.	Dry	-	B = Bulk disturbed D = Small disturbed CBR = Undisturbed CBR ES = Environmental

Contract No: 6179	**Trial Pit and Dynamic Probe Log**				Trial Pit No: **TP15**
Contract:	Mulla Valley	Easting:	696280.002	Date:	18/09/2023
Location:	Louth Village, Co. Louth	Northing:	801215.071	Excavator:	3T Tracked Excavator
Client:	Louth County Council	Elevation:	46.11	Logged By:	P. McGonagle
Engineer:	Doherty Finegan Kelly	Dimensions (LxWxD) (m):	3.20 x 0.50 x 2.60	Scale:	1:25

Level (mbgl) Scale:	Depth	Stratum Description	Legend	Level (mOD) Scale:	Depth:	Samples Depth	Type	Probe	Water Strike
0.5	0.30	TOPSOIL.		46.0	45.81	0.50	CBR	0 1 2 2 5 3 1 3 4 6 5 5 4 6 5 3 2 2 5 6 3 3 25 35	
1.0		Firm becoming stiff brown slightly sandy gravelly silty CLAY with high cobble and medium boulder content. Sand is fine to coarse. Gravel is fine to coarse, angular to subangular of limestone. Cobbles and boulders are angular to subangular of limestone (up to 300mm diameter).		45.5		1.00	B		
1.5				45.0					
2.0				44.5					
2.5	2.60	Obstruction - boulders. **Pit terminated at 2.60m**		44.0	43.51	2.50	B		
3.0				43.5					
3.5				43.0					
4.0				42.5					
4.5				42.0					
				41.5					

Termination:	Pit Wall Stability:	Groundwater Rate:	Remarks:	Key:
Obstruction - boulders.	Pit walls stable.	Dry	-	B = Bulk disturbed D = Small disturbed CBR = Undisturbed CBR ES = Environmental

Contract No: 6179	**Trial Pit and Dynamic Probe Log**				Trial Pit No: **TP16**
Contract:	Mulla Valley	Easting:	696139.620	Date:	18/09/2023
Location:	Louth Village, Co. Louth	Northing:	801170.073	Excavator:	3T Tracked Excavator
Client:	Louth County Council	Elevation:	43.42	Logged By:	P. McGonagle
Engineer:	Doherty Finegan Kelly	Dimensions (LxWxD) (m):	3.30 x 0.50 x 2.90	Scale:	1:25

Level (mbgl) Scale:	Depth	Stratum Description	Legend	Level (mOD) Scale:	Depth:	Samples Depth	Type	Probe	Water Strike
0.5	0.40	TOPSOIL.		43.0	43.02	0.50	CBR	0 0 1 2 2 2 3 2 2	
1.0		Firm becoming stiff brown slightly sandy gravelly silty CLAY with high cobble and medium boulder content. Sand is fine to coarse. Gravel is fine to coarse, angular to subangular of limestone. Cobbles and boulders are angular to subangular of limestone (up to 300mm diameter).		42.5		1.00	B	6 7 8 15 25 35	
1.5				42.0					
2.0				41.5					
2.5				41.0		2.50	B		
3.0	2.90	Obstruction - boulders. **Pit terminated at 2.90m**		40.5	40.52				
3.5				40.0					
4.0				39.5					
4.5				39.0					
				38.5					

Termination:	Pit Wall Stability:	Groundwater Rate:	Remarks:	Key:
Obstruction - boulders.	Pit walls stable.	Dry	-	B = Bulk disturbed D = Small disturbed CBR = Undisturbed CBR ES = Environmental

Contract No: 6179	**Trial Pit and Dynamic Probe Log**				Trial Pit No: **TP17**
Contract:	Mulla Valley	Easting:	696197.902	Date:	18/09/2023
Location:	Louth Village, Co. Louth	Northing:	801149.954	Excavator:	3T Tracked Excavator
Client:	Louth County Council	Elevation:	41.42	Logged By:	P. McGonagle
Engineer:	Doherty Finegan Kelly	Dimensions (LxWxD) (m):	3.40 x 0.50 x 3.00	Scale:	1:25

Level (mbgl) Scale:	Depth	Stratum Description	Legend	Level (mOD) Scale:	Depth:	Samples Depth	Type	Probe	Water Strike
0.5	0.40	TOPSOIL.		41.0	41.02	0.50 0.50	CBR ES	0 0 1 1 4 3 3 4 3 3 6 7 9 5 7 7 6 4 6 6 4 7 8 9 11 15 21 24 35	
1.0		Firm becoming stiff brown slightly sandy gravelly silty CLAY with high cobble and medium boulder content. Sand is fine to coarse. Gravel is fine to coarse, angular to subangular of limestone. Cobbles and boulders are angular to subangular of limestone (up to 300mm diameter).		40.5		1.00	B		
1.5				40.0					
2.0				39.5					
2.5				39.0		2.50	B		
3.0	3.00	Obstruction - boulders. **Pit terminated at 3.00m**		38.5	38.42				
3.5				38.0					
4.0				37.5					
4.5				37.0					
				36.5					

Termination:	Pit Wall Stability:	Groundwater Rate:	Remarks:	Key:
Obstruction - boulders.	Pit walls stable.	Dry	-	B = Bulk disturbed D = Small disturbed CBR = Undisturbed CBR ES = Environmental

Contract No: 6179	**Trial Pit and Dynamic Probe Log**				Trial Pit No: **TP18**
Contract:	Mulla Valley	Easting:	696241.344	Date:	18/09/2023
Location:	Louth Village, Co. Louth	Northing:	801149.324	Excavator:	3T Tracked Excavator
Client:	Louth County Council	Elevation:	41.14	Logged By:	P. McGonagle
Engineer:	Doherty Finegan Kelly	Dimensions (LxWxD) (m):	3.60 x 0.50 x 3.00	Scale:	1:25

Level (mbgl) Scale:	Depth	Stratum Description	Legend	Level (mOD) Scale:	Depth:	Samples Depth	Type	Probe	Water Strike
0.5	0.40	TOPSOIL.		41.0	40.74			0 1 3 2 2 3 3 8 7 6	
1.0		Firm becoming stiff brown slightly sandy gravelly silty CLAY with high cobble and medium boulder content. Sand is fine to coarse. Gravel is fine to coarse, angular to subangular of limestone. Cobbles and boulders are angular to subangular of limestone (up to 300mm diameter).		40.5		1.00	B	3 5 10 7 6 4 4 5 5 5	
1.5				40.0					
2.0				39.5					
2.5				39.0		2.50	B	3 4 6 5 5 8 19 35	
3.0	3.00	Obstruction - boulders. **Pit terminated at 3.00m**		38.5	38.14				
3.5				38.0					
4.0				37.5					
4.5				37.0					
				36.5					

Termination:	Pit Wall Stability:	Groundwater Rate:	Remarks:	Key:
Obstruction - boulders.	Pit walls stable.	Dry	-	B = Bulk disturbed D = Small disturbed CBR = Undisturbed CBR ES = Environmental

TP01 Sidewall

TP01 Spoil

TP02 Sidewall

TP02 Spoil

TP03 Sidewall

TP03 Spoil

TP04 Sidewall

TP04 Spoil

TP05 Sidewall

TP05 Spoil

TP06 Sidewall

TP06 Spoil

TP07 Sidewall

TP07 Spoil

TP08 Sidewall

TP08 Spoil

TP09 Sidewall

TP09 Spoil

TP10 Sidewall

TP10 Spoil

TP11 Sidewall

TP11 Spoil

TP12 Sidewall

TP12 Spoil

TP13 Sidewall

TP13 Spoil

TP14 Sidewall

TP14 Spoil

TP15 Sidewall

TP05 Spoil

TP16 Sidewall

TP16 Spoil

TP17 Sidewall

TP17 Spoil

TP18 Sidewall

TP18 Spoil

Appendix 3

California Bearing Ratio Test Results

California Bearing Ratio (CBR) In accordance with BS1377: Part 4: Method 7

Client	Louth County Council
Site	Mulla Valley, Louth Village
S.I. File No	6179 / 23
Test Lab	Site Investigations Ltd., Carhugar The Grange, 12th Lock Rd., Lucan Co. Dublin. Tel (01) 6108768 Email info@siteinvestigations.ie
Report Date	25th September 2023

CBR No	Depth (mBGL)	Sample No	Lab Ref	Sample Type	Moisture Content (%)	CBR Value (%)	Location / Remarks
TP01	0.50	PM37	23/1475	B	14.8	7.3	
TP03	0.50	PM38	23/1476	B	8.8	7.6	
TP04	0.50	PM39	23/1477	B	13.8	5.4	
TP05	0.50	PM40	23/1478	B	14.5	4.8	
TP06	0.50	PM41	23/1479	B	10.5	12.3	
TP07	0.50	PM42	23/1480	B	13.9	7.8	
TP08	0.50	PM43	23/1481	B	9.5	12.8	
TP10	0.50	PM44	23/1482	B	14.6	5.1	
TP11	0.50	PM45	23/1483	B	9.1	14.8	
TP12	0.50	PM46	23/1484	B	12.8	4.8	
TP13	0.50	PM47	23/1485	B	7.3	16.8	
TP14	0.50	PM48	23/1486	B	7.2	12.2	
TP15	0.50	PM49	23/1487	B	9.4	12.9	
TP16	0.50	PM50	23/1488	B	14.1	4.9	
TP17	0.50	PM51	23/1489	B	7.5	9.8	

Appendix 4

Soakaway Test Results and Photographs

SOAKAWAY TEST

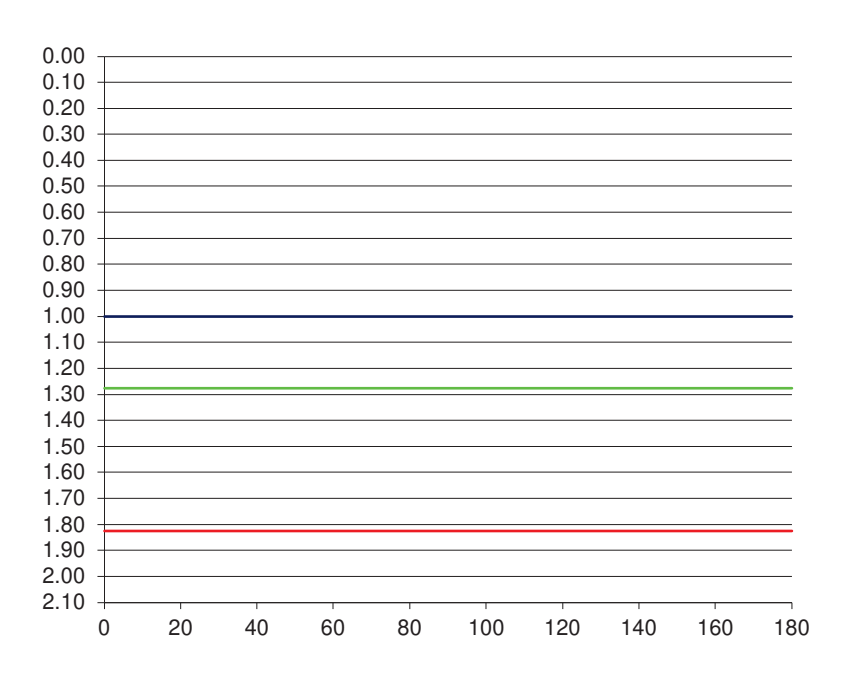
Project Reference:	6179
Contract name:	Mulla Valley
Location:	Louth Village, Co. Louth
Test No:	SA01
Date:	19/09/2023

Ground Conditions

From	To	
0.00	0.40	TOPSOIL.
0.40	2.20	Firm becoming stiff brown slightly sandy gravelly silty CLAY with high cobble and low boulder content.

Elapsed Time (mins)	Fall of Water (m)
0	1.00
0.5	1.00
1	1.00
1.5	1.00
2	1.00
2.5	1.00
3	1.00
3.5	1.00
4	1.00
4.5	1.00
5	1.00
6	1.00
7	1.00
8	1.00
9	1.00
10	1.00
12	1.00
14	1.00
16	1.00
18	1.00
20	1.00
25	1.00
30	1.00
40	1.00
50	1.00
60	1.00
75	1.00
90	1.00
120	1.00
150	1.00
180	1.00

Pit Dimensions (m)		
Length (m)	2.30	m
Width (m)	0.50	m
Depth	2.10	m
Water		
Start Depth of Water	1.00	m
Depth of Water	1.10	m
75% Full	1.28	m
25% Full	1.83	m
75%-25%	0.55	m
Volume of water (75%-25%)	**0.63**	m3
Area of Drainage	**11.76**	m2
Area of Drainage (75%-25%)	**4.23**	m2
Time		
75% Full	N/A	min
25% Full	N/A	min
Time 75% to 25%	**N/A**	min
Time 75% to 25% (sec)	**N/A**	sec



f = **Fail** m/min or **Fail** m/s

SOAKAWAY TEST

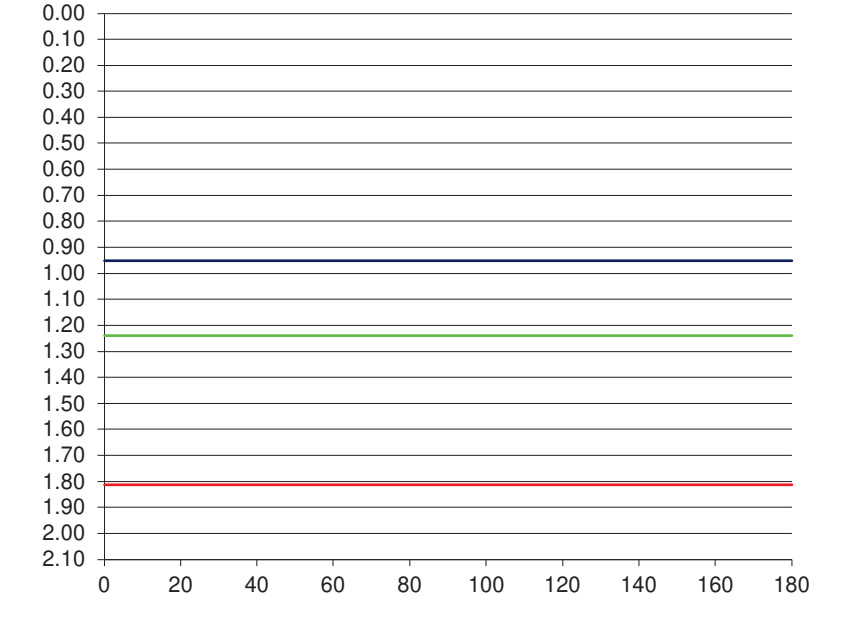
Project Reference:	6179
Contract name:	Mulla Valley
Location:	Louth Village, Co. Louth
Test No:	SA02
Date:	19/09/2023

Ground Conditions

From	To	
0.00	0.40	TOPSOIL.
0.40	2.20	Firm becoming stiff brown slightly sandy gravelly silty CLAY with high cobble and low boulder content.

Elapsed Time (mins)	Fall of Water (m)
0	0.95
0.5	0.95
1	0.95
1.5	0.95
2	0.95
2.5	0.95
3	0.95
3.5	0.95
4	0.95
4.5	0.95
5	0.95
6	0.95
7	0.95
8	0.95
9	0.95
10	0.95
12	0.95
14	0.95
16	0.95
18	0.95
20	0.95
25	0.95
30	0.95
40	0.95
50	0.95
60	0.95
75	0.95
90	0.95
120	0.95
150	0.95
180	0.95

Pit Dimensions (m)		
Length (m)	2.50	m
Width (m)	0.50	m
Depth	2.10	m
Water		
Start Depth of Water	0.95	m
Depth of Water	1.15	m
75% Full	1.24	m
25% Full	1.81	m
75%-25%	0.58	m
Volume of water (75%-25%)	**0.72**	m3
Area of Drainage	**12.60**	m2
Area of Drainage (75%-25%)	**4.70**	m2
Time		
75% Full	N/A	min
25% Full	N/A	min
Time 75% to 25%	**N/A**	min
Time 75% to 25% (sec)	**N/A**	sec



f = **Fail** **m/min** or **Fail** **m/s**

SA01 Sidewall

SA01 Spoil

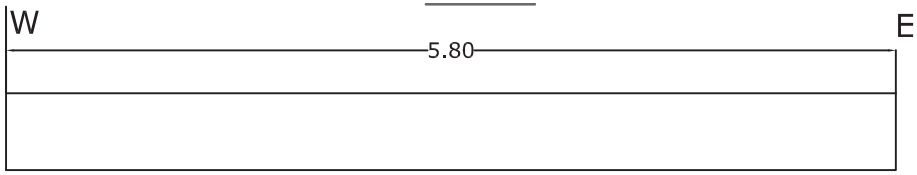
SA02 Sidewall

SA02 Spoil

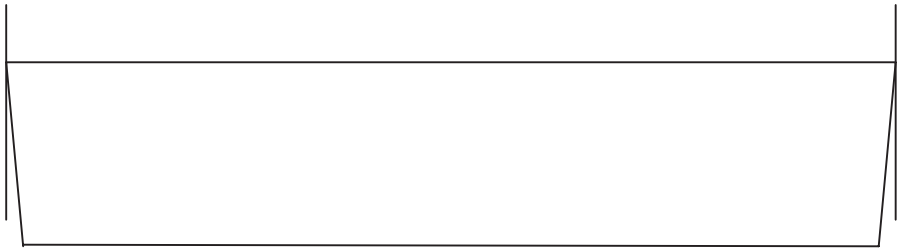
Appendix 5
Slit Trench Logs

ST01

Plan



Cross Section



Services

No:	Diameter:	Colour:	Utility:	Distance:	Depth:	Alignment:
No Services Encountered.						

Ground Conditions

From:	To:	Description:
0.00m	0.10m	TOPSOIL.
0.10m	1.20m	Firm brown slightly sandy gravelly silty CLAY with high cobble and low boulder content.

Trench Dimensions

Point:	Easting:	Northing:	Level:
Start	696137.698	801241.561	48.50
End	696132.057	801242.960	48.23

Length:	Width:	Depth:
5.80m	1.00m	1.20m

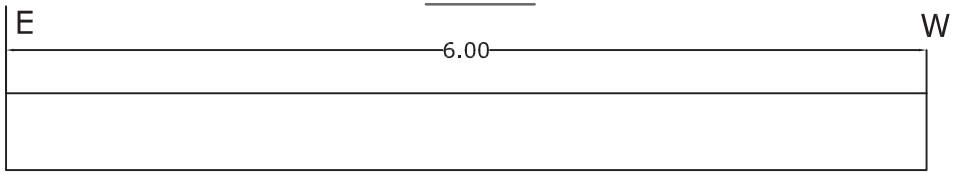
Photographs

SITE INVESTIGATIONS LTD

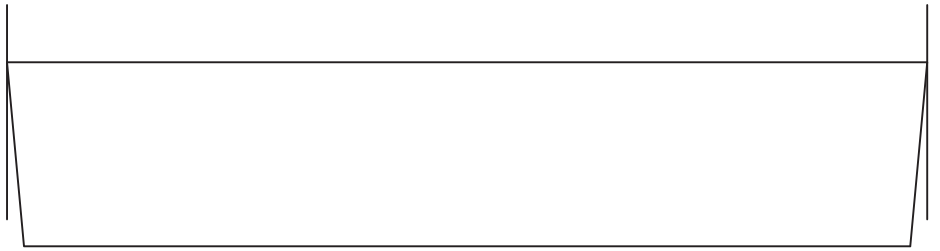
Project:	Mulla Valley, Louth Village, Co. Louth	Logged by: P. McGonagle	Excavation Started: 19/09/2023	Excavation Finished: 19/09/2023	CONTRACT NUMBER
Client:	Louth County Council	Scale: NOT TO SCALE, ALL DISTANCES IN m			6179
Consultant:	Doherty Finegan Kelly	DEPTH ARE TO THE TOP OF SERVICES			

ST02

Plan



Cross Section



Services

No:	Diameter:	Colour:	Utility:	Distance:	Depth:	Alignment:
No Services Encountered.						

Ground Conditions

From:	To:	Description:
0.00m	0.40m	TOPSOIL.
0.40m	1.20m	Firm brown slightly sandy gravelly silty CLAY with high cobble and low boulder content.

Trench Dimensions

Point:	Easting:	Northing:	Level:
Start	696059.437	801331.793	38.83
End	696054.845	801327.929	38.93

Length:	Width:	Depth:
6.00m	1.00m	1.20m

Photographs

SITE INVESTIGATIONS LTD

Project:	Mulla Valley, Louth Village, Co. Louth	Logged by: P. McGonagle	Excavation Started: 19/09/2023	Excavation Finished: 19/09/2023	CONTRACT NUMBER
Client:	Louth County Council	Scale: NOT TO SCALE, ALL DISTANCES IN m			6179
Consultant:	Doherty Finegan Kelly	DEPTH ARE TO THE TOP OF SERVICES			

Appendix 6

Groundwater Monitoring

Groundwater Readings

BH No:	Depth of standpipe	Depth to water - mbgl	Depth to water - mOD
13/10/2023			
BH01	3.94	3.34	36.14

Appendix 7

Geotechnical Laboratory Test Results

Classification Tests
In accordance with BS 1377: Part 2

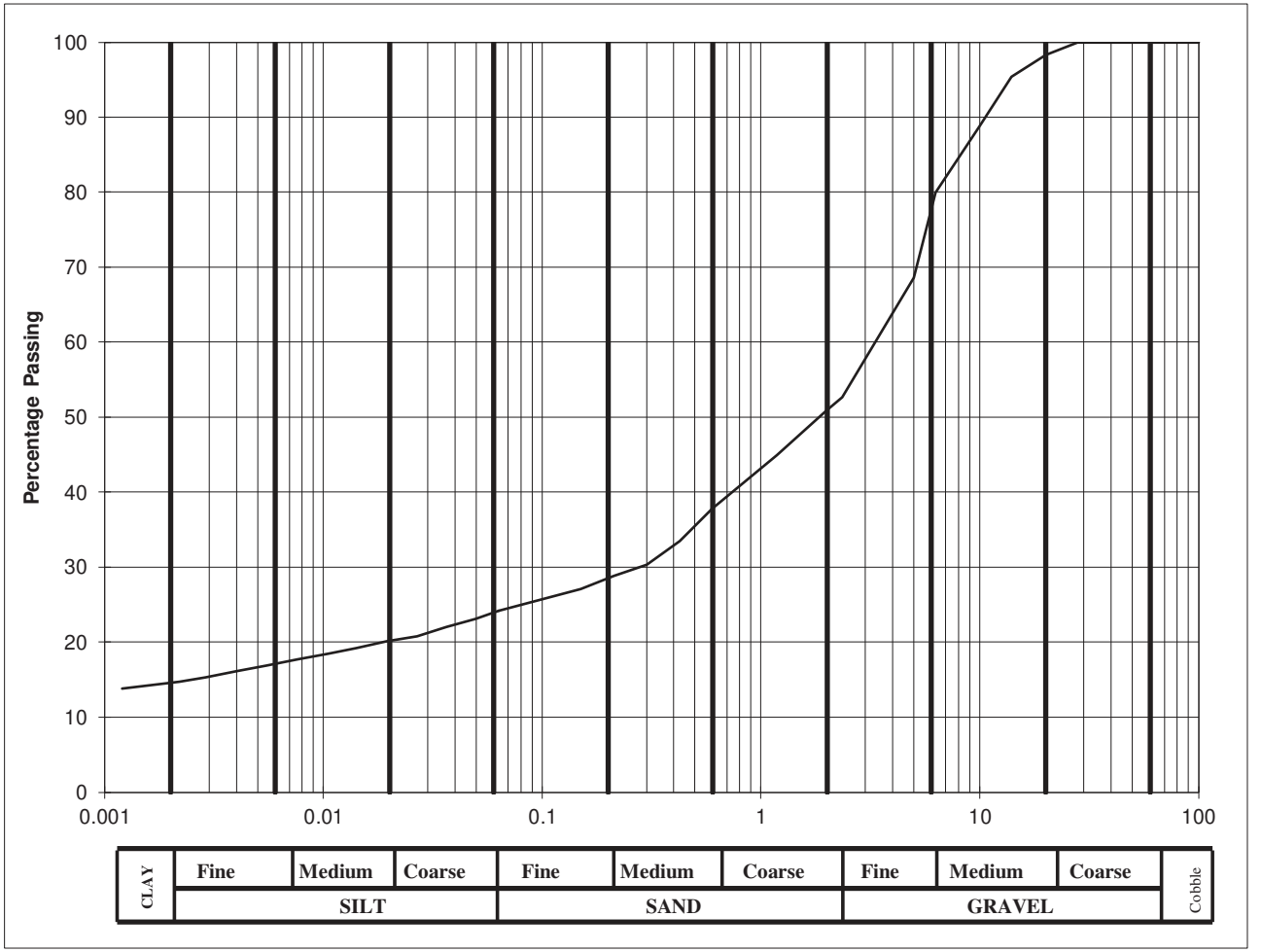
Client	Louth County Council
Site	Mullavalley, Louth Village
S.I. File No	6179 / 23
Test Lab	Site Investigations Ltd., Carhugar The Grange, 12th Lock Rd., Lucan Co. Dublin. Tel (01) 6108768 Email:info@siteinvestigations.ie
Report Date	2nd October 2023

Hole ID	Depth	Sample No	Lab Ref No.	Sample Type	Natural Moisture Content %	Liquid Limit %	Plastic Limit %	Plastic Index %	Bulk Density Mg/m^3	Dry Density Mg/m^3	% passing 425um	Comments	**Remarks** **C**=Clay; **M**=Silt **Plasticity**: **L**=Low; **I**=Intermediate; **H**=High; **V**=Very High; **E**=Extremely High
TP02	1.00	PM33	23/1470	B	15.7	29	20	9			33.5		CL
TP06	1.00	PM25	23/1471	B	8.0	32	20	12			35.8		CL
TP09	1.00	PM19	23/1472	B	16.4	29	20	9			33.2		CL
TP10	1.00	PM01	23/1473	B	15.0	30	20	10			37.4		CL
TP17	1.00	PM11	23/1474	B	16.4	30	19	11			46.6		CL

BS 1377 Particle Size Analysis

Site Investigations Limited

BS Sieve size, mm	Percent passing	Hydrometer analysis	
		Diameter, mm	% passing
100	100	**0.0630**	24
90	100	**0.0200**	20
75	100	**0.0060**	17
63	100	**0.0020**	15
50	100		
37.5	100		
28	100		
20	98.3		
14	95.4		
10	88.8		
6.3	79.9		
5.0	68.6		
2.36	52.6		
2.00	50.9		
1.18	44.9		
0.600	37.8		
0.425	33.5		
0.300	30.3		
0.212	28.8		
0.150	27.1		
0.063	24		



Cobbles, %	0
Gravel, %	49
Sand, %	27
Silt, %	9
Clay, %	15

Client :	Louth County Council
Project :	Mullavalley, Louth Village

Lab. No :	23/1470
Sample No :	PM33

Hole ID :	TP 02
Depth, m :	1.00

Material description :	slightly sandy gravelly silty CLAY
Remarks :	Soils with clay or silt content between 15% - 35% can be classified as clay or silt depending on the field Engineers assessment of in-situ behaviour. Where material is for re-use and therefore disturbed, only soils with clay or silt >35% are classified as clay or silt

Printed 16/10/2023

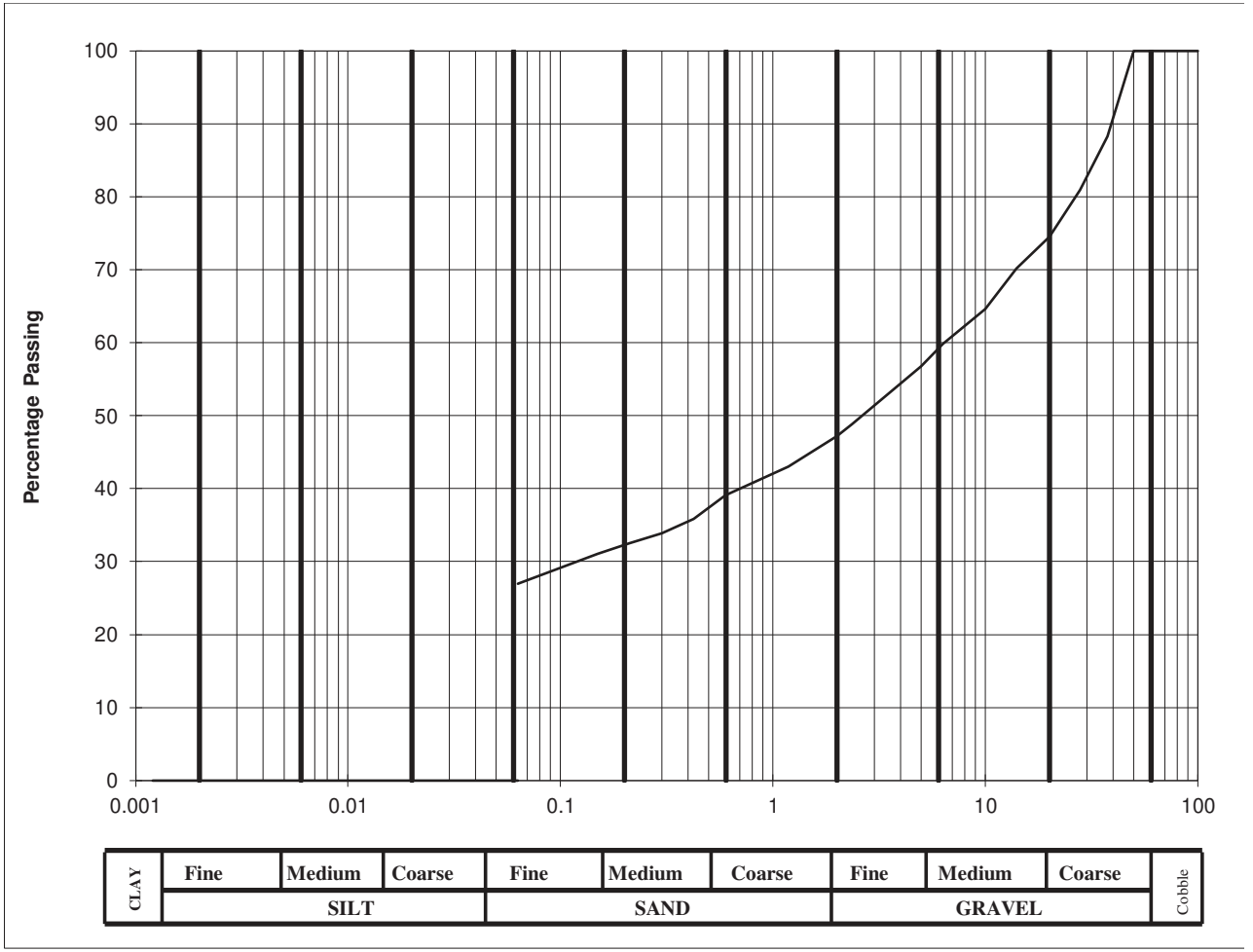
_____Paddy McGonagle
Site Investigations Ltd

BS 1377 Particle Size Analysis

Site Investigations Limited

BS Sieve size, mm	Percent passing	Hydrometer analysis	
		Diameter, mm	% passing
100	100	**0.0630**	
90	100	**0.0200**	
75	100	**0.0060**	
63	100	**0.0020**	
50	100		
37.5	88.3		
28	80.9		
20	74.5		
14	70.2		
10	64.6		
6.3	59.8		
5.0	56.8		
2.36	48.8		
2.00	47.2		
1.18	43		
0.600	39.1		
0.425	35.8		
0.300	33.9		
0.212	32.5		
0.150	31.1		
0.063	27		

Cobbles, %	0
Gravel, %	53
Sand, %	20
Clay / Silt, %	27



Client :	Louth County Council
Project :	Mullavalley, Louth Village

Lab. No :	23/1471
Sample No :	PM25

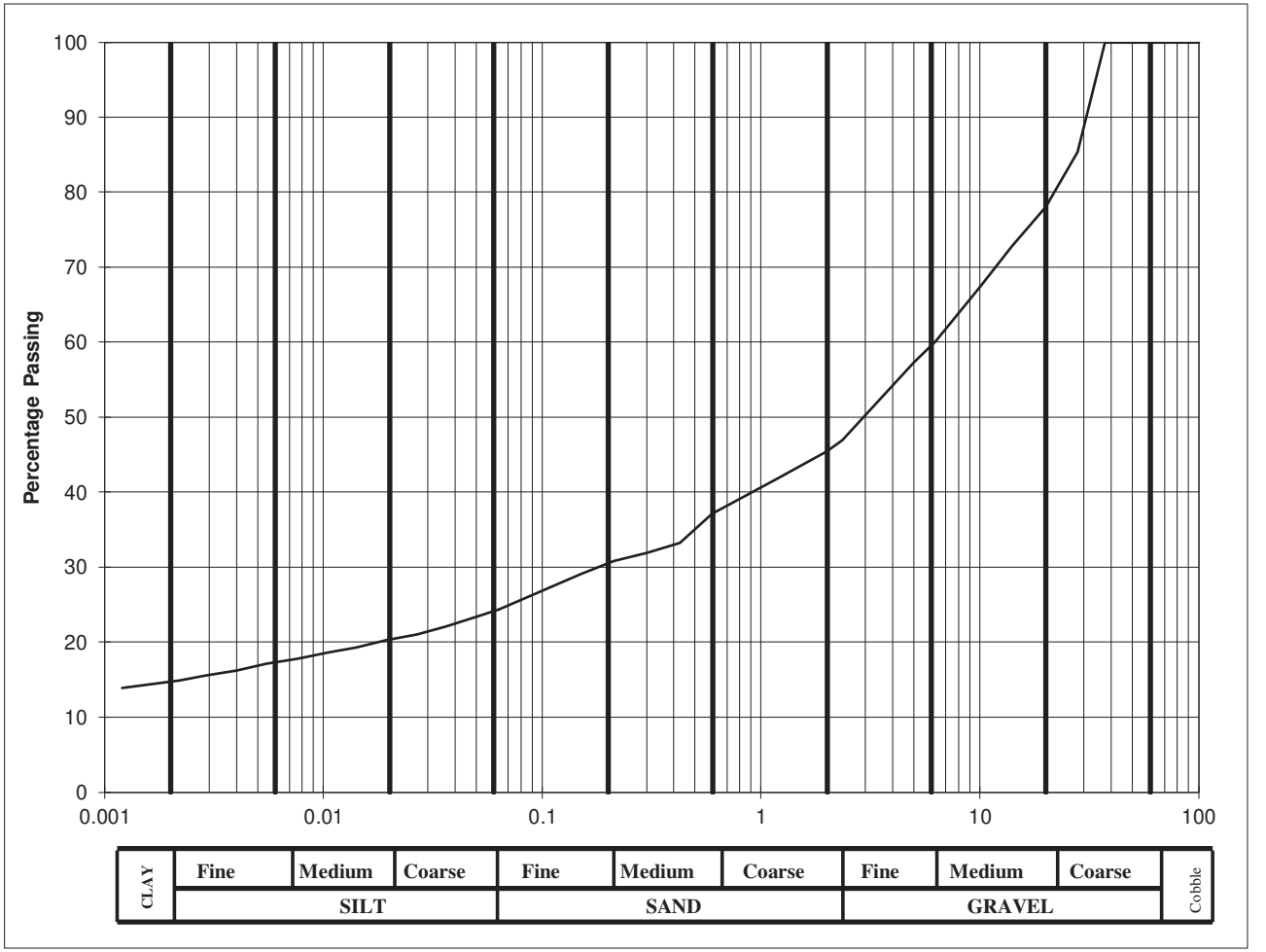
Hole ID :	TP 06
Depth, m :	1.00

Material description :	slightly sandy gravelly silty CLAY
Remarks :	Soils with clay or silt content between 15% - 35% can be classified as clay or silt depending on the field Engineers assessment of in-situ behaviour. Where material is for re-use and therefore disturbed, only soils with clay or silt >35% are classified as clay or silt

BS 1377 Particle Size Analysis

Site Investigations Limited

BS Sieve size, mm	Percent passing	Hydrometer analysis	
		Diameter, mm	% passing
100	100	**0.0630**	24
90	100	**0.0200**	20
75	100	**0.0060**	17
63	100	**0.0020**	15
50	100		
37.5	100		
28	85.3		
20	78		
14	72.7		
10	67.3		
6.3	60.1		
5.0	57.3		
2.36	46.9		
2.00	45.4		
1.18	41.8		
0.600	37.1		
0.425	33.2		
0.300	31.9		
0.212	30.8		
0.150	29.1		
0.063	24		



Cobbles, %	0
Gravel, %	55
Sand, %	21
Silt, %	9
Clay, %	15

Client :	Louth County Council
Project :	Mullavalley, Louth Village

Lab. No :	23/1472
Sample No :	PM19

Hole ID :	TP 09
Depth, m :	1.00

Material description :	slightly sandy gravelly silty CLAY
Remarks :	Soils with clay or silt content between 15% - 35% can be classified as clay or silt depending on the field Engineers assessment of in-situ behaviour. Where material is for re-use and therefore disturbed, only soils with clay or silt >35% are classified as clay or silt

Printed 16/10/2023

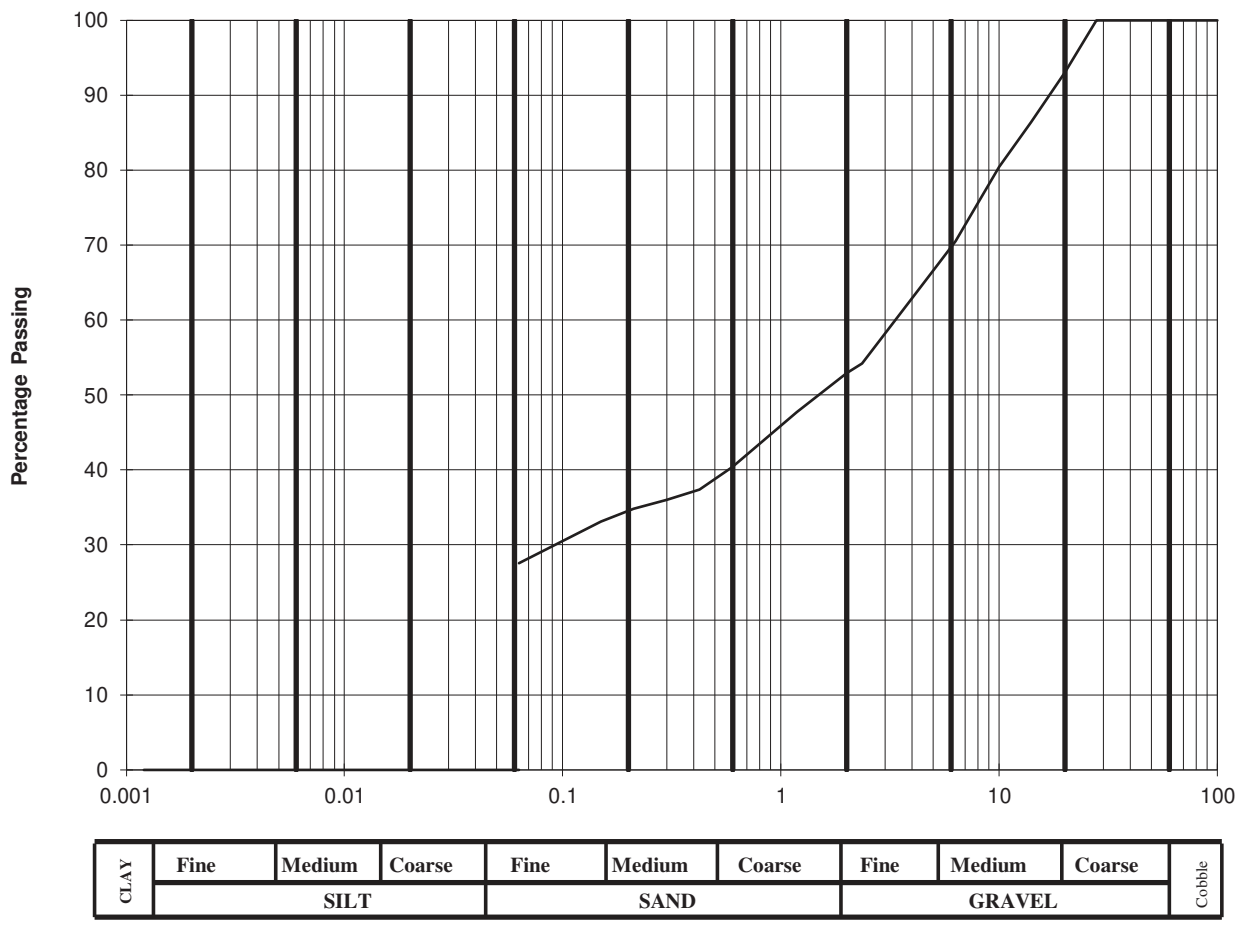
_____Paddy McGonagle
Site Investigations Ltd

BS 1377 Particle Size Analysis

Site Investigations Limited

BS Sieve size, mm	Percent passing	Hydrometer analysis	
		Diameter, mm	% passing
100	100	**0.0630**	
90	100	**0.0200**	
75	100	**0.0060**	
63	100	**0.0020**	
50	100		
37.5	100		
28	100		
20	93		
14	86.4		
10	80.4		
6.3	70.5		
5.0	66.6		
2.36	54.2		
2.00	52.9		
1.18	47.7		
0.600	40.4		
0.425	37.4		
0.300	36		
0.212	34.8		
0.150	33.1		
0.063	28		

Cobbles, %	0
Gravel, %	47
Sand, %	25
Clay / Silt, %	28



Client :	Louth County Council
Project :	Mullavalley, Louth Village

Lab. No :	23/1473
Sample No :	PM01

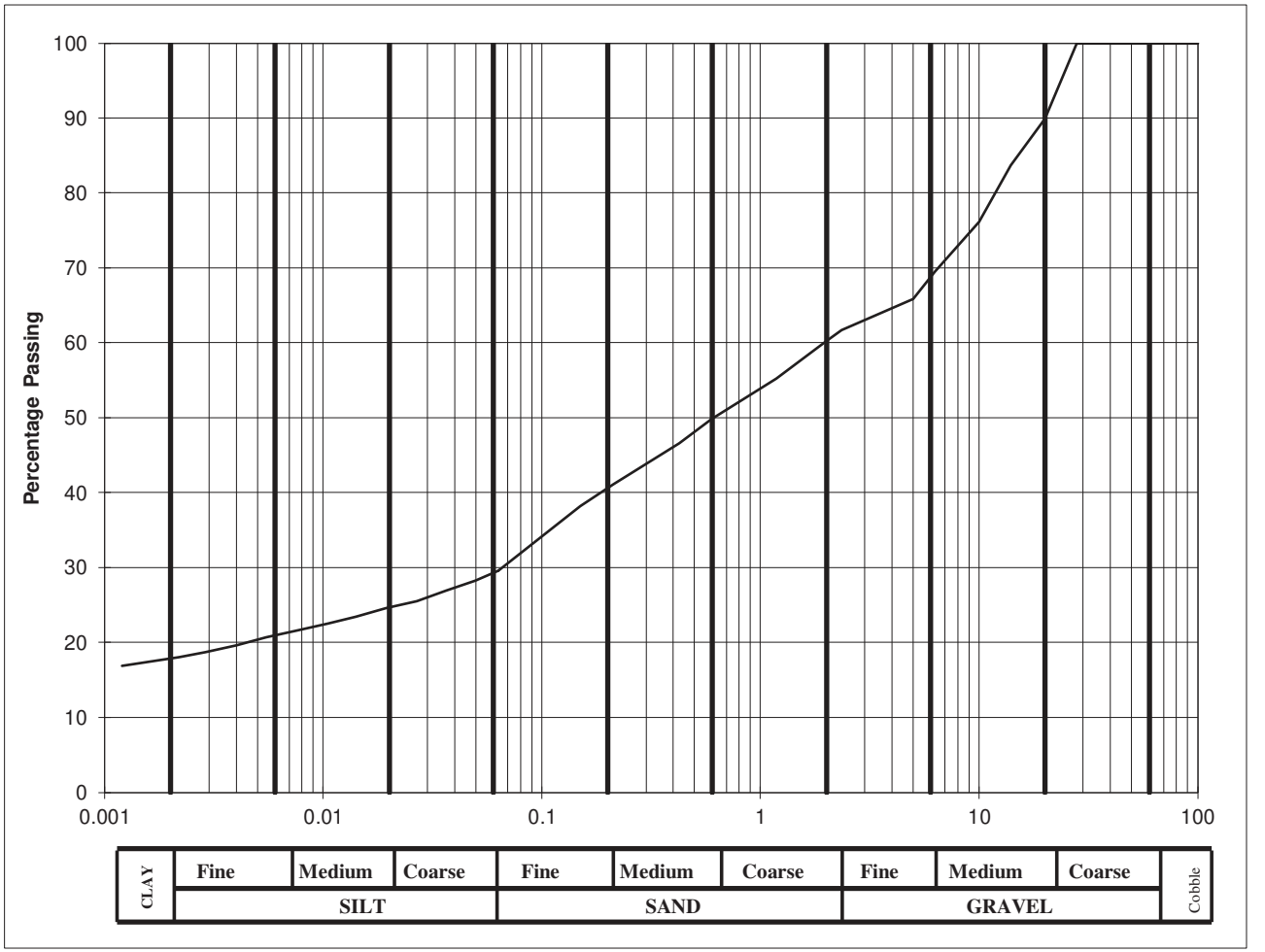
Hole ID :	TP 10
Depth, m :	1.00

Material description :	slightly sandy gravelly silty CLAY
Remarks :	Soils with clay or silt content between 15% - 35% can be classified as clay or silt depending on the field Engineers assessment of in-situ behaviour. Where material is for re-use and therefore disturbed, only soils with clay or silt >35% are classified as clay or silt

BS 1377 Particle Size Analysis

Site Investigations Limited

BS Sieve size, mm	Percent passing	Hydrometer analysis	
		Diameter, mm	% passing
100	100	**0.0630**	30
90	100	**0.0200**	25
75	100	**0.0060**	21
63	100	**0.0020**	18
50	100		
37.5	100		
28	100		
20	89.9		
14	83.7		
10	76.1		
6.3	69.5		
5.0	65.8		
2.36	61.7		
2.00	60.2		
1.18	55.2		
0.600	49.8		
0.425	46.6		
0.300	43.8		
0.212	41.1		
0.150	38.2		
0.063	30		



Cobbles, %	0
Gravel, %	40
Sand, %	30
Silt, %	12
Clay, %	18

Client :	Louth County Council
Project :	Mullavalley, Louth Village

Lab. No :	23/1474
Sample No :	PM11

Hole ID :	TP 17
Depth, m :	1.00

Material description :	slightly sandy gravelly silty CLAY
Remarks :	Soils with clay or silt content between 15% - 35% can be classified as clay or silt depending on the field Engineers assessment of in-situ behaviour. Where material is for re-use and therefore disturbed, only soils with clay or silt >35% are classified as clay or silt

Printed 16/10/2023

_____Paddy McGonagle
Site Investigations Ltd

Chemical Testing
In accordance with BS 1377: Part 3

Client	Louth County Council
Site	Mullavalley, Louth Village
S.I. File No	6179 / 23
Test Lab	Site Investigations Ltd., Carhugar The Grange, 12th Lock Rd., Lucan Co. Dublin. Tel (01) 6108768 Email:info@siteinvestigations.ie
Report Date	2nd October 2023

Hole Id	Depth (mBGL)	Sample No	Lab Ref	pH Value	Water Soluble Sulphate Content (2:1 Water-soil extract) (SO_3) g/L	Water Soluble Sulphate Content (2:1 Water-soil extract) (SO_3) %	Acid Soluble Sulphate Content (2:1 Water-soil extract) (SO_4) g/L	Acid Soluble Sulphate Content (2:1 Water-soil extract) (SO_4) %	Chloride ion Content (water:soil ratio 2:1) %	% passing 2mm
TP02	1.00	PM33	23/1470	8.55	0.119	0.060				50.9
TP06	1.00	PM25	23/1471	8.61	0.122	0.057				47.2
TP09	1.00	PM19	23/1472	8.70	0.117	0.053				45.4
TP10	1.00	PM01	23/1473	8.79	0.124	0.100				80.4
TP17	1.00	PM11	23/1474	8.74	0.120	0.072				60.2

Printed 16/10/2023

Site Investigations Ltd.

Appendix 8

Environmental Laboratory Test Results

Unit 7-8 Hawarden Business Park
Manor Road (off Manor Lane)
Hawarden
Deeside
CH5 3US
Tel: (01244) 528777
email: hawardencustomerservices@alsglobal.com
Website: www.alsenvironmental.co.uk

Site Investigations Ltd
The Grange
Carhugar
12th Lock Road
Lucan
Co. Dublin

Attention: Stephen Letch

CERTIFICATE OF ANALYSIS

Date of report Generation:	29 September 2023
Customer:	Site Investigations Ltd
Sample Delivery Group (SDG):	230922-106
Your Reference:	
Location:	Mullavalley, Louth Village
Report No:	705880
Order Number:	61/A/23

We received 4 samples on Friday September 22, 2023 and 4 of these samples were scheduled for analysis which was completed on Friday September 29, 2023. Accredited laboratory tests are defined within the report, but opinions, interpretations and on-site data expressed herein are outside the scope of ISO 17025 accreditation.

Should this report require incorporation into client reports, it must be used in its entirety and not simply with the data sections alone.

Chemical testing (unless subcontracted) performed at ALS Laboratories (UK) Limited Hawarden.

All sample data is provided by the customer. The reported results relate to the sample supplied, and on the basis that this data is correct.
Incorrect sampling dates and/or sample information will affect the validity of results.

Approved By:

Sonia McWhan
Operations Manager

1291

CERTIFICATE OF ANALYSIS

SDG: 230922-106 **Report Number:** 705880 **Superseded Report:**
Client Ref.: **Location:** Mullavalley, Louth Village

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
28672502	TP01		0.50	
28672503	TP08		0.50	
28672505	TP11		0.50	
28672506	TP17		0.50	

Only received samples which have had analysis scheduled will be shown on the following pages.

CERTIFICATE OF ANALYSIS

SDG: 230922-106 **Report Number:** 705880 **Superseded Report:**
Client Ref.: **Location:** Mullavalley, Louth Village

Results Legend

X Test

N No Determination Possible

Sample Types -
S - Soil/Solid
UNS - Unspecified Solid
GW - Ground Water
SW - Surface Water
LE - Land Leachate
PL - Prepared Leachate
PR - Process Water
SA - Saline Water
TE - Trade Effluent
TS - Treated Sewage
US - Untreated Sewage
RE - Recreational Water
DW - Drinking Water
Non-regulatory
UNL - Unspecified Liquid
SL - Sludge
G - Gas
OTH - Other

			Lab Sample No(s)	28672502			28672503			28672505			28672506		
			Customer Sample Reference	TP01			TP08			TP11			TP17		
			AGS Reference												
			Depth (m)	0.50			0.50			0.50			0.50		
			Container	1kg TUB with Handle (ALE260)	250g Amber Jar (ALE210)	60g VOC (ALE215)	1kg TUB with Handle (ALE260)	250g Amber Jar (ALE210)	60g VOC (ALE215)	1kg TUB with Handle (ALE260)	250g Amber Jar (ALE210)	60g VOC (ALE215)	1kg TUB with Handle (ALE260)	250g Amber Jar (ALE210)	60g VOC (ALE215)
			Sample Type	S	S	S	S	S	S	S	S	S	S	S	S
Anions by Kone (w)	All	NDPs: 0 Tests: 4		X			X			X			X		
CEN Readings	All	NDPs: 0 Tests: 4		X			X			X			X		
Chromium III	All	NDPs: 0 Tests: 4			X			X			X			X	
Coronene	All	NDPs: 0 Tests: 4			X			X			X			X	
Dissolved Metals by ICP-MS	All	NDPs: 0 Tests: 4		X			X			X			X		
Dissolved Organic/Inorganic Carbon	All	NDPs: 0 Tests: 4		X			X			X			X		
EPH by GCxGC-FID	All	NDPs: 0 Tests: 4			X			X			X			X	
EPH CWG GC (S)	All	NDPs: 0 Tests: 4			X			X			X			X	
Fluoride	All	NDPs: 0 Tests: 4		X			X			X			X		
GRO by GC-FID (S)	All	NDPs: 0 Tests: 4				X			X			X			X
Hexavalent Chromium (s)	All	NDPs: 0 Tests: 4			X			X			X			X	
Loss on Ignition in soils	All	NDPs: 0 Tests: 4			X			X			X			X	
Mercury Dissolved	All	NDPs: 0 Tests: 4		X			X			X			X		
Metals in solid samples by OES	All	NDPs: 0 Tests: 4			X			X			X			X	
PAH 16 & 17 Calc	All	NDPs: 0 Tests: 4			X			X			X			X	

CERTIFICATE OF ANALYSIS

SDG: 230922-106 **Report Number:** 705880 **Superseded Report:**
Client Ref.: **Location:** Mullavalley, Louth Village

Results Legend

X Test

N No Determination Possible

Sample Types -
S - Soil/Solid
UNS - Unspecified Solid
GW - Ground Water
SW - Surface Water
LE - Land Leachate
PL - Prepared Leachate
PR - Process Water
SA - Saline Water
TE - Trade Effluent
TS - Treated Sewage
US - Untreated Sewage
RE - Recreational Water
DW - Drinking Water Non-regulatory
UNL - Unspecified Liquid
SL - Sludge
G - Gas
OTH - Other

			Lab Sample No(s)	28672502	28672503	28672505	28672506
			Customer Sample Reference	TP01	TP08	TP11	TP17
			AGS Reference				
			Depth (m)	0.50	0.50	0.50	0.50
			Container	1kg TUB with Handle (ALE260)	250g Amber Jar (ALE210)	60g VOC (ALE215)	1kg TUB with Handle (ALE260)	250g Amber Jar (ALE210)	60g VOC (ALE215)	1kg TUB with Handle (ALE260)	250g Amber Jar (ALE210)	60g VOC (ALE215)	1kg TUB with Handle (ALE260)	250g Amber Jar (ALE210)	60g VOC (ALE215)
			Sample Type	S	S	S	S	S	S	S	S	S	S	S	S
PAH by GCMS	All	NDPs: 0 Tests: 4			X			X			X			X	
PCBs by GCMS	All	NDPs: 0 Tests: 4			X			X			X			X	
pH	All	NDPs: 0 Tests: 4			X			X			X			X	
pH Value of Filtered Water	All	NDPs: 0 Tests: 4	X			X			X			X		
Phenols by HPLC (W)	All	NDPs: 0 Tests: 4	X			X			X			X		
Sample description	All	NDPs: 0 Tests: 4		X			X			X			X	
Total Dissolved Solids on Leachates	All	NDPs: 0 Tests: 4	X			X			X			X		
Total Organic Carbon	All	NDPs: 0 Tests: 4		X			X			X			X	
TPH CWG GC (S)	All	NDPs: 0 Tests: 4		X			X			X			X	
VOC MS (S)	All	NDPs: 0 Tests: 4			X			X			X			X

Sample Descriptions

Grain Sizes

very fine	<0.063mm	fine	0.063mm - 0.1mm	medium	0.1mm - 2mm	coarse	2mm - 10mm	very coarse	>10mm

Lab Sample No(s)	Customer Sample Ref.	Depth (m)	Colour	Description	Inclusions	Inclusions 2
28672502	TP01	0.50	Dark Brown	Sandy Loam	Stones	Vegetation
28672503	TP08	0.50	Dark Brown	Loamy Sand	Stones	Vegetation
28672505	TP11	0.50	Dark Brown	Loamy Sand	Stones	Vegetation
28672506	TP17	0.50	Dark Brown	Loamy Sand	Stones	None

These descriptions are only intended to act as a cross check if sample identities are questioned, and to provide a log of sample matrices with respect to MCERTS validation. They are not intended as full geological descriptions.

We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally ocurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample.

Other coarse granular materials such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

CERTIFICATE OF ANALYSIS

SDG: 230922-106 **Report Number:** 705880 **Superseded Report:**
Client Ref.: **Location:** Mullavalley, Louth Village

Results Legend
- # ISO17025 accredited.
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- aq Aqueous / settled sample.
- diss.filt Dissolved / filtered sample.
- tot.unfilt Total / unfiltered sample.
- * Subcontracted - refer to subcontractor report for accreditation status.
- ** % recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
- (F) Trigger breach confirmed
- 1-4+§@ Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	TP01	TP08	TP11	TP17		
			Depth (m)	0.50	0.50	0.50	0.50		
			Sample Type	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)		
			Date Sampled	-	-	-	-		
			Sample Time	-	-	-	-		
			Date Received	22/09/2023	22/09/2023	22/09/2023	22/09/2023		
			SDG Ref	230922-106	230922-106	230922-106	230922-106		
			Lab Sample No.(s)	28672502	28672503	28672505	28672506		
			AGS Reference						
Moisture Content Ratio (% of as received sample)	%	PM024		6.7 §	12 §	6.5 §	6.2 §		
Loss on ignition	<0.7 %	TM018		2.68 § M	1.88 § M	3.55 § M	1.83 § M		
Organic Carbon, Total	<0.2 %	TM132		3.75 § M	0.251 § M	<0.2 § M	<0.2 § M		
pH	1 pH Units	TM133		6.81 § M	7.01 § M	7.53 § M	8.93 § M		
Chromium, Hexavalent	<0.6 mg/kg	TM151		<0.6 § M	<0.6 § M	<0.6 § M	<0.6 § M		
PCB congener 28	<3 µg/kg	TM168		<3 § M	<3 § M	<3 § M	<3 § M		
PCB congener 52	<3 µg/kg	TM168		<3 § M	<3 § M	<3 § M	<3 § M		
PCB congener 101	<3 µg/kg	TM168		<3 § M	<3 § M	<3 § M	<3 § M		
PCB congener 118	<3 µg/kg	TM168		<3 § M	<3 § M	<3 § M	<3 § M		
PCB congener 138	<3 µg/kg	TM168		<3 § M	<3 § M	<3 § M	<3 § M		
PCB congener 153	<3 µg/kg	TM168		<3 § M	<3 § M	<3 § M	<3 § M		
PCB congener 180	<3 µg/kg	TM168		<3 § M	<3 § M	<3 § M	<3 § M		
Sum of detected PCB 7 Congeners	<21 µg/kg	TM168		<21 §	<21 §	<21 §	<21 §		
Chromium, Trivalent	<0.9 mg/kg	TM181		34.7 §	36.2 §	33 §	34 §		
Antimony	<0.6 mg/kg	TM181		<0.6 § #	<0.6 § #	<0.6 § #	<0.6 § #		
Arsenic	<0.6 mg/kg	TM181		4.58 § M	4.39 § M	4.02 § M	6.78 § M		
Barium	<0.6 mg/kg	TM181		79.2 § #	69.7 § #	97.2 § #	53 § #		
Cadmium	<0.02 mg/kg	TM181		<0.02 § M	<0.02 § M	<0.02 § M	<0.02 § M		
Chromium	<0.9 mg/kg	TM181		34.7 § M	36.2 § M	33 § M	34 § M		
Copper	<1.4 mg/kg	TM181		32.9 § M	28.3 § M	42.3 § M	18.3 § M		
Lead	<0.7 mg/kg	TM181		9.07 § M	9.64 § M	7.65 § M	7.39 § M		
Mercury	<0.1 mg/kg	TM181		<0.1 § M	<0.1 § M	<0.1 § M	<0.1 § M		
Molybdenum	<0.1 mg/kg	TM181		<0.1 § #	<0.1 § #	<0.1 § #	<0.1 § #		
Nickel	<0.2 mg/kg	TM181		60 § M	56.9 § M	58.2 § M	50.2 § M		
Selenium	<1 mg/kg	TM181		<1 § #	<1 § #	<1 § #	<1 § #		
Zinc	<1.9 mg/kg	TM181		65.7 § M	62.6 § M	64.4 § M	66.1 § M		
PAH Total 17 (inc Coronene) Moisture Corrected	<10 mg/kg	TM410		<10 §	<10 §	<10 §	<10 §		
Coronene	<200 µg/kg	TM410		<200 §	<200 §	<200 §	<200 §		
Mineral Oil >C10-C40 (EH_2D_AL)	<5 mg/kg	TM415		<5 §	<5 §	<5 §	<5 §		

CERTIFICATE OF ANALYSIS

SDG: 230922-106 **Report Number:** 705880 **Superseded Report:**
Client Ref.: **Location:** Mullavalley, Louth Village

PAH by GCMS

Results Legend
- # ISO17025 accredited.
- M mCERTS accredited.
- aq Aqueous / settled sample.
- diss.filt Dissolved / filtered sample.
- tot.unfilt Total / unfiltered sample.
- * Subcontracted - refer to subcontractor report for accreditation status.
- ** % recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
- (F) Trigger breach confirmed
- 1-4♦§@ Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	TP01	TP08	TP11	TP17		
			Depth (m)	0.50	0.50	0.50	0.50		
			Sample Type	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)		
			Date Sampled	-	-	-	-		
			Sample Time	.	.	.	.		
			Date Received	22/09/2023	22/09/2023	22/09/2023	22/09/2023		
			SDG Ref	230922-106	230922-106	230922-106	230922-106		
			Lab Sample No.(s)	28672502	28672503	28672505	28672506		
			AGS Reference						
Naphthalene	<9 µg/kg	TM218		<9 § M	<9 § M	<9 § M	<9 § M		
Acenaphthylene	<12 µg/kg	TM218		<12 § M	<12 § M	<12 § M	<12 § M		
Acenaphthene	<8 µg/kg	TM218		<8 § M	<8 § M	<8 § M	<8 § M		
Fluorene	<10 µg/kg	TM218		<10 § M	<10 § M	<10 § M	<10 § M		
Phenanthrene	<15 µg/kg	TM218		<15 § M	<15 § M	<15 § M	<15 § M		
Anthracene	<16 µg/kg	TM218		<16 § M	<16 § M	<16 § M	<16 § M		
Fluoranthene	<17 µg/kg	TM218		<17 § M	<17 § M	<17 § M	<17 § M		
Pyrene	<15 µg/kg	TM218		<15 § M	<15 § M	<15 § M	<15 § M		
Benz(a)anthracene	<14 µg/kg	TM218		<14 § M	<14 § M	<14 § M	<14 § M		
Chrysene	<10 µg/kg	TM218		<10 § M	<10 § M	<10 § M	<10 § M		
Benzo(b)fluoranthene	<15 µg/kg	TM218		<15 § M	<15 § M	<15 § M	<15 § M		
Benzo(k)fluoranthene	<14 µg/kg	TM218		<14 § M	<14 § M	<14 § M	<14 § M		
Benzo(a)pyrene	<15 µg/kg	TM218		<15 § M	<15 § M	<15 § M	<15 § M		
Indeno(1,2,3-cd)pyrene	<18 µg/kg	TM218		<18 § M	<18 § M	<18 § M	<18 § M		
Dibenzo(a,h)anthracene	<23 µg/kg	TM218		<23 § M	<23 § M	<23 § M	<23 § M		
Benzo(g,h,i)perylene	<24 µg/kg	TM218		<24 § M	<24 § M	<24 § M	<24 § M		
PAH, Total Detected USEPA 16	<118 µg/kg	TM218		<118 §	<118 §	<118 §	<118 §		

CERTIFICATE OF ANALYSIS

SDG: 230922-106 **Report Number:** 705880 **Superseded Report:**
Client Ref.: **Location:** Mullavalley, Louth Village

TPH CWG (S)

Results Legend
- # ISO17025 accredited.
- M mCERTS accredited.
- aq Aqueous / settled sample.
- diss.filt Dissolved / filtered sample.
- tot.unfilt Total / unfiltered sample.
- * Subcontracted - refer to subcontractor report for accreditation status.
- ** % recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
- (F) Trigger breach confirmed
- 1-4+§@ Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	TP01	TP08	TP11	TP17		
			Depth (m)	0.50	0.50	0.50	0.50		
			Sample Type	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)		
			Date Sampled	-	-	-	-		
			Sample Time	-	-	-	-		
			Date Received	22/09/2023	22/09/2023	22/09/2023	22/09/2023		
			SDG Ref	230922-106	230922-106	230922-106	230922-106		
			Lab Sample No.(s)	28672502	28672503	28672505	28672506		
			AGS Reference						
GRO Surrogate % recovery**	%	TM089		107 §	98.6 §	98.8 §	102 §		
Aliphatics >C5-C6 (HS_1D_AL)	<10 µg/kg	TM089		<10 §	<10 §	<10 §	<10 §		
Aliphatics >C6-C8 (HS_1D_AL)	<10 µg/kg	TM089		<10 §	<10 §	<10 §	<10 §		
Aliphatics >C8-C10 (HS_1D_AL)	<10 µg/kg	TM089		<10 §	<10 §	<10 §	<10 §		
Aliphatics >C10-C12 (EH_2D_AL_#1)	<1000 µg/kg	TM414		<1000 § #	<1000 § #	<1000 § #	<1000 § #		
Aliphatics >C12-C16 (EH_2D_AL_#1)	<1000 µg/kg	TM414		<1000 § #	<1000 § #	<1000 § #	<1000 § #		
Aliphatics >C16-C21 (EH_2D_AL_#1)	<1000 µg/kg	TM414		<1000 § #	<1000 § #	<1000 § #	<1000 § #		
Aliphatics >C21-C35 (EH_2D_AL_#1)	<1000 µg/kg	TM414		<1000 § #	<1000 § #	<1000 § #	<1000 § #		
Aliphatics >C35-C44 (EH_2D_AL_#1)	<1000 µg/kg	TM414		<1000 §	<1000 §	<1000 §	<1000 §		
Total Aliphatics >C10-C44 (EH_2D_AR_#1)	<5000 µg/kg	TM414		<5000 §	<5000 §	<5000 §	<5000 §		
Total Aliphatics & Aromatics >C10-C44 (EH_2D_Total_#1)	<10000 µg/kg	TM414		<10000 §	<10000 §	<10000 §	<10000 §		
Aromatics >EC5-EC7 (HS_1D_AR)	<10 µg/kg	TM089		<10 §	<10 §	<10 §	<10 §		
Aromatics >EC7-EC8 (HS_1D_AR)	<10 µg/kg	TM089		<10 §	<10 §	<10 §	<10 §		
Aromatics >EC8-EC10 (HS_1D_AR)	<10 µg/kg	TM089		<10 §	<10 §	<10 §	<10 §		
Aromatics > EC10-EC12 (EH_2D_AR_#1)	<1000 µg/kg	TM414		<1000 § #	<1000 § #	<1000 § #	<1000 § #		
Aromatics > EC12-EC16 (EH_2D_AR_#1)	<1000 µg/kg	TM414		<1000 § #	<1000 § #	<1000 § #	<1000 § #		
Aromatics > EC16-EC21 (EH_2D_AR_#1)	<1000 µg/kg	TM414		<1000 § #	<1000 § #	<1000 § #	<1000 § #		
Aromatics > EC21-EC35 (EH_2D_AR_#1)	<1000 µg/kg	TM414		<1000 § #	<1000 § #	<1000 § #	<1000 § #		
Aromatics >EC35-EC44 (EH_2D_AR_#1)	<1000 µg/kg	TM414		<1000 §	<1000 §	<1000 §	<1000 §		
Aromatics > EC40-EC44 (EH_2D_AR_#1)	<1000 µg/kg	TM414		<1000 §	<1000 §	<1000 §	<1000 §		
Total Aromatics > EC10-EC44 (EH_2D_AR_#1)	<5000 µg/kg	TM414		<5000 §	<5000 §	<5000 §	<5000 §		
Total Aliphatics & Aromatics >C5-C44 (EH_2D_Total_#1+HS_1D_Total)	<10000 µg/kg	TM414		<10000 §	<10000 §	<10000 §	<10000 §		
GRO >C5-C6 (HS_1D)	<20 µg/kg	TM089		<20 §	<20 §	<20 §	<20 §		
GRO >C6-C7 (HS_1D)	<20 µg/kg	TM089		<20 §	<20 §	<20 §	<20 §		
GRO >C7-C8 (HS_1D)	<20 µg/kg	TM089		<20 §	<20 §	<20 §	<20 §		
GRO >C8-C10 (HS_1D)	<20 µg/kg	TM089		<20 §	<20 §	<20 §	<20 §		
GRO >C10-C12 (HS_1D)	<20 µg/kg	TM089		<20 §	<20 §	<20 §	<20 §		
Total Aliphatics >C5-C10 (HS_1D_AL_TOTAL)	<50 µg/kg	TM089		<50 §	<50 §	<50 §	<50 §		
Total Aromatics >EC5-EC10 (HS_1D_AR_TOTAL)	<50 µg/kg	TM089		<50 §	<50 §	<50 §	<50 §		
GRO >C5-C10 (HS_1D_TOTAL)	<20 µg/kg	TM089		<20 §	<20 §	<20 §	<20 §		

CERTIFICATE OF ANALYSIS

SDG: 230922-106 **Report Number:** 705880 **Superseded Report:**
Client Ref.: **Location:** Mullavalley, Louth Village

VOC MS (S)

Results Legend
- # ISO17025 accredited.
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- aq Aqueous / settled sample.
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- (F) Trigger breach confirmed
- 1-4♦§@ Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	TP01	TP08	TP11	TP17		
			Depth (m)	0.50	0.50	0.50	0.50		
			Sample Type	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)		
			Date Sampled	-	-	-	-		
			Sample Time	.	.	.	.		
			Date Received	22/09/2023	22/09/2023	22/09/2023	22/09/2023		
			SDG Ref	230922-106	230922-106	230922-106	230922-106		
			Lab Sample No.(s)	28672502	28672503	28672505	28672506		
			AGS Reference						
Dibromofluoromethane**	%	TM116		108 §	113 §	112 §	112 §		
Toluene-d8**	%	TM116		100 §	100 §	100 §	99.9 §		
4-Bromofluorobenzene**	%	TM116		103 §	103 §	98 §	97 §		
Methyl Tertiary Butyl Ether	<0.5 µg/kg	TM116		<0.5 § M	<0.5 § M	<0.5 § M	<0.5 § M		
Benzene	<1 µg/kg	TM116		<1 § M	<1 § M	<1 § M	<1 § M		
Toluene	<1 µg/kg	TM116		<1 § M	<1 § M	<1 § M	<1 § M		
Ethylbenzene	<1 µg/kg	TM116		<1 § M	<1 § M	<1 § M	<1 § M		
p/m-Xylene	<2 µg/kg	TM116		<2 § #	<2 § #	<2 § #	<2 § #		
o-Xylene	<2 µg/kg	TM116		<2 § M	<2 § M	<2 § M	<2 § M		

Validated

CERTIFICATE OF ANALYSIS

SDG: 230922-106 Report Number: 705880 Superseded Report:
Client Ref.: Location: Mullavalley, Louth Village

CEN 10:1 SINGLE STAGE LEACHATE TEST

WAC ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference		**Site Location**	Mullavalley, Louth Village
Mass Sample taken (kg)	0.102	**Natural Moisture Content (%)**	13.7
Mass of dry sample (kg)	0.090	**Dry Matter Content (%)**	88
Particle Size <4mm	>95%		

Case	
SDG	230922-106
Lab Sample Number(s)	28672502
Sampled Date	
Customer Sample Ref.	TP01
Depth (m)	0.50

Solid Waste Analysis	**Result**	**Landfill Waste Acceptance Criteria Limits**		
		Inert Waste Landfill	Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill	Hazardous Waste Landfill
Total Organic Carbon (%)	3.75	3	5	6
Loss on Ignition (%)	2.68	-	-	10
Sum of BTEX (mg/kg)	-	-	-	-
Sum of 7 PCBs (mg/kg)	<0.021	1	-	-
Mineral Oil (mg/kg) (EH_2D_AL)	<5	500	-	-
PAH Sum of 17 (mg/kg)	<10	100	-	-
pH (pH Units)	6.81	-	>6	-
ANC to pH 6 (mol/kg)	-	-	-	-
ANC to pH 4 (mol/kg)	-	-	-	-

Eluate Analysis	**C_2 Concⁿ in 10:1 eluate (mg/l)**		**A_2 10:1 concⁿ leached (mg/kg)**		**Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg**		
	Result	Limit of Detection	Result	Limit of Detection			
Arsenic	<0.0005	<0.0005	<0.005	<0.005	0.5	2	25
Barium	0.029	<0.0002	0.29	<0.002	20	100	300
Cadmium	<0.00008	<0.00008	<0.0008	<0.0008	0.04	1	5
Chromium	<0.001	<0.001	<0.01	<0.01	0.5	10	70
Copper	0.00275	<0.0003	0.0275	<0.003	2	50	100
Mercury Dissolved (CVAF)	0.0000102	<0.00001	0.000102	<0.0001	0.01	0.2	2
Molybdenum	<0.003	<0.003	<0.03	<0.03	0.5	10	30
Nickel	0.000791	<0.0004	0.00791	<0.004	0.4	10	40
Lead	0.000282	<0.0002	0.00282	<0.002	0.5	10	50
Antimony	<0.001	<0.001	<0.01	<0.01	0.06	0.7	5
Selenium	<0.001	<0.001	<0.01	<0.01	0.1	0.5	7
Zinc	0.00414	<0.001	0.0414	<0.01	4	50	200
Chloride	<2	<2	<20	<20	800	15000	25000
Fluoride	<0.5	<0.5	<5	<5	10	150	500
Sulphate (soluble)	<2	<2	<20	<20	1000	20000	50000
Total Dissolved Solids	16.5	<10	165	<100	4000	60000	100000
Total Monohydric Phenols (W)	<0.016	<0.016	<0.16	<0.16	1	-	-
Dissolved Organic Carbon	3.41	<3	34.1	<30	500	800	1000

Leach Test Information

Date Prepared	23-Sep-2023
pH (pH Units)	7.46
Conductivity (µS/cm)	23
Volume Leachant (Litres)	0.888

Solid Results are expressed on a dry weight basis, after correction for moisture content where applicable
Leachates prepared in accordance with BS EN 12457 will be carried out at room temperature (20±5°C)
Stated limits are for guidance only and ALS Laboratories (UK) Limited cannot be held responsible for any discrepancies with current legislation

29/09/2023 14:26:44

14:26:38 29/09/2023

Validated

CERTIFICATE OF ANALYSIS

SDG: 230922-106 Report Number: 705880 Superseded Report:
Client Ref.: Location: Mullavalley, Louth Village

CEN 10:1 SINGLE STAGE LEACHATE TEST

WAC ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference		**Site Location**	Mullavalley, Louth Village
Mass Sample taken (kg)	0.102	**Natural Moisture Content (%)**	14
Mass of dry sample (kg)	0.090	**Dry Matter Content (%)**	87.7
Particle Size <4mm	>95%		

Case	
SDG	230922-106
Lab Sample Number(s)	28672503
Sampled Date	
Customer Sample Ref.	TP08
Depth (m)	0.50

Solid Waste Analysis	**Result**	**Landfill Waste Acceptance Criteria Limits**		
		Inert Waste Landfill	Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill	Hazardous Waste Landfill
Total Organic Carbon (%)	0.251	3	5	6
Loss on Ignition (%)	1.88	-	-	10
Sum of BTEX (mg/kg)	-	-	-	-
Sum of 7 PCBs (mg/kg)	<0.021	1	-	-
Mineral Oil (mg/kg) (EH_2D_AL)	<5	500	-	-
PAH Sum of 17 (mg/kg)	<10	100	-	-
pH (pH Units)	7.01	-	>6	-
ANC to pH 6 (mol/kg)	-	-	-	-
ANC to pH 4 (mol/kg)	-	-	-	-

Eluate Analysis	**C_2 Concⁿ in 10:1 eluate (mg/l)**		**A_2 10:1 concⁿ leached (mg/kg)**		**Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg**		
	Result	Limit of Detection	Result	Limit of Detection			
Arsenic	<0.0005	<0.0005	<0.005	<0.005	0.5	2	25
Barium	0.086	<0.0002	0.86	<0.002	20	100	300
Cadmium	<0.00008	<0.00008	<0.0008	<0.0008	0.04	1	5
Chromium	<0.001	<0.001	<0.01	<0.01	0.5	10	70
Copper	0.0015	<0.0003	0.015	<0.003	2	50	100
Mercury Dissolved (CVAF)	0.000011	<0.00001	0.00011	<0.0001	0.01	0.2	2
Molybdenum	<0.003	<0.003	<0.03	<0.03	0.5	10	30
Nickel	0.000677	<0.0004	0.00677	<0.004	0.4	10	40
Lead	0.000591	<0.0002	0.00591	<0.002	0.5	10	50
Antimony	<0.001	<0.001	<0.01	<0.01	0.06	0.7	5
Selenium	<0.001	<0.001	<0.01	<0.01	0.1	0.5	7
Zinc	0.01	<0.001	0.1	<0.01	4	50	200
Chloride	<2	<2	<20	<20	800	15000	25000
Fluoride	<0.5	<0.5	<5	<5	10	150	500
Sulphate (soluble)	<2	<2	<20	<20	1000	20000	50000
Total Dissolved Solids	17.5	<10	175	<100	4000	60000	100000
Total Monohydric Phenols (W)	<0.016	<0.016	<0.16	<0.16	1	-	-
Dissolved Organic Carbon	4.87	<3	48.7	<30	500	800	1000

Leach Test Information

Date Prepared	23-Sep-2023
pH (pH Units)	7.51
Conductivity (µS/cm)	24
Volume Leachant (Litres)	0.888

Solid Results are expressed on a dry weight basis, after correction for moisture content where applicable
Leachates prepared in accordance with BS EN 12457 will be carried out at room temperature (20±5°C)
Stated limits are for guidance only and ALS Laboratories (UK) Limited cannot be held responsible for any discrepancies with current legislation

29/09/2023 14:26:44

14:26:38 29/09/2023

Validated

CERTIFICATE OF ANALYSIS

SDG: 230922-106 Report Number: 705880 Superseded Report:
Client Ref.: Location: Mullavalley, Louth Village

CEN 10:1 SINGLE STAGE LEACHATE TEST

WAC ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference		**Site Location**	Mullavalley, Louth Village
Mass Sample taken (kg)	0.102	**Natural Moisture Content (%)**	13.9
Mass of dry sample (kg)	0.090	**Dry Matter Content (%)**	87.8
Particle Size <4mm	>95%		

Case	
SDG	230922-106
Lab Sample Number(s)	28672505
Sampled Date	
Customer Sample Ref.	TP11
Depth (m)	0.50

Solid Waste Analysis	**Result**	**Landfill Waste Acceptance Criteria Limits**		
		Inert Waste Landfill	Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill	Hazardous Waste Landfill
Total Organic Carbon (%)	<0.2	3	5	6
Loss on Ignition (%)	3.55	-	-	10
Sum of BTEX (mg/kg)	-	-	-	-
Sum of 7 PCBs (mg/kg)	<0.021	1	-	-
Mineral Oil (mg/kg) (EH_2D_AL)	<5	500	-	-
PAH Sum of 17 (mg/kg)	<10	100	-	-
pH (pH Units)	7.53	-	>6	-
ANC to pH 6 (mol/kg)	-	-	-	-
ANC to pH 4 (mol/kg)	-	-	-	-

Eluate Analysis	**C_2 Concⁿ in 10:1 eluate (mg/l)**		**A_2 10:1 concⁿ leached (mg/kg)**		**Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg**		
	Result	Limit of Detection	Result	Limit of Detection			
Arsenic	<0.0005	<0.0005	<0.005	<0.005	0.5	2	25
Barium	0.05	<0.0002	0.5	<0.002	20	100	300
Cadmium	<0.00008	<0.00008	<0.0008	<0.0008	0.04	1	5
Chromium	<0.001	<0.001	<0.01	<0.01	0.5	10	70
Copper	0.00272	<0.0003	0.0272	<0.003	2	50	100
Mercury Dissolved (CVAF)	<0.00001	<0.00001	<0.0001	<0.0001	0.01	0.2	2
Molybdenum	<0.003	<0.003	<0.03	<0.03	0.5	10	30
Nickel	0.00068	<0.0004	0.0068	<0.004	0.4	10	40
Lead	0.000291	<0.0002	0.00291	<0.002	0.5	10	50
Antimony	<0.001	<0.001	<0.01	<0.01	0.06	0.7	5
Selenium	<0.001	<0.001	<0.01	<0.01	0.1	0.5	7
Zinc	0.00571	<0.001	0.0571	<0.01	4	50	200
Chloride	<2	<2	<20	<20	800	15000	25000
Fluoride	<0.5	<0.5	<5	<5	10	150	500
Sulphate (soluble)	<2	<2	<20	<20	1000	20000	50000
Total Dissolved Solids	18.2	<10	182	<100	4000	60000	100000
Total Monohydric Phenols (W)	<0.016	<0.016	<0.16	<0.16	1	-	-
Dissolved Organic Carbon	<3	<3	<30	<30	500	800	1000

Leach Test Information

Date Prepared	23-Sep-2023
pH (pH Units)	7.61
Conductivity (µS/cm)	25
Volume Leachant (Litres)	0.888

Solid Results are expressed on a dry weight basis, after correction for moisture content where applicable
Leachates prepared in accordance with BS EN 12457 will be carried out at room temperature (20±5°C)
Stated limits are for guidance only and ALS Laboratories (UK) Limited cannot be held responsible for any discrepancies with current legislation

29/09/2023 14:26:44

14:26:38 29/09/2023

Validated

CERTIFICATE OF ANALYSIS

SDG: 230922-106 Report Number: 705880 Superseded Report:
Client Ref.: Location: Mullavalley, Louth Village

CEN 10:1 SINGLE STAGE LEACHATE TEST

WAC ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference		**Site Location**	Mullavalley, Louth Village
Mass Sample taken (kg)	0.100	**Natural Moisture Content (%)**	10.9
Mass of dry sample (kg)	0.090	**Dry Matter Content (%)**	90.2
Particle Size <4mm	>95%		

Case	
SDG	230922-106
Lab Sample Number(s)	28672506
Sampled Date	
Customer Sample Ref.	TP17
Depth (m)	0.50

Solid Waste Analysis	**Result**	**Landfill Waste Acceptance Criteria Limits**		
		Inert Waste Landfill	Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill	Hazardous Waste Landfill
Total Organic Carbon (%)	<0.2	3	5	6
Loss on Ignition (%)	1.83	-	-	10
Sum of BTEX (mg/kg)	-	-	-	-
Sum of 7 PCBs (mg/kg)	<0.021	1	-	-
Mineral Oil (mg/kg) (EH_2D_AL)	<5	500	-	-
PAH Sum of 17 (mg/kg)	<10	100	-	-
pH (pH Units)	8.93	-	>6	-
ANC to pH 6 (mol/kg)	-	-	-	-
ANC to pH 4 (mol/kg)	-	-	-	-

Eluate Analysis	**C_2 Concⁿ in 10:1 eluate (mg/l)**		**A_2 10:1 concⁿ leached (mg/kg)**		**Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg**		
	Result	Limit of Detection	Result	Limit of Detection			
Arsenic	<0.0005	<0.0005	<0.005	<0.005	0.5	2	25
Barium	0.00338	<0.0002	0.0338	<0.002	20	100	300
Cadmium	<0.00008	<0.00008	<0.0008	<0.0008	0.04	1	5
Chromium	<0.001	<0.001	<0.01	<0.01	0.5	10	70
Copper	<0.0003	<0.0003	<0.003	<0.003	2	50	100
Mercury Dissolved (CVAF)	<0.00001	<0.00001	<0.0001	<0.0001	0.01	0.2	2
Molybdenum	<0.003	<0.003	<0.03	<0.03	0.5	10	30
Nickel	<0.0004	<0.0004	<0.004	<0.004	0.4	10	40
Lead	<0.0002	<0.0002	<0.002	<0.002	0.5	10	50
Antimony	<0.001	<0.001	<0.01	<0.01	0.06	0.7	5
Selenium	<0.001	<0.001	<0.01	<0.01	0.1	0.5	7
Zinc	<0.001	<0.001	<0.01	<0.01	4	50	200
Chloride	<2	<2	<20	<20	800	15000	25000
Fluoride	<0.5	<0.5	<5	<5	10	150	500
Sulphate (soluble)	<2	<2	<20	<20	1000	20000	50000
Total Dissolved Solids	50.5	<10	505	<100	4000	60000	100000
Total Monohydric Phenols (W)	<0.016	<0.016	<0.16	<0.16	1	-	-
Dissolved Organic Carbon	<3	<3	<30	<30	500	800	1000

Leach Test Information

Date Prepared	23-Sep-2023
pH (pH Units)	8.21
Conductivity (µS/cm)	72
Volume Leachant (Litres)	0.890

Solid Results are expressed on a dry weight basis, after correction for moisture content where applicable
Leachates prepared in accordance with BS EN 12457 will be carried out at room temperature (20±5°C)
Stated limits are for guidance only and ALS Laboratories (UK) Limited cannot be held responsible for any discrepancies with current legislation

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Table of Results - Appendix

Method No	Description
TM104	Determination of Fluoride using the Kone Analyser
TM183	Determination of Trace Level Mercury in Waters and Leachates by PSA Cold Vapour Atomic Fluorescence Spectrometry
TM184	The Determination of Anions in Aqueous Matrices using the Kone Spectrophotometric Analysers
TM414	Determination of Speciated Extractable Petroleum Hydrocarbons in Soils by GCxGC-FID
PM115	Leaching Procedure for CEN One Stage Leach Test 2:1 & 10:1 1 Step
TM018	Determination of Loss on Ignition
TM090	Determination of Total Organic Carbon/Total Inorganic Carbon in Water and Waste Water
TM116	Determination of Volatile Organic Compounds by Headspace / GC-MS
TM123	The Determination of Total Dissolved Solids in Water
TM132	ELTRA CS800 Operators Guide
TM133	Determination of pH in Soil and Water using the GLpH pH Meter
TM259	Determination of Phenols in Waters and Leachates by HPLC
TM410	Determination of Coronene in soils by GCMS
PM024	Soil preparation including homogenisation, moisture screens of soils for Asbestos Containing Material
TM089	Determination of Gasoline Range Hydrocarbons (GRO) by Headspace GC-FID (C4-C12)
TM151	Determination of Hexavalent Chromium using Kone analyser
TM181	Determination of Routine Metals in Soil by iCap 6500 Duo ICP-OES
TM152	Analysis of Aqueous Samples by ICP-MS
TM168	Determination of WHO12 and EC7 Polychlorinated Biphenyl Congeners by GC-MS in Soils
TM218	The determination of PAH in soil samples by GC-MS
TM256	Determination of pH, EC, TDS and Alkalinity in Aqueous samples
TM415	Determination of Extractable Petroleum Hydrocarbons in Soils by GCxGC-FID

NA = not applicable.
Chemical testing (unless subcontracted) performed at ALS Laboratories (UK) Limited Hawarden (Method codes TM).

CERTIFICATE OF ANALYSIS

SDG: 230922-106 **Report Number:** 705880 **Superseded Report:**
Client Ref.: **Location:** Mullavalley, Louth Village

Test Completion Dates

Lab Sample No(s)	28672502	28672503	28672505	28672506
Customer Sample Ref.	TP01	TP08	TP11	TP17
AGS Ref.				
Depth	0.50	0.50	0.50	0.50
Type	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)
Anions by Kone (w)	27-Sep-2023	27-Sep-2023	27-Sep-2023	27-Sep-2023
CEN 10:1 Leachate (1 Stage)	23-Sep-2023	23-Sep-2023	23-Sep-2023	23-Sep-2023
CEN Readings	28-Sep-2023	28-Sep-2023	28-Sep-2023	28-Sep-2023
Chromium III	28-Sep-2023	28-Sep-2023	28-Sep-2023	28-Sep-2023
Coronene	27-Sep-2023	27-Sep-2023	27-Sep-2023	27-Sep-2023
Dissolved Metals by ICP-MS	28-Sep-2023	28-Sep-2023	28-Sep-2023	28-Sep-2023
Dissolved Organic/Inorganic Carbon	29-Sep-2023	29-Sep-2023	29-Sep-2023	29-Sep-2023
EPH by GCxGC-FID	27-Sep-2023	27-Sep-2023	27-Sep-2023	27-Sep-2023
EPH CWG GC (S)	27-Sep-2023	27-Sep-2023	27-Sep-2023	27-Sep-2023
Fluoride	29-Sep-2023	29-Sep-2023	29-Sep-2023	29-Sep-2023
GRO by GC-FID (S)	26-Sep-2023	27-Sep-2023	26-Sep-2023	26-Sep-2023
Hexavalent Chromium (s)	28-Sep-2023	28-Sep-2023	28-Sep-2023	28-Sep-2023
Loss on Ignition in soils	27-Sep-2023	27-Sep-2023	26-Sep-2023	26-Sep-2023
Mercury Dissolved	28-Sep-2023	28-Sep-2023	28-Sep-2023	28-Sep-2023
Metals in solid samples by OES	27-Sep-2023	28-Sep-2023	26-Sep-2023	27-Sep-2023
Moisture at 105C	23-Sep-2023	23-Sep-2023	23-Sep-2023	23-Sep-2023
PAH 16 & 17 Calc	27-Sep-2023	27-Sep-2023	27-Sep-2023	27-Sep-2023
PAH by GCMS	26-Sep-2023	26-Sep-2023	26-Sep-2023	26-Sep-2023
PCBs by GCMS	26-Sep-2023	26-Sep-2023	26-Sep-2023	26-Sep-2023
pH	27-Sep-2023	26-Sep-2023	27-Sep-2023	26-Sep-2023
pH Value of Filtered Water	28-Sep-2023	28-Sep-2023	28-Sep-2023	28-Sep-2023
Phenols by HPLC (W)	29-Sep-2023	29-Sep-2023	28-Sep-2023	28-Sep-2023
Sample description	23-Sep-2023	23-Sep-2023	23-Sep-2023	23-Sep-2023
Total Dissolved Solids on Leachates	27-Sep-2023	27-Sep-2023	27-Sep-2023	27-Sep-2023
Total Organic Carbon	28-Sep-2023	28-Sep-2023	27-Sep-2023	27-Sep-2023
TPH CWG GC (S)	27-Sep-2023	27-Sep-2023	27-Sep-2023	27-Sep-2023
VOC MS (S)	26-Sep-2023	26-Sep-2023	26-Sep-2023	26-Sep-2023

Appendix

General

1. Results are expressed on a dry weight basis (dried at 35ºC) for all soil analyses except for the following: NRA and CEN Leach tests, flash point LOI, pH, ammonium as NH4 by the BRE method, VOC TICs and SVOC TICs.

2. If sufficient sample is received a sub sample will be retained free of charge for 15 days after analysis is completed (e-mailed) for all sample types unless the sample is destroyed on testing. The prepared soil sub sample that is analysed for asbestos will be retained for a period of 6 months after the analysis date. All bulk samples will be retained for a period of 6 months after the analysis date. All samples received and not scheduled will be disposed of 15 days after the date of receipt unless we are instructed to the contrary. Once the initial period has expired, a storage charge will be applied for each month or part thereof until the client cancels the request for sample storage. ALS reserve the right to charge for samples received and stored but not analysed.

3. With respect to turnaround, we will always endeavour to meet client requirements wherever possible, but turnaround times cannot be absolutely guaranteed due to so many variables beyond our control.

4. We take responsibility for any test performed by sub-contractors (marked with an asterisk). We endeavour to use UKAS/MCERTS Accredited Laboratories, who either complete a quality questionnaire or are audited by ourselves. For some determinands there are no UKAS/MCERTS Accredited Laboratories, in this instance a laboratory with a known track record will be utilised.

5. If no separate volatile sample is supplied by the client, or if a headspace or sediment is present in the volatile sample, the integrity of the data may be compromised. This will be flagged up as an invalid VOC on the test schedule and the result marked as deviating on the test certificate.

6. NDP - No determination possible due to insufficient/unsuitable sample.

7. Results relate only to the items tested.

8. LoDs (Limit of Detection) for wet tests reported on a dry weight basis are not corrected for moisture content.

9. **Surrogate recoveries** - Surrogates are added to your sample to monitor recovery of the test requested. A % recovery is reported, results are not corrected for the recovery measured. Typical recoveries for organics tests are 70-130%. Recoveries in soils are affected by organic rich or clay rich matrices. Waters can be affected by remediation fluids or high amounts of sediment. Test results are only ever reported if all of the associated quality checks pass; it is assumed that all recoveries outside of the values above are due to matrix affect.

10. Stones/debris are not routinely removed. We always endeavour to take a representative sub sample from the received sample.

11. In certain circumstances the method detection limit may be elevated due to the sample being outside the calibration range. Other factors that may contribute to this include possible interferences. In both cases the sample would be diluted which would cause the method detection limit to be raised.

12. For dried and crushed preparations of soils volatile loss may occur e.g volatile mercury

13. For leachate preparations other than Zero Headspace Extraction (ZHE) volatile loss may occur.

14. For the BSEN 12457-3 two batch process to allow the cumulative release to be calculated, the volume of the leachate produced is measured and filtered for all tests. We therefore cannot carry out any unfiltered analysis. The tests affected include volatiles GCFID/GCMS and all subcontracted analysis.

15. Analysis and identification of specific compounds using GCFID is by retention time only, and we routinely calibrate and quantify for benzene, toluene, ethylbenzenes and xylenes (BTEX). For total volatiles in the C5-C12 range, the total area of the chromatogram is integrated and expressed as ug/kg or ug/l. Although this analysis is commonly used for the quantification of gasoline range organics (GRO), the system will also detect other compounds such as chlorinated solvents, and this may lead to a falsely high result with respect to hydrocarbons only. It is not possible to specifically identify these non-hydrocarbons, as standards are not routinely run for any other compounds, and for more definitive identification, volatiles by GCMS should be utilised.

16. We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample. Other coarse granular material such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

17 Data retention. All records, communications and reports pertaining to the analysis are archived for seven years from the date of issue of the final report.

18. **Tentatively Identified Compounds (TICs)** are non-target peaks in VOC and SVOC analysis. All non-target peaks detected with a concentration above the LoD are subjected to a mass spectral library search. Non-target peaks with a library search confidence of >75% are reported based on the best mass spectral library match. When a non-target peak with a library search confidence of <75% is detected it is reported as “mixed hydrocarbons”. Non-target compounds identified from the scan data are semi-quantified relative to one of the deuterated internal standards, under the same chromatographic conditions as the target compounds. This result is reported as a semi-quantitative value and reported as Tentatively Identified Compounds (TICs). TICs are outside the scope of UKAS accreditation and are not moisture corrected.

19. **Sample Deviations**

If a sample is classed as deviated then the associated results may be compromised.

1	**Container with Headspace provided for volatiles analysis**
2	**Incorrect container received**
3	**Deviation from method**
4	**Matrix interference**
♦	**Sample holding time exceeded in laboratory**
@	**Sample holding time exceeded due to late arrival of instructions or samples**
§	**Sampled on date not provided**

20. **Asbestos**

When requested, the individual sub sample scheduled will be analysed in house for the presence of asbestos fibres and asbestos containing material by our documented in house method TM048 based on HSG 248 (2021), which is accredited to ISO17025. If a specific asbestos fibre type is not found this will be reported as “Not detected”. If no asbestos fibre types are found all will be reported as “Not detected” and the sub sample analysed deemed to be clear of asbestos. If an asbestos fibre type is found it will be reported as detected (for each fibre type found). Testing can be carried out on asbestos positive samples, but, due to Health and Safety considerations, may be replaced by alternative tests or reported as No Determination Possible (NDP). The quantity of asbestos present is not determined unless specifically requested.

Identification of Asbestos in Bulk Materials & Soils

The results for identification of asbestos in bulk materials and soils are obtained from supplied bulk materials andd soils which have been examined to determine the presence of asbestos fibres using ALS (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2021).

The results for identification of asbestos in soils are obtained from a homogenised sub sample which has been examined to determine the presence of asbestos fibres using ALS (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining.

Asbestos Type	Common Name
Chrysotile	White Asbestos
Amosite	Brown Asbestos
Crocidolite	Blue Asbestos
Fibrous Actinolite	-
Fibrous Anthophyllite	-
Fibrous Tremolite	-

Visual Estimation Of Fibre Content

Estimation of fibre content is not permitted as part of our UKAS accredited test other than: - Trace - Where only one or two asbestos fibres were identified.

Respirable Fibres

Respirable fibres are defined as fibres of <3 µm diameter, longer than 5 µm and with aspect ratios of at least 3:1 that can be inhaled into the lower regions of the lung and are generally acknowledged to be most important predictor of hazard and risk for cancers of the lung.

Further guidance on typical asbestos fibre content of manufactured products can be found in HSG 264.

The identification of asbestos containing materials and soils falls within our schedule of tests for which we hold UKAS accreditation, however opinions, interpretations and all other information contained in the report are outside the scope of UKAS accreditation.

Appendix 9

Waste Classification Report

HazWasteOnline™

Waste Classification Report

HazWasteOnline™ classifies waste as either **hazardous** or **non-hazardous** based on its chemical composition, related legislation and the rules and data defined in the current UK or EU technical guidance (Appendix C) (note that HP 9 Infectious is not assessed). It is the responsibility of the classifier named below to:

a) understand the origin of the waste
b) select the correct List of Waste code(s)
c) confirm that the list of determinands, results and sampling plan are fit for purpose
d) select and justify the chosen metal species (Appendix B)
e) correctly apply moisture correction and other available corrections
f) add the meta data for their user-defined substances (Appendix A)
g) check that the classification engine is suitable with respect to the national destination of the waste (Appendix C)

To aid the reviewer, the laboratory results, assumptions and justifications managed by the classifier are highlighted in pale yellow.

Z3WT0-52BQN-W31J8

Job name

6179

Description/Comments

Client: Louth County Council
Engineer: Doherty Finegan Kelly

Project

Mulla Valley

Site

Louth Village, Co. Louth

Classified by

Name:
Stephen Letch
Date:
16 Oct 2023 13:28 GMT
Telephone:
00353 86817 9449

Company:
Site Investigations Ltd
The Grange
12th Lock Road
Lucan
K78 F598

HazWasteOnline™ provides a two day, hazardous waste classification course that covers the use of the software and both basic and advanced waste classification techniques. Certification has to be renewed every 3 years.

HazWasteOnline™ Certification: **CERTIFIED**

Course	Date
Hazardous Waste Classification	09 Oct 2019
Most recent 3 year Refresher	04 Oct 2022

Next 3 year Refresher due by Oct 2025

Purpose of classification

2 - Material Characterisation

Address of the waste

Mulla Valley, Louth Village, Co. Louth **Post Code** N/A

SIC for the process giving rise to the waste

43130 Test drilling and boring

Description of industry/producer giving rise to the waste

Site Investigation

Description of the specific process, sub-process and/or activity that created the waste

Soils recovered for environmental testing

Description of the waste

Natural soils

Job summary

#	Sample name	Depth [m]	Classification Result	Hazard properties	WAC Results		Page
					Inert	Non Haz	
1	TP01-0.50	0.50	Non Hazardous		Fail	Pass	3
2	TP08-0.50	0.50	Non Hazardous		Pass	Pass	7
3	TP11-0.50	0.50	Non Hazardous		Pass	Pass	11
4	TP17-0.50	0.50	Non Hazardous		Pass	Pass	15

Related documents

#	Name	Description
1	230922-106.hwol	ALS Hawarden .hwol file used to populate the Job
2	Rilta Suite NEW	waste stream template used to create this Job

WAC results

WAC Settings: samples in this Job constitute a single population.

WAC limits used to evaluate the samples in this Job: "Ireland"
The WAC used in this report are the WAC defined for the inert and non-hazardous classes of landfill in the Republic of Ireland. You should check the actual acceptance criteria when the disposal site is identified as they may differ from the generic WAC used in this report.

Report

Created by: Stephen Letch

Created date: 16 Oct 2023 13:28 GMT

Classification of sample: TP01-0.50

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

Sample details

Sample name:
TP01-0.50
Sample Depth:
0.50 m
Moisture content:
6.7%
(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: 6.7% Wet Weight Moisture Correction applied (MC)

#	Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
1	TPH (C6 to C40) petroleum group			TPH		<10 mg/kg		<10 mg/kg	<0.001 %		<LOD
2	confirm TPH has NOT arisen from diesel or petrol					☑					
3	antimony { antimony trioxide }	051-005-00-X	215-175-0	1309-64-4		<0.6 mg/kg	1.197	<0.718 mg/kg	<0.0000718 %		<LOD
4	arsenic { arsenic pentoxide }	033-004-00-6	215-116-9	1303-28-2		4.58 mg/kg	1.534	6.554 mg/kg	0.000655 %	✓	
5	barium { barium sulphide }	016-002-00-X	244-214-4	21109-95-5		79.2 mg/kg	1.233	91.147 mg/kg	0.00911 %	✓	
6	cadmium { cadmium sulfate }	048-009-00-9	233-331-6	10124-36-4		<0.02 mg/kg	1.855	<0.0371 mg/kg	<0.00000371 %		<LOD
7	copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		32.9 mg/kg	1.126	34.56 mg/kg	0.00346 %	✓	
8	lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) }	082-001-00-6			1	9.07 mg/kg		8.462 mg/kg	0.000846 %	✓	
9	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
10	molybdenum { molybdenum(VI) oxide }	042-001-00-9	215-204-7	1313-27-5		<0.1 mg/kg	1.5	<0.15 mg/kg	<0.000015 %		<LOD
11	nickel { nickel sulfate }	028-009-00-5	232-104-9	7786-81-4		60 mg/kg	2.637	147.602 mg/kg	0.0148 %	✓	
12	selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }	034-002-00-8				<1 mg/kg	1.405	<1.405 mg/kg	<0.000141 %		<LOD
13	zinc { zinc sulphate }	030-006-00-9	231-793-3 [1] 231-793-3 [2]	7446-19-7 [1] 7733-02-0 [2]		65.7 mg/kg	2.469	151.363 mg/kg	0.0151 %	✓	
14	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }		215-160-9	1308-38-9		34.7 mg/kg	1.462	47.318 mg/kg	0.00473 %	✓	

#		Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
15		chromium in chromium(VI) compounds { chromium(VI) oxide }	024-001-00-0	215-607-8	1333-82-0		<0.6	mg/kg	1.923	<1.154	mg/kg	<0.000115 %		<LOD
16		naphthalene	601-052-00-2	202-049-5	91-20-3		<0.009	mg/kg		<0.009	mg/kg	<0.0000009 %		<LOD
17		acenaphthylene		205-917-1	208-96-8		<0.012	mg/kg		<0.012	mg/kg	<0.0000012 %		<LOD
18		acenaphthene		201-469-6	83-32-9		<0.008	mg/kg		<0.008	mg/kg	<0.0000008 %		<LOD
19		fluorene		201-695-5	86-73-7		<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
20		phenanthrene		201-581-5	85-01-8		<0.015	mg/kg		<0.015	mg/kg	<0.0000015 %		<LOD
21		anthracene		204-371-1	120-12-7		<0.016	mg/kg		<0.016	mg/kg	<0.0000016 %		<LOD
22		fluoranthene		205-912-4	206-44-0		<0.017	mg/kg		<0.017	mg/kg	<0.0000017 %		<LOD
23		pyrene		204-927-3	129-00-0		<0.015	mg/kg		<0.015	mg/kg	<0.0000015 %		<LOD
24		benzo[a]anthracene	601-033-00-9	200-280-6	56-55-3		<0.014	mg/kg		<0.014	mg/kg	<0.0000014 %		<LOD
25		chrysene	601-048-00-0	205-923-4	218-01-9		<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
26		benzo[b]fluoranthene	601-034-00-4	205-911-9	205-99-2		<0.015	mg/kg		<0.015	mg/kg	<0.0000015 %		<LOD
27		benzo[k]fluoranthene	601-036-00-5	205-916-6	207-08-9		<0.014	mg/kg		<0.014	mg/kg	<0.0000014 %		<LOD
28		benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5	50-32-8		<0.015	mg/kg		<0.015	mg/kg	<0.0000015 %		<LOD
29		indeno[123-cd]pyrene		205-893-2	193-39-5		<0.018	mg/kg		<0.018	mg/kg	<0.0000018 %		<LOD
30		dibenz[a,h]anthracene	601-041-00-2	200-181-8	53-70-3		<0.023	mg/kg		<0.023	mg/kg	<0.0000023 %		<LOD
31		benzo[ghi]perylene		205-883-8	191-24-2		<0.024	mg/kg		<0.024	mg/kg	<0.0000024 %		<LOD
32		polychlorobiphenyls; PCB	602-039-00-4	215-648-1	1336-36-3		<0.021	mg/kg		<0.021	mg/kg	<0.0000021 %		<LOD
33		tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane	603-181-00-X	216-653-1	1634-04-4		<0.0005	mg/kg		<0.0005	mg/kg	<0.00000005 %		<LOD
34		benzene	601-020-00-8	200-753-7	71-43-2		<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<LOD
35		toluene	601-021-00-3	203-625-9	108-88-3		<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<LOD
36		ethylbenzene	601-023-00-4	202-849-4	100-41-4		<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<LOD
37		coronene		205-881-7	191-07-1		<0.2	mg/kg		<0.2	mg/kg	<0.00002 %		<LOD
38		pH			PH		6.81	pH		6.81	pH	6.81 pH		
39		o-xylene; [1] p-xylene; [2] m-xylene; [3] xylene [4]	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]		<0.004	mg/kg		<0.004	mg/kg	<0.0000004 %		<LOD
											Total:	0.0501 %		

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

WAC results for sample: TP01-0.50

WAC Settings: samples in this Job constitute a single population.

WAC limits used to evaluate this sample: "Ireland"
The WAC used in this report are the WAC defined for the inert and non-hazardous classes of landfill in the Republic of Ireland. You should check the actual acceptance criteria when the disposal site is identified as they may differ from the generic WAC used in this report.

The sample FAILS the Inert (Inert waste landfill) criteria.

The sample PASSES the Non Haz (Non hazardous waste landfill) criteria.

WAC Determinands

Solid Waste Analysis				Landfill Waste Acceptance Criteria Limits	
#	Determinand		User entered data	Inert waste landfill	Non hazardous waste landfill
1	TOC (total organic carbon)	%	3.75	3	5
2	LOI (loss on ignition)	%	2.68	-	-
3	BTEX (benzene, toluene, ethylbenzene and xylenes)	mg/kg	<0.007	6	-
4	PCBs (polychlorinated biphenyls, 7 congeners)	mg/kg	<0.021	1	-
5	Mineral oil (C10 to C40)	mg/kg	<5	500	-
6	PAHs (polycyclic aromatic hydrocarbons)	mg/kg	<10	100	-
7	pH	pH	6.81	-	>6
8	ANC (acid neutralisation capacity)	mol/kg		-	-
Eluate Analysis 10:1					
9	arsenic	mg/kg	<0.005	0.5	2
10	barium	mg/kg	0.29	20	100
11	cadmium	mg/kg	<0.0008	0.04	1
12	chromium	mg/kg	<0.01	0.5	10
13	copper	mg/kg	0.0275	2	50
14	mercury	mg/kg	0.0001	0.01	0.2
15	molybdenum	mg/kg	<0.03	0.5	10
16	nickel	mg/kg	0.0079	0.4	10
17	lead	mg/kg	0.0028	0.5	10
18	antimony	mg/kg	<0.01	0.06	0.7
19	selenium	mg/kg	<0.01	0.1	0.5
20	zinc	mg/kg	0.0414	4	50
21	chloride	mg/kg	<20	800	15,000
22	fluoride	mg/kg	<5	10	150
23	sulphate	mg/kg	<20	1,000	20,000
24	phenol index	mg/kg	<0.16	1	-
25	DOC (dissolved organic carbon)	mg/kg	34.1	500	800
26	TDS (total dissolved solids)	mg/kg	165	4,000	60,000

Key

	User supplied data
	Inert WAC criteria fail

Classification of sample: TP08-0.50

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

Sample details

Sample name:
TP08-0.50
Sample Depth:
0.50 m
Moisture content:
12%
(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% Wet Weight Moisture Correction applied (MC)

#	Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
1	TPH (C6 to C40) petroleum group			TPH		<10 mg/kg		<10 mg/kg	<0.001 %		<LOD
2	confirm TPH has NOT arisen from diesel or petrol					☑					
3	antimony { antimony trioxide }	051-005-00-X	215-175-0	1309-64-4		<0.6 mg/kg	1.197	<0.718 mg/kg	<0.0000718 %		<LOD
4	arsenic { arsenic pentoxide }	033-004-00-6	215-116-9	1303-28-2		4.39 mg/kg	1.534	5.926 mg/kg	0.000593 %	✓	
5	barium { barium sulphide }	016-002-00-X	244-214-4	21109-95-5		69.7 mg/kg	1.233	75.658 mg/kg	0.00757 %	✓	
6	cadmium { cadmium sulfate }	048-009-00-9	233-331-6	10124-36-4		<0.02 mg/kg	1.855	<0.0371 mg/kg	<0.00000371 %		<LOD
7	copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		28.3 mg/kg	1.126	28.039 mg/kg	0.0028 %	✓	
8	lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) }	082-001-00-6			1	9.64 mg/kg		8.483 mg/kg	0.000848 %	✓	
9	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
10	molybdenum { molybdenum(VI) oxide }	042-001-00-9	215-204-7	1313-27-5		<0.1 mg/kg	1.5	<0.15 mg/kg	<0.000015 %		<LOD
11	nickel { nickel sulfate }	028-009-00-5	232-104-9	7786-81-4		56.9 mg/kg	2.637	132.024 mg/kg	0.0132 %	✓	
12	selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }	034-002-00-8				<1 mg/kg	1.405	<1.405 mg/kg	<0.000141 %		<LOD
13	zinc { zinc sulphate }	030-006-00-9	231-793-3 [1] 231-793-3 [2]	7446-19-7 [1] 7733-02-0 [2]		62.6 mg/kg	2.469	136.029 mg/kg	0.0136 %	✓	
14	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }		215-160-9	1308-38-9		36.2 mg/kg	1.462	46.559 mg/kg	0.00466 %	✓	

#		Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
15		chromium in chromium(VI) compounds { chromium(VI) oxide }	024-001-00-0	215-607-8	1333-82-0		<0.6	mg/kg	1.923	<1.154	mg/kg	<0.000115 %		<LOD
16		naphthalene	601-052-00-2	202-049-5	91-20-3		<0.009	mg/kg		<0.009	mg/kg	<0.0000009 %		<LOD
17		acenaphthylene		205-917-1	208-96-8		<0.012	mg/kg		<0.012	mg/kg	<0.0000012 %		<LOD
18		acenaphthene		201-469-6	83-32-9		<0.008	mg/kg		<0.008	mg/kg	<0.0000008 %		<LOD
19		fluorene		201-695-5	86-73-7		<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
20		phenanthrene		201-581-5	85-01-8		<0.015	mg/kg		<0.015	mg/kg	<0.0000015 %		<LOD
21		anthracene		204-371-1	120-12-7		<0.016	mg/kg		<0.016	mg/kg	<0.0000016 %		<LOD
22		fluoranthene		205-912-4	206-44-0		<0.017	mg/kg		<0.017	mg/kg	<0.0000017 %		<LOD
23		pyrene		204-927-3	129-00-0		<0.015	mg/kg		<0.015	mg/kg	<0.0000015 %		<LOD
24		benzo[a]anthracene	601-033-00-9	200-280-6	56-55-3		<0.014	mg/kg		<0.014	mg/kg	<0.0000014 %		<LOD
25		chrysene	601-048-00-0	205-923-4	218-01-9		<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
26		benzo[b]fluoranthene	601-034-00-4	205-911-9	205-99-2		<0.015	mg/kg		<0.015	mg/kg	<0.0000015 %		<LOD
27		benzo[k]fluoranthene	601-036-00-5	205-916-6	207-08-9		<0.014	mg/kg		<0.014	mg/kg	<0.0000014 %		<LOD
28		benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5	50-32-8		<0.015	mg/kg		<0.015	mg/kg	<0.0000015 %		<LOD
29		indeno[123-cd]pyrene		205-893-2	193-39-5		<0.018	mg/kg		<0.018	mg/kg	<0.0000018 %		<LOD
30		dibenz[a,h]anthracene	601-041-00-2	200-181-8	53-70-3		<0.023	mg/kg		<0.023	mg/kg	<0.0000023 %		<LOD
31		benzo[ghi]perylene		205-883-8	191-24-2		<0.024	mg/kg		<0.024	mg/kg	<0.0000024 %		<LOD
32		polychlorobiphenyls; PCB	602-039-00-4	215-648-1	1336-36-3		<0.021	mg/kg		<0.021	mg/kg	<0.0000021 %		<LOD
33		tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane	603-181-00-X	216-653-1	1634-04-4		<0.0005	mg/kg		<0.0005	mg/kg	<0.00000005 %		<LOD
34		benzene	601-020-00-8	200-753-7	71-43-2		<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<LOD
35		toluene	601-021-00-3	203-625-9	108-88-3		<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<LOD
36		ethylbenzene	601-023-00-4	202-849-4	100-41-4		<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<LOD
37		coronene		205-881-7	191-07-1		<0.2	mg/kg		<0.2	mg/kg	<0.00002 %		<LOD
38		pH			PH		7.01	pH		7.01	pH	7.01 pH		
39		o-xylene; [1] p-xylene; [2] m-xylene; [3] xylene [4]	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]		<0.004	mg/kg		<0.004	mg/kg	<0.0000004 %		<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

WAC results for sample: TP08-0.50

WAC Settings: samples in this Job constitute a single population.

WAC limits used to evaluate this sample: "Ireland"
The WAC used in this report are the WAC defined for the inert and non-hazardous classes of landfill in the Republic of Ireland. You should check the actual acceptance criteria when the disposal site is identified as they may differ from the generic WAC used in this report.

The sample PASSES the Inert (Inert waste landfill) criteria.

The sample PASSES the Non Haz (Non hazardous waste landfill) criteria.

WAC Determinands

Solid Waste Analysis				Landfill Waste Acceptance Criteria Limits	
#	Determinand		User entered data	Inert waste landfill	Non hazardous waste landfill
1	TOC (total organic carbon)	%	0.251	3	5
2	LOI (loss on ignition)	%	1.88	-	-
3	BTEX (benzene, toluene, ethylbenzene and xylenes)	mg/kg	<0.007	6	-
4	PCBs (polychlorinated biphenyls, 7 congeners)	mg/kg	<0.021	1	-
5	Mineral oil (C10 to C40)	mg/kg	<5	500	-
6	PAHs (polycyclic aromatic hydrocarbons)	mg/kg	<10	100	-
7	pH	pH	7.01	-	>6
8	ANC (acid neutralisation capacity)	mol/kg		-	-
Eluate Analysis 10:1					
9	arsenic	mg/kg	<0.005	0.5	2
10	barium	mg/kg	0.86	20	100
11	cadmium	mg/kg	<0.0008	0.04	1
12	chromium	mg/kg	<0.01	0.5	10
13	copper	mg/kg	0.015	2	50
14	mercury	mg/kg	0.0001	0.01	0.2
15	molybdenum	mg/kg	<0.03	0.5	10
16	nickel	mg/kg	0.0067	0.4	10
17	lead	mg/kg	0.0059	0.5	10
18	antimony	mg/kg	<0.01	0.06	0.7
19	selenium	mg/kg	<0.01	0.1	0.5
20	zinc	mg/kg	0.1	4	50
21	chloride	mg/kg	<20	800	15,000
22	fluoride	mg/kg	<5	10	150
23	sulphate	mg/kg	<20	1,000	20,000
24	phenol index	mg/kg	<0.16	1	-
25	DOC (dissolved organic carbon)	mg/kg	48.7	500	800
26	TDS (total dissolved solids)	mg/kg	175	4,000	60,000

Key

User supplied data

Classification of sample: TP11-0.50

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

Sample details

Sample name:
TP11-0.50
Sample Depth:
0.50 m
Moisture content:
6.5%
(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: 6.5% Wet Weight Moisture Correction applied (MC)

#	Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
1	TPH (C6 to C40) petroleum group			TPH		<10 mg/kg		<10 mg/kg	<0.001 %		**<LOD**
2	confirm TPH has NOT arisen from diesel or petrol					☑					
3	antimony { antimony trioxide }	051-005-00-X	215-175-0	1309-64-4		<0.6 mg/kg	1.197	<0.718 mg/kg	<0.0000718 %		**<LOD**
4	arsenic { arsenic pentoxide }	033-004-00-6	215-116-9	1303-28-2		4.02 mg/kg	1.534	5.765 mg/kg	0.000577 %	✓	
5	barium { barium sulphide }	016-002-00-X	244-214-4	21109-95-5		97.2 mg/kg	1.233	112.102 mg/kg	0.0112 %	✓	
6	cadmium { cadmium sulfate }	048-009-00-9	233-331-6	10124-36-4		<0.02 mg/kg	1.855	<0.0371 mg/kg	<0.00000371 %		**<LOD**
7	copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		42.3 mg/kg	1.126	44.529 mg/kg	0.00445 %	✓	
8	lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) }	082-001-00-6			1	7.65 mg/kg		7.153 mg/kg	0.000715 %	✓	
9	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**
10	molybdenum { molybdenum(VI) oxide }	042-001-00-9	215-204-7	1313-27-5		<0.1 mg/kg	1.5	<0.15 mg/kg	<0.000015 %		**<LOD**
11	nickel { nickel sulfate }	028-009-00-5	232-104-9	7786-81-4		58.2 mg/kg	2.637	143.48 mg/kg	0.0143 %	✓	
12	selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }	034-002-00-8				<1 mg/kg	1.405	<1.405 mg/kg	<0.000141 %		**<LOD**
13	zinc { zinc sulphate }	030-006-00-9	231-793-3 [1] 231-793-3 [2]	7446-19-7 [1] 7733-02-0 [2]		64.4 mg/kg	2.469	148.686 mg/kg	0.0149 %	✓	
14	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }		215-160-9	1308-38-9		33 mg/kg	1.462	45.096 mg/kg	0.00451 %	✓	

#		Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
15		chromium in chromium(VI) compounds { chromium(VI) oxide }	024-001-00-0	215-607-8	1333-82-0		<0.6	mg/kg	1.923	<1.154	mg/kg	<0.000115 %		<LOD
16		naphthalene	601-052-00-2	202-049-5	91-20-3		<0.009	mg/kg		<0.009	mg/kg	<0.0000009 %		<LOD
17		acenaphthylene		205-917-1	208-96-8		<0.012	mg/kg		<0.012	mg/kg	<0.0000012 %		<LOD
18		acenaphthene		201-469-6	83-32-9		<0.008	mg/kg		<0.008	mg/kg	<0.0000008 %		<LOD
19		fluorene		201-695-5	86-73-7		<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
20		phenanthrene		201-581-5	85-01-8		<0.015	mg/kg		<0.015	mg/kg	<0.0000015 %		<LOD
21		anthracene		204-371-1	120-12-7		<0.016	mg/kg		<0.016	mg/kg	<0.0000016 %		<LOD
22		fluoranthene		205-912-4	206-44-0		<0.017	mg/kg		<0.017	mg/kg	<0.0000017 %		<LOD
23		pyrene		204-927-3	129-00-0		<0.015	mg/kg		<0.015	mg/kg	<0.0000015 %		<LOD
24		benzo[a]anthracene	601-033-00-9	200-280-6	56-55-3		<0.014	mg/kg		<0.014	mg/kg	<0.0000014 %		<LOD
25		chrysene	601-048-00-0	205-923-4	218-01-9		<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
26		benzo[b]fluoranthene	601-034-00-4	205-911-9	205-99-2		<0.015	mg/kg		<0.015	mg/kg	<0.0000015 %		<LOD
27		benzo[k]fluoranthene	601-036-00-5	205-916-6	207-08-9		<0.014	mg/kg		<0.014	mg/kg	<0.0000014 %		<LOD
28		benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5	50-32-8		<0.015	mg/kg		<0.015	mg/kg	<0.0000015 %		<LOD
29		indeno[123-cd]pyrene		205-893-2	193-39-5		<0.018	mg/kg		<0.018	mg/kg	<0.0000018 %		<LOD
30		dibenz[a,h]anthracene	601-041-00-2	200-181-8	53-70-3		<0.023	mg/kg		<0.023	mg/kg	<0.0000023 %		<LOD
31		benzo[ghi]perylene		205-883-8	191-24-2		<0.024	mg/kg		<0.024	mg/kg	<0.0000024 %		<LOD
32		polychlorobiphenyls; PCB	602-039-00-4	215-648-1	1336-36-3		<0.021	mg/kg		<0.021	mg/kg	<0.0000021 %		<LOD
33		tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane	603-181-00-X	216-653-1	1634-04-4		<0.0005	mg/kg		<0.0005	mg/kg	<0.00000005 %		<LOD
34		benzene	601-020-00-8	200-753-7	71-43-2		<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<LOD
35		toluene	601-021-00-3	203-625-9	108-88-3		<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<LOD
36		ethylbenzene	601-023-00-4	202-849-4	100-41-4		<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<LOD
37		coronene		205-881-7	191-07-1		<0.2	mg/kg		<0.2	mg/kg	<0.00002 %		<LOD
38		pH			PH		7.53	pH		7.53	pH	7.53 pH		
39		o-xylene; [1] p-xylene; [2] m-xylene; [3] xylene [4]	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]		<0.004	mg/kg		<0.004	mg/kg	<0.0000004 %		<LOD
											Total:	0.0521 %		

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

WAC results for sample: TP11-0.50

WAC Settings: samples in this Job constitute a single population.

WAC limits used to evaluate this sample: "Ireland"
The WAC used in this report are the WAC defined for the inert and non-hazardous classes of landfill in the Republic of Ireland. You should check the actual acceptance criteria when the disposal site is identified as they may differ from the generic WAC used in this report.

The sample PASSES the Inert (Inert waste landfill) criteria.

The sample PASSES the Non Haz (Non hazardous waste landfill) criteria.

WAC Determinands

Solid Waste Analysis				Landfill Waste Acceptance Criteria Limits	
#	Determinand		User entered data	Inert waste landfill	Non hazardous waste landfill
1	TOC (total organic carbon)	%	<0.2	3	5
2	LOI (loss on ignition)	%	3.55	-	-
3	BTEX (benzene, toluene, ethylbenzene and xylenes)	mg/kg	<0.007	6	-
4	PCBs (polychlorinated biphenyls, 7 congeners)	mg/kg	<0.021	1	-
5	Mineral oil (C10 to C40)	mg/kg	<5	500	-
6	PAHs (polycyclic aromatic hydrocarbons)	mg/kg	<10	100	-
7	pH	pH	7.53	-	>6
8	ANC (acid neutralisation capacity)	mol/kg		-	-
Eluate Analysis 10:1					
9	arsenic	mg/kg	<0.005	0.5	2
10	barium	mg/kg	0.5	20	100
11	cadmium	mg/kg	<0.0008	0.04	1
12	chromium	mg/kg	<0.01	0.5	10
13	copper	mg/kg	0.0272	2	50
14	mercury	mg/kg	<0.0001	0.01	0.2
15	molybdenum	mg/kg	<0.03	0.5	10
16	nickel	mg/kg	0.0068	0.4	10
17	lead	mg/kg	0.0029	0.5	10
18	antimony	mg/kg	<0.01	0.06	0.7
19	selenium	mg/kg	<0.01	0.1	0.5
20	zinc	mg/kg	0.0571	4	50
21	chloride	mg/kg	<20	800	15,000
22	fluoride	mg/kg	<5	10	150
23	sulphate	mg/kg	<20	1,000	20,000
24	phenol index	mg/kg	<0.16	1	-
25	DOC (dissolved organic carbon)	mg/kg	<30	500	800
26	TDS (total dissolved solids)	mg/kg	182	4,000	60,000

Key

User supplied data

Classification of sample: TP17-0.50

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

Sample details

Sample name:
TP17-0.50
Sample Depth:
0.50 m
Moisture content:
6.2%
(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: 6.2% Wet Weight Moisture Correction applied (MC)

#	Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
1	TPH (C6 to C40) petroleum group			TPH		<10 mg/kg		<10 mg/kg	<0.001 %		**<LOD**
2	confirm TPH has NOT arisen from diesel or petrol					☑					
3	antimony { antimony trioxide }	051-005-00-X	215-175-0	1309-64-4		<0.6 mg/kg	1.197	<0.718 mg/kg	<0.0000718 %		**<LOD**
4	arsenic { arsenic pentoxide }	033-004-00-6	215-116-9	1303-28-2		6.78 mg/kg	1.534	9.755 mg/kg	0.000975 %	✓	
5	barium { barium sulphide }	016-002-00-X	244-214-4	21109-95-5		53 mg/kg	1.233	61.322 mg/kg	0.00613 %	✓	
6	cadmium { cadmium sulfate }	048-009-00-9	233-331-6	10124-36-4		<0.02 mg/kg	1.855	<0.0371 mg/kg	<0.00000371 %		**<LOD**
7	copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		18.3 mg/kg	1.126	19.326 mg/kg	0.00193 %	✓	
8	lead { lead compounds with the exception of those specified elsewhere in this Annex (worst case) }	082-001-00-6			1	7.39 mg/kg		6.932 mg/kg	0.000693 %	✓	
9	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**
10	molybdenum { molybdenum(VI) oxide }	042-001-00-9	215-204-7	1313-27-5		<0.1 mg/kg	1.5	<0.15 mg/kg	<0.000015 %		**<LOD**
11	nickel { nickel sulfate }	028-009-00-5	232-104-9	7786-81-4		50.2 mg/kg	2.637	124.155 mg/kg	0.0124 %	✓	
12	selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }	034-002-00-8				<1 mg/kg	1.405	<1.405 mg/kg	<0.000141 %		**<LOD**
13	zinc { zinc sulphate }	030-006-00-9	231-793-3 [1] 231-793-3 [2]	7446-19-7 [1] 7733-02-0 [2]		66.1 mg/kg	2.469	153.101 mg/kg	0.0153 %	✓	
14	chromium in chromium(III) compounds { chromium(III) oxide (worst case) }		215-160-9	1308-38-9		34 mg/kg	1.462	46.612 mg/kg	0.00466 %	✓	

#		Determinand	EU CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
15		chromium in chromium(VI) compounds { chromium(VI) oxide }	024-001-00-0	215-607-8	1333-82-0		<0.6	mg/kg	1.923	<1.154	mg/kg	<0.000115 %		<LOD
16		naphthalene	601-052-00-2	202-049-5	91-20-3		<0.009	mg/kg		<0.009	mg/kg	<0.0000009 %		<LOD
17		acenaphthylene		205-917-1	208-96-8		<0.012	mg/kg		<0.012	mg/kg	<0.0000012 %		<LOD
18		acenaphthene		201-469-6	83-32-9		<0.008	mg/kg		<0.008	mg/kg	<0.0000008 %		<LOD
19		fluorene		201-695-5	86-73-7		<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
20		phenanthrene		201-581-5	85-01-8		<0.015	mg/kg		<0.015	mg/kg	<0.0000015 %		<LOD
21		anthracene		204-371-1	120-12-7		<0.016	mg/kg		<0.016	mg/kg	<0.0000016 %		<LOD
22		fluoranthene		205-912-4	206-44-0		<0.017	mg/kg		<0.017	mg/kg	<0.0000017 %		<LOD
23		pyrene		204-927-3	129-00-0		<0.015	mg/kg		<0.015	mg/kg	<0.0000015 %		<LOD
24		benzo[a]anthracene	601-033-00-9	200-280-6	56-55-3		<0.014	mg/kg		<0.014	mg/kg	<0.0000014 %		<LOD
25		chrysene	601-048-00-0	205-923-4	218-01-9		<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
26		benzo[b]fluoranthene	601-034-00-4	205-911-9	205-99-2		<0.015	mg/kg		<0.015	mg/kg	<0.0000015 %		<LOD
27		benzo[k]fluoranthene	601-036-00-5	205-916-6	207-08-9		<0.014	mg/kg		<0.014	mg/kg	<0.0000014 %		<LOD
28		benzo[a]pyrene; benzo[def]chrysene	601-032-00-3	200-028-5	50-32-8		<0.015	mg/kg		<0.015	mg/kg	<0.0000015 %		<LOD
29		indeno[123-cd]pyrene		205-893-2	193-39-5		<0.018	mg/kg		<0.018	mg/kg	<0.0000018 %		<LOD
30		dibenz[a,h]anthracene	601-041-00-2	200-181-8	53-70-3		<0.023	mg/kg		<0.023	mg/kg	<0.0000023 %		<LOD
31		benzo[ghi]perylene		205-883-8	191-24-2		<0.024	mg/kg		<0.024	mg/kg	<0.0000024 %		<LOD
32		polychlorobiphenyls; PCB	602-039-00-4	215-648-1	1336-36-3		<0.021	mg/kg		<0.021	mg/kg	<0.0000021 %		<LOD
33		tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane	603-181-00-X	216-653-1	1634-04-4		<0.0005	mg/kg		<0.0005	mg/kg	<0.00000005 %		<LOD
34		benzene	601-020-00-8	200-753-7	71-43-2		<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<LOD
35		toluene	601-021-00-3	203-625-9	108-88-3		<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<LOD
36		ethylbenzene	601-023-00-4	202-849-4	100-41-4		<0.001	mg/kg		<0.001	mg/kg	<0.0000001 %		<LOD
37		coronene		205-881-7	191-07-1		<0.2	mg/kg		<0.2	mg/kg	<0.00002 %		<LOD
38		pH			PH		8.93	pH		8.93	pH	8.93 pH		
39		o-xylene; [1] p-xylene; [2] m-xylene; [3] xylene [4]	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]		<0.004	mg/kg		<0.004	mg/kg	<0.0000004 %		<LOD
											Total:	0.0435 %		

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

WAC results for sample: TP17-0.50

WAC Settings: samples in this Job constitute a single population.

WAC limits used to evaluate this sample: "Ireland"
The WAC used in this report are the WAC defined for the inert and non-hazardous classes of landfill in the Republic of Ireland. You should check the actual acceptance criteria when the disposal site is identified as they may differ from the generic WAC used in this report.

The sample PASSES the Inert (Inert waste landfill) criteria.

The sample PASSES the Non Haz (Non hazardous waste landfill) criteria.

WAC Determinands

Solid Waste Analysis				Landfill Waste Acceptance Criteria Limits	
#	Determinand		User entered data	Inert waste landfill	Non hazardous waste landfill
1	TOC (total organic carbon)	%	<0.2	3	5
2	LOI (loss on ignition)	%	1.83	-	-
3	BTEX (benzene, toluene, ethylbenzene and xylenes)	mg/kg	<0.007	6	-
4	PCBs (polychlorinated biphenyls, 7 congeners)	mg/kg	<0.021	1	-
5	Mineral oil (C10 to C40)	mg/kg	<5	500	-
6	PAHs (polycyclic aromatic hydrocarbons)	mg/kg	<10	100	-
7	pH	pH	8.93	-	>6
8	ANC (acid neutralisation capacity)	mol/kg		-	-
Eluate Analysis 10:1					
9	arsenic	mg/kg	<0.005	0.5	2
10	barium	mg/kg	0.0338	20	100
11	cadmium	mg/kg	<0.0008	0.04	1
12	chromium	mg/kg	<0.01	0.5	10
13	copper	mg/kg	<0.003	2	50
14	mercury	mg/kg	<0.0001	0.01	0.2
15	molybdenum	mg/kg	<0.03	0.5	10
16	nickel	mg/kg	<0.004	0.4	10
17	lead	mg/kg	<0.002	0.5	10
18	antimony	mg/kg	<0.01	0.06	0.7
19	selenium	mg/kg	<0.01	0.1	0.5
20	zinc	mg/kg	<0.01	4	50
21	chloride	mg/kg	<20	800	15,000
22	fluoride	mg/kg	<5	10	150
23	sulphate	mg/kg	<20	1,000	20,000
24	phenol index	mg/kg	<0.16	1	-
25	DOC (dissolved organic carbon)	mg/kg	<30	500	800
26	TDS (total dissolved solids)	mg/kg	505	4,000	60,000

Key

User supplied data

Appendix A: Classifier defined and non EU CLP determinands

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: Flam. Liq. 3; H226 , Asp. Tox. 1; H304 , STOT RE 2; H373 , Muta. 1B; H340 , Carc. 1B; H350 , Repr. 2; H361d , Aquatic Chronic 2; H411

confirm TPH has NOT arisen from diesel or petrol

Description/Comments: Chapter 3, section 4b requires a positive confirmation for benzo[a]pyrene to be used as a marker in evaluating Carc. 1B; H350 (HP 7) and Muta. 1B; H340 (HP 11)
Data source: WM3 1st Edition 2015
Data source date: 25 May 2015
Hazard Statements: None.

barium sulphide (EC Number: 244-214-4, CAS Number: 21109-95-5)

EU CLP index number: 016-002-00-X
Description/Comments:
Additional Hazard Statement(s): EUH031 >= 0.8 %
Reason for additional Hazards Statement(s):
14 Dec 2015 - EUH031 >= 0.8 % hazard statement sourced from: WM3, Table C12.2

lead compounds with the exception of those specified elsewhere in this Annex (worst case)

EU CLP index number: 082-001-00-6
Description/Comments: Worst Case: IARC considers lead compounds Group 2A; Probably carcinogenic to humans; Lead REACH Consortium, following CLP protocols, considers lead compounds from smelting industries, flue dust and similar to be Carcinogenic category 1A
Additional Hazard Statement(s): Carc. 1A; H350
Reason for additional Hazards Statement(s):
03 Jun 2015 - Carc. 1A; H350 hazard statement sourced from: IARC Group 2A (Sup 7, 87) 2006; Lead REACH Consortium www.reach-lead.eu/substanceinformation.html (worst case lead compounds). Review date 29/09/2015

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

Description/Comments: Data from C&L Inventory Database
Data source: https://echa.europa.eu/information-on-chemicals/cl-inventory-database/-/discli/details/33806
Data source date: 17 Jul 2015
Hazard Statements: Acute Tox. 4; H332 , Acute Tox. 4; H302 , Eye Irrit. 2; H319 , STOT SE 3; H335 , Skin Irrit. 2; H315 , Resp. Sens. 1; H334 , Skin Sens. 1; H317 , Repr. 1B; H360FD , Aquatic Acute 1; H400 , Aquatic Chronic 1; H410

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: Acute Tox. 4; H302 , Acute Tox. 1; H330 , Acute Tox. 1; H310 , Eye Irrit. 2; H319 , STOT SE 3; H335 , Skin Irrit. 2; H315

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: Eye Irrit. 2; H319 , STOT SE 3; H335 , Skin Irrit. 2; H315 , Aquatic Acute 1; H400 , Aquatic Chronic 1; H410 , Aquatic Chronic 2; H411

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 Acute 1; H400 , Aquatic Chronic 1; H410

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: Acute Tox. 4; H302 , Eye Irrit. 2; H319 , STOT SE 3; H335 , Carc. 2; H351 , Skin Sens. 1; H317 , Aquatic Acute 1; H400 , Aquatic Chronic 1; H410 , Skin Irrit. 2; H315

- **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: Eye Irrit. 2; H319 , STOT SE 3; H335 , Skin Irrit. 2; H315 , Skin Sens. 1; H317 , Aquatic Acute 1; H400 , Aquatic Chronic 1; H410

- **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: Acute Tox. 4; H302 , Aquatic Acute 1; H400 , Aquatic Chronic 1; H410

- **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: Skin Irrit. 2; H315 , Eye Irrit. 2; H319 , STOT SE 3; H335 , Aquatic Acute 1; H400 , Aquatic Chronic 1; H410

- **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 Acute 1; H400 , Aquatic Chronic 1; H410

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

EU 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.
Additional Hazard Statement(s): Carc. 1A; H350
Reason for additional Hazards Statement(s):
29 Sep 2015 - Carc. 1A; H350 hazard statement sourced from: IARC Group 1 (23, Sup 7, 100C) 2012

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

EU CLP index number: 601-023-00-4
Description/Comments:
Additional Hazard Statement(s): Carc. 2; H351
Reason for additional Hazards Statement(s):
03 Jun 2015 - Carc. 2; H351 hazard statement sourced from: IARC Group 2B (77) 2000

- **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

- **pH** (CAS Number: PH)

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

Appendix B: Rationale for selection of metal species

antimony {antimony trioxide}

Worst case scenario.

arsenic {arsenic pentoxide}

Arsenic pentoxide used as most hazardous species.

barium {barium sulphide}

Chromium VI at limits of detection. Barium sulphide used as the next most hazardous species. No chromate present.

cadmium {cadmium sulfate}

Cadmium sulphate used as the most hazardous species.

copper {dicopper oxide; copper (I) oxide}

Reasonable case CLP species based on hazard statements/molecular weight and insolubility in water. Worse case copper sulphate is very soluble and likely to have been leached away if ever present and/or not enough soluble sulphate detected.

lead {lead compounds with the exception of those specified elsewhere in this Annex (worst case)}

Chromium VI at limits of detection. Lead compounds used as the next most hazardous species. No chromate present.

mercury {mercury dichloride}

Worst case CLP species based on hazard statements/molecular weight

molybdenum {molybdenum(VI) oxide}

Worst case CLP species based on hazard statements/molecular weight.

nickel {nickel sulfate}

Chromium VI at limits of detection. Nickel sulphate used as the next most hazardous species. No chromate present.

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.

zinc {zinc sulphate}

Chromium VI at limits of detection. Zinc sulphate used as the next most hazardous species. No chromate present.

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

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

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.

Appendix C: Version

HazWasteOnline Classification Engine: WM3 1st Edition v1.1.NI - Jan 2021
HazWasteOnline Classification Engine Version: 2023.289.5779.10675 (16 Oct 2023)
HazWasteOnline Database: 2023.283.5774.10667 (10 Oct 2023)

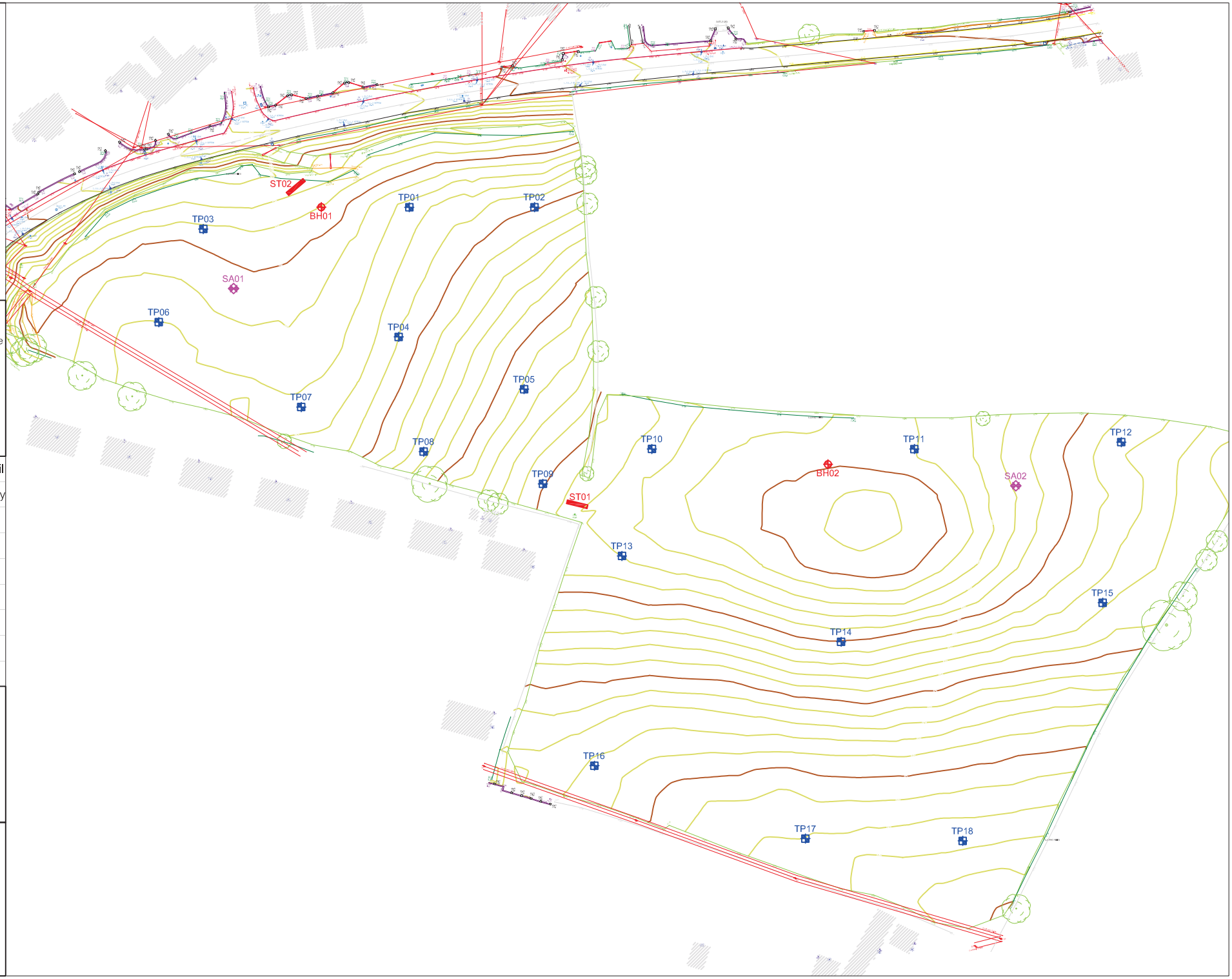
This classification utilises the following guidance and legislation:
WM3 v1.1.NI - Waste Classification - 1st Edition v1.1.NI - Jan 2021
CLP Regulation - Regulation 1272/2008/EC of 16 December 2008
1st ATP - Regulation 790/2009/EC of 10 August 2009
2nd ATP - Regulation 286/2011/EC of 10 March 2011
3rd 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 Waste 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
14th ATP - Regulation (EU) 2020/217 of 4 October 2019
15th ATP - Regulation (EU) 2020/1182 of 19 May 2020
The Chemicals (Health and Safety) and Genetically Modified Organisms (Contained Use)(Amendment etc.) (EU Exit) Regulations 2020 - UK: 2020 No. 1567 of 16th December 2020
The Waste and Environmental Permitting etc. (Legislative Functions and Amendment etc.) (EU Exit) Regulations 2020 - UK: 2020 No. 1540 of 16th December 2020
17th ATP - Regulation (EU) 2021/849 of 11 March 2021
18th ATP - Regulation (EU) 2022/692 of 16 February 2022
19th ATP - Regulation (EU) 2023/1434 of 25 April 2023
20th ATP - Regulation (EU) 2023/1435 of 25 2 May 2023

Appendix 10

Survey Data

Survey Data

Location	Irish Transverse Mercator		Elevation	Irish National Grid	
	Easting	Northing		Easting	Northing
Cable Percussive Boreholes					
BH01	696064.202	801324.283	39.48	296133.742	301312.407
BH02	696204.153	801253.276	50.09	296273.723	301241.385
Trial Pits					
TP01	696088.503	801324.251	41.14	296158.048	301312.375
TP02	696123.085	801324.277	42.38	296192.638	301312.401
TP03	696031.593	801318.243	39.59	296101.126	301306.365
TP04	696085.570	801288.459	41.96	296155.115	301276.575
TP05	696120.210	801274.035	45.63	296189.763	301262.148
TP06	696019.315	801292.535	40.98	296088.846	301280.652
TP07	696058.657	801269.095	41.11	296128.197	301257.207
TP08	696092.464	801256.779	44.04	296162.011	301244.889
TP09	696125.400	801247.881	47.62	296194.954	301235.989
TP10	696155.502	801257.519	48.76	296225.062	301245.629
TP11	696227.991	801257.507	49.67	296297.567	301245.617
TP12	696285.131	801259.407	46.8	296354.719	301247.518
TP13	696147.232	801227.985	48.68	296216.791	301216.089
TP14	696207.768	801204.286	47.58	296277.340	301192.385
TP15	696280.002	801215.071	46.11	296349.589	301203.173
TP16	696139.620	801170.073	43.42	296209.178	301158.164
TP17	696197.902	801149.954	41.42	296267.472	301138.041
TP18	696241.344	801149.324	41.14	296310.923	301137.411
Soakaway Tests					
SA01	696039.972	801301.800	40.12	296109.507	301289.919
SA02	696256.021	801247.367	48.47	296325.603	301235.475
Slit Trenches					
ST01 Start	696137.698	801241.561	48.5	296207.255	301229.668
ST01 End	696132.057	801242.960	48.23	296201.612	301231.067
ST02 Start	696059.437	801331.793	38.83	296128.976	301319.919
ST02 End	696054.845	801327.929	38.93	296124.383	301316.054



Legend:

- Cable Percussion Borehole
- Trial Pit
- Soakaway Test
- Slit Trench

Client :	Louth County Council
Engineer :	Doherty Finegan Kelly
Project :	Point Road, Dundalk
Date :	13-10-2023
Description :	Site Investigation
Drawing No. :	6180:01/01
Scale:	Not to Scale
Rev:	1
Drawn By :	SL

Site Investigations Ltd
The Grange
12th Lock Road
Lucan
Co. Dublin

T: 01 6108768
E: info@siteinvestigations.ie
www.siteinvestigations.ie

Appendix G – Confirmation of Feasibility

CONFIRMATION OF FEASIBILITY

Justin Sexton
Housing Capital Civic Offices
Fair Street
Drogheda
Louth
A92P440

Uisce Éireann
Bosca OP 448
Oifig Sheachadta na
Cathrach Theas
Cathair Chorcaí

Irish Water
PO Box 448,
South City
Delivery Office,
Cork City.

www.water.ie

21 July 2023

Our Ref: CDS23002129 Pre-Connection Enquiry
LH-0006, Mullavally, Louth Village, Louth

Dear Applicant/Agent,

We have completed the review of the Pre-Connection Enquiry.

Irish Water has reviewed the pre-connection enquiry in relation to a Water & Wastewater connection for a Housing Development of 90 unit(s) at LH-0006, Mullavally, Louth Village, Louth, (the **Development)**.

Based upon the details provided we can advise the following regarding connecting to the networks;

- **Water Connection**
  - Feasible Subject to upgrades
  - There is pressure issued noted in the area (Knockfergus Housing Estate). Pressure logging would be required for the entire DMA to identify the condition of the CI Mains and if any restriction near the reservoir or inlet meter which is causing these concerns at Knockfergus. This could be undertaken at Connection Application Stage.

    There are two options or a combination of both may be required to improve the pressure at the proposed development. Pressure logging would be required to ascertain the upgrades required.

    Upgrading the 100mm CI mains from reservoir would help improve the pressures however, the minimum

		pressure that can be achieved at the proposed development is 13.3m (61.3m-48m) assuming no headloss. Which is under the required 15m UE min service level. Pumping the entire DMA from the reservoir site would help achieve the minimum pressure greater than 15m. However, the CI mains will be subjected to very high headloss.
• **Wastewater Connection**	-	Feasible without infrastructure upgrade by Irish Water
	-	

This letter does not constitute an offer, in whole or in part, to provide a connection to any Irish Water infrastructure. Before the Development can be connected to our network(s) you must submit a connection application and be granted and sign a connection agreement with Irish Water.

As the network capacity changes constantly, this review is only valid at the time of its completion. As soon as planning permission has been granted for the Development, a completed connection application should be submitted. The connection application is available at www.water.ie/connections/get-connected/

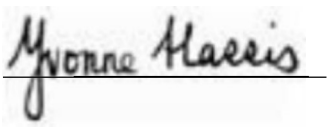
Where can you find more information?

- **Section A -** What is important to know?
- **Section B -** Details of Irish Water's Network(s)

This letter is issued to provide information about the current feasibility of the proposed connection(s) to Irish Water's network(s). This is not a connection offer and capacity in Irish Water's network(s) may only be secured by entering into a connection agreement with Irish Water.

For any further information, visit **www.water.ie/connections**, **email newconnections@water.ie** or contact 1800 278 278**.**

Yours sincerely,



Yvonne Harris
Head of Customer Operations

Section A - What is important to know?

What is important to know?	Why is this important?
Do you need a contract to connect?	• Yes, a contract is required to connect. This letter does not constitute a contract or an offer in whole or in part to provide a connection to Irish Water's network(s). • Before the Development can connect to Irish Water's network(s), you must submit a connection application and be granted and sign a connection agreement with Irish Water.
When should I submit a Connection Application?	• A connection application should only be submitted after planning permission has been granted.
Where can I find information on connection charges?	• Irish Water connection charges can be found at: https://www.water.ie/connections/information/charges/
Who will carry out the connection work?	• All works to Irish Water's network(s), including works in the public space, must be carried out by Irish Water*. *Where a Developer has been granted specific permission and has been issued a connection offer for Self-Lay in the Public Road/Area, they may complete the relevant connection works
Fire flow Requirements	• The Confirmation of Feasibility does not extend to fire flow requirements for the Development. Fire flow requirements are a matter for the Developer to determine. • **What to do?** - Contact the relevant Local Fire Authority
Plan for disposal of storm water	• The Confirmation of Feasibility does not extend to the management or disposal of storm water or ground waters. • **What to do?** - Contact the relevant Local Authority to discuss the management or disposal of proposed storm water or ground water discharges.
Where do I find details of Irish Water's network(s)?	• Requests for maps showing Irish Water's network(s) can be submitted to: datarequests@water.ie

What are the design requirements for the connection(s)?	• The design and construction of the Water & Wastewater pipes and related infrastructure to be installed in this Development shall comply with ***the Irish Water Connections and Developer Services Standard Details and Codes of Practice,*** available at www.water.ie/connections
Trade Effluent Licensing	• Any person discharging trade effluent** to a sewer, must have a Trade Effluent Licence issued pursuant to section 16 of the Local Government (Water Pollution) Act, 1977 (as amended). • More information and an application form for a Trade Effluent License can be found at the following link: https://www.water.ie/business/trade-effluent/about/ **trade effluent is defined in the Local Government (Water Pollution) Act, 1977 (as amended)

Section B – Details of Irish Water's Network(s)

The map included below outlines the current Irish Water infrastructure adjacent the Development: To access Irish Water Maps email datarequests@water.ie

Reproduced from the Ordnance Survey of Ireland by Permission of the Government. License No. 3-3-34

Note: The information provided on the included maps as to the position of Irish Water's underground network(s) is provided as a general guide only. The information is based on the best available information provided by each Local Authority in Ireland to Irish Water.

Whilst every care has been taken in respect of the information on Irish Water's network(s), Irish Water assumes no responsibility for and gives no guarantees, undertakings or warranties concerning the accuracy, completeness or up to date nature of the information provided, nor does it accept any liability whatsoever arising from or out of any errors or omissions. This information should not be solely relied upon in the event of excavations or any other works being carried out in the vicinity of Irish Water's underground network(s). The onus is on the parties carrying out excavations or any other works to ensure the exact location of Irish Water's underground network(s) is identified prior to excavations or any other works being carried out. Service connection pipes are not generally shown but their presence should be anticipated.

Appendix H – Road Safety Audit

23185-03-001

SHD SITES LOUTH - MULLAVALLEY HOUSING

Road Safety Audit Stage 1

for

Hayes Higgins Partnership

April 2024

ROADPLAN CONSULTING

7, Ormonde Road
Kilkenny.
R95 N4FE

Tel: 056 7795800
info@roadplan.ie
www.roadplan.ie

DOCUMENT CONTROL SHEET

Project Title	SHD sites Louth – Mullavalley Housing
Project No.	23185-03
Client	Hayes Higgins Partnership
Document Title	Road Safety Audit Stage 1
Document No.	23185-03-001

Status	Author(s)	Reviewed By	Approved By	Issue Date
Draft 1	RB / DD	RB / DD	GF	01/02/2024
Final	RB / DD	RB / DD	GF	11/4/24
	As per Section 3.1			

TABLE OF CONTENTS

1. INTRODUCTION

1.1 This report describes a Stage 1 Road Safety Audit carried out at a proposed housing development. The proposed project is off R171 Road, Louth Village, County Louth in the townland of Mullavalley. The audit was carried out on 13th of February 2024 in the offices of Roadplan Consulting, Kilkenny.

1.2 The audit team members were as follows:

- Ray Butler, BE CEng MIEI
  Auditor Number RB210538

- Dermot Donovan, BE CEng FIEI
  Auditor Number DD50250

1.3 Dermot Donovan visited the site on the 24th of January 2024. The audit comprised of an examination of the drawings relating to the scheme supplied by Hayes Higgins Partnership and an examination of the site.

1.4 The speed limit at the proposed works location on the R171 Road is 50 km/h.

1.5 This Stage 1 Audit has been carried out in accordance with the relevant sections of TII GE-STY-01024. The team has examined only those issues within the design relating to the road safety implications of the scheme and has therefore not examined or verified the compliance of the design to any other criteria.

1.6 All problems described in this report are considered by the audit team to require action in order to improve the safety of the scheme and minimise accident occurrence.

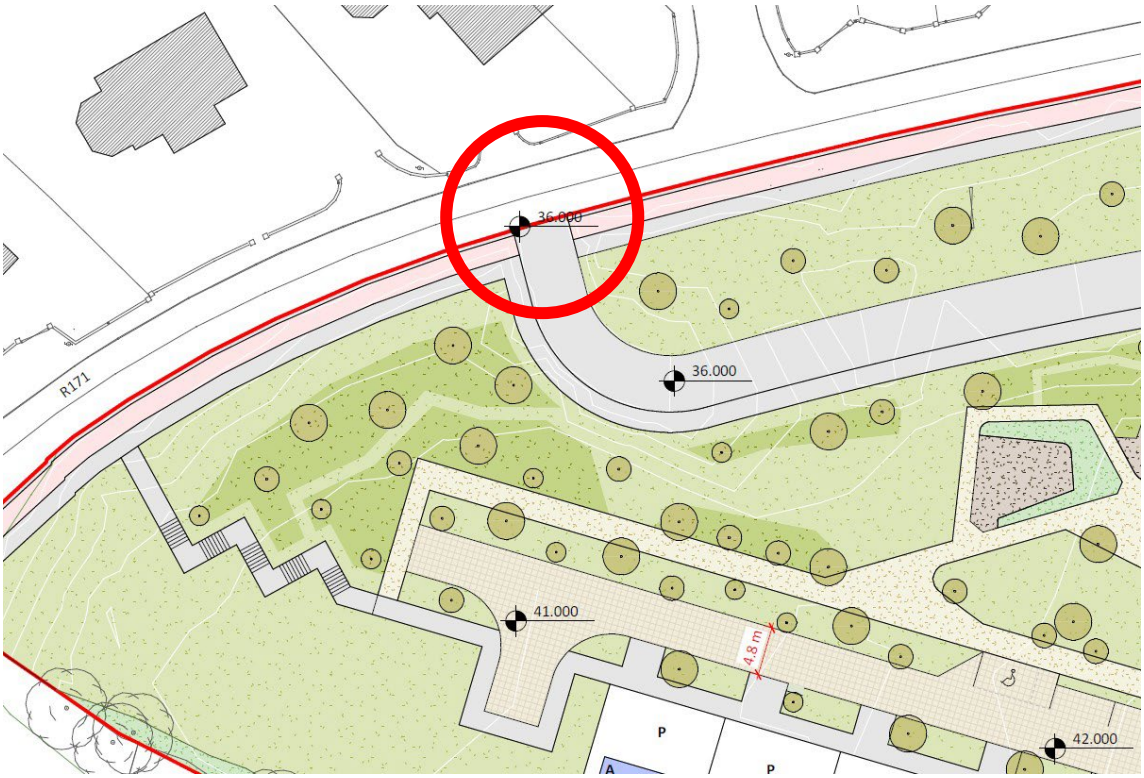
1.7 Appendix A contains copies of the audited drawings.

2. STAGE 1 AUDIT

Location: Site Access

2.1 **Problem:** Junction Radii

The access road meets the R171 at right angles with no turning radii. The lack of turning radii may lead to rear-end collisions where a driver has to brake suddenly to negotiate the turning movement.



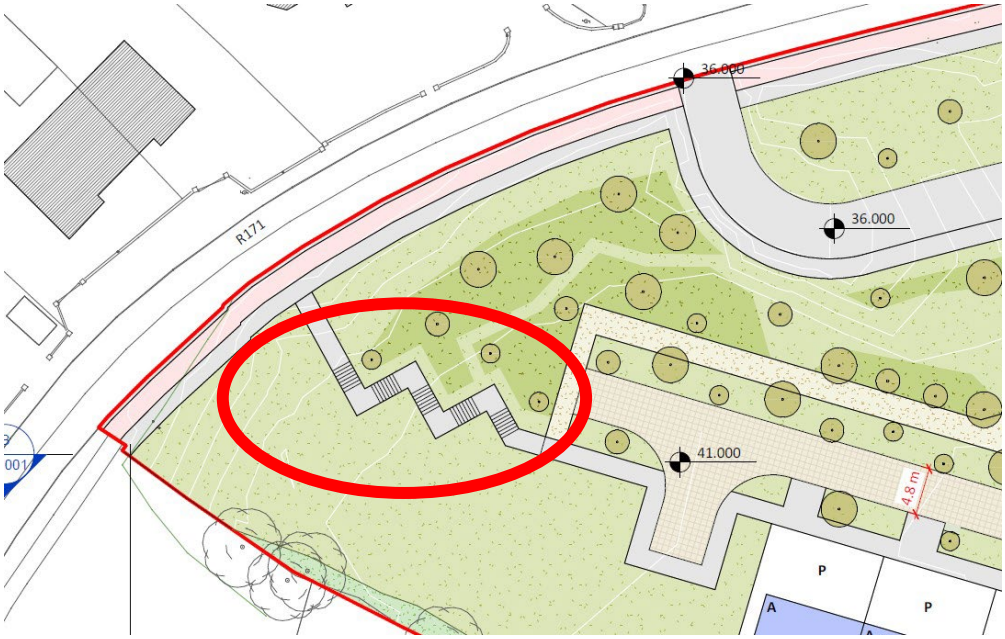
Recommendation:

Provide adequate visibility of approaching vehicles for drivers exiting the site.

Location: Southwest Site Boundary

2.2 **Problem:** Footpath Access to Village

There appears to be five flights of steps on the village access footpath at the southwest corner of the site. Wheelchair users and people with prams will have to walk down the vehicle access at the west of the site, which is a much longer journey, putting them at greater risk of exposure to collision with a vehicle.



Recommendation:
Provide a wheelchair accessible path at the southeast.

Location: Access Road

2.3 **Problem:** Traffic speed

The section of access road that extends between Blocks No 5 and 11 is relatively long and straight. The chicane at house No 9 does not have a layout that would restrain vehicular speed. Motor vehicles could enter the home zone area at excessive speed.

Recommendation:
Provide measures to restrict the speed of motor vehicles on this section of road.

Location: Entire development

2.4 **Problem:** Crossing facilities

Facilities for pedestrians to cross the road are not provided at the mouth of the development access or within the development at junctions and other locations where they will cross. This may increase difficulty for pedestrians, particularly those with restricted mobility, and may increase the risk of their being struck by motor vehicles.

Recommendation:
Provide dropped kerbs and tactile paving to facilitate pedestrians in crossing the road.

Location: Entire Development

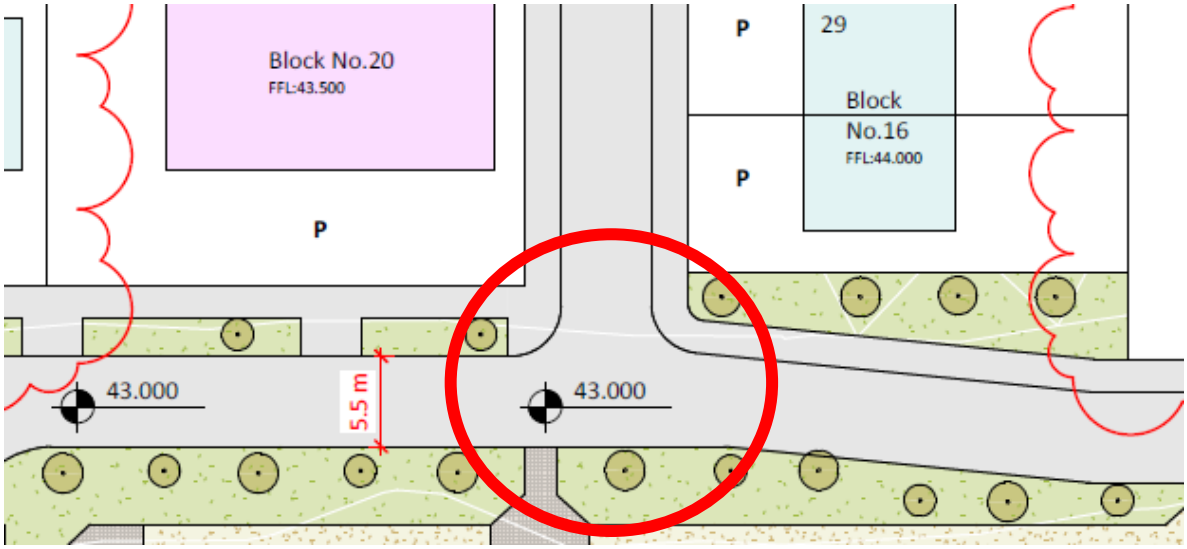
2.5 **Observation:** Cycle Parking

Some dwellings are terraced and do not have exterior access to rear gardens. Provision should be made for cycle parking so that bikes need not be wheeled through the dwellings.

Location: Junction at Block 16

2.6 **Observation:** Traffic priority

The intended priority of turning traffic streams may not be clear to drivers using the junction. Provision of regulatory road markings to designate junction priority is recommended.



3. AUDIT TEAM STATEMENT

3.1 We certify that we have examined the drawings listed in Appendix A and have inspected the site. This examination has been carried out with the sole purpose of identifying any features of the scheme that could be removed or modified to improve the safety of the scheme.

Signed…… ……. Ray Butler

Date ..... 13th February 2024……...

Signed…… …… Dermot Donovan

Date .....13th February 2024……...

4. SAFETY AUDIT FEEDBACK FORM

Scheme: SHD Sites Louth - Mullavalley Housing, Louth Village, Co. Louth

Document Number: 23185-03-001

Audit Stage: Stage 1 RSA

Date Audit Completed: 13th February 2024

Paragraph No. in Safety Audit Report	To Be Completed By Designer			To Be Completed by Audit Team Leader
	Problem accepted (yes/no)	Recommended measure Accepted (yes/no)	Describe alternative measure(s). Give reasons for not accepting recommended measure. Only complete if recommended measure is not accepted.	Alternative measures or reasons accepted by auditors (yes/no)
2.1	Yes	Yes	----------	----------
2.2	Yes	No	Wheelchair users etc. will have to use the footpath along the main access road. We don't believe ramp access is viable from the western corner - the level difference is ~6.9m which would mean a ramp of 138m length @ 1/20, or over 80m at the max. slope of 1/12.	Yes
2.3	Yes	Yes	----------	----------
2.4	Yes	Yes	Raised table pedestrian crossings will be provided	----------

Safety Audit Signed off ..... **Design Team Leader**

Print Name Donal Higgins **Date** 20/3/24

Safety Audit Signed off ..... **Employer**

Print Name 10.04.2024 **Date** 10.04.2024

Safety Audit Signed off ..... **Audit Team Leader**

Print Name Ray Butler **Date** 11/4/24

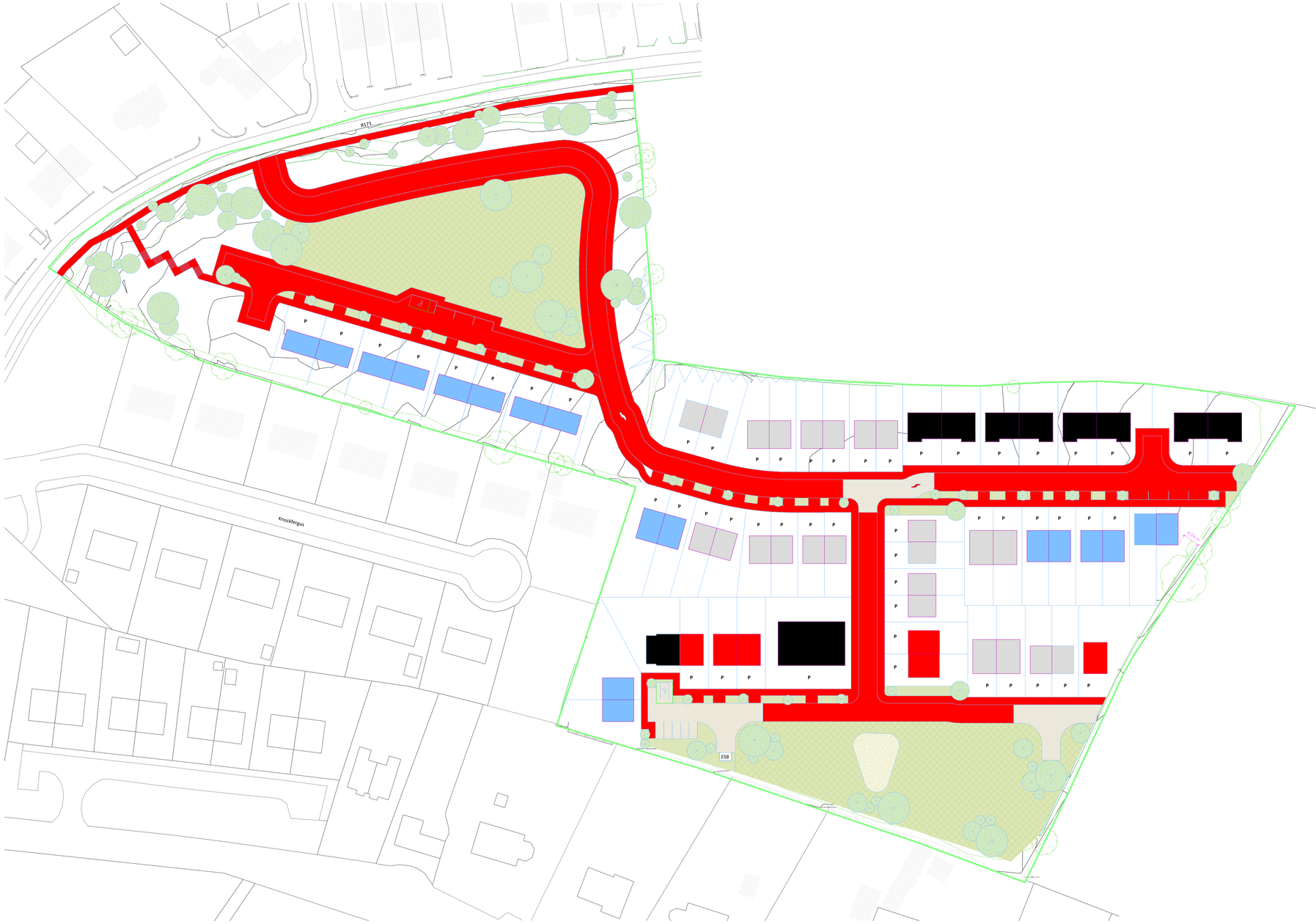
Please complete and return to: Roadplan Consulting,
7, Ormonde Road
Kilkenny
E-mail: info@roadplan.ie

APPENDIX A

List of Drawings Examined

The following drawings have been provided electronically in PDF format by Hayes Higgins Partnership and are appended.

Drawing Number	Rev	Drawing Title
3588-EML-XX-02-DR-A-0003	A	Proposed Site Layout
01		Proposed Levels Proposed Layout 01



REV	DATE	DESCRIPTION	DWG BY	APPR. BY

ISSUED
STAGE 1 – PLANNING

CLIENT
LOUTH COUNTY COUNCIL

PROJECT NAME
MULLAVALLEY, LOUTH VILLAGE

DRAWING NAME
PROPOSED LEVELS
PROPOSED LAYOUT
01

PROJECT No.
23D048

DRAWING No.	REVISION
01	

SCALE	DRAWN DATE
AS SHOWN	8.12.23

CAD DRAWN BY	CHECKED BY	APPROVED BY
R.M.	L.M.	D.H.

HAYES HIGGINS PARTNERSHIP
The Glass House, 11 Coke Lane
Smithfield, Dublin 7. Tel: 01 6612321
E-mail: admin@hayeshiggins.ie
Gas House Lane, Kilkenny. Tel: (056) 7764710
Email: info@hhp.ie

A1

is this on the desire line?

close to the speed limits; entry speeds may be high, consider traffic calming

dropped kerbs anbd tactile paving

shape the access

should be sightlines

New pedestrian crossing and transition gateway to be provided separately by LCC.

New cycleway and footpath to regional road - see accompanying drawings by HHP.

desire line (steps) between crossing and path

R171

R171

L1170

Knockfergus

36.000

40.150

40.650

41.000

42.000

43.000

44.30

46.000

45.100

45.000

44.300

43.300

43.000

43.000

43.000

4.8 m

5.5 m

5.5 m

5.5 m

4.8 m

4.8 m

5.5 m

Block No.1 FFL: 41.275

Block No.2 FFL: 42.015

Block No.3 FFL: 42.760

Block No.4 FFL: 43.500

Block No.5 FFL:44.450

Block No.6 FFL:44.950

Block No.7 FFL:45.460

Block No.8 FFL:46.000

Block No.9 FFL:45.500

Block No.10 FFL:45.250

Block No.11 FFL:45.000

Block No.12 FFL:45.000

Block No.13 FFL:45.350

Block No.14 FFL:45.500

Block No.15 FFL:44.750

Block No.16 FFL:44.000

Block No.17 FFL:43.500

Block No.18 FFL:43.500

Block No.19 FFL:43.500

Block No.20 FFL:43.500

Block No.21 FFL:45.250

Block No.22 FFL:44.900

Block No.23 FFL:44.550

Block No.24 FFL:44.200

FFL: 37.58 approx.

FFL: 39.24 approx.

FFL: 40.64 approx.

FFL: 42.41 approx.

FFL: 43.41 approx.

FFL: 45.23 approx.

FFL: 46.13 approx.

ESB

New cycleway and footpath to regional road - see accompanying drawings by HHP.

Adjacent agricultural land (zoned *L1 Strategic Reserve*)

long straight; traffic calming feature provided; nothing to restrict speed - may be uneffective

Allowance for future connection through to adjacent lands

Adjacent agricultural land (zoned *A2 New Residential Phase 1*)

terraced houses; parking solution

B A-2001

A A-2001

A A-2001

A A-2001

Key plan
Scale 1:2000

GENERAL NOTES:

A. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL RELEVANT ARCHITECTURAL DRAWINGS, THE SPECIFICATION, AND ALL RELEVANT STANDARD DETAIL DRAWINGS.

B. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL RELEVANT CIVIL, STRUCTURAL, MECHANICAL AND ELECTRICAL DRAWINGS TOGETHER WITH THE SPECIFICATIONS AND SCHEDULES.

C. ALL DIMENSIONS IN MILLIMETRES. DO NOT SCALE FROM THIS DRAWING. USE FIGURED DIMENSIONS ONLY.

D. CONTRACTOR MUST VERIFY ALL DIMENSIONS ON SITE BEFORE SETTING OUT, COMMENCING WORK, OR PRODUCING ANY SHOP DRAWINGS.

2 Bed 3 Person Bungalow (UD) - House Type A	- 8no.
2 Bed 4 Person House - House Type B	- 20no.
3 Bed 5 Person House - House Type C	- 18no.
3 Bed 5 Person House (UD) - House Type D	- 6no.
4 Bed 7 Person House (UD) - House Type E	- 1no.
4 Bed 7 Person House - House Type F	- 4no.
3 Bed 5 Person House (UD+) - House Type G	- 0no.
Supported Living House (UD) - House Type H	- 1no.
Total Unit Numbers	**- 58no.**
Site Area	- 3.48ha
Public Open Space	- 5621sqm (16%)
Site Boundary	
P House with in-curtilage parking	
Indicative raised tables or homezone surfacing	
A Affordable Houses	

Rev	Description	By	Ckd	Date
A	Several blocks combined into terraces. Associated garden realignments.			29/1/24

eml ARCHITECTS

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eml Job No.	**Job Name**
3588	Mullavalley Housing
Client	Louth County Council
Sheet Title	Proposed Site Layout
Stage	2a
Suitability	S2 - Suitable for Information

Date	Scale @ A1	Drawn by	Checked by
30/01/2024	1:500	AH	TM

Drawing No. 3588-EML-XX-02-DR-**A-0003** **Rev** **A**

Project - Originator - Volume - Level - Form - Role - Number

Appendix I – Traffic Impact Assessment

23185-03-002

PROPOSED RESIDENTIAL DEVELOPMENT
AT MULLAVALLEY, Co. LOUTH

Traffic & Impact Assessment

for

Louth County Council

April 2024

ROADPLAN CONSULTING

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DOCUMENT CONTROL SHEET

Project Title	Proposed Residential Development at Mullavalley, Co. Louth
Project No.	23185-03
Client	Louth County Council
Document Title	Traffic Impact Assessment
Document No.	23185-0-002

Status	Author(s)	Reviewed By	Approved By	Issue Date
Draft 1	RF	DD	GF	27/02/2024
Final	RF	DD	GF	11/4/2024

TABLE OF CONTENTS

1. INTRODUCTION

1.1. INTRODUCTION

Roadplan Consulting was commissioned by Hayes Higgins Partnership on behalf of Louth County Council to prepare a Traffic Impact Assessment for a proposed residential development at Mullavalley, Co. Louth.

In preparing this report, Roadplan Consulting has made reference to:

- The Louth County Development Plan 2021 - 2027;
- The Institute of Highways and Transportation Guidelines on the Preparation of Traffic Impact Assessments;
- The TII Transport Assessment Guidelines;
- The TII National Traffic Model.

1.2. OBJECTIVES

The objective of this report is to examine the traffic implications of the proposed residential development in terms of how it can integrate with existing traffic in the area. The report will determine and quantify the extent of additional trips generated by the residential development and the impact of such trips on the operational performance of the local road network and junctions, in particular the proposed R171 / Development Access priority junction and the existing R171 / L1170 / L4700 crossroads.

1.3. STUDY METHODOLOGY

The methodology adopted for this report is summarised as follows:

- Traffic counts were undertaken by IDASO on Tuesday 9th of January 2024 during a 12-hour period (07:00 to 19:00). Count information was obtained at the existing R171 / L1170 / L4700 crossroads and the existing R171 / Knockfergus Housing Estate priority junction.
- Existing Traffic Assessment – A spreadsheet model was created which contains the base year DO-NOTHING traffic count data described above. The traffic count data was used to develop an PICADY model of the proposed R171 / Development Access priority junction and the existing R171 / L1170 / L4700 crossroads.
- Future Year Assessment – The estimated future year traffic volumes on the study area road network, as a result of the increase in background traffic and development related traffic was used to assess the future operational performance of the junction at the year of opening of the proposed development, 5 years after opening and 15 years after opening.

1.4. STRUCTURE OF REPORT

Following this introduction, the report is set out as follows:

- Chapter 2 provides details of the proposed development;
- Chapter 3 provides an overview of the existing traffic conditions and the local road network, identifying any existing issues related to traffic flow or road infrastructure;
- Chapters 4 and 5 outline the analysis as described in the Study Methodology above. The analysis examines trip generation, distribution and resulting junction operational performance with the future development in place;

- Chapter 6 establishes the parking requirements for the development and sets out how these needs are provided for;
- Chapter 7 presents the conclusions of the report

2. PROPOSED DEVELOPMENT

2.1. SITE LOCATION

The proposed residential development is located at Mullavalley, Co. Louth. The proposed development is bounded by a residential estate to the south, the R171 regional road to the west, agricultural land to the north and west as shown on *Figure 2.1 'Site Location Map'.*

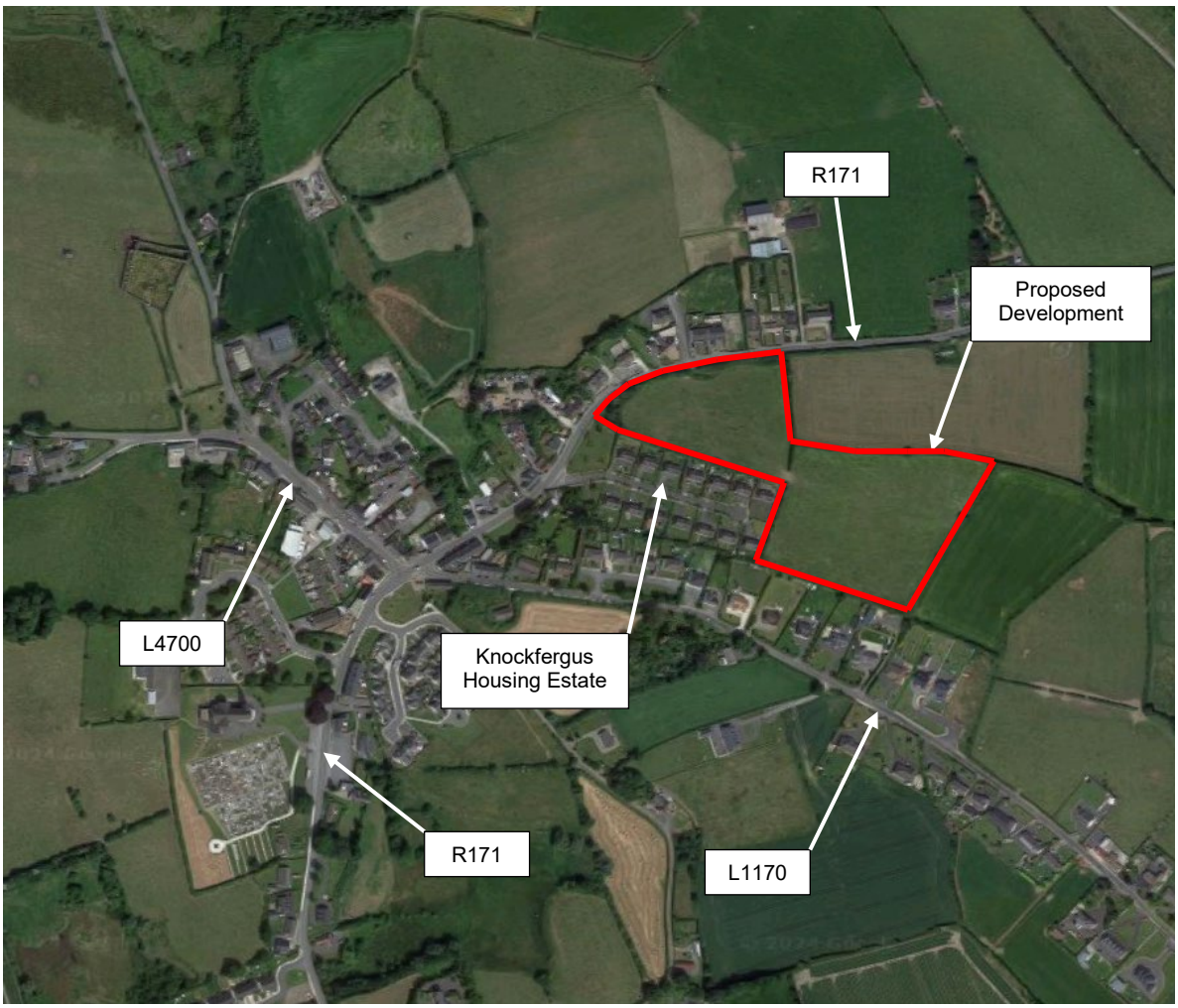

Figure 2.1 *– Site Location Map*

2.2. DESCRIPTION OF PROPOSED DEVELOPMENT

The development will comprise of the construction of 58 no. residential units and all ancillary development works including access roads, footpaths, parking, drainage, landscaping and amenity areas.

A layout of the proposed residential development, its access point and its internal access road is shown on the site plan which is contained in *Appendix A – Drawings*.

3. EXISTING AND PROPOSED TRAFFIC CONDITIONS

3.1. EXISTING TRAFFIC FLOWS

A traffic count was undertaken by IDASO on Tuesday 09th of January 2024 during a 12-hour period (07:00 to 19:00). The count data is provided in *Appendix B – Traffic Counts*. Count information was obtained at the following junctions:

- the existing R171 / L1170 / L4700 crossroads
- the existing R171 / Knockfergus Housing Estate priority junction.

The traffic flows during the AM and PM peak hours were abstracted from the surveyed data and are shown in the following tables.

R171 / L1170 / L4700 Crossroads Junction

2024 AM Peak – Base Flows

From / To	R171 (north)	L1170	R171 (south	L4700	Totals
R171 (north)	0	7	43	10	**60**
L1170	7	0	7	22	**36**
R171 (south)	59	12	0	32	**103**
L4700	42	20	84	0	**146**
Totals	**108**	**39**	**134**	**64**	**345**

2024 PM Peak – Base Flows

From / To	R171 (north)	L1170	R171 (south	L4700	Totals
R171 (north)	0	14	57	45	**116**
L1170	9	0	10	35	**54**
R171 (south)	33	7	0	80	**120**
L4700	29	24	42	0	**95**
Totals	**71**	**45**	**109**	**160**	**385**

R171 / Knockfergus Housing Estate Priority Junction

2024 AM Peak – Base Flows

From / To	R171 (north)	Knockfergus Estate	R171 (south	Totals
R171 (north)	0	2	54	**56**
Knockfergus Estate	5	0	4	**9**
R171 (south)	105	1	0	**106**
Totals	**110**	**3**	**58**	**171**

2024 PM Peak – Base Flows

From / To	R171 (north)	Knockfergus Estate	R171 (south	Totals
R171 (north)	0	1	104	**105**
Knockfergus Estate	2	0	1	**3**
R171 (south)	56	5	0	**61**
Totals	**58**	**6**	**105**	**169**

3.2. EXISTING ROAD NETWORK

Access to the proposed residential development will be via a proposed access onto the R171 regional road. The R171 regional road carries traffic between Ardee and Dundalk.

The R171 regional road has the following characteristics at the proposed access to the residential development:

- It is a single carriageway road that is approximately 6m wide.
- There is an existing footpath provided on the northern side of the R171 regional road.
- Street lighting is provided on the northern side of the R171 regional road.
- At the access to the development the R171 regional road is governed by a 50km/h speed limit.

4. TRAFFIC GENERATION AND TRIP DISTRIBUTION

4.1. DEVELOPMENT TRIP GENERATION

The TRICS database has been used to predict the trip generation to and from the proposed residential development for the AM and PM peak periods. Full details of the TRICS information used for the assessments are provided in Appendix D - TRICS information.

4.1.1 Residential

The category of "Residential – Local Authority Houses" has been assessed as the most appropriate development type category for this part of the development and the trip rates for the AM and PM peak periods are shown below.

Trip Rates per No. of Units

	Trip rate to development	Trip rate from development
AM Peak	0.112	0.246
PM Peak	0.246	0.164

For the proposed 58 residential units, this would give the following trips to and from the proposed development.

Trip Generation – 58 Dwellings

	Trip rate to development	Trip rate from development
AM Peak	7	15
PM Peak	15	10

4.2. TRIP DISTRIBUTION

Vehicular trips to and from the proposed residential development will arrive / depart via the proposed R171 / Development Access priority junction. It is assumed that the distribution of development traffic at the proposed access will follow the same pattern as the distribution of existing traffic at the existing R171 / Knockfergus Housing Estate priority junction.

The following diagram shows the proposed traffic distribution percentage for the AM and PM peak at the proposed R171 / Development Access priority.

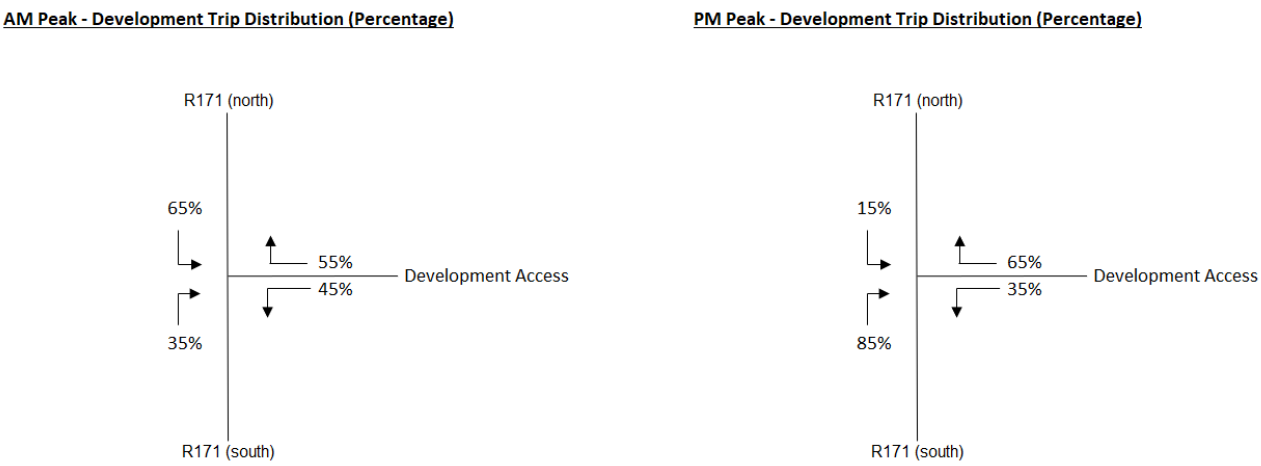

***Figure 4.1** – Existing traffic distribution percentage*

Using the proposed directional splits shown above and the trips generated by the proposed residential development outlined in 4.1, the following diagrams show the turning

movements of predicted development traffic at the proposed R171 / Development Access priority junction during the AM and PM peak hours.

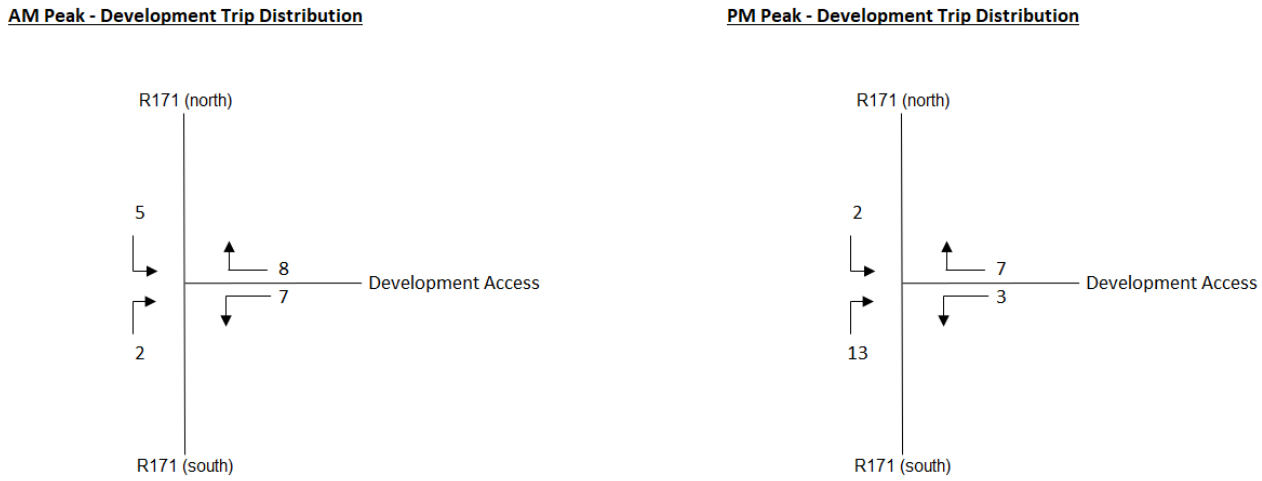

***Figure 4.2** – Proposed traffic distribution*

It is assumed that development traffic travelling via the existing R171 / L1170 / L4700 crossroads junction. will follow the same pattern as the distribution of existing traffic at the existing R171 / L1170 / L4700 crossroads junction R171 / Knockfergus Housing Estate priority junction. The predicted traffic flows at the existing R171 / L1170 / L4700 crossroads junction are provided in Appendix C – Traffic Flows Sheets.

4.3. FUTURE YEAR TRAFFIC GROWTH

The TII issues a range of forecasts: low growth, medium growth and high growth. Due to the location and nature of the proposed residential development, and given the recent economic expansion, we have used medium growth factors in our assessment.

The zone in which the site is located is number 165 in the TII National Traffic Model. The medium growth factors for each assessment year are as follows.

Zone	2024 Base Year	2026 Development Completion	2031 5 years after dev. completion	2041 15 years after dev. completion
165	1.00	4.52%	16.75%	19.44%

5. OPERATIONAL ASSESSMENTS

5.1. INTRODUCTION

Traffic generated by the proposed development will have some effect on the local road network surrounding the site. The following junction was assessed:

- proposed R171 / Development Access priority junction
- the existing R171 / L1170 / L4700 crossroads

5.2. PROPOSED R171 / DEVELOPMENT ACCESS PRIORITY JN

A capacity assessment has been undertaken using the computer program PICADY for the AM and PM peak hours.

The following table summarises the effects that the proposed development will have on this junction in 2026, 2031 and 2041 using the existing and predicted traffic flows shown in Appendix C – Traffic Flow Sheets. Full PICADY printouts are provided *in Appendix E – PICADY Results.*

The parameters shown in the tables are defined as follows:

Ratio of Flow to Capacity (RFC) is a factor indicating the flow on a junction arm relative to its capacity. An RFC of 1.0 means the junction has reached its ultimate capacity and an RFC of 0.85 means that the junction has reached its practical capacity.

Avg. Queue is the average number of vehicles queued over the time period on the junction approach.

Queue delay is the average number of seconds delay to each vehicle in the time period.

Total Delay is the total number of vehicle hours of delay to all vehicles at the junction over the time period

Year	Period	Approach	Predicted RFC value	Avg Queue (vehicles)	Queue delay (secs./veh.)
2026 With Development	AM Peak	R171 (north)	-	-	-
		Development Access	0.03	0	8
		R171 (south)	0.00	0	6
	PM Peak	R171 (north)	-	-	-
		Development Access	0.04	0	8
		R171 (south)	0.00	0	6
2031 With Development	AM Peak	R171 (north)	-	-	-
		Development Access	0.04	0	8
		R171 (south)	0.00	0	6
	PM Peak	R171 (north)	-	-	-
		Development Access	0.02	0	8
		R171 (south)	0.03	0	6
2041 With Development	AM Peak	R171 (north)	-	-	-
		Development Access	0.04	0	8
		R171 (south)	0.00	0	6
	PM Peak	R171 (north)	-	-	-
		Development Access	0.02	0	8
		R171 (south)	0.03	0	6

The summary predictions shown in the table above indicate that in 2026, 2031 and 2041 with an increase in background flows and the proposed development operational the proposed R171 / Development Access priority junction will operate within capacity with no queues and minimal delays during the AM and PM peak period.

5.3. EXISTING R171 / L1170 / L4700 CROSSROADS JN

A capacity assessment has been undertaken using the computer program PICADY for the AM and PM peak hours.

The following table summarises the effects that the proposed development will have on this junction in 2026, 2031 and 2041 using the existing and predicted traffic flows shown in Appendix C – Traffic Flow Sheets. Full PICADY printouts are provided *in Appendix E – PICADY Results.*

Year	Period	Approach	Predicted RFC value	Avg Queue (vehicles)	Queue delay (secs./veh.)
2024 Base Flows	AM Peak	R171 (north)	0.07	0	7
		L1170	0.08	0	7
		R171 (south)	0.07	0	6
		L4700	0.34	1	12
	PM Peak	R171 (north)	0.18	0	8
		L1170	0.11	0	8
		R171 (south)	0.06	0	6
		L4700	0.22	0	10
2026 No Development	AM Peak	R171 (north)	0.07	0	7
		L1170	0.08	0	7
		R171 (south)	0.07	0	6
		L4700	0.36	1	12
	PM Peak	R171 (north)	0.19	0	8
		L1170	0.12	0	8
		R171 (south)	0.07	0	6
		L4700	0.23	0	10
2026 With Development	AM Peak	R171 (north)	0.07	0	7
		L1170	0.08	0	8
		R171 (south)	0.07	0	6
		L4700	0.36	1	12
	PM Peak	R171 (north)	0.19	0	9
		L1170	0.12	0	8
		R171 (south)	0.07	0	6
		L4700	0.24	0	10
2031 No Development	AM Peak	R171 (north)	0.08	0	7
		L1170	0.09	0	8
		R171 (south)	0.08	0	6
		L4700	0.41	1	13
	PM Peak	R171 (north)	0.21	0	8
		L1170	0.14	0	8
		R171 (south)	0.07	0	6
		L4700	0.26	0	10
2031 With Development	AM Peak	R171 (north)	0.09	0	7
		L1170	0.09	0	8
		R171 (south)	0.08	0	6
		L4700	0.41	1	13
	PM Peak	R171 (north)	0.22	0	8
		L1170	0.14	0	8
		R171 (south)	0.08	0	6
		L4700	0.27	0	11
2031 No Development	AM Peak	R171 (north)	0.08	0	7
		L1170	0.09	0	8
		R171 (south)	0.08	0	6
		L4700	0.42	1	13
	PM Peak	R171 (north)	0.22	0	8
		L1170	0.14	0	8
		R171 (south)	0.08	0	6
		L4700	0.27	0	11
2031 With Development	AM Peak	R171 (north)	0.09	0	7
		L1170	0.09	0	8
		R171 (south)	0.08	0	6

Year	Period	Approach	Predicted RFC value	Avg Queue (vehicles)	Queue delay (secs./veh.)
		L4700	0.42	1	14
	PM Peak	R171 (north)	0.22	0	8
		L1170	0.14	0	8
		R171 (south)	0.08	0	6
		L4700	0.28	0	11

At present the existing R171 / L1170 / L4700 crossroads junction operates within capacity with minimal queues and delays during the AM and PM peak period.

In 2026, 2031 and 2041 with an increase in background flows and no development the existing R171 / L1170 / L4700 crossroads junction will operate within capacity with minimal queues and delays during the AM and PM peak period.

In 2026, 2031 and 2041 with an increase in background flows and the proposed residential development complete the existing R171 / L1170 / L4700 crossroads junction will operate within capacity with minimal queues and delays during the AM and PM peak period.

6. PARKING

6.1. CAR PARKING PROVISION

A total of 120 car parking spaces will be provided to cater for the proposed residential development as shown on the architect's drawing contained in Appendix A – Drawings.

6.2. CAR PARKING REQUIREMENTS FROM DEVELOPMENT PLAN

The '*Louth County Development Plan 2021-2027'* lists standard provision for car parking and the table below sets out those requirements in relation to the residential development.

Parking Standards for Residential Development			
Land-use	Requirements	Quantity	Parking
Residential	1 car space per unit	58 Dwellings	58 spaces
		Total	**58 spaces**

Table 6.1 – *Car parking requirements from the Louth County Development Plan*

The Louth County Development Plan indicates that the number of parking spaces required for the proposed residential development is 58 parking spaces.

It is proposed to provide a total of 120 car parking spaces which will cater for the proposed residential development.

6.3. BICYCLE PARKING REQUIREMENTS FROM DEVELOPMENT PLAN

The *'Louth County Development Plan 2021-2027'* lists standard provision for bicycle parking and the table below sets out those requirements in relation to the residential development.

Parking Standards for Residential Development			
Land-use	Requirements	Quantity	Parking
Residential	1 bicycle space per unit + 1 space per 5 units for visitors	58 Dwellings	58 spaces + 12 spaces
		Total	**70 spaces**

Table 6.2 – *Bicycle parking requirements from the Louth County Development Plan*

The Louth County Development Plan indicates that the number of bicycle parking spaces required for the proposed residential development is 70 bicycle parking spaces.

It is proposed to provide a total of 70 bicycle parking spaces which will cater for the proposed residential development.

7. CONCLUSIONS

The main conclusions of this study are summarised as follows:

- Capacity analysis of the proposed R171 / Development Access priority junction indicates that in 2026, 2031 and 2041 with an increase in background flows and the proposed residential development operational the proposed R171 / Development Access priority junction will operate within capacity with no queues and minimal delays during the AM and PM peak period.
- At present the existing R171 / L1170 / L4700 crossroads junction operates within capacity with minimal queues and delays during the AM and PM peak period.
- In 2026, 2031 and 2041 with an increase in background flows and no development the existing R171 / L1170 / L4700 crossroads junction will operate within capacity with minimal queues and delays during the AM and PM peak period.
- In 2026, 2031 and 2041 with an increase in background flows and the proposed residential development complete the existing R171 / L1170 / L4700 crossroads junction will operate within capacity with minimal queues and delays during the AM and PM peak period.
- The development provides adequate car parking spaces and bicycle spaces as set-out in Chapter 6 above.
- Facilities for pedestrians are included in the internal layout.

APPENDICES

APPENDIX A – DRAWINGS

APPENDIX B – TRAFFIC COUNTS

IDASO

Survey Name: 001 (24) 23707 - Co. Louth

Site: Site 2.1

Location: R171/L1170/Local Road

Date: Tue 09-Jan-2024

	A => A									A => B									A => C									A => D								
TIME	P/C	M/C	CAR	LGV	OGV1	OGV2	PSV	TOT	PCU	P/C	M/C	CAR	LGV	OGV1	OGV2	PSV	TOT	PCU	P/C	M/C	CAR	LGV	OGV1	OGV2	PSV	TOT	PCU	P/C	M/C	CAR	LGV	OGV1	OGV2	PSV	TOT	PCU
07:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	3	3	0	0	1	0	0	0	0	1	1
07:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0	0	0	1	5	6	0	0	1	0	0	0	0	1	1
07:30	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	1	0	0	5	1	0	0	0	6	6	0	0	4	1	0	0	0	5	5
07:45	0	0	1	0	0	0	0	1	1	0	0	1	0	0	0	0	1	1	0	0	7	0	1	0	0	8	8.5	0	0	0	0	0	0	0	0	0
H/TOT	0	0	1	0	0	0	0	1	1	0	0	1	1	0	0	0	2	2	0	0	19	1	1	0	1	22	23.5	0	0	6	1	0	0	0	7	7
08:00	0	0	1	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	7	1	1	0	0	9	9.5	0	0	1	0	0	0	0	1	1
08:15	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	1	0	0	12	2	0	0	0	14	14	0	0	4	0	0	0	0	4	4
08:30	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	3	3	0	0	9	1	0	0	1	11	12	0	0	2	1	0	0	0	3	3
08:45	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	3	3	0	0	7	2	0	0	0	9	9	0	0	2	0	0	0	0	2	2
H/TOT	0	0	1	0	0	0	0	1	1	0	0	7	0	0	0	0	7	7	0	0	35	6	1	0	1	43	44.5	0	0	9	1	0	0	0	10	10
09:00	0	0	1	0	0	0	0	1	1	0	0	1	1	0	0	0	2	2	0	0	11	0	1	0	0	12	12.5	0	0	3	0	0	0	0	3	3
09:15	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	1	0	0	9	0	0	0	0	9	9	0	0	3	1	0	0	0	4	4
09:30	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	1	0	0	7	1	1	0	1	10	11.5	0	0	2	0	0	0	0	2	2
09:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5	1	0	0	0	6	6	0	0	2	0	1	1	0	4	5.8
H/TOT	0	0	1	0	0	0	0	1	1	0	0	3	1	0	0	0	4	4	0	0	32	2	2	0	1	37	39	0	0	10	1	1	1	0	13	14.8
10:00	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	1	0	0	7	1	0	0	0	8	8	0	0	2	0	0	0	0	2	2
10:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	1	0	0	0	4	4	0	0	4	2	0	0	0	6	6
10:30	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	1	0	0	1	0	0	0	1	2	3	0	0	1	1	0	0	0	2	2
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H/TOT	0	0	0	0	0	0	0	0	0	0	0	2	0	1	0	0	3	3.5	0	0	12	3	0	0	1	16	17	0	0	10	3	0	1	0	14	15.3
11:00	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	2	2	0	0	5	0	1	0	0	6	6.5	0	0	4	0	1	0	0	5	5.5
11:15	0	0	1	0	0	0	0	1	1	0	0	0	0	1	0	0	1	1.5	0	0	2	1	0	0	0	3	3	0	0	5	1	1	1	0	8	9.8
11:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6	1	0	0	1	8	9	0	0	4	2	0	0	0	6	6
11:45	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	2	2	0	0	7	0	1	0	0	8	8.5	0	0	6	1	0	0	0	7	7
H/TOT	0	0	1	0	0	0	0	1	1	0	0	2	2	1	0	0	5	5.5	0	0	20	2	2	0	1	25	27	0	0	19	4	2	1	0	26	28.3
12:00	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	1	0	0	5	0	0	0	0	5	5	0	0	6	0	0	1	0	7	8.3
12:15	0	0	0	0	0	0	0	0	0	0	0	2	1	0	0	0	3	3	0	0	4	1	0	0	0	5	5	0	0	5	1	1	0	0	7	7.5
12:30	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	1	0	0	4	0	1	0	1	6	7.5	0	0	4	1	0	0	0	5	5
12:45	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	1	0	0	3	0	0	0	0	3	3	0	0	3	0	0	0	0	3	3
H/TOT	0	0	0	0	0	0	0	0	0	0	0	3	3	0	0	0	6	6	0	0	16	1	1	0	1	19	20.5	0	0	18	2	1	1	0	22	23.8
13:00	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	2	2	0	0	6	0	1	0	0	7	7.5	0	0	5	1	0	0	0	6	6
13:15	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	3	3	0	0	6	1	1	0	0	8	8.5	0	0	4	0	0	0	0	4	4
13:30	0	0	0	0	0	0	0	0	0	0	0	2	1	0	0	0	3	3	0	0	7	1	0	0	1	9	10	0	0	3	0	0	0	0	3	3
13:45	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	1	0	0	4	2	1	0	0	7	7.5	0	0	2	1	0	0	0	3	3
H/TOT	0	0	0	0	0	0	0	0	0	0	0	8	1	0	0	0	9	9	0	0	23	4	3	0	1	31	33.5	0	0	14	2	0	0	0	16	16
14:00	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	2	2	0	0	5	2	1	0	0	8	8.5	0	0	5	0	1	1	0	7	8.8
14:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	9	1	0	0	0	10	10	0	0	6	1	0	0	0	7	7
14:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	11	0	0	0	1	12	13	0	0	10	0	0	0	0	10	10
14:45	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	3	3	0	0	14	0	1	0	0	15	15.5	0	0	7	3	0	0	0	10	10
H/TOT	0	0	0	0	0	0	0	0	0	0	0	5	0	0	0	0	5	5	0	0	39	3	2	0	1	45	47	0	0	28	4	1	1	0	34	35.8
15:00	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	2	2	0	0	10	1	1	0	0	12	12.5	0	0	4	0	0	1	0	5	6.3
15:15	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	1	0	0	8	0	0	0	0	8	8	0	0	5	2	0	0	0	7	7
15:30	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	1	0	0	8	3	0	0	1	12	13	0	0	8	0	0	0	0	8	8
15:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	11	0	0	0	0	11	11	0	0	7	0	0	0	0	7	7
H/TOT	0	0	0	0	0	0	0	0	0	0	0	3	1	0	0	0	4	4	0	0	37	4	1	0	1	43	44.5	0	0	24	2	0	1	0	27	28.3
16:00	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	1	1	0	7	0	0	0	0	8	7.2	0	0	9	3	0	0	0	12	12
16:15	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	3	3	0	0	12	4	0	0	0	16	16	0	0	7	2	0	0	0	9	9
16:30	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	2	3	0	0	6	2	0	0	1	9	10	0	0	5	2	0	0	0	7	7
16:45	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	3	3	0	0	21	1	0	0	1	23	24	0	0	10	3	0	0	0	13	13
H/TOT	0	0	0	0	0	0	0	0	0	0	0	8	0	0	0	1	9	10	1	0	66	7	0	0	2	56	57.2	0	0	31	10	0	0	0	41	41
17:00	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	2	2	0	1	11	0	0	0	0	12	11.4	0	0	8	2	0	0	0	10	10
17:15	0	0	0	0	0	0	0	0	0	1	0	5	0	0	0	0	6	5.2	0	0	7	1	1	0	0	9	9.5	0	0	13	0	1	0	0	14	14.5
17:30	0	0	1	0	0	0	0	1	1	0	0	1	0	0	0	0	1	1	0	0	19	3	0	0	1	23	24	0	0	11	2	0	0	0	13	13
17:45	0	0	0	0	0	0	0	0	0	0	0	4	0	1	0	0	5	5.5	0	0	11	2	0	0	0	13	13	0	0	8	0	0	0	0	8	8
H/TOT	0	0	1	0	0	0	0	1	1	1	0	12	0	1	0	0	14	13.7	0	1	48	6	1	0	1	57	57.9	0	0	40	4	1	0	0	45	45.5
18:00	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	1	0	0	9	0	0	0	0	9	9	0	0	8	0	0	0	0	8	8
18:15	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	1	0	0	8	2	0	0	0	10	10	0	0	2	0	0	0	0	2	2
18:30	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	1	0	0	6	1	0	0	1	8	9	0	0	4	0	0	0	0	4	4
18:45	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	1	0	0	9	0	0	0	0	9	9	0	0	7	1	0	0	0	8	8
H/TOT	0	0	0	0	0	0	0	0	0	0	0	4	0	0	0	0	4	4	0	0	32	3	0	0	1	36	37	0	0	21	1	0	0	0	22	22
12 TOT	0	0	5	0	0	0	0	5	5	1	0	58	9	3	0	1	72	73.7	1	1	359	42	14	0	13	430	448.6	0	0	230	35	6	6	0	277	287.8

B => A									B => B									B => C									B => D								
P/C	M/C	CAR	LGV	OGV1	OGV2	PSV	TOT	PCU	P/C	M/C	CAR	LGV	OGV1	OGV2	PSV	TOT	PCU	P/C	M/C	CAR	LGV	OGV1	OGV2	PSV	TOT	PCU	P/C	M/C	CAR	LGV	OGV1	OGV2	PSV	TOT	PCU
0	0	2	0	0	0	0	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	1	0	0	0	3	3
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0
0	0	4	0	0	0	0	4	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	1	3	4
0	0	1	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	5	0	0	0	1	6	7	0	0	5	1	0	0	0	6	6
0	0	7	0	0	0	0	7	7	0	0	0	0	0	0	0	0	0	0	0	6	0	0	0	1	7	8	0	0	9	2	0	0	1	12	13
0	0	1	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	1	0	0	5	2	0	0	0	7	7
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0	0	8	0	0	0	0	8	8	0	0	0	0	0	0	0	0	0	0	0	8	1	0	0	0	9	9	0	0	18	0	0	1	0	19	20.3
0	0	79	8	2	1	0	90	92.3	0	0	1	0	0	0	0	1	1	0	0	91	11	2	2	1	107	111.6	1	0	142	36	4	5	2	190	199.7

C => A									C => B									C => C									C => D								
P/C	M/C	CAR	LGV	OGV1	OGV2	PSV	TOT	PCU	P/C	M/C	CAR	LGV	OGV1	OGV2	PSV	TOT	PCU	P/C	M/C	CAR	LGV	OGV1	OGV2	PSV	TOT	PCU	P/C	M/C	CAR	LGV	OGV1	OGV2	PSV	TOT	PCU
0	0	5	0	0	0	0	5	5	0	0	1	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	1
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D => A									D => B									D => C									D => D								
P/C	M/C	CAR	LGV	OGV1	OGV2	PSV	TOT	PCU	P/C	M/C	CAR	LGV	OGV1	OGV2	PSV	TOT	PCU	P/C	M/C	CAR	LGV	OGV1	OGV2	PSV	TOT	PCU	P/C	M/C	CAR	LGV	OGV1	OGV2	PSV	TOT	PCU
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0	0	21	6	1	0	0	28	28.5	0	0	15	2	0	1	1	19	21.5	0	0	23	4	0	0	1	28	29	0	0	4	2	0	0	0	6	6
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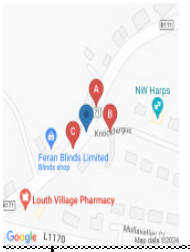
0	0	242	55	9	8	0	314	328.9	0	0	132	30	6	4	2	174	184.2	2	0	445	62	12	4	1	526	536.6	0	0	26	5	0	0	0	31	31



IDASO

Survey Name: 001 (24) 23707 - Co. Louth

Site: Site 2.2

Location: R171/Knockfergus

Date: Tue 09-Jan-2024

	A => A									A => B									A => C								
TIME	P/C	M/C	CAR	LGV	OGV1	OGV2	PSV	TOT	PCU	P/C	M/C	CAR	LGV	OGV1	OGV2	PSV	TOT	PCU	P/C	M/C	CAR	LGV	OGV1	OGV2	PSV	TOT	PCU
07:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	3	3
07:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0	0	0	1	5	6
07:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7	3	0	0	0	10	10
07:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7	0	1	0	0	8	8.5
H/TOT	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	21	3	1	0	1	26	27.5
08:00	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	1	0	0	8	0	1	0	0	9	9.5
08:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	14	2	0	0	0	16	16
08:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	13	2	0	0	1	16	17
08:45	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	1	0	0	12	1	0	0	0	13	13
H/TOT	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	2	2	0	0	47	5	1	0	1	54	55.5
09:00	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	1	0	0	13	0	1	0	0	14	14.5
09:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7	1	0	0	0	8	8
09:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	10	1	1	0	1	13	14.5
09:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7	1	1	1	0	10	11.8
H/TOT	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	1	0	0	37	3	3	1	1	45	48.8
10:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	9	1	0	0	0	10	10
10:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7	2	0	0	0	9	9
10:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	1	0	0	1	5	6
10:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	1	1	1	0	7	8.8
H/TOT	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	23	5	1	1	1	31	33.8
11:00	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	1	0	0	7	1	2	0	0	10	11
11:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6	2	1	1	0	10	11.8
11:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	8	2	0	0	1	11	12
11:45	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	1	0	0	12	1	1	0	0	14	14.5
H/TOT	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	2	2	0	0	33	6	4	1	1	45	48.3
12:00	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	3	3	0	0	8	0	0	1	0	9	10.3
12:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	12	2	1	0	0	15	15.5
12:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5	2	1	0	1	9	10.5
12:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	8	1	0	0	0	9	9
H/TOT	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	3	3	0	0	33	5	2	1	1	42	45.3
13:00	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	1	0	0	13	1	1	0	0	15	15.5
13:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	11	1	1	0	0	13	13.5
13:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	11	2	0	0	1	14	15
13:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	8	3	1	0	0	12	12.5
H/TOT	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	1	0	0	43	7	3	0	1	54	56.5
14:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	10	1	2	1	0	14	16.3
14:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	12	2	0	0	0	14	14
14:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	19	0	0	0	1	20	21
14:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24	2	2	0	0	28	29
H/TOT	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	65	5	4	1	1	76	80.1
15:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	14	1	0	1	0	16	17.3
15:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	8	2	0	0	0	10	10
15:30	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	1	0	0	15	4	0	0	1	20	21
15:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	14	0	0	0	0	14	14
H/TOT	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	1	0	0	51	7	0	1	1	60	62.3
16:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	14	1	0	0	0	16	15.2
16:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	20	6	0	0	0	26	26
16:30	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	1	0	0	10	3	0	0	3	16	19
16:45	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	1	0	0	28	4	0	0	0	32	32
H/TOT	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	2	2	1	0	72	14	0	0	3	90	92.2
17:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	18	3	0	0	0	21	21
17:15	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	1	1	0	20	0	2	0	0	23	23.2
17:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	29	5	0	0	1	35	36
17:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	22	2	1	0	0	25	25.5
H/TOT	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	1	1	0	89	10	3	0	1	104	105.7
18:00	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	1	0	0	19	0	0	0	0	19	19
18:15	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	2	2	0	0	11	2	0	0	0	13	13
18:30	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	1	0	0	9	1	0	0	1	11	12
18:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	17	1	0	0	0	18	18
H/TOT	0	0	0	0	0	0	0	0	0	0	0	4	0	0	0	0	4	4	0	0	56	4	0	0	1	61	62
12 TOT	0	0	0	0	0	0	0	0	0	0	0	16	1	0	0	0	17	17	2	0	570	74	22	6	14	688	718.2

B => A									B => B									B => C								
P/C	M/C	CAR	LGV	OGV1	OGV2	PSV	TOT	PCU	P/C	M/C	CAR	LGV	OGV1	OGV2	PSV	TOT	PCU	P/C	M/C	CAR	LGV	OGV1	OGV2	PSV	TOT	PCU
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
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0	0	3	0	0	0	0	3	3	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	2	2
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	3	0	0	0	0	3	3	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	2	2
0	0	20	0	0	1	0	21	22.3	0	0	0	0	0	0	0	0	0	0	0	18	4	0	0	0	22	22

C => A									C => B									C => C								
P/C	M/C	CAR	LGV	OGV1	OGV2	PSV	TOT	PCU	P/C	M/C	CAR	LGV	OGV1	OGV2	PSV	TOT	PCU	P/C	M/C	CAR	LGV	OGV1	OGV2	PSV	TOT	PCU
0	0	6	3	0	0	0	9	9	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	2	2
0	0	6	2	0	0	0	8	8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	18	2	0	0	1	21	22	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	18	6	0	0	2	26	28	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	48	13	0	0	3	64	67	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	2	2
0	0	20	4	1	0	0	25	25.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	23	2	2	0	1	28	30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	31	2	0	0	0	33	33	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	17	1	1	0	0	19	19.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	91	9	4	0	1	105	108	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	25	0	1	1	0	27	28.8	0	0	1	0	0	0	0	1	1	0	0	3	0	0	0	0	3	3
0	0	11	5	1	0	1	18	19.5	0	0	2	1	0	0	0	3	3	0	0	2	0	0	0	0	2	2
0	0	9	1	1	0	0	11	11.5	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	1
0	0	3	0	1	0	0	4	4.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	1	48	6	4	1	1	60	64.3	0	0	3	1	0	0	0	4	4	0	0	6	0	0	0	0	6	6
0	0	9	1	0	0	0	10	10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	11	0	0	0	1	12	13	0	0	0	0	0	1	0	1	2.3	0	0	0	0	0	0	0	0	0
0	0	8	1	2	1	0	12	14.3	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	1
0	0	9	3	1	1	0	14	15.8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	37	5	3	2	1	48	53.1	0	0	0	0	0	1	0	1	2.3	0	0	1	0	0	0	0	1	1
0	0	16	2	0	0	0	18	18	0	0	0	1	0	0	0	1	1	0	0	1	0	1	0	0	2	2.5
0	0	18	1	0	2	1	22	25.6	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	1
0	0	8	2	1	1	0	12	13.8	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	2	2
0	0	8	1	0	0	0	9	9	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	3	3
0	0	50	6	1	3	1	61	66.4	0	0	0	1	0	0	0	1	1	0	0	7	0	1	0	0	8	8.5
0	0	11	2	0	0	0	13	13	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	1
0	0	8	3	1	0	1	13	14.5	0	0	1	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0
0	0	17	1	0	1	0	19	20.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	4	1	1	1	0	7	8.8	0	0	1	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0
0	0	40	7	2	2	1	52	56.6	0	0	2	0	0	0	0	2	2	0	0	1	0	0	0	0	1	1
0	0	12	3	0	0	0	15	15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	5	2	1	0	1	9	10.5	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	1
0	0	17	0	0	0	0	17	17	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	1
0	0	8	2	0	0	0	10	10	0	0	1	0	0	0	0	1	1	0	0	1	0	0	0	0	1	1
0	0	42	7	1	0	1	51	52.5	0	0	1	0	0	0	0	1	1	0	0	3	0	0	0	0	3	3
0	0	14	3	0	0	0	17	17	0	0	1	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0
0	0	12	3	1	0	1	17	18.5	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	2	2
0	0	12	1	1	0	0	14	14.5	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	1
1	0	20	1	2	1	0	25	26.5	0	0	3	0	0	0	0	3	3	0	0	0	0	0	0	0	0	0
1	0	58	8	4	1	1	73	76.5	0	0	4	0	0	0	0	4	4	0	0	3	0	0	0	0	3	3
0	0	10	3	1	1	0	15	16.8	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	3	3
0	0	8	2	1	0	1	12	13.5	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	1
0	0	12	3	0	0	0	15	15	0	0	1	0	0	0	0	1	1	0	0	2	0	0	0	0	2	2
0	0	12	2	0	1	0	15	16.3	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	2	2
0	0	42	10	2	2	1	57	61.6	0	0	1	0	0	0	0	1	1	0	0	8	0	0	0	0	8	8
0	0	10	0	0	0	1	11	12	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	3	3
0	0	15	2	0	0	1	18	19	0	0	1	0	0	0	0	1	1	0	0	3	0	0	0	0	3	3
0	0	15	4	0	0	0	19	19	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	2	2
0	0	7	2	1	0	0	10	10.5	0	0	1	0	0	0	0	1	1	0	0	6	0	0	0	0	6	6
0	0	47	8	1	0	2	58	60.5	0	0	2	0	0	0	0	2	2	0	0	14	0	0	0	0	14	14
0	0	7	3	1	0	0	11	11.5	0	0	1	0	0	0	0	1	1	0	0	3	0	0	0	0	3	3
0	0	9	2	0	0	0	11	11	0	0	1	0	0	0	0	1	1	0	0	3	0	0	0	0	3	3
0	0	12	4	0	0	1	17	18	0	0	2	0	0	0	0	2	2	0	0	0	0	0	0	0	0	0
0	0	17	0	0	0	0	17	17	0	0	1	0	0	0	0	1	1	0	0	2	0	0	0	0	2	2
0	0	45	9	1	0	1	56	57.5	0	0	5	0	0	0	0	5	5	0	0	8	0	0	0	0	8	8
0	0	8	1	1	0	0	10	10.5	0	0	1	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0
0	0	9	2	0	0	1	12	13	0	0	0	1	0	0	0	1	1	0	0	0	0	0	0	0	0	0
0	0	20	0	0	0	0	20	20	0	0	2	0	0	0	0	2	2	0	0	0	0	0	0	0	0	0
0	0	12	2	1	0	0	15	15.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	49	5	2	0	1	57	59	0	0	3	1	0	0	0	4	4	0	0	0	0	0	0	0	0	0
1	0	597	93	25	11	15	742	783	0	0	21	3	0	1	0	25	26.3	0	0	53	0	1	0	0	54	54.5

APPENDIX C – TRAFFIC FLOW SHEETS

Proposed Development Access Junction - AM Peak Hour

2023 AM Peak - Base Flows

From / To	R171 (north)	Development Access	R171 (south)	**Totals**
R171 (north)	0	0	110	**110**
Development Access	0	0	0	**0**
R171 (south)	58	0	0	**58**
Totals	**58**	**0**	**110**	**168**

AM Peak - Development flows

From / To	R171 (north)	Development Access	R171 (south)	**Totals**
R171 (north)	0	5	0	**5**
Development Access	8	0	7	**15**
R171 (south)	0	2	0	**2**
Totals	**8**	**7**	**7**	**22**

2026 AM Peak - No Development (Existing + 4.52%)

From / To	R171 (north)	Development Access	R171 (south)	**Totals**
R171 (north)	0	0	115	**115**
Development Access	0	0	0	**0**
R171 (south)	61	0	0	**61**
Totals	**61**	**0**	**115**	**176**

2026 AM Peak - With Development

From / To	R171 (north)	Development Access	R171 (south)	**Totals**
R171 (north)	0	5	115	**120**
Development Access	8	0	7	**15**
R171 (south)	61	2	0	**63**
Totals	**69**	**7**	**122**	**198**

2031 AM Peak - No Development (Existing + 16.75%)

From / To	R171 (north)	Development Access	R171 (south)	**Totals**
R171 (north)	0	0	128	**128**
Development Access	0	0	0	**0**
R171 (south)	68	0	0	**68**
Totals	**68**	**0**	**128**	**196**

2031 AM Peak - With Development

From / To	R171 (north)	Development Access	R171 (south)	**Totals**
R171 (north)	0	5	128	**133**
Development Access	8	0	7	**15**
R171 (south)	68	2	0	**70**
Totals	**76**	**7**	**135**	**218**

2041 AM Peak - No Development (Existing + 19.44%)

From / To	R171 (north)	Development Access	R171 (south)	**Totals**
R171 (north)	0	0	131	**131**
Development Access	0	0	0	**0**
R171 (south)	69	0	0	**69**
Totals	**69**	**0**	**131**	**201**

2041 AM Peak - With Development

From / To	R171 (north)	Development Access	R171 (south)	**Totals**
R171 (north)	0	5	131	**136**
Development Access	8	0	7	**15**
R171 (south)	69	2	0	**71**
Totals	**77**	**7**	**138**	**223**

Proposed Development Access Junction - PM Peak Hour

2023 PM Peak - Base Flows

From / To	R171 (north)	Development Access	R171 (south)	**Totals**
R171 (north)	0	0	105	**105**
Development Access	0	0	0	**0**
R171 (south)	58	0	0	**58**
Totals	**58**	**0**	**105**	**163**

PM Peak - Development flows

From / To	R171 (north)	Development Access	R171 (south)	**Totals**
R171 (north)	0	2	0	**2**
Development Access	7	0	3	**10**
R171 (south)	0	13	0	**13**
Totals	**7**	**15**	**3**	**25**

2026 PM Peak - No Development (Existing + 4.52%)

From / To	R171 (north)	Development Access	R171 (south)	**Totals**
R171 (north)	0	0	110	**110**
Development Access	0	0	0	**0**
R171 (south)	61	0	0	**61**
Totals	**61**	**0**	**110**	**170**

2026 PM Peak - With Development

From / To	R171 (north)	Development Access	R171 (south)	**Totals**
R171 (north)	0	2	110	**112**
Development Access	7	0	3	**10**
R171 (south)	61	13	0	**74**
Totals	**68**	**15**	**113**	**195**

2031 PM Peak - No Development (Existing + 16.75%)

From / To	R171 (north)	Development Access	R171 (south)	**Totals**
R171 (north)	0	0	123	**123**
Development Access	0	0	0	**0**
R171 (south)	68	0	0	**68**
Totals	**68**	**0**	**123**	**190**

2031 PM Peak - With Development

From / To	R171 (north)	Development Access	R171 (south)	**Totals**
R171 (north)	0	2	123	**125**
Development Access	7	0	3	**10**
R171 (south)	68	13	0	**81**
Totals	**75**	**15**	**126**	**215**

2041 PM Peak - No Development (Existing + 19.44%)

From / To	R171 (north)	Development Access	R171 (south)	**Totals**
R171 (north)	0	0	125	**125**
Development Access	0	0	0	**0**
R171 (south)	69	0	0	**69**
Totals	**69**	**0**	**125**	**195**

2041 PM Peak - With Development

From / To	R171 (north)	Development Access	R171 (south)	**Totals**
R171 (north)	0	2	125	**127**
Development Access	7	0	3	**10**
R171 (south)	69	13	0	**82**
Totals	**76**	**15**	**128**	**220**

R171 / L1170 / L4700 crossroads Junction - AM Peak Hour

2023 AM Peak - Base Flows

From / To	R171 (north)	L1170	R171 (south)	L4700	**Totals**
R171 (north)	0	7	43	10	**60**
L1170	7	0	7	22	**36**
R171 (south)	59	12	0	32	**103**
L4700	42	20	84	0	**146**
Totals	**108**	**39**	**134**	**64**	**345**

AM Peak - Development flows

From / To	R171 (north)	L1170	R171 (south)	L4700	**Totals**
R171 (north)	0	1	5	1	**7**
L1170	0	0	0	0	**0**
R171 (south)	1	0	0	0	**1**
L4700	1	0	0	0	**1**
Totals	**2**	**1**	**5**	**1**	**9**

2026 AM Peak - No Development (Existing + 4.52%)

From / To	R171 (north)	L1170	R171 (south)	L4700	**Totals**
R171 (north)	0	7	45	10	**63**
L1170	7	0	7	23	**38**
R171 (south)	62	13	0	33	**108**
L4700	44	21	88	0	**153**
Totals	**113**	**41**	**140**	**67**	**361**

2026 AM Peak - With Development

From / To	R171 (north)	L1170	R171 (south)	L4700	**Totals**
R171 (north)	0	8	50	11	**70**
L1170	7	0	7	23	**38**
R171 (south)	63	13	0	33	**109**
L4700	45	21	88	0	**154**
Totals	**115**	**42**	**145**	**68**	**370**

2031 AM Peak - No Development (Existing + 16.75%)

From / To	R171 (north)	L1170	R171 (south)	L4700	**Totals**
R171 (north)	0	8	50	12	**70**
L1170	8	0	8	26	**42**
R171 (south)	69	14	0	37	**120**
L4700	49	23	98	0	**170**
Totals	**126**	**46**	**156**	**75**	**403**

2031 AM Peak - With Development

From / To	R171 (north)	L1170	R171 (south)	L4700	**Totals**
R171 (north)	0	9	55	13	**77**
L1170	8	0	8	26	**42**
R171 (south)	70	14	0	37	**121**
L4700	50	23	98	0	**171**
Totals	**128**	**47**	**161**	**76**	**412**

2041 AM Peak - No Development (Existing + 19.44%)

From / To	R171 (north)	L1170	R171 (south)	L4700	**Totals**
R171 (north)	0	8	51	12	**72**
L1170	8	0	8	26	**43**
R171 (south)	70	14	0	38	**123**
L4700	50	24	100	0	**174**
Totals	**129**	**47**	**160**	**76**	**412**

2041 AM Peak - With Development

From / To	R171 (north)	L1170	R171 (south)	L4700	**Totals**
R171 (north)	0	9	56	13	**79**
L1170	8	0	8	26	**43**
R171 (south)	71	14	0	38	**124**
L4700	51	24	100	0	**175**
Totals	**131**	**48**	**165**	**77**	**421**

R171 / L1170 / L4700 crossroads Junction - PM Peak Hour

2023 PM Peak - Base Flows

From / To	R171 (north)	L1170	R171 (south)	L4700	**Totals**
R171 (north)	0	14	57	45	**116**
L1170	9	0	10	35	**54**
R171 (south)	33	7	0	80	**120**
L4700	29	24	42	0	**95**
Totals	**71**	**45**	**109**	**160**	**385**

PM Peak - Development flows

From / To	R171 (north)	L1170	R171 (south)	L4700	**Totals**
R171 (north)	0	0	2	1	**3**
L1170	1	0	0	0	**1**
R171 (south)	6	0	0	0	**6**
L4700	6	0	0	0	**6**
Totals	**13**	**0**	**2**	**1**	**16**

2026 PM Peak - No Development (Existing + 4.52%)

From / To	R171 (north)	L1170	R171 (south)	L4700	**Totals**
R171 (north)	0	15	60	47	**121**
L1170	9	0	10	37	**56**
R171 (south)	34	7	0	84	**125**
L4700	30	25	44	0	**99**
Totals	**74**	**47**	**114**	**167**	**402**

2026 PM Peak - With Development

From / To	R171 (north)	L1170	R171 (south)	L4700	**Totals**
R171 (north)	0	15	62	48	**124**
L1170	10	0	10	37	**57**
R171 (south)	40	7	0	84	**131**
L4700	36	25	44	0	**105**
Totals	**87**	**47**	**116**	**168**	**418**

2031 PM Peak - No Development (Existing + 16.75%)

From / To	R171 (north)	L1170	R171 (south)	L4700	**Totals**
R171 (north)	0	16	67	53	**135**
L1170	11	0	12	41	**63**
R171 (south)	39	8	0	93	**140**
L4700	34	28	49	0	**111**
Totals	**83**	**53**	**127**	**187**	**449**

2031 PM Peak - With Development

From / To	R171 (north)	L1170	R171 (south)	L4700	**Totals**
R171 (north)	0	16	69	54	**138**
L1170	12	0	12	41	**64**
R171 (south)	45	8	0	93	**146**
L4700	40	28	49	0	**117**
Totals	**96**	**53**	**129**	**188**	**465**

2041 PM Peak - No Development (Existing + 19.44%)

From / To	R171 (north)	L1170	R171 (south)	L4700	**Totals**
R171 (north)	0	17	68	54	**139**
L1170	11	0	12	42	**64**
R171 (south)	39	8	0	96	**143**
L4700	35	29	50	0	**113**
Totals	**85**	**54**	**130**	**191**	**460**

2041 PM Peak - With Development

From / To	R171 (north)	L1170	R171 (south)	L4700	**Totals**
R171 (north)	0	17	70	55	**142**
L1170	12	0	12	42	**65**
R171 (south)	45	8	0	96	**149**
L4700	41	29	50	0	**119**
Totals	**98**	**54**	**132**	**192**	**476**

APPENDIX D – TRICS INFORMATION

 Licence No: 619801

Calculation Reference: AUDIT-619801-240206-0204

TRIP RATE CALCULATION SELECTION PARAMETERS:

Land Use : 03 - RESIDENTIAL
Category : B - AFFORDABLE/LOCAL AUTHORITY HOUSES
TOTAL VEHICLES

Selected regions and areas:

13	MUNSTER		
	TI	TIPPERARY	2 days
15	GREATER DUBLIN		
	DL	DUBLIN	2 days

This section displays the number of survey days per TRICS® sub-region in the selected set

Primary Filtering selection:

This data displays the chosen trip rate parameter and its selected range. Only sites that fall within the parameter range are included in the trip rate calculation.

Parameter: No of Dwellings
Actual Range: 8 to 48 (units:)
Range Selected by User: 8 to 120 (units:)

Parking Spaces Range: All Surveys Included

Parking Spaces per Dwelling Range: All Surveys Included

Bedrooms per Dwelling Range: All Surveys Included

Percentage of dwellings privately owned: All Surveys Included

Public Transport Provision:
Selection by: Include all surveys

Date Range: 01/01/15 to 20/11/17

This data displays the range of survey dates selected. Only surveys that were conducted within this date range are included in the trip rate calculation.

Selected survey days:

Monday	2 days
Tuesday	1 days
Friday	1 days

This data displays the number of selected surveys by day of the week.

Selected survey types:

Manual count	4 days
Directional ATC Count	0 days

This data displays the number of manual classified surveys and the number of unclassified ATC surveys, the total adding up to the overall number of surveys in the selected set. Manual surveys are undertaken using staff, whilst ATC surveys are undertaking using machines.

Selected Locations:

Suburban Area (PPS6 Out of Centre)	3
Neighbourhood Centre (PPS6 Local Centre)	1

This data displays the number of surveys per main location category within the selected set. The main location categories consist of Free Standing, Edge of Town, Suburban Area, Neighbourhood Centre, Edge of Town Centre, Town Centre and Not Known.

Selected Location Sub Categories:

Residential Zone	4

This data displays the number of surveys per location sub-category within the selected set. The location sub-categories consist of Commercial Zone, Industrial Zone, Development Zone, Residential Zone, Retail Zone, Built-Up Zone, Village, Out of Town, High Street and No Sub Category.

Inclusion of Servicing Vehicles Counts:

Servicing vehicles Included	X days - Selected
Servicing vehicles Excluded	4 days - Selected

Secondary Filtering selection:

Use Class:

C3	4 days

This data displays the number of surveys per Use Class classification within the selected set. The Use Classes Order (England) 2020 has been used for this purpose, which can be found within the Library module of TRICS®.

Population within 500m Range:
All Surveys Included

Secondary Filtering selection (Cont.):

Population within 1 mile:

1,001 to 5,000	1 days
5,001 to 10,000	2 days
15,001 to 20,000	1 days

This data displays the number of selected surveys within stated 1-mile radii of population.

Population within 5 miles:

5,001 to 25,000	2 days
250,001 to 500,000	1 days
500,001 or More	1 days

This data displays the number of selected surveys within stated 5-mile radii of population.

Car ownership within 5 miles:

0.6 to 1.0	3 days
1.1 to 1.5	1 days

This data displays the number of selected surveys within stated ranges of average cars owned per residential dwelling, within a radius of 5-miles of selected survey sites.

Travel Plan:

No	4 days

This data displays the number of surveys within the selected set that were undertaken at sites with Travel Plans in place, and the number of surveys that were undertaken at sites without Travel Plans.

PTAL Rating:

No PTAL Present	4 days

This data displays the number of selected surveys with PTAL Ratings.

LIST OF SITES relevant to selection parameters

1	DL-03-B-02	TERRACED HOUSES	DUBLIN
	MARIGOLD ROAD		
	DUBLIN		
	DARNDALE		
	Neighbourhood Centre (PPS6 Local Centre)		
	Residential Zone		
	Total No of Dwellings:	35	
	Survey date: MONDAY	*19/10/15*	*Survey Type: MANUAL*
2	DL-03-B-03	SEMI-DETACHED & TERRACED	DUBLIN
	HOME PARK ROAD		
	DUBLIN		
	DRUMCONDRA		
	Suburban Area (PPS6 Out of Centre)		
	Residential Zone		
	Total No of Dwellings:	48	
	Survey date: TUESDAY	*22/11/16*	*Survey Type: MANUAL*
3	TI-03-B-01	MIXED HOUSES	TIPPERARY
	LIMERICK ROAD		
	NENAGH		
	Suburban Area (PPS6 Out of Centre)		
	Residential Zone		
	Total No of Dwellings:	43	
	Survey date: FRIDAY	*27/05/16*	*Survey Type: MANUAL*
4	TI-03-B-02	BUNGALOWS	TIPPERARY
	STRADAVOHER		
	THURLES		
	Suburban Area (PPS6 Out of Centre)		
	Residential Zone		
	Total No of Dwellings:	8	
	Survey date: MONDAY	*20/11/17*	*Survey Type: MANUAL*

This section provides a list of all survey sites and days in the selected set. For each individual survey site, it displays a unique site reference code and site address, the selected trip rate calculation parameter and its value, the day of the week and date of each survey, and whether the survey was a manual classified count or an ATC count.

TRIP RATE for Land Use 03 - RESIDENTIAL/B - AFFORDABLE/LOCAL AUTHORITY HOUSES
TOTAL VEHICLES
Calculation factor: 1 DWELLS
BOLD print indicates peak (busiest) period

	ARRIVALS			DEPARTURES			TOTALS		
Time Range	No. Days	Ave. DWELLS	Trip Rate	No. Days	Ave. DWELLS	Trip Rate	No. Days	Ave. DWELLS	Trip Rate
00:00 - 01:00									
01:00 - 02:00									
02:00 - 03:00									
03:00 - 04:00									
04:00 - 05:00									
05:00 - 06:00									
06:00 - 07:00									
07:00 - 08:00	4	34	0.075	4	34	0.157	4	34	0.232
08:00 - 09:00	4	34	0.112	4	34	0.246	4	34	0.358
09:00 - 10:00	4	34	0.157	4	34	0.231	4	34	0.388
10:00 - 11:00	4	34	0.209	4	34	0.157	4	34	0.366
11:00 - 12:00	4	34	0.194	4	34	0.224	4	34	0.418
12:00 - 13:00	4	34	0.254	4	34	0.149	4	34	0.403
13:00 - 14:00	4	34	0.142	4	34	0.224	4	34	0.366
14:00 - 15:00	4	34	0.239	4	34	0.194	4	34	0.433
15:00 - 16:00	4	34	0.284	4	34	0.254	4	34	0.538
16:00 - 17:00	4	34	0.246	4	34	0.164	4	34	0.410
17:00 - 18:00	4	34	0.388	4	34	0.269	4	34	0.657
18:00 - 19:00	4	34	0.246	4	34	0.209	4	34	0.455
19:00 - 20:00									
20:00 - 21:00									
21:00 - 22:00									
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			2.546			2.478			5.024

This section displays the trip rate results based on the selected set of surveys and the selected count type (shown just above the table). It is split by three main columns, representing arrivals trips, departures trips, and total trips (arrivals plus departures). Within each of these main columns are three sub-columns. These display the number of survey days where count data is included (per time period), the average value of the selected trip rate calculation parameter (per time period), and the trip rate result (per time period). Total trip rates (the sum of the column) are also displayed at the foot of the table.

*To obtain a trip rate, the average (mean) trip rate parameter value (TRP) is first calculated for all selected survey days that have count data available for the stated time period. The average (mean) number of arrivals, departures or totals (whichever applies) is also calculated (COUNT) for all selected survey days that have count data available for the stated time period. Then, the average count is divided by the average trip rate parameter value, and multiplied by the stated calculation factor (shown just above the table and abbreviated here as FACT). So, the method is: COUNT/TRP*FACT. Trip rates are then rounded to 3 decimal places.*

Parameter summary

Trip rate parameter range selected:	8 - 48 (units:)
Survey date date range:	01/01/15 - 20/11/17
Number of weekdays (Monday-Friday):	4
Number of Saturdays:	0
Number of Sundays:	0
Surveys automatically removed from selection:	0
Surveys manually removed from selection:	0

This section displays a quick summary of some of the data filtering selections made by the TRICS® user. The trip rate calculation parameter range of all selected surveys is displayed first, followed by the range of minimum and maximum survey dates selected by the user. Then, the total number of selected weekdays and weekend days in the selected set of surveys are show. Finally, the number of survey days that have been manually removed from the selected set outside of the standard filtering procedure are displayed.

APPENDIX E – PICADY RESULTS

Junctions 9

PICADY 9 - Priority Intersection Module

Filename: Proposed Junction.j9
Path: S:\Jobs\2023\23185 3 x SHD sites Louth RSA1 + TIA\23185-03 Mullavalley\Reports\Working\PICADY
Report generation date: 27/02/2024 10:15:46

Summary of junction performance

	AM				PM			
	Queue (Veh)	Delay (s)	RFC	LOS	Queue (Veh)	Delay (s)	RFC	LOS
	2026 with dev							
Stream B-AC	0.0	7.90	0.03	A	0.0	8.22	0.02	A
Stream C-AB	0.0	6.33	0.00	A	0.0	6.42	0.03	A
	2031 with dev							
Stream B-AC	0.0	7.97	0.04	A	0.0	8.30	0.02	A
Stream C-AB	0.0	6.31	0.00	A	0.0	6.40	0.03	A
	2041 with dev							
Stream B-AC	0.0	7.99	0.04	A	0.0	8.32	0.02	A
Stream C-AB	0.0	6.31	0.00	A	0.0	6.40	0.03	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	
Location	
Site number	
Date	27/02/2024
Version	
Status	(new file)
Identifier	
Client	
Jobnumber	
Enumerator	ROADPLAN01\jbyrne
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	Veh	Veh	perHour	s	-Min	perMin

Analysis Options

Vehicle length (m)	Calculate Queue Percentiles	Calculate detailed queueing delay	Calculate residual capacity	RFC Threshold	Average Delay threshold (s)	Queue threshold (PCU)
5.75				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)	Run automatically
D1	2026 with dev	AM	ONE HOUR	07:45	09:15	15	✓
D2	2026 with dev	PM	ONE HOUR	16:45	18:15	15	✓
D3	2031 with dev	AM	ONE HOUR	07:45	09:15	15	✓
D4	2031 with dev	PM	ONE HOUR	16:45	18:15	15	✓
D5	2041 with dev	AM	ONE HOUR	07:45	09:15	15	✓
D6	2041 with dev	PM	ONE HOUR	16:45	18:15	15	✓

Analysis Set Details

ID	Include in report	Network flow scaling factor (%)	Network capacity scaling factor (%)
A1	✓	100.000	100.000

2026 with dev, 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		0.67	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	6.00			75.0	✓	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)	Visibility to left (m)	Visibility to right (m)
B	One lane	3.25	15	15

Slope / Intercept / Capacity

Priority Intersection Slopes and Intercepts

Junction	Stream	Intercept (Veh/hr)	Slope for A-B	Slope for A-C	Slope for C-A	Slope for C-B
1	B-A	502	0.091	0.231	0.145	0.330
1	B-C	649	0.100	0.252	-	-
1	C-B	617	0.239	0.239	-	-

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)	Run automatically
D1	2026 with dev	AM	ONE HOUR	07:45	09:15	15	✓

Default vehicle mix	Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (Veh/hr)	Scaling Factor (%)
A		ONE HOUR	✓	120	100.000
B		ONE HOUR	✓	15	100.000
C		ONE HOUR	✓	63	100.000

Origin-Destination Data

Demand (Veh/hr)

		To		
		A	B	C
From	A	0	5	115
	B	8	0	7
	C	61	2	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 (Veh)	Max LOS	Average Demand (Veh/hr)	Total Junction Arrivals (Veh)
B-AC	0.03	7.90	0.0	A	14	21
C-AB	0.00	6.33	0.0	A	2	3
C-A					56	84
A-B					5	7
A-C					106	158

Main Results for each time segment

07:45 - 08:00

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	11	3	484	0.023	11	0.0	0.0	7.606	A
C-AB	2	0.41	570	0.003	2	0.0	0.0	6.328	A
C-A	46	11			46				
A-B	4	1			4				
A-C	87	22			87				

08:00 - 08:15

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	13	3	479	0.028	13	0.0	0.0	7.729	A
C-AB	2	0.50	572	0.003	2	0.0	0.0	6.310	A
C-A	55	14			55				
A-B	4	1			4				
A-C	103	26			103				

08:15 - 08:30

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	17	4	472	0.035	16	0.0	0.0	7.900	A
C-AB	2	0.62	575	0.004	2	0.0	0.0	6.286	A
C-A	67	17			67				
A-B	6	1			6				
A-C	127	32			127				

08:30 - 08:45

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	17	4	472	0.035	17	0.0	0.0	7.900	A
C-AB	2	0.62	575	0.004	2	0.0	0.0	6.286	A
C-A	67	17			67				
A-B	6	1			6				
A-C	127	32			127				

08:45 - 09:00

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	13	3	479	0.028	14	0.0	0.0	7.730	A
C-AB	2	0.50	572	0.003	2	0.0	0.0	6.313	A
C-A	55	14			55				
A-B	4	1			4				
A-C	103	26			103				

09:00 - 09:15

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	11	3	484	0.023	11	0.0	0.0	7.613	A
C-AB	2	0.41	570	0.003	2	0.0	0.0	6.328	A
C-A	46	11			46				
A-B	4	1			4				
A-C	87	22			87				

2026 with dev, 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		0.89	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)	Run automatically
D2	2026 with dev	PM	ONE HOUR	16:45	18:15	15	✓

Default vehicle mix	Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (Veh/hr)	Scaling Factor (%)
A		ONE HOUR	✓	112	100.000
B		ONE HOUR	✓	10	100.000
C		ONE HOUR	✓	74	100.000

Origin-Destination Data

Demand (Veh/hr)

		To		
		A	B	C
From	A	0	2	110
	B	7	0	3
	C	61	13	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 (Veh)	Max LOS	Average Demand (Veh/hr)	Total Junction Arrivals (Veh)
B-AC	0.02	8.22	0.0	A	9	14
C-AB	0.03	6.42	0.0	A	13	20
C-A					55	82
A-B					2	3
A-C					101	151

Main Results for each time segment

16:45 - 17:00

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	8	2	462	0.016	7	0.0	0.0	7.922	A
C-AB	11	3	572	0.019	11	0.0	0.0	6.414	A
C-A	45	11			45				
A-B	2	0.38			2				
A-C	83	21			83				

17:00 - 17:15

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	9	2	456	0.020	9	0.0	0.0	8.046	A
C-AB	13	3	574	0.023	13	0.0	0.0	6.415	A
C-A	54	13			54				
A-B	2	0.45			2				
A-C	99	25			99				

17:15 - 17:30

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	11	3	449	0.025	11	0.0	0.0	8.222	A
C-AB	16	4	577	0.028	16	0.0	0.0	6.417	A
C-A	65	16			65				
A-B	2	0.55			2				
A-C	121	30			121				

17:30 - 17:45

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	11	3	449	0.025	11	0.0	0.0	8.222	A
C-AB	16	4	577	0.028	16	0.0	0.0	6.420	A
C-A	65	16			65				
A-B	2	0.55			2				
A-C	121	30			121				

17:45 - 18:00

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	9	2	456	0.020	9	0.0	0.0	8.048	A
C-AB	13	3	574	0.023	13	0.0	0.0	6.416	A
C-A	54	13			54				
A-B	2	0.45			2				
A-C	99	25			99				

18:00 - 18:15

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	8	2	462	0.016	8	0.0	0.0	7.924	A
C-AB	11	3	572	0.019	11	0.0	0.0	6.414	A
C-A	45	11			45				
A-B	2	0.38			2				
A-C	83	21			83				

2031 with dev, 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		0.61	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)	Run automatically
D3	2031 with dev	AM	ONE HOUR	07:45	09:15	15	✓

Default vehicle mix	Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (Veh/hr)	Scaling Factor (%)
A		ONE HOUR	✓	133	100.000
B		ONE HOUR	✓	15	100.000
C		ONE HOUR	✓	70	100.000

Origin-Destination Data

Demand (Veh/hr)

		To		
		A	B	C
From	A	0	5	128
	B	8	0	7
	C	68	2	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 (Veh)	Max LOS	Average Demand (Veh/hr)	Total Junction Arrivals (Veh)
B-AC	0.04	7.97	0.0	A	14	21
C-AB	0.00	6.31	0.0	A	2	3
C-A					62	93
A-B					5	7
A-C					117	176

Main Results for each time segment

07:45 - 08:00

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	11	3	481	0.023	11	0.0	0.0	7.653	A
C-AB	2	0.41	572	0.003	2	0.0	0.0	6.314	A
C-A	51	13			51				
A-B	4	1			4				
A-C	96	24			96				

08:00 - 08:15

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	13	3	476	0.028	13	0.0	0.0	7.787	A
C-AB	2	0.50	574	0.004	2	0.0	0.0	6.294	A
C-A	61	15			61				
A-B	4	1			4				
A-C	115	29			115				

08:15 - 08:30

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	17	4	468	0.035	16	0.0	0.0	7.975	A
C-AB	3	0.63	577	0.004	3	0.0	0.0	6.265	A
C-A	75	19			75				
A-B	6	1			6				
A-C	141	35			141				

08:30 - 08:45

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	17	4	468	0.035	17	0.0	0.0	7.975	A
C-AB	3	0.63	577	0.004	3	0.0	0.0	6.265	A
C-A	75	19			75				
A-B	6	1			6				
A-C	141	35			141				

08:45 - 09:00

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	13	3	476	0.028	14	0.0	0.0	7.790	A
C-AB	2	0.50	574	0.004	2	0.0	0.0	6.294	A
C-A	61	15			61				
A-B	4	1			4				
A-C	115	29			115				

09:00 - 09:15

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	11	3	481	0.023	11	0.0	0.0	7.660	A
C-AB	2	0.41	572	0.003	2	0.0	0.0	6.314	A
C-A	51	13			51				
A-B	4	1			4				
A-C	96	24			96				

2031 with dev, 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		0.82	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)	Run automatically
D4	2031 with dev	PM	ONE HOUR	16:45	18:15	15	✓

Default vehicle mix	Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (Veh/hr)	Scaling Factor (%)
A		ONE HOUR	✓	125	100.000
B		ONE HOUR	✓	10	100.000
C		ONE HOUR	✓	81	100.000

Origin-Destination Data

Demand (Veh/hr)

		To		
		A	B	C
From	A	0	2	123
	B	7	0	3
	C	68	13	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 (Veh)	Max LOS	Average Demand (Veh/hr)	Total Junction Arrivals (Veh)
B-AC	0.02	8.30	0.0	A	9	14
C-AB	0.03	6.40	0.0	A	13	20
C-A					61	91
A-B					2	3
A-C					113	169

Main Results for each time segment

16:45 - 17:00

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	8	2	459	0.016	7	0.0	0.0	7.974	A
C-AB	11	3	573	0.019	11	0.0	0.0	6.400	A
C-A	50	13			50				
A-B	2	0.38			2				
A-C	93	23			93				

17:00 - 17:15

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	9	2	453	0.020	9	0.0	0.0	8.110	A
C-AB	13	3	576	0.023	13	0.0	0.0	6.399	A
C-A	60	15			60				
A-B	2	0.45			2				
A-C	111	28			111				

17:15 - 17:30

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	11	3	444	0.025	11	0.0	0.0	8.304	A
C-AB	16	4	579	0.028	16	0.0	0.0	6.398	A
C-A	73	18			73				
A-B	2	0.55			2				
A-C	135	34			135				

17:30 - 17:45

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	11	3	444	0.025	11	0.0	0.0	8.304	A
C-AB	16	4	579	0.028	16	0.0	0.0	6.401	A
C-A	73	18			73				
A-B	2	0.55			2				
A-C	135	34			135				

17:45 - 18:00

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	9	2	453	0.020	9	0.0	0.0	8.113	A
C-AB	13	3	576	0.023	13	0.0	0.0	6.400	A
C-A	60	15			60				
A-B	2	0.45			2				
A-C	111	28			111				

18:00 - 18:15

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	8	2	459	0.016	8	0.0	0.0	7.978	A
C-AB	11	3	573	0.019	11	0.0	0.0	6.404	A
C-A	50	13			50				
A-B	2	0.38			2				
A-C	93	23			93				

2041 with dev, 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		0.60	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)	Run automatically
D5	2041 with dev	AM	ONE HOUR	07:45	09:15	15	✓

Default vehicle mix	Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (Veh/hr)	Scaling Factor (%)
A		ONE HOUR	✓	136	100.000
B		ONE HOUR	✓	15	100.000
C		ONE HOUR	✓	71	100.000

Origin-Destination Data

Demand (Veh/hr)

		To		
		A	B	C
From	A	0	5	131
	B	8	0	7
	C	69	2	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 (Veh)	Max LOS	Average Demand (Veh/hr)	Total Junction Arrivals (Veh)
B-AC	0.04	7.99	0.0	A	14	21
C-AB	0.00	6.31	0.0	A	2	3
C-A					63	95
A-B					5	7
A-C					120	180

Main Results for each time segment

07:45 - 08:00

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	11	3	481	0.023	11	0.0	0.0	7.663	A
C-AB	2	0.41	572	0.003	2	0.0	0.0	6.314	A
C-A	52	13			52				
A-B	4	1			4				
A-C	99	25			99				

08:00 - 08:15

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	13	3	475	0.028	13	0.0	0.0	7.800	A
C-AB	2	0.50	574	0.004	2	0.0	0.0	6.294	A
C-A	62	15			62				
A-B	4	1			4				
A-C	118	29			118				

08:15 - 08:30

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	17	4	467	0.035	16	0.0	0.0	7.991	A
C-AB	3	0.63	577	0.004	3	0.0	0.0	6.265	A
C-A	76	19			76				
A-B	6	1			6				
A-C	144	36			144				

08:30 - 08:45

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	17	4	467	0.035	17	0.0	0.0	7.991	A
C-AB	3	0.63	577	0.004	3	0.0	0.0	6.268	A
C-A	76	19			76				
A-B	6	1			6				
A-C	144	36			144				

08:45 - 09:00

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	13	3	475	0.028	14	0.0	0.0	7.802	A
C-AB	2	0.50	574	0.004	2	0.0	0.0	6.296	A
C-A	62	15			62				
A-B	4	1			4				
A-C	118	29			118				

09:00 - 09:15

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	11	3	481	0.023	11	0.0	0.0	7.670	A
C-AB	2	0.41	572	0.003	2	0.0	0.0	6.314	A
C-A	52	13			52				
A-B	4	1			4				
A-C	99	25			99				

2041 with dev, 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		0.81	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)	Run automatically
D6	2041 with dev	PM	ONE HOUR	16:45	18:15	15	✓

Default vehicle mix	Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (Veh/hr)	Scaling Factor (%)
A		ONE HOUR	✓	127	100.000
B		ONE HOUR	✓	10	100.000
C		ONE HOUR	✓	82	100.000

Origin-Destination Data

Demand (Veh/hr)

		To		
		A	B	C
From	A	0	2	125
	B	7	0	3
	C	69	13	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 (Veh)	Max LOS	Average Demand (Veh/hr)	Total Junction Arrivals (Veh)
B-AC	0.02	8.32	0.0	A	9	14
C-AB	0.03	6.40	0.0	A	13	20
C-A					62	93
A-B					2	3
A-C					115	172

Main Results for each time segment

16:45 - 17:00

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	8	2	458	0.016	7	0.0	0.0	7.982	A
C-AB	11	3	573	0.019	11	0.0	0.0	6.399	A
C-A	51	13			51				
A-B	2	0.38			2				
A-C	94	24			94				

17:00 - 17:15

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	9	2	452	0.020	9	0.0	0.0	8.120	A
C-AB	13	3	576	0.023	13	0.0	0.0	6.397	A
C-A	61	15			61				
A-B	2	0.45			2				
A-C	112	28			112				

17:15 - 17:30

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	11	3	444	0.025	11	0.0	0.0	8.317	A
C-AB	16	4	579	0.028	16	0.0	0.0	6.395	A
C-A	74	18			74				
A-B	2	0.55			2				
A-C	138	34			138				

17:30 - 17:45

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	11	3	444	0.025	11	0.0	0.0	8.317	A
C-AB	16	4	579	0.028	16	0.0	0.0	6.398	A
C-A	74	18			74				
A-B	2	0.55			2				
A-C	138	34			138				

17:45 - 18:00

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	9	2	452	0.020	9	0.0	0.0	8.121	A
C-AB	13	3	576	0.023	13	0.0	0.0	6.401	A
C-A	61	15			61				
A-B	2	0.45			2				
A-C	112	28			112				

18:00 - 18:15

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	8	2	458	0.016	8	0.0	0.0	7.986	A
C-AB	11	3	573	0.019	11	0.0	0.0	6.402	A
C-A	51	13			51				
A-B	2	0.38			2				
A-C	94	24			94				

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: Crossroads Junction.j9
Path: S:\Jobs\2023\23185 3 x SHD sites Louth RSA1 + TIA\23185-03 Mullavalley\Reports\Working\PICADY
Report generation date: 27/02/2024 11:06:33

Summary of junction performance

	AM				PM			
	Queue (Veh)	Delay (s)	RFC	LOS	Queue (Veh)	Delay (s)	RFC	LOS
	2024							
Stream B-ACD	0.1	7.42	0.08	A	0.1	7.85	0.11	A
Stream AB-CD	0.1	6.91	0.07	A	0.2	7.70	0.18	A
Stream D-ABC	0.5	11.75	0.34	B	0.3	9.68	0.22	A
Stream CD-AB	0.1	5.95	0.07	A	0.1	6.32	0.06	A
	2026 no dev							
Stream B-ACD	0.1	7.43	0.08	A	0.1	7.90	0.12	A
Stream AB-CD	0.1	6.92	0.07	A	0.3	7.77	0.19	A
Stream D-ABC	0.6	12.13	0.36	B	0.3	9.86	0.23	A
Stream CD-AB	0.1	5.94	0.07	A	0.1	6.34	0.07	A
	2026 with dev							
Stream B-ACD	0.1	7.46	0.08	A	0.1	7.99	0.12	A
Stream AB-CD	0.1	6.89	0.07	A	0.3	7.80	0.19	A
Stream D-ABC	0.6	12.20	0.36	B	0.3	9.98	0.24	A
Stream CD-AB	0.1	5.95	0.07	A	0.1	6.26	0.07	A
	2031 no dev							
Stream B-ACD	0.1	7.57	0.09	A	0.2	8.17	0.14	A
Stream AB-CD	0.1	6.99	0.08	A	0.3	7.98	0.21	A
Stream D-ABC	0.7	13.17	0.41	B	0.3	10.39	0.26	B
Stream CD-AB	0.1	5.93	0.08	A	0.1	6.38	0.07	A
	2031 with dev							
Stream B-ACD	0.1	7.60	0.09	A	0.2	8.26	0.14	A
Stream AB-CD	0.1	6.97	0.09	A	0.3	8.02	0.22	A
Stream D-ABC	0.7	13.25	0.41	B	0.4	10.53	0.27	B
Stream CD-AB	0.1	5.94	0.08	A	0.1	6.30	0.08	A
	2041 no dev							
Stream B-ACD	0.1	7.58	0.09	A	0.2	8.20	0.14	A
Stream AB-CD	0.1	6.99	0.08	A	0.3	8.03	0.22	A
Stream D-ABC	0.7	13.39	0.42	B	0.4	10.50	0.27	B
Stream CD-AB	0.1	5.93	0.08	A	0.1	6.39	0.08	A
	2041 with dev							
Stream B-ACD	0.1	7.61	0.09	A	0.2	8.29	0.14	A
Stream AB-CD	0.1	6.96	0.09	A	0.3	8.07	0.22	A
Stream D-ABC	0.7	13.48	0.42	B	0.4	10.65	0.28	B
Stream CD-AB	0.1	5.94	0.08	A	0.1	6.31	0.08	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	
Location	
Site number	
Date	27/02/2024
Version	
Status	(new file)
Identifier	
Client	
Jobnumber	
Enumerator	ROADPLAN01\jbyrne
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	Veh	Veh	perHour	s	-Min	perMin

Analysis Options

Vehicle length (m)	Calculate Queue Percentiles	Calculate detailed queueing delay	Calculate residual capacity	RFC Threshold	Average Delay threshold (s)	Queue threshold (PCU)
5.75				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)	Run automatically
D1	2024	AM	ONE HOUR	07:45	09:15	15	✓
D2	2024	PM	ONE HOUR	07:45	09:15	15	✓
D3	2026 no dev	AM	ONE HOUR	07:45	09:15	15	✓
D4	2026 no dev	PM	ONE HOUR	07:45	09:15	15	✓
D5	2026 with dev	AM	ONE HOUR	07:45	09:15	15	✓
D6	2026 with dev	PM	ONE HOUR	07:45	09:15	15	✓
D7	2031 no dev	AM	ONE HOUR	07:45	09:15	15	✓
D8	2031 no dev	PM	ONE HOUR	07:45	09:15	15	✓
D9	2031 with dev	AM	ONE HOUR	07:45	09:15	15	✓
D10	2031 with dev	PM	ONE HOUR	07:45	09:15	15	✓
D11	2041 no dev	AM	ONE HOUR	07:45	09:15	15	✓
D12	2041 no dev	PM	ONE HOUR	07:45	09:15	15	✓
D13	2041 with dev	AM	ONE HOUR	07:45	09:15	15	✓
D14	2041 with dev	PM	ONE HOUR	07:45	09:15	15	✓

Analysis Set Details

ID	Include in report	Network flow scaling factor (%)	Network capacity scaling factor (%)
A1	✓	100.000	100.000

2024, 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		4.37	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	6.00			53.0	✓	0.00
C	6.00			140.0	✓	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)	Visibility to left (m)	Visibility to right (m)
B	One lane	3.00	26	20
D	One lane	3.00	30	30

Slope / Intercept / Capacity

Priority Intersection Slopes and Intercepts

Junction	Stream	Intercept (Veh/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	605	-	-	-	-	-	0.234	0.234	0.234	-	-
1	B-A	496	0.090	0.228	0.228	-	-	0.144	0.326	-	0.144	0.326
1	B-CD	637	0.098	0.247	0.247	-	-	-	-	-	-	-
1	CD-B	655	0.254	0.254	0.254	-	-	-	-	-	-	-
1	D-AB	643	-	-	-	-	-	0.249	0.249	0.099	-	-
1	D-C	502	-	0.145	0.330	0.145	0.330	0.231	0.231	0.091	-	-

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)	Run automatically
D1	2024	AM	ONE HOUR	07:45	09:15	15	✓

Default vehicle mix	Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (Veh/hr)	Scaling Factor (%)
A		ONE HOUR	✓	60	100.000
B		ONE HOUR	✓	36	100.000
C		ONE HOUR	✓	103	100.000
D		ONE HOUR	✓	146	100.000

Origin-Destination Data

Demand (Veh/hr)

		To			
		A	B	C	D
From	A	0	7	43	10
	B	7	0	7	22
	C	59	12	0	32
	D	42	20	84	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 (Veh)	Max LOS	Average Demand (Veh/hr)	Total Junction Arrivals (Veh)
B-ACD	0.08	7.42	0.1	A	33	50
A-B					6	10
A-C					39	59
A-D					9	14
AB-CD	0.07	6.91	0.1	A	32	48
AB-C					43	65
D-ABC	0.34	11.75	0.5	B	134	201
C-D					29	44
C-A					54	81
C-B					11	17
CD-AB	0.07	5.95	0.1	A	34	52
CD-A					88	131

Main Results for each time segment

07:45 - 08:00

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-ACD	27	7	533	0.051	27	0.0	0.1	7.116	A
A-B	5	1			5				
A-C	32	8			32				
A-D	8	2			8				
AB-CD	26	6	557	0.046	25	0.0	0.1	6.773	A
AB-C	36	9			36				
D-ABC	110	27	479	0.230	109	0.0	0.3	9.674	A
C-D	24	6			24				
C-A	44	11			44				
C-B	9	2			9				
CD-AB	27	7	633	0.043	27	0.0	0.1	5.942	A
CD-A	72	18			72				

08:00 - 08:15

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-ACD	32	8	529	0.061	32	0.1	0.1	7.242	A
A-B	6	2			6				
A-C	39	10			39				
A-D	9	2			9				
AB-CD	31	8	558	0.056	31	0.1	0.1	6.827	A
AB-C	42	11			42				
D-ABC	131	33	474	0.277	131	0.3	0.4	10.493	B
C-D	29	7			29				
C-A	53	13			53				
C-B	11	3			11				
CD-AB	33	8	640	0.052	33	0.1	0.1	5.932	A
CD-A	86	21			86				

08:15 - 08:30

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-ACD	40	10	525	0.076	40	0.1	0.1	7.416	A
A-B	8	2			8				
A-C	47	12			47				
A-D	11	3			11				
AB-CD	39	10	561	0.070	39	0.1	0.1	6.901	A
AB-C	51	13			51				
D-ABC	161	40	467	0.344	160	0.4	0.5	11.715	B
C-D	35	9			35				
C-A	65	16			65				
C-B	13	3			13				
CD-AB	42	11	651	0.065	42	0.1	0.1	5.919	A
CD-A	104	26			104				

08:30 - 08:45

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-ACD	40	10	525	0.076	40	0.1	0.1	7.416	A
A-B	8	2			8				
A-C	47	12			47				
A-D	11	3			11				
AB-CD	39	10	561	0.070	39	0.1	0.1	6.905	A
AB-C	51	13			51				
D-ABC	161	40	467	0.344	161	0.5	0.5	11.755	B
C-D	35	9			35				
C-A	65	16			65				
C-B	13	3			13				
CD-AB	43	11	651	0.065	43	0.1	0.1	5.920	A
CD-A	104	26			104				

08:45 - 09:00

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-ACD	32	8	529	0.061	32	0.1	0.1	7.245	A
A-B	6	2			6				
A-C	39	10			39				
A-D	9	2			9				
AB-CD	31	8	558	0.056	31	0.1	0.1	6.833	A
AB-C	42	11			42				
D-ABC	131	33	474	0.277	132	0.5	0.4	10.549	B
C-D	29	7			29				
C-A	53	13			53				
C-B	11	3			11				
CD-AB	34	8	640	0.053	34	0.1	0.1	5.936	A
CD-A	86	22			86				

09:00 - 09:15

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-ACD	27	7	532	0.051	27	0.1	0.1	7.123	A
A-B	5	1			5				
A-C	32	8			32				
A-D	8	2			8				
AB-CD	26	6	557	0.046	26	0.1	0.1	6.782	A
AB-C	36	9			36				
D-ABC	110	27	478	0.230	110	0.4	0.3	9.786	A
C-D	24	6			24				
C-A	44	11			44				
C-B	9	2			9				
CD-AB	27	7	633	0.043	28	0.1	0.1	5.948	A
CD-A	73	18			73				

2024, 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		3.61	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)	Run automatically
D2	2024	PM	ONE HOUR	07:45	09:15	15	✓

Default vehicle mix	Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (Veh/hr)	Scaling Factor (%)
A		ONE HOUR	✓	116	100.000
B		ONE HOUR	✓	54	100.000
C		ONE HOUR	✓	120	100.000
D		ONE HOUR	✓	95	100.000

Origin-Destination Data

Demand (Veh/hr)

		To			
		A	B	C	D
From	A	0	14	57	45
	B	9	0	10	35
	C	33	7	0	80
	D	29	24	42	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 (Veh)	Max LOS	Average Demand (Veh/hr)	Total Junction Arrivals (Veh)
B-ACD	0.11	7.85	0.1	A	50	74
A-B					13	19
A-C					52	78
A-D					41	62
AB-CD	0.18	7.70	0.2	A	83	124
AB-C					52	78
D-ABC	0.22	9.68	0.3	A	87	131
C-D					73	110
C-A					30	45
C-B					6	10
CD-AB	0.06	6.32	0.1	A	31	47
CD-A					54	81

Main Results for each time segment

07:45 - 08:00

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-ACD	41	10	529	0.077	40	0.0	0.1	7.362	A
A-B	11	3			11				
A-C	43	11			43				
A-D	34	8			34				
AB-CD	66	16	563	0.117	65	0.0	0.1	7.232	A
AB-C	44	11			44				
D-ABC	72	18	491	0.146	71	0.0	0.2	8.561	A
C-D	60	15			60				
C-A	25	6			25				
C-B	5	1			5				
CD-AB	25	6	604	0.042	25	0.0	0.0	6.220	A
CD-A	45	11			45				

08:00 - 08:15

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-ACD	49	12	524	0.093	48	0.1	0.1	7.564	A
A-B	13	3			13				
A-C	51	13			51				
A-D	40	10			40				
AB-CD	80	20	565	0.142	80	0.1	0.2	7.423	A
AB-C	52	13			52				
D-ABC	85	21	485	0.176	85	0.2	0.2	9.008	A
C-D	72	18			72				
C-A	30	7			30				
C-B	6	2			6				
CD-AB	31	8	605	0.051	31	0.0	0.1	6.263	A
CD-A	53	13			53				

08:15 - 08:30

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-ACD	59	15	518	0.115	59	0.1	0.1	7.847	A
A-B	15	4			15				
A-C	63	16			63				
A-D	50	12			50				
AB-CD	101	25	569	0.178	101	0.2	0.2	7.689	A
AB-C	61	15			61				
D-ABC	105	26	477	0.220	104	0.2	0.3	9.665	A
C-D	88	22			88				
C-A	36	9			36				
C-B	8	2			8				
CD-AB	38	10	608	0.063	38	0.1	0.1	6.321	A
CD-A	64	16			64				

08:30 - 08:45

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-ACD	59	15	518	0.115	59	0.1	0.1	7.851	A
A-B	15	4			15				
A-C	63	16			63				
A-D	50	12			50				
AB-CD	101	25	569	0.178	101	0.2	0.2	7.698	A
AB-C	61	15			61				
D-ABC	105	26	476	0.220	105	0.3	0.3	9.680	A
C-D	88	22			88				
C-A	36	9			36				
C-B	8	2			8				
CD-AB	38	10	608	0.063	38	0.1	0.1	6.322	A
CD-A	64	16			64				

08:45 - 09:00

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-ACD	49	12	524	0.093	49	0.1	0.1	7.571	A
A-B	13	3			13				
A-C	51	13			51				
A-D	40	10			40				
AB-CD	81	20	565	0.143	81	0.2	0.2	7.437	A
AB-C	52	13			52				
D-ABC	85	21	485	0.176	86	0.3	0.2	9.029	A
C-D	72	18			72				
C-A	30	7			30				
C-B	6	2			6				
CD-AB	31	8	605	0.051	31	0.1	0.1	6.268	A
CD-A	53	13			53				

09:00 - 09:15

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-ACD	41	10	529	0.077	41	0.1	0.1	7.376	A
A-B	11	3			11				
A-C	43	11			43				
A-D	34	8			34				
AB-CD	66	17	563	0.118	66	0.2	0.1	7.259	A
AB-C	44	11			44				
D-ABC	72	18	490	0.146	72	0.2	0.2	8.600	A
C-D	60	15			60				
C-A	25	6			25				
C-B	5	1			5				
CD-AB	25	6	604	0.042	25	0.1	0.1	6.227	A
CD-A	45	11			45				

2026 no dev, 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		4.48	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)	Run automatically
D3	2026 no dev	AM	ONE HOUR	07:45	09:15	15	✓

Default vehicle mix	Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (Veh/hr)	Scaling Factor (%)
A		ONE HOUR	✓	62	100.000
B		ONE HOUR	✓	37	100.000
C		ONE HOUR	✓	108	100.000
D		ONE HOUR	✓	153	100.000

Origin-Destination Data

Demand (Veh/hr)

		To			
		A	B	C	D
From	A	0	7	45	10
	B	7	0	7	23
	C	62	13	0	33
	D	44	21	88	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 (Veh)	Max LOS	Average Demand (Veh/hr)	Total Junction Arrivals (Veh)
B-ACD	0.08	7.43	0.1	A	34	51
A-B					6	10
A-C					41	62
A-D					9	14
AB-CD	0.07	6.92	0.1	A	33	50
AB-C					45	67
D-ABC	0.36	12.13	0.6	B	140	211
C-D					30	45
C-A					57	85
C-B					12	18
CD-AB	0.07	5.94	0.1	A	37	55
CD-A					91	137

Main Results for each time segment

07:45 - 08:00

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-ACD	28	7	533	0.052	28	0.0	0.1	7.123	A
A-B	5	1			5				
A-C	34	8			34				
A-D	8	2			8				
AB-CD	27	7	557	0.048	26	0.0	0.1	6.782	A
AB-C	37	9			37				
D-ABC	115	29	477	0.241	114	0.0	0.3	9.871	A
C-D	25	6			25				
C-A	47	12			47				
C-B	10	2			10				
CD-AB	29	7	635	0.046	29	0.0	0.1	5.940	A
CD-A	76	19			76				

08:00 - 08:15

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-ACD	33	8	529	0.063	33	0.1	0.1	7.254	A
A-B	6	2			6				
A-C	40	10			40				
A-D	9	2			9				
AB-CD	32	8	559	0.058	32	0.1	0.1	6.839	A
AB-C	44	11			44				
D-ABC	138	34	472	0.291	137	0.3	0.4	10.730	B
C-D	30	7			30				
C-A	56	14			56				
C-B	12	3			12				
CD-AB	36	9	643	0.056	36	0.1	0.1	5.931	A
CD-A	90	22			90				

08:15 - 08:30

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-ACD	41	10	525	0.078	41	0.1	0.1	7.434	A
A-B	8	2			8				
A-C	50	12			50				
A-D	11	3			11				
AB-CD	40	10	561	0.072	40	0.1	0.1	6.916	A
AB-C	53	13			53				
D-ABC	168	42	465	0.362	168	0.4	0.6	12.077	B
C-D	36	9			36				
C-A	68	17			68				
C-B	14	4			14				
CD-AB	45	11	654	0.070	45	0.1	0.1	5.919	A
CD-A	108	27			108				

08:30 - 08:45

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-ACD	41	10	525	0.078	41	0.1	0.1	7.434	A
A-B	8	2			8				
A-C	50	12			50				
A-D	11	3			11				
AB-CD	40	10	561	0.072	40	0.1	0.1	6.921	A
AB-C	53	13			53				
D-ABC	168	42	465	0.362	168	0.6	0.6	12.125	B
C-D	36	9			36				
C-A	68	17			68				
C-B	14	4			14				
CD-AB	46	11	654	0.070	46	0.1	0.1	5.923	A
CD-A	109	27			109				

08:45 - 09:00

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-ACD	33	8	529	0.063	33	0.1	0.1	7.259	A
A-B	6	2			6				
A-C	40	10			40				
A-D	9	2			9				
AB-CD	32	8	559	0.058	33	0.1	0.1	6.845	A
AB-C	44	11			44				
D-ABC	138	34	472	0.291	138	0.6	0.4	10.794	B
C-D	30	7			30				
C-A	56	14			56				
C-B	12	3			12				
CD-AB	36	9	643	0.056	36	0.1	0.1	5.933	A
CD-A	90	23			90				

09:00 - 09:15

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-ACD	28	7	533	0.052	28	0.1	0.1	7.134	A
A-B	5	1			5				
A-C	34	8			34				
A-D	8	2			8				
AB-CD	27	7	557	0.048	27	0.1	0.1	6.791	A
AB-C	37	9			37				
D-ABC	115	29	477	0.241	116	0.4	0.3	9.961	A
C-D	25	6			25				
C-A	47	12			47				
C-B	10	2			10				
CD-AB	29	7	635	0.046	29	0.1	0.1	5.944	A
CD-A	76	19			76				

2026 no dev, 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		3.65	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)	Run automatically
D4	2026 no dev	PM	ONE HOUR	07:45	09:15	15	✓

Default vehicle mix	Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (Veh/hr)	Scaling Factor (%)
A		ONE HOUR	✓	122	100.000
B		ONE HOUR	✓	56	100.000
C		ONE HOUR	✓	125	100.000
D		ONE HOUR	✓	99	100.000

Origin-Destination Data

Demand (Veh/hr)

		To			
		A	B	C	D
From	A	0	15	60	47
	B	9	0	10	37
	C	34	7	0	84
	D	30	25	44	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 (Veh)	Max LOS	Average Demand (Veh/hr)	Total Junction Arrivals (Veh)
B-ACD	0.12	7.90	0.1	A	51	77
A-B					14	21
A-C					55	83
A-D					43	65
AB-CD	0.19	7.77	0.3	A	87	131
AB-C					54	81
D-ABC	0.23	9.86	0.3	A	91	136
C-D					77	116
C-A					31	47
C-B					6	10
CD-AB	0.07	6.34	0.1	A	33	49
CD-A					55	83

Main Results for each time segment

07:45 - 08:00

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-ACD	42	11	529	0.080	42	0.0	0.1	7.386	A
A-B	11	3			11				
A-C	45	11			45				
A-D	35	9			35				
AB-CD	70	17	563	0.123	69	0.0	0.2	7.275	A
AB-C	46	12			46				
D-ABC	75	19	489	0.152	74	0.0	0.2	8.656	A
C-D	63	16			63				
C-A	26	6			26				
C-B	5	1			5				
CD-AB	26	6	603	0.043	26	0.0	0.1	6.231	A
CD-A	46	11			46				

08:00 - 08:15

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-ACD	50	13	524	0.096	50	0.1	0.1	7.598	A
A-B	13	3			13				
A-C	54	13			54				
A-D	42	11			42				
AB-CD	85	21	566	0.150	85	0.2	0.2	7.479	A
AB-C	53	13			53				
D-ABC	89	22	483	0.184	89	0.2	0.2	9.135	A
C-D	76	19			76				
C-A	31	8			31				
C-B	6	2			6				
CD-AB	32	8	605	0.052	32	0.1	0.1	6.276	A
CD-A	54	14			54				

08:15 - 08:30

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-ACD	62	15	517	0.119	62	0.1	0.1	7.895	A
A-B	17	4			17				
A-C	66	17			66				
A-D	52	13			52				
AB-CD	107	27	570	0.188	107	0.2	0.3	7.766	A
AB-C	63	16			63				
D-ABC	109	27	474	0.230	109	0.2	0.3	9.842	A
C-D	92	23			92				
C-A	37	9			37				
C-B	8	2			8				
CD-AB	40	10	608	0.065	40	0.1	0.1	6.338	A
CD-A	66	16			66				

08:30 - 08:45

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-ACD	62	15	517	0.119	62	0.1	0.1	7.899	A
A-B	17	4			17				
A-C	66	17			66				
A-D	52	13			52				
AB-CD	107	27	570	0.188	107	0.3	0.3	7.775	A
AB-C	63	16			63				
D-ABC	109	27	474	0.230	109	0.3	0.3	9.859	A
C-D	92	23			92				
C-A	37	9			37				
C-B	8	2			8				
CD-AB	40	10	608	0.066	40	0.1	0.1	6.342	A
CD-A	66	16			66				

08:45 - 09:00

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-ACD	50	13	524	0.096	50	0.1	0.1	7.605	A
A-B	13	3			13				
A-C	54	13			54				
A-D	42	11			42				
AB-CD	85	21	566	0.150	85	0.3	0.2	7.491	A
AB-C	53	13			53				
D-ABC	89	22	483	0.184	89	0.3	0.2	9.159	A
C-D	76	19			76				
C-A	31	8			31				
C-B	6	2			6				
CD-AB	32	8	605	0.053	32	0.1	0.1	6.282	A
CD-A	55	14			55				

09:00 - 09:15

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-ACD	42	11	529	0.080	42	0.1	0.1	7.401	A
A-B	11	3			11				
A-C	45	11			45				
A-D	35	9			35				
AB-CD	70	17	563	0.124	70	0.2	0.2	7.300	A
AB-C	46	12			46				
D-ABC	75	19	489	0.152	75	0.2	0.2	8.697	A
C-D	63	16			63				
C-A	26	6			26				
C-B	5	1			5				
CD-AB	26	7	604	0.043	26	0.1	0.1	6.239	A
CD-A	46	12			46				

2026 with dev, 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		4.41	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)	Run automatically
D5	2026 with dev	AM	ONE HOUR	07:45	09:15	15	✓

Default vehicle mix	Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (Veh/hr)	Scaling Factor (%)
A		ONE HOUR	✓	69	100.000
B		ONE HOUR	✓	37	100.000
C		ONE HOUR	✓	109	100.000
D		ONE HOUR	✓	154	100.000

Origin-Destination Data

Demand (Veh/hr)

		To			
		A	B	C	D
From	A	0	8	50	11
	B	7	0	7	23
	C	63	13	0	33
	D	45	21	88	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 (Veh)	Max LOS	Average Demand (Veh/hr)	Total Junction Arrivals (Veh)
B-ACD	0.08	7.46	0.1	A	34	51
A-B					7	11
A-C					46	69
A-D					10	15
AB-CD	0.07	6.89	0.1	A	34	52
AB-C					49	73
D-ABC	0.36	12.20	0.6	B	141	212
C-D					30	45
C-A					58	87
C-B					12	18
CD-AB	0.07	5.95	0.1	A	37	56
CD-A					93	140

Main Results for each time segment

07:45 - 08:00

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-ACD	28	7	532	0.052	28	0.0	0.1	7.141	A
A-B	6	2			6				
A-C	38	9			38				
A-D	8	2			8				
AB-CD	28	7	559	0.049	27	0.0	0.1	6.766	A
AB-C	41	10			41				
D-ABC	116	29	477	0.243	115	0.0	0.3	9.896	A
C-D	25	6			25				
C-A	47	12			47				
C-B	10	2			10				
CD-AB	29	7	634	0.046	29	0.0	0.1	5.944	A
CD-A	77	19			77				

08:00 - 08:15

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-ACD	33	8	528	0.063	33	0.1	0.1	7.275	A
A-B	7	2			7				
A-C	45	11			45				
A-D	10	2			10				
AB-CD	34	8	561	0.060	34	0.1	0.1	6.818	A
AB-C	48	12			48				
D-ABC	138	35	472	0.293	138	0.3	0.4	10.771	B
C-D	30	7			30				
C-A	57	14			57				
C-B	12	3			12				
CD-AB	36	9	642	0.056	36	0.1	0.1	5.935	A
CD-A	92	23			92				

08:15 - 08:30

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-ACD	41	10	523	0.078	41	0.1	0.1	7.462	A
A-B	9	2			9				
A-C	55	14			55				
A-D	12	3			12				
AB-CD	42	11	564	0.075	42	0.1	0.1	6.892	A
AB-C	58	15			58				
D-ABC	170	42	465	0.365	169	0.4	0.6	12.143	B
C-D	36	9			36				
C-A	69	17			69				
C-B	14	4			14				
CD-AB	46	11	653	0.070	46	0.1	0.1	5.925	A
CD-A	110	28			110				

08:30 - 08:45

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-ACD	41	10	523	0.078	41	0.1	0.1	7.462	A
A-B	9	2			9				
A-C	55	14			55				
A-D	12	3			12				
AB-CD	42	11	564	0.075	42	0.1	0.1	6.894	A
AB-C	58	15			58				
D-ABC	170	42	465	0.365	170	0.6	0.6	12.195	B
C-D	36	9			36				
C-A	69	17			69				
C-B	14	4			14				
CD-AB	46	11	653	0.070	46	0.1	0.1	5.929	A
CD-A	111	28			111				

08:45 - 09:00

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-ACD	33	8	528	0.063	33	0.1	0.1	7.281	A
A-B	7	2			7				
A-C	45	11			45				
A-D	10	2			10				
AB-CD	34	8	562	0.060	34	0.1	0.1	6.825	A
AB-C	48	12			48				
D-ABC	138	35	472	0.293	139	0.6	0.4	10.837	B
C-D	30	7			30				
C-A	57	14			57				
C-B	12	3			12				
CD-AB	36	9	643	0.056	36	0.1	0.1	5.940	A
CD-A	92	23			92				

09:00 - 09:15

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-ACD	28	7	531	0.052	28	0.1	0.1	7.149	A
A-B	6	2			6				
A-C	38	9			38				
A-D	8	2			8				
AB-CD	28	7	559	0.050	28	0.1	0.1	6.771	A
AB-C	41	10			41				
D-ABC	116	29	477	0.243	116	0.4	0.3	9.989	A
C-D	25	6			25				
C-A	47	12			47				
C-B	10	2			10				
CD-AB	29	7	635	0.046	29	0.1	0.1	5.948	A
CD-A	78	19			78				

2026 with dev, 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		3.64	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)	Run automatically
D6	2026 with dev	PM	ONE HOUR	07:45	09:15	15	✓

Default vehicle mix	Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (Veh/hr)	Scaling Factor (%)
A		ONE HOUR	✓	125	100.000
B		ONE HOUR	✓	57	100.000
C		ONE HOUR	✓	131	100.000
D		ONE HOUR	✓	105	100.000

Origin-Destination Data

Demand (Veh/hr)

		To			
		A	B	C	D
From	A	0	15	62	48
	B	10	0	10	37
	C	40	7	0	84
	D	36	25	44	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 (Veh)	Max LOS	Average Demand (Veh/hr)	Total Junction Arrivals (Veh)
B-ACD	0.12	7.99	0.1	A	52	78
A-B					14	21
A-C					57	85
A-D					44	66
AB-CD	0.19	7.80	0.3	A	89	133
AB-C					55	83
D-ABC	0.24	9.98	0.3	A	96	145
C-D					77	116
C-A					37	55
C-B					6	10
CD-AB	0.07	6.26	0.1	A	33	50
CD-A					66	99

Main Results for each time segment

07:45 - 08:00

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-ACD	43	11	525	0.082	43	0.0	0.1	7.450	A
A-B	11	3			11				
A-C	47	12			47				
A-D	36	9			36				
AB-CD	71	18	563	0.125	70	0.0	0.2	7.290	A
AB-C	47	12			47				
D-ABC	79	20	492	0.161	78	0.0	0.2	8.694	A
C-D	63	16			63				
C-A	30	8			30				
C-B	5	1			5				
CD-AB	26	7	609	0.043	26	0.0	0.1	6.179	A
CD-A	54	14			54				

08:00 - 08:15

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-ACD	51	13	520	0.098	51	0.1	0.1	7.672	A
A-B	13	3			13				
A-C	56	14			56				
A-D	43	11			43				
AB-CD	86	22	566	0.152	86	0.2	0.2	7.499	A
AB-C	55	14			55				
D-ABC	94	24	485	0.195	94	0.2	0.2	9.201	A
C-D	76	19			76				
C-A	36	9			36				
C-B	6	2			6				
CD-AB	32	8	612	0.053	32	0.1	0.1	6.214	A
CD-A	65	16			65				

08:15 - 08:30

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-ACD	63	16	513	0.122	63	0.1	0.1	7.985	A
A-B	17	4			17				
A-C	68	17			68				
A-D	53	13			53				
AB-CD	109	27	570	0.191	108	0.2	0.3	7.795	A
AB-C	64	16			64				
D-ABC	116	29	476	0.243	115	0.2	0.3	9.957	A
C-D	92	23			92				
C-A	44	11			44				
C-B	8	2			8				
CD-AB	41	10	616	0.066	41	0.1	0.1	6.262	A
CD-A	78	20			78				

08:30 - 08:45

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-ACD	63	16	513	0.122	63	0.1	0.1	7.988	A
A-B	17	4			17				
A-C	68	17			68				
A-D	53	13			53				
AB-CD	109	27	570	0.191	109	0.3	0.3	7.804	A
AB-C	64	16			64				
D-ABC	116	29	476	0.243	116	0.3	0.3	9.977	A
C-D	92	23			92				
C-A	44	11			44				
C-B	8	2			8				
CD-AB	41	10	616	0.066	41	0.1	0.1	6.263	A
CD-A	78	20			78				

08:45 - 09:00

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-ACD	51	13	520	0.098	51	0.1	0.1	7.676	A
A-B	13	3			13				
A-C	56	14			56				
A-D	43	11			43				
AB-CD	86	22	566	0.153	87	0.3	0.2	7.512	A
AB-C	55	14			55				
D-ABC	94	24	485	0.195	95	0.3	0.2	9.228	A
C-D	76	19			76				
C-A	36	9			36				
C-B	6	2			6				
CD-AB	32	8	612	0.053	33	0.1	0.1	6.219	A
CD-A	65	16			65				

09:00 - 09:15

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-ACD	43	11	525	0.082	43	0.1	0.1	7.462	A
A-B	11	3			11				
A-C	47	12			47				
A-D	36	9			36				
AB-CD	71	18	563	0.126	71	0.2	0.2	7.318	A
AB-C	47	12			47				
D-ABC	79	20	491	0.161	79	0.2	0.2	8.737	A
C-D	63	16			63				
C-A	30	8			30				
C-B	5	1			5				
CD-AB	27	7	609	0.044	27	0.1	0.1	6.186	A
CD-A	55	14			55				

2031 no dev, 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		4.77	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)	Run automatically
D7	2031 no dev	AM	ONE HOUR	07:45	09:15	15	✓

Default vehicle mix	Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (Veh/hr)	Scaling Factor (%)
A		ONE HOUR	✓	70	100.000
B		ONE HOUR	✓	42	100.000
C		ONE HOUR	✓	120	100.000
D		ONE HOUR	✓	170	100.000

Origin-Destination Data

Demand (Veh/hr)

		To			
		A	B	C	D
From	A	0	8	50	12
	B	8	0	8	26
	C	69	14	0	37
	D	49	23	98	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 (Veh)	Max LOS	Average Demand (Veh/hr)	Total Junction Arrivals (Veh)
B-ACD	0.09	7.57	0.1	A	39	58
A-B					7	11
A-C					46	69
A-D					11	17
AB-CD	0.08	6.99	0.1	A	39	58
AB-C					49	74
D-ABC	0.41	13.17	0.7	B	156	234
C-D					34	51
C-A					63	95
C-B					13	19
CD-AB	0.08	5.93	0.1	A	41	61
CD-A					101	152

Main Results for each time segment

07:45 - 08:00

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-ACD	32	8	531	0.060	31	0.0	0.1	7.208	A
A-B	6	2			6				
A-C	38	9			38				
A-D	9	2			9				
AB-CD	31	8	558	0.055	31	0.0	0.1	6.822	A
AB-C	41	10			41				
D-ABC	128	32	474	0.270	127	0.0	0.4	10.312	B
C-D	28	7			28				
C-A	52	13			52				
C-B	11	3			11				
CD-AB	32	8	639	0.050	32	0.0	0.1	5.928	A
CD-A	84	21			84				

08:00 - 08:15

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-ACD	38	9	527	0.072	38	0.1	0.1	7.359	A
A-B	7	2			7				
A-C	45	11			45				
A-D	11	3			11				
AB-CD	38	9	560	0.067	38	0.1	0.1	6.892	A
AB-C	49	12			49				
D-ABC	153	38	468	0.326	152	0.4	0.5	11.373	B
C-D	33	8			33				
C-A	62	16			62				
C-B	13	3			13				
CD-AB	40	10	648	0.061	40	0.1	0.1	5.917	A
CD-A	99	25			99				

08:15 - 08:30

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-ACD	46	12	522	0.089	46	0.1	0.1	7.570	A
A-B	9	2			9				
A-C	55	14			55				
A-D	13	3			13				
AB-CD	47	12	562	0.084	47	0.1	0.1	6.986	A
AB-C	58	15			58				
D-ABC	187	47	461	0.406	186	0.5	0.7	13.094	B
C-D	41	10			41				
C-A	76	19			76				
C-B	15	4			15				
CD-AB	51	13	660	0.077	50	0.1	0.1	5.906	A
CD-A	120	30			120				

08:30 - 08:45

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-ACD	46	12	522	0.089	46	0.1	0.1	7.570	A
A-B	9	2			9				
A-C	55	14			55				
A-D	13	3			13				
AB-CD	47	12	562	0.084	47	0.1	0.1	6.988	A
AB-C	58	15			58				
D-ABC	187	47	460	0.406	187	0.7	0.7	13.165	B
C-D	41	10			41				
C-A	76	19			76				
C-B	15	4			15				
CD-AB	51	13	660	0.077	51	0.1	0.1	5.910	A
CD-A	120	30			120				

08:45 - 09:00

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-ACD	38	9	527	0.072	38	0.1	0.1	7.362	A
A-B	7	2			7				
A-C	45	11			45				
A-D	11	3			11				
AB-CD	38	9	560	0.067	38	0.1	0.1	6.897	A
AB-C	49	12			49				
D-ABC	153	38	468	0.326	154	0.7	0.5	11.463	B
C-D	33	8			33				
C-A	62	16			62				
C-B	13	3			13				
CD-AB	40	10	648	0.062	40	0.1	0.1	5.923	A
CD-A	100	25			100				

09:00 - 09:15

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-ACD	32	8	530	0.060	32	0.1	0.1	7.217	A
A-B	6	2			6				
A-C	38	9			38				
A-D	9	2			9				
AB-CD	31	8	558	0.056	31	0.1	0.1	6.832	A
AB-C	41	10			41				
D-ABC	128	32	474	0.270	128	0.5	0.4	10.431	B
C-D	28	7			28				
C-A	52	13			52				
C-B	11	3			11				
CD-AB	32	8	639	0.051	33	0.1	0.1	5.932	A
CD-A	84	21			84				

2031 no dev, 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		3.82	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)	Run automatically
D8	2031 no dev	PM	ONE HOUR	07:45	09:15	15	✓

Default vehicle mix	Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (Veh/hr)	Scaling Factor (%)
A		ONE HOUR	✓	136	100.000
B		ONE HOUR	✓	64	100.000
C		ONE HOUR	✓	140	100.000
D		ONE HOUR	✓	111	100.000

Origin-Destination Data

Demand (Veh/hr)

		To			
		A	B	C	D
From	A	0	16	67	53
	B	11	0	12	41
	C	39	8	0	93
	D	34	28	49	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 (Veh)	Max LOS	Average Demand (Veh/hr)	Total Junction Arrivals (Veh)
B-ACD	0.14	8.17	0.2	A	59	88
A-B					15	22
A-C					61	92
A-D					49	73
AB-CD	0.21	7.98	0.3	A	99	149
AB-C					59	89
D-ABC	0.26	10.39	0.3	B	102	153
C-D					85	128
C-A					36	54
C-B					7	11
CD-AB	0.07	6.38	0.1	A	37	56
CD-A					63	94

Main Results for each time segment

07:45 - 08:00

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-ACD	48	12	524	0.092	48	0.0	0.1	7.553	A
A-B	12	3			12				
A-C	50	13			50				
A-D	40	10			40				
AB-CD	79	20	565	0.139	78	0.0	0.2	7.380	A
AB-C	51	13			51				
D-ABC	84	21	486	0.172	83	0.0	0.2	8.919	A
C-D	70	18			70				
C-A	29	7			29				
C-B	6	2			6				
CD-AB	30	7	605	0.049	29	0.0	0.1	6.251	A
CD-A	52	13			52				

08:00 - 08:15

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-ACD	58	14	519	0.111	57	0.1	0.1	7.806	A
A-B	14	4			14				
A-C	60	15			60				
A-D	48	12			48				
AB-CD	97	24	569	0.170	96	0.2	0.2	7.621	A
AB-C	59	15			59				
D-ABC	100	25	479	0.209	100	0.2	0.3	9.494	A
C-D	84	21			84				
C-A	35	9			35				
C-B	7	2			7				
CD-AB	36	9	607	0.060	36	0.1	0.1	6.301	A
CD-A	62	15			62				

08:15 - 08:30

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-ACD	70	18	511	0.138	70	0.1	0.2	8.167	A
A-B	18	4			18				
A-C	74	18			74				
A-D	58	15			58				
AB-CD	122	30	573	0.213	122	0.2	0.3	7.971	A
AB-C	68	17			68				
D-ABC	122	31	469	0.261	122	0.3	0.3	10.365	B
C-D	102	26			102				
C-A	43	11			43				
C-B	9	2			9				
CD-AB	46	11	610	0.075	45	0.1	0.1	6.372	A
CD-A	74	19			74				

08:30 - 08:45

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-ACD	70	18	511	0.138	70	0.2	0.2	8.172	A
A-B	18	4			18				
A-C	74	18			74				
A-D	58	15			58				
AB-CD	122	31	573	0.213	122	0.3	0.3	7.982	A
AB-C	68	17			68				
D-ABC	122	31	469	0.261	122	0.3	0.3	10.388	B
C-D	102	26			102				
C-A	43	11			43				
C-B	9	2			9				
CD-AB	46	11	610	0.075	46	0.1	0.1	6.376	A
CD-A	74	19			74				

08:45 - 09:00

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-ACD	58	14	518	0.111	58	0.2	0.1	7.815	A
A-B	14	4			14				
A-C	60	15			60				
A-D	48	12			48				
AB-CD	97	24	569	0.170	97	0.3	0.2	7.642	A
AB-C	59	15			59				
D-ABC	100	25	478	0.209	100	0.3	0.3	9.525	A
C-D	84	21			84				
C-A	35	9			35				
C-B	7	2			7				
CD-AB	36	9	608	0.060	36	0.1	0.1	6.307	A
CD-A	62	15			62				

09:00 - 09:15

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-ACD	48	12	524	0.092	48	0.1	0.1	7.569	A
A-B	12	3			12				
A-C	50	13			50				
A-D	40	10			40				
AB-CD	79	20	565	0.140	79	0.2	0.2	7.411	A
AB-C	51	13			51				
D-ABC	84	21	485	0.172	84	0.3	0.2	8.972	A
C-D	70	18			70				
C-A	29	7			29				
C-B	6	2			6				
CD-AB	30	7	605	0.049	30	0.1	0.1	6.256	A
CD-A	52	13			52				

2031 with dev, 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		4.71	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)	Run automatically
D9	2031 with dev	AM	ONE HOUR	07:45	09:15	15	✓

Default vehicle mix	Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (Veh/hr)	Scaling Factor (%)
A		ONE HOUR	✓	77	100.000
B		ONE HOUR	✓	42	100.000
C		ONE HOUR	✓	121	100.000
D		ONE HOUR	✓	171	100.000

Origin-Destination Data

Demand (Veh/hr)

		To			
		A	B	C	D
From	A	0	9	55	13
	B	8	0	8	26
	C	70	14	0	37
	D	50	23	98	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 (Veh)	Max LOS	Average Demand (Veh/hr)	Total Junction Arrivals (Veh)
B-ACD	0.09	7.60	0.1	A	39	58
A-B					8	12
A-C					50	76
A-D					12	18
AB-CD	0.09	6.97	0.1	A	40	60
AB-C					54	80
D-ABC	0.41	13.25	0.7	B	157	235
C-D					34	51
C-A					64	96
C-B					13	19
CD-AB	0.08	5.94	0.1	A	41	62
CD-A					103	154

Main Results for each time segment

07:45 - 08:00

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-ACD	32	8	529	0.060	31	0.0	0.1	7.226	A
A-B	7	2			7				
A-C	41	10			41				
A-D	10	2			10				
AB-CD	32	8	560	0.057	32	0.0	0.1	6.805	A
AB-C	45	11			45				
D-ABC	129	32	474	0.272	127	0.0	0.4	10.345	B
C-D	28	7			28				
C-A	53	13			53				
C-B	11	3			11				
CD-AB	32	8	639	0.050	32	0.0	0.1	5.931	A
CD-A	85	21			85				

08:00 - 08:15

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-ACD	38	9	525	0.072	38	0.1	0.1	7.382	A
A-B	8	2			8				
A-C	49	12			49				
A-D	12	3			12				
AB-CD	39	10	563	0.069	39	0.1	0.1	6.872	A
AB-C	53	13			53				
D-ABC	154	38	468	0.329	153	0.4	0.5	11.422	B
C-D	33	8			33				
C-A	63	16			63				
C-B	13	3			13				
CD-AB	40	10	648	0.062	40	0.1	0.1	5.922	A
CD-A	101	25			101				

08:15 - 08:30

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-ACD	46	12	520	0.089	46	0.1	0.1	7.599	A
A-B	10	2			10				
A-C	61	15			61				
A-D	14	4			14				
AB-CD	49	12	566	0.086	49	0.1	0.1	6.962	A
AB-C	63	16			63				
D-ABC	188	47	460	0.409	187	0.5	0.7	13.176	B
C-D	41	10			41				
C-A	77	19			77				
C-B	15	4			15				
CD-AB	51	13	660	0.077	51	0.1	0.1	5.912	A
CD-A	122	30			122				

08:30 - 08:45

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-ACD	46	12	520	0.089	46	0.1	0.1	7.599	A
A-B	10	2			10				
A-C	61	15			61				
A-D	14	4			14				
AB-CD	49	12	566	0.087	49	0.1	0.1	6.967	A
AB-C	63	16			63				
D-ABC	188	47	460	0.409	188	0.7	0.7	13.250	B
C-D	41	10			41				
C-A	77	19			77				
C-B	15	4			15				
CD-AB	51	13	660	0.077	51	0.1	0.1	5.916	A
CD-A	122	30			122				

08:45 - 09:00

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-ACD	38	9	525	0.072	38	0.1	0.1	7.385	A
A-B	8	2			8				
A-C	49	12			49				
A-D	12	3			12				
AB-CD	39	10	563	0.069	39	0.1	0.1	6.877	A
AB-C	53	13			53				
D-ABC	154	38	468	0.329	154	0.7	0.5	11.515	B
C-D	33	8			33				
C-A	63	16			63				
C-B	13	3			13				
CD-AB	40	10	648	0.062	40	0.1	0.1	5.925	A
CD-A	101	25			101				

09:00 - 09:15

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-ACD	32	8	529	0.060	32	0.1	0.1	7.238	A
A-B	7	2			7				
A-C	41	10			41				
A-D	10	2			10				
AB-CD	32	8	560	0.057	32	0.1	0.1	6.815	A
AB-C	45	11			45				
D-ABC	129	32	474	0.272	129	0.5	0.4	10.465	B
C-D	28	7			28				
C-A	53	13			53				
C-B	11	3			11				
CD-AB	33	8	639	0.051	33	0.1	0.1	5.936	A
CD-A	86	21			86				

2031 with dev, 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		3.81	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)	Run automatically
D10	2031 with dev	PM	ONE HOUR	07:45	09:15	15	✓

Default vehicle mix	Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (Veh/hr)	Scaling Factor (%)
A		ONE HOUR	✓	139	100.000
B		ONE HOUR	✓	65	100.000
C		ONE HOUR	✓	146	100.000
D		ONE HOUR	✓	117	100.000

Origin-Destination Data

Demand (Veh/hr)

		To			
		A	B	C	D
From	A	0	16	69	54
	B	12	0	12	41
	C	45	8	0	93
	D	40	28	49	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 (Veh)	Max LOS	Average Demand (Veh/hr)	Total Junction Arrivals (Veh)
B-ACD	0.14	8.26	0.2	A	60	89
A-B					15	22
A-C					63	95
A-D					50	74
AB-CD	0.22	8.02	0.3	A	101	151
AB-C					61	91
D-ABC	0.27	10.53	0.4	B	107	161
C-D					85	128
C-A					41	62
C-B					7	11
CD-AB	0.08	6.30	0.1	A	38	57
CD-A					73	109

Main Results for each time segment

07:45 - 08:00

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-ACD	49	12	521	0.094	49	0.0	0.1	7.615	A
A-B	12	3			12				
A-C	52	13			52				
A-D	41	10			41				
AB-CD	80	20	565	0.141	79	0.0	0.2	7.397	A
AB-C	52	13			52				
D-ABC	88	22	488	0.181	87	0.0	0.2	8.968	A
C-D	70	18			70				
C-A	34	8			34				
C-B	6	2			6				
CD-AB	30	8	610	0.049	30	0.0	0.1	6.198	A
CD-A	61	15			61				

08:00 - 08:15

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-ACD	58	15	515	0.113	58	0.1	0.1	7.879	A
A-B	14	4			14				
A-C	62	16			62				
A-D	49	12			49				
AB-CD	98	24	569	0.172	98	0.2	0.2	7.643	A
AB-C	60	15			60				
D-ABC	105	26	481	0.219	105	0.2	0.3	9.576	A
C-D	84	21			84				
C-A	40	10			40				
C-B	7	2			7				
CD-AB	37	9	614	0.060	37	0.1	0.1	6.239	A
CD-A	72	18			72				

08:15 - 08:30

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-ACD	72	18	507	0.141	71	0.1	0.2	8.258	A
A-B	18	4			18				
A-C	76	19			76				
A-D	59	15			59				
AB-CD	124	31	573	0.216	124	0.2	0.3	8.003	A
AB-C	70	17			70				
D-ABC	129	32	471	0.274	128	0.3	0.4	10.505	B
C-D	102	26			102				
C-A	50	12			50				
C-B	9	2			9				
CD-AB	47	12	618	0.075	47	0.1	0.1	6.295	A
CD-A	86	22			86				

08:30 - 08:45

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-ACD	72	18	507	0.141	72	0.2	0.2	8.263	A
A-B	18	4			18				
A-C	76	19			76				
A-D	59	15			59				
AB-CD	124	31	573	0.216	124	0.3	0.3	8.016	A
AB-C	70	17			70				
D-ABC	129	32	471	0.274	129	0.4	0.4	10.530	B
C-D	102	26			102				
C-A	50	12			50				
C-B	9	2			9				
CD-AB	47	12	618	0.076	47	0.1	0.1	6.297	A
CD-A	87	22			87				

08:45 - 09:00

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-ACD	58	15	515	0.113	59	0.2	0.1	7.889	A
A-B	14	4			14				
A-C	62	16			62				
A-D	49	12			49				
AB-CD	98	25	569	0.173	98	0.3	0.2	7.664	A
AB-C	60	15			60				
D-ABC	105	26	481	0.219	106	0.4	0.3	9.611	A
C-D	84	21			84				
C-A	40	10			40				
C-B	7	2			7				
CD-AB	37	9	614	0.060	37	0.1	0.1	6.242	A
CD-A	72	18			72				

09:00 - 09:15

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-ACD	49	12	521	0.094	49	0.1	0.1	7.631	A
A-B	12	3			12				
A-C	52	13			52				
A-D	41	10			41				
AB-CD	80	20	565	0.142	81	0.2	0.2	7.427	A
AB-C	52	13			52				
D-ABC	88	22	488	0.181	88	0.3	0.2	9.023	A
C-D	70	18			70				
C-A	34	8			34				
C-B	6	2			6				
CD-AB	30	8	611	0.050	30	0.1	0.1	6.204	A
CD-A	61	15			61				

2041 no dev, 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		4.84	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)	Run automatically
D11	2041 no dev	AM	ONE HOUR	07:45	09:15	15	✓

Default vehicle mix	Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (Veh/hr)	Scaling Factor (%)
A		ONE HOUR	✓	71	100.000
B		ONE HOUR	✓	42	100.000
C		ONE HOUR	✓	122	100.000
D		ONE HOUR	✓	174	100.000

Origin-Destination Data

Demand (Veh/hr)

		To			
		A	B	C	D
From	A	0	8	51	12
	B	8	0	8	26
	C	70	14	0	38
	D	50	24	100	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 (Veh)	Max LOS	Average Demand (Veh/hr)	Total Junction Arrivals (Veh)
B-ACD	0.09	7.58	0.1	A	39	58
A-B					7	11
A-C					47	70
A-D					11	17
AB-CD	0.08	6.99	0.1	A	39	58
AB-C					50	75
D-ABC	0.42	13.39	0.7	B	160	239
C-D					35	52
C-A					64	96
C-B					13	19
CD-AB	0.08	5.93	0.1	A	42	63
CD-A					103	154

Main Results for each time segment

07:45 - 08:00

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-ACD	32	8	530	0.060	31	0.0	0.1	7.213	A
A-B	6	2			6				
A-C	38	10			38				
A-D	9	2			9				
AB-CD	31	8	558	0.055	31	0.0	0.1	6.820	A
AB-C	42	10			42				
D-ABC	131	33	474	0.276	129	0.0	0.4	10.404	B
C-D	29	7			29				
C-A	53	13			53				
C-B	11	3			11				
CD-AB	33	8	640	0.052	33	0.0	0.1	5.929	A
CD-A	85	21			85				

08:00 - 08:15

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-ACD	38	9	526	0.072	38	0.1	0.1	7.365	A
A-B	7	2			7				
A-C	46	11			46				
A-D	11	3			11				
AB-CD	38	9	560	0.067	38	0.1	0.1	6.891	A
AB-C	49	12			49				
D-ABC	156	39	468	0.334	156	0.4	0.5	11.510	B
C-D	34	9			34				
C-A	63	16			63				
C-B	13	3			13				
CD-AB	41	10	649	0.063	41	0.1	0.1	5.920	A
CD-A	101	25			101				

08:15 - 08:30

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-ACD	46	12	521	0.089	46	0.1	0.1	7.577	A
A-B	9	2			9				
A-C	56	14			56				
A-D	13	3			13				
AB-CD	47	12	563	0.084	47	0.1	0.1	6.984	A
AB-C	59	15			59				
D-ABC	192	48	460	0.416	191	0.5	0.7	13.315	B
C-D	42	10			42				
C-A	77	19			77				
C-B	15	4			15				
CD-AB	52	13	661	0.079	52	0.1	0.1	5.910	A
CD-A	121	30			121				

08:30 - 08:45

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-ACD	46	12	521	0.089	46	0.1	0.1	7.578	A
A-B	9	2			9				
A-C	56	14			56				
A-D	13	3			13				
AB-CD	47	12	563	0.084	47	0.1	0.1	6.986	A
AB-C	59	15			59				
D-ABC	192	48	460	0.416	192	0.7	0.7	13.393	B
C-D	42	10			42				
C-A	77	19			77				
C-B	15	4			15				
CD-AB	52	13	661	0.079	52	0.1	0.1	5.912	A
CD-A	122	30			122				

08:45 - 09:00

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-ACD	38	9	526	0.072	38	0.1	0.1	7.371	A
A-B	7	2			7				
A-C	46	11			46				
A-D	11	3			11				
AB-CD	38	9	560	0.067	38	0.1	0.1	6.898	A
AB-C	49	12			49				
D-ABC	156	39	468	0.334	157	0.7	0.5	11.604	B
C-D	34	9			34				
C-A	63	16			63				
C-B	13	3			13				
CD-AB	41	10	649	0.063	41	0.1	0.1	5.923	A
CD-A	101	25			101				

09:00 - 09:15

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-ACD	32	8	530	0.060	32	0.1	0.1	7.222	A
A-B	6	2			6				
A-C	38	10			38				
A-D	9	2			9				
AB-CD	31	8	558	0.056	31	0.1	0.1	6.833	A
AB-C	42	10			42				
D-ABC	131	33	474	0.276	131	0.5	0.4	10.529	B
C-D	29	7			29				
C-A	53	13			53				
C-B	11	3			11				
CD-AB	33	8	640	0.052	33	0.1	0.1	5.934	A
CD-A	86	21			86				

2041 no dev, 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		3.86	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)	Run automatically
D12	2041 no dev	PM	ONE HOUR	07:45	09:15	15	✓

Default vehicle mix	Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (Veh/hr)	Scaling Factor (%)
A		ONE HOUR	✓	139	100.000
B		ONE HOUR	✓	65	100.000
C		ONE HOUR	✓	143	100.000
D		ONE HOUR	✓	114	100.000

Origin-Destination Data

Demand (Veh/hr)

		To			
		A	B	C	D
From	A	0	17	68	54
	B	11	0	12	42
	C	39	8	0	96
	D	35	29	50	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 (Veh)	Max LOS	Average Demand (Veh/hr)	Total Junction Arrivals (Veh)
B-ACD	0.14	8.20	0.2	A	60	89
A-B					16	23
A-C					62	94
A-D					50	74
AB-CD	0.22	8.03	0.3	A	102	152
AB-C					60	90
D-ABC	0.27	10.50	0.4	B	105	157
C-D					88	132
C-A					36	54
C-B					7	11
CD-AB	0.08	6.39	0.1	A	38	57
CD-A					63	95

Main Results for each time segment

07:45 - 08:00

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-ACD	49	12	524	0.093	49	0.0	0.1	7.566	A
A-B	13	3			13				
A-C	51	13			51				
A-D	41	10			41				
AB-CD	81	20	565	0.143	80	0.0	0.2	7.408	A
AB-C	52	13			52				
D-ABC	86	21	485	0.177	85	0.0	0.2	8.971	A
C-D	72	18			72				
C-A	29	7			29				
C-B	6	2			6				
CD-AB	30	8	605	0.050	30	0.0	0.1	6.261	A
CD-A	53	13			53				

08:00 - 08:15

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-ACD	58	15	518	0.113	58	0.1	0.1	7.824	A
A-B	15	4			15				
A-C	61	15			61				
A-D	49	12			49				
AB-CD	99	25	569	0.174	99	0.2	0.2	7.657	A
AB-C	59	15			59				
D-ABC	102	26	478	0.214	102	0.2	0.3	9.568	A
C-D	86	22			86				
C-A	35	9			35				
C-B	7	2			7				
CD-AB	37	9	607	0.061	37	0.1	0.1	6.314	A
CD-A	62	16			62				

08:15 - 08:30

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-ACD	72	18	511	0.140	71	0.1	0.2	8.194	A
A-B	19	5			19				
A-C	75	19			75				
A-D	59	15			59				
AB-CD	125	31	573	0.218	125	0.2	0.3	8.022	A
AB-C	69	17			69				
D-ABC	126	31	468	0.268	125	0.3	0.4	10.475	B
C-D	106	26			106				
C-A	43	11			43				
C-B	9	2			9				
CD-AB	47	12	610	0.077	47	0.1	0.1	6.388	A
CD-A	75	19			75				

08:30 - 08:45

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-ACD	72	18	511	0.140	72	0.2	0.2	8.199	A
A-B	19	5			19				
A-C	75	19			75				
A-D	59	15			59				
AB-CD	125	31	573	0.218	125	0.3	0.3	8.033	A
AB-C	69	17			69				
D-ABC	126	31	468	0.268	126	0.4	0.4	10.500	B
C-D	106	26			106				
C-A	43	11			43				
C-B	9	2			9				
CD-AB	47	12	610	0.077	47	0.1	0.1	6.392	A
CD-A	75	19			75				

08:45 - 09:00

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-ACD	58	15	518	0.113	59	0.2	0.1	7.832	A
A-B	15	4			15				
A-C	61	15			61				
A-D	49	12			49				
AB-CD	99	25	569	0.174	99	0.3	0.2	7.675	A
AB-C	59	15			59				
D-ABC	102	26	478	0.214	103	0.4	0.3	9.603	A
C-D	86	22			86				
C-A	35	9			35				
C-B	7	2			7				
CD-AB	37	9	607	0.062	38	0.1	0.1	6.320	A
CD-A	63	16			63				

09:00 - 09:15

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-ACD	49	12	524	0.093	49	0.1	0.1	7.582	A
A-B	13	3			13				
A-C	51	13			51				
A-D	41	10			41				
AB-CD	81	20	565	0.143	81	0.2	0.2	7.441	A
AB-C	52	13			52				
D-ABC	86	21	485	0.177	86	0.3	0.2	9.024	A
C-D	72	18			72				
C-A	29	7			29				
C-B	6	2			6				
CD-AB	31	8	605	0.051	31	0.1	0.1	6.266	A
CD-A	53	13			53				

2041 with dev, 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		4.78	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)	Run automatically
D13	2041 with dev	AM	ONE HOUR	07:45	09:15	15	✓

Default vehicle mix	Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (Veh/hr)	Scaling Factor (%)
A		ONE HOUR	✓	78	100.000
B		ONE HOUR	✓	42	100.000
C		ONE HOUR	✓	123	100.000
D		ONE HOUR	✓	175	100.000

Origin-Destination Data

Demand (Veh/hr)

		To			
		A	B	C	D
From	A	0	9	56	13
	B	8	0	8	26
	C	71	14	0	38
	D	51	24	100	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 (Veh)	Max LOS	Average Demand (Veh/hr)	Total Junction Arrivals (Veh)
B-ACD	0.09	7.61	0.1	A	39	58
A-B					8	12
A-C					51	77
A-D					12	18
AB-CD	0.09	6.96	0.1	A	40	60
AB-C					54	82
D-ABC	0.42	13.48	0.7	B	161	241
C-D					35	52
C-A					65	98
C-B					13	19
CD-AB	0.08	5.94	0.1	A	42	63
CD-A					104	157

Main Results for each time segment

07:45 - 08:00

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-ACD	32	8	529	0.060	31	0.0	0.1	7.231	A
A-B	7	2			7				
A-C	42	11			42				
A-D	10	2			10				
AB-CD	32	8	561	0.057	32	0.0	0.1	6.803	A
AB-C	45	11			45				
D-ABC	132	33	474	0.278	130	0.0	0.4	10.435	B
C-D	29	7			29				
C-A	53	13			53				
C-B	11	3			11				
CD-AB	33	8	640	0.052	33	0.0	0.1	5.933	A
CD-A	87	22			87				

08:00 - 08:15

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-ACD	38	9	525	0.072	38	0.1	0.1	7.388	A
A-B	8	2			8				
A-C	50	13			50				
A-D	12	3			12				
AB-CD	39	10	563	0.069	39	0.1	0.1	6.870	A
AB-C	54	13			54				
D-ABC	157	39	468	0.336	157	0.4	0.5	11.558	B
C-D	34	9			34				
C-A	64	16			64				
C-B	13	3			13				
CD-AB	41	10	649	0.063	41	0.1	0.1	5.924	A
CD-A	103	26			103				

08:15 - 08:30

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-ACD	46	12	519	0.089	46	0.1	0.1	7.607	A
A-B	10	2			10				
A-C	62	15			62				
A-D	14	4			14				
AB-CD	49	12	566	0.087	49	0.1	0.1	6.960	A
AB-C	64	16			64				
D-ABC	193	48	460	0.419	192	0.5	0.7	13.401	B
C-D	42	10			42				
C-A	78	20			78				
C-B	15	4			15				
CD-AB	52	13	661	0.079	52	0.1	0.1	5.916	A
CD-A	123	31			123				

08:30 - 08:45

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-ACD	46	12	519	0.089	46	0.1	0.1	7.607	A
A-B	10	2			10				
A-C	62	15			62				
A-D	14	4			14				
AB-CD	49	12	566	0.087	49	0.1	0.1	6.965	A
AB-C	64	16			64				
D-ABC	193	48	460	0.419	193	0.7	0.7	13.481	B
C-D	42	10			42				
C-A	78	20			78				
C-B	15	4			15				
CD-AB	53	13	661	0.079	53	0.1	0.1	5.918	A
CD-A	124	31			124				

08:45 - 09:00

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-ACD	38	9	525	0.072	38	0.1	0.1	7.391	A
A-B	8	2			8				
A-C	50	13			50				
A-D	12	3			12				
AB-CD	39	10	563	0.069	39	0.1	0.1	6.875	A
AB-C	54	13			54				
D-ABC	157	39	468	0.336	158	0.7	0.5	11.659	B
C-D	34	9			34				
C-A	64	16			64				
C-B	13	3			13				
CD-AB	41	10	649	0.064	41	0.1	0.1	5.930	A
CD-A	103	26			103				

09:00 - 09:15

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-ACD	32	8	529	0.060	32	0.1	0.1	7.240	A
A-B	7	2			7				
A-C	42	11			42				
A-D	10	2			10				
AB-CD	32	8	561	0.057	32	0.1	0.1	6.813	A
AB-C	45	11			45				
D-ABC	132	33	474	0.278	132	0.5	0.4	10.563	B
C-D	29	7			29				
C-A	53	13			53				
C-B	11	3			11				
CD-AB	34	8	640	0.052	34	0.1	0.1	5.938	A
CD-A	87	22			87				

2041 with dev, 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		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)	Run automatically
D14	2041 with dev	PM	ONE HOUR	07:45	09:15	15	✓

Default vehicle mix	Vehicle mix varies over turn	Vehicle mix varies over entry	Vehicle mix source	PCU Factor for a HV (PCU)
✓	✓	✓	HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Profile type	Use O-D data	Average Demand (Veh/hr)	Scaling Factor (%)
A		ONE HOUR	✓	142	100.000
B		ONE HOUR	✓	66	100.000
C		ONE HOUR	✓	149	100.000
D		ONE HOUR	✓	120	100.000

Origin-Destination Data

Demand (Veh/hr)

		To			
		A	B	C	D
From	A	0	17	70	55
	B	12	0	12	42
	C	45	8	0	96
	D	41	29	50	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 (Veh)	Max LOS	Average Demand (Veh/hr)	Total Junction Arrivals (Veh)
B-ACD	0.14	8.29	0.2	A	61	91
A-B					16	23
A-C					64	96
A-D					50	76
AB-CD	0.22	8.07	0.3	A	103	154
AB-C					61	92
D-ABC	0.28	10.65	0.4	B	110	165
C-D					88	132
C-A					41	62
C-B					7	11
CD-AB	0.08	6.31	0.1	A	39	59
CD-A					74	111

Main Results for each time segment

07:45 - 08:00

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-ACD	50	12	521	0.095	49	0.0	0.1	7.628	A
A-B	13	3			13				
A-C	53	13			53				
A-D	41	10			41				
AB-CD	82	20	565	0.144	81	0.0	0.2	7.424	A
AB-C	53	13			53				
D-ABC	90	23	488	0.185	89	0.0	0.2	9.022	A
C-D	72	18			72				
C-A	34	8			34				
C-B	6	2			6				
CD-AB	31	8	610	0.051	31	0.0	0.1	6.208	A
CD-A	61	15			61				

08:00 - 08:15

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-ACD	59	15	515	0.115	59	0.1	0.1	7.897	A
A-B	15	4			15				
A-C	63	16			63				
A-D	49	12			49				
AB-CD	100	25	569	0.176	100	0.2	0.2	7.680	A
AB-C	61	15			61				
D-ABC	108	27	480	0.225	108	0.2	0.3	9.654	A
C-D	86	22			86				
C-A	40	10			40				
C-B	7	2			7				
CD-AB	38	9	614	0.062	38	0.1	0.1	6.251	A
CD-A	72	18			72				

08:15 - 08:30

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-ACD	73	18	507	0.143	73	0.1	0.2	8.284	A
A-B	19	5			19				
A-C	77	19			77				
A-D	61	15			61				
AB-CD	127	32	573	0.221	126	0.2	0.3	8.057	A
AB-C	70	18			70				
D-ABC	132	33	470	0.281	132	0.3	0.4	10.621	B
C-D	106	26			106				
C-A	50	12			50				
C-B	9	2			9				
CD-AB	48	12	618	0.078	48	0.1	0.1	6.312	A
CD-A	87	22			87				

08:30 - 08:45

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-ACD	73	18	507	0.143	73	0.2	0.2	8.289	A
A-B	19	5			19				
A-C	77	19			77				
A-D	61	15			61				
AB-CD	127	32	573	0.221	127	0.3	0.3	8.066	A
AB-C	70	18			70				
D-ABC	132	33	470	0.281	132	0.4	0.4	10.648	B
C-D	106	26			106				
C-A	50	12			50				
C-B	9	2			9				
CD-AB	48	12	618	0.078	48	0.1	0.1	6.313	A
CD-A	87	22			87				

08:45 - 09:00

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-ACD	59	15	515	0.115	59	0.2	0.1	7.907	A
A-B	15	4			15				
A-C	63	16			63				
A-D	49	12			49				
AB-CD	100	25	569	0.176	101	0.3	0.2	7.699	A
AB-C	61	15			61				
D-ABC	108	27	480	0.225	108	0.4	0.3	9.691	A
C-D	86	22			86				
C-A	40	10			40				
C-B	7	2			7				
CD-AB	38	10	614	0.062	38	0.1	0.1	6.255	A
CD-A	73	18			73				

09:00 - 09:15

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-ACD	50	12	521	0.095	50	0.1	0.1	7.647	A
A-B	13	3			13				
A-C	53	13			53				
A-D	41	10			41				
AB-CD	82	21	565	0.145	82	0.2	0.2	7.458	A
AB-C	53	13			53				
D-ABC	90	23	487	0.185	91	0.3	0.2	9.078	A
C-D	72	18			72				
C-A	34	8			34				
C-B	6	2			6				
CD-AB	31	8	611	0.051	31	0.1	0.1	6.214	A
CD-A	62	15			62				

Appendix J – SUDS / Green Infrastructure Feasibility Checklist

SUDS/Green Infrastructure feasibility checklist – 23D048 – February 2024

SuDS Measures	Measures to be used on this site	Rationale for selecting/not selecting measure
Source Control		
Swales	N	There is limited suitable space within the site for same.
Tree Pits	Y	Tree pits will be included in landscape design. Not included in the SuDs calculations, given the poor infiltration rate on site, but they will contribute.
Rainwater Butts	TBC	Usage will be reviewed with architect and client.
Rainwater harvesting	TBC	Will be reviewed with the architect and client to see if it is a viable option.
Soakaways	N	Not viable due to impermeable ground conditions
Infiltration trenches	N	Not required.
Permeable pavement	N	Permeable surfacing will not be provided to allow infiltration directly to the ground due to the impermeable ground conditions.
Green Roofs	N	Not viable due to nature of development
Filter strips	N	Filter strips maybe included in landscape design. Not included in the SuDs calculations, due to the impermeable ground conditions, but they will contribute.
Bio-retention systems/Raingardens	Y	Raingardens may be included in landscape design. Not included in the SuDs calculations, due to the impermeable ground conditions, but they will contribute in a small way.
Blue Roofs	N	Not cost effective over the lifespan due to maintenance.
Filter Drain	N	Not currently proposed.
Site Control		
Detention Basins	N	No available room on site for large bodies of water and poses a potential drowning hazard.
Retentions basins	N	No available room on site for large bodies of water and poses a potential drowning hazard.
Regional Control		
Ponds	N	No available room on site for large bodies of water and poses a potential drowning hazard
Wetlands	N	No available room on site for large bodies of water and poses a potential drowning hazard.
Other		
Petrol/Oil interceptor	Y	Included in overall drainage design
Attenuation tank – only as a last resort where other measures are not feasible	Y	Provided on site. Site storage for 1/100 storm + 20% climate change with hydrobrake connection to mains.

Appendix K – DMURS Statement of Consistency

HAYES HIGGINS PARTNERSHIP
CHARTERED ENGINEERS • PROJECT MANAGERS

DMURS Statement of Consistency

For

Development at Mullavalley, Louth Village

Louth County Council,

Comhairle Contae Lú
Louth County Council

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Contents

DOCUMENT CONTROL SHEET

	Client	Louth County Council							
	Project Title	Development at Mullavalley, Community Facilities & Associated Works via Modern Methods of Construction							
	Project Ref.	23D048							
	Document Title	DMURS Statement of Consistency							
	Document No.	23D048							
	This Document Comprises	DCS	PD	TOC	Text	-	-	-	Appendices
		1	-	1	5				0
	Check								

Revision	Status	Author	Reviewed By	Approved By	Issue Dates
P	S 179 A	RM	LM	DH	April 2024

1. Introduction

Hayes Higgins Partnership has been commissioned to prepare a DMURS Statement of Consistency alongside a Civil Engineering Services Report for the proposed development at Mullavalley, Louth Village, County Louth.

The site in question is located at Mullavalley, Louth Village, County Louth. The existing site is a greenfield site and measures approximately 3.54 hectares and is zoned A2 New residential Phase 1 in the Louth County Development Plan.

The site is bound by residential units to the south and north. There is a roadway, R171 separating the site from the houses to the north of the site. The site is bound by greenfield site to the east. There are hedges & vegetation around the site perimeter, there are a number of residential units and housing development to the south/west. The topography of the site shows a general downward slope from south-east to north-west. Resident car parking is provided within the site.

An objective of the current Louth County Council Development Plan is to 'focus on creating places where people want to live and delivering well designed and located housing that is adaptable and resilient to the impacts of climate change and capable of meeting the current and future housing needs of the County' (LCDP 2021-2027, Volume 1, Chapter 3 – Housing)

The proposed development will comprise the construction of 58no. houses including 8no. 2-bed bungalows, 20no. two storey 2-bed houses, 24no. two storey 3-bed houses, 5no. two storey 4-bed houses, and 1no. 5-bed bungalow, on a site of c. 3.54 hectares in the townland of Mullavally, Louth Village, Co. Louth.

The development will also include the construction of a new entrance onto the R171; provision of new cycleway, footpath, and public lighting along the boundary with the R171; new estate roads and homezones within the site; 109no. car parking spaces including both on-street and in-curtilage parking; cycle parking; hard and soft landscaping including public open spaces, roads, playground, and private gardens; boundary treatments; ESB substation; lighting; laying of underground sewers, mains and pipes; underground attenuation tank; and all associated works. A copy of the site survey drawing is included in Appendix C. The development will be accessed from an entrance on R171, this entrance is located in the north-west corner.

The proposed development will utilise existing services in the vicinity of the site.

The objective of DMURS is 'to put well-designed streets at the heart of communities' (DMURS, 2019)

'Well designed streets can create connected physical, social and transport networks that promote real alternatives to car journeys, namely walking, cycling or public transport' (DMURS, March 2013)

The aim of DMURS is to encourage a more sustainable approach to network design and to better the experience of all road users, through reduction in traffic speeds, encourage non-motorised traffic, and essentially healthier environments and communities. , thereby providing safe, attractive & comfortable streets for all users.

2. Smarter Travel

Smarter Travel - A Sustainable Transport Future -A New Transport Policy for Ireland 2009-2020, sets out five (5) key goals:

a. *To reduce overall travel demand*
b. *To maximise the efficiency of transport network*
c. *To reduce reliance on fossil fuels*
d. *To reduce transport emissions*
e. *To improve accessibility to public transport*

Planning Guidelines: Local Area Plans 2013
For local area plans focused on meeting the needs of communities in newly developing areas, the emphasis should be on:

- *providing compact, walkable neighbourhoods incorporating a variety of house types with mixed tenure;*
- *providing conveniently-located neighbourhood facilities commensurate with projected population, including playground/play areas;*
- *providing a mix of residential and commercial uses with adequate local employment opportunities;*
- *designing in active streets and designing out anti-social behaviour through urban master planning, encouraging good mixture of uses and adaptability of buildings; and*
- *measures to encourage local people to adopt healthier, smarter ways to travel around their local communities, especially walking and cycling.*

Louth County Development Plan 2021 – 2027

Strategic Objective SO 15

Ensure the proper integration of transportation and land use planning through the increased use of sustainable transport modes and the minimisation of travel demand to achieve a sustainable, integrated and low carbon transport system with excellent connectivity both within and beyond the County.

Strategic Objective SO 17

Facilitate the development of infrastructural projects, which will underpin sustainable development throughout the County during the period of the Plan.

Housing Policy Objective HOU 3

To support the delivery of social housing in Louth in accordance with the Council's Social Housing Delivery Programme and Government Policy as set out in Rebuilding Ireland: Action Plan for Housing and Homelessness.

Movement Policy Objective MOV 06

To promote and support the principles of universal design ensuring that all environments are inclusive and are accessible to and can be used to the fullest extent possible by all users regardless of age, ability or disability.

The concept of smarter travel is further exemplified through the 'Principles for Quality Design and Layout' such as 'Placemaking'. 'The design approach aims to add value to a development. This takes account of the location, character, topography, history and any other issues that have shaped the area in which a development is located.' Chapter 3, Housing, Louth County Development Plan, 2021-2027

3. Creating A Better Environment

UK manual for streets (2007) – detail principles that should influence layout and design of streets – principles include:

a. Connectivity and permeability

b. Sustainability

c. Safety

d. Legibility

e. Sense of place

The basic concepts of DMURS are identified through the following principles, namely

i. Connectivity – ' A core objective of a segregated approach to street design is the creation of a highly functional traffic network'

ii. Comfort

iii. Active Edge and

iv. Pedestrian Facilities

i. Connectivity

DMURS provides guidance on the hierarchy of needs of pedestrians, cyclists, public transport and private vehicles.

The attached image from DMURS shows the prioritisation of considerations.

The Mullavalley development proposed plan aligns with consideration of pedestrians throughout the residential estate, ensuring that connectivity is provided to the main road via different access routes, through intended newly constructed pedestrian walkways and links, as well as dropped kerbs and tactile paving to assist with the movement of visually impaired persons.

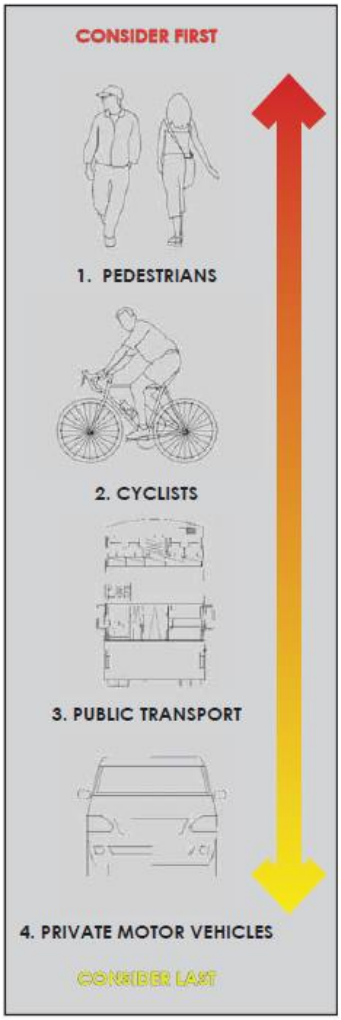


Figure 2.21: User hierarchy that promotes and prioritises sustainable forms of transportation

Although the site is not within immediate connection to any bus routes, access is provided for easy access to link roads for bus routes.

The proposed residential development has been thoughtfully designed to accommodate and promote inter-connectivity between all modes of movements, with a strong leaning towards pedestrian movements, especially noted in the movements across the residential estate.

There is one main road and vehicle access to the residential estate as per accompanying layout and drawings. Through-access roads have been avoided where possible to reduce traffic speed and 'passing-through' traffic. Horizontally straight roads have been accompanied by chicanes and speed humps to reduce the speed of traffic within the residential estate.

The proposed residential development abides by the principle of integrated and non-segregated connectivity of DMURS.

ii. Comfort

The traffic facilities have been designed to allow for best usage of movement, through adequate pedestrian walkway, cycleway and road widths, along with appropriate turning radii. Footpaths and cycle paths have been kept clear of roadside furniture and clutter which would impede or impair the free flow movement of traffic. Where possible, throughout the site, careful thought has provided non-isolating walkways ensuring persons have freedom of movement. The use of landscaping techniques and layout ensure the inclusivity of all road users and the encouragement of free movement within the designated areas.

iii. Active Edge

The residential units each have access to the road, enlivening the frontage of the homes and access, with incorporated cul-de-sacs providing a sense of bounded communities.

iv. Pedestrian Facilities

The proposed residential development has been designed to facilitate and enhance pedestrian movement and connectivity, allowing all units to have direct access to pedestrian facilities and equally providing surveillance and openness of the footpaths increasing the sense of security and safety.

The development has some speed reducing elements incorporated into the design, such as chicanes, slight bends and speed humps as traffic calming facilities, and the development will likely have a 30km/h speed limit..

The pedestrian facilities are 1.8m wide, providing adequate passing space for two persons passing one another comfortably.

DMURS guidelines provides 1.8m to 2.5m widths for areas of low pedestrian activity and moderate pedestrian activity respectively. A 1.8m footpath is most suitable and feasible for the proposed residential development.

The footpath for the proposed residential development provides interconnectivity throughout the estate and access to the main network in the area, providing suitable and comfortable access to the transport links, retail and healthcare facilities.

Cyclepaths are also provided along the existing road, ensuring dedicated cycle lanes and widths of 2.0m, establishing a fully integrated network for cyclists, encouraging the usage of such means of transportation.

4. DMURS Design Principles from DMURS 2019 2.2.3 (Key Design Principles)

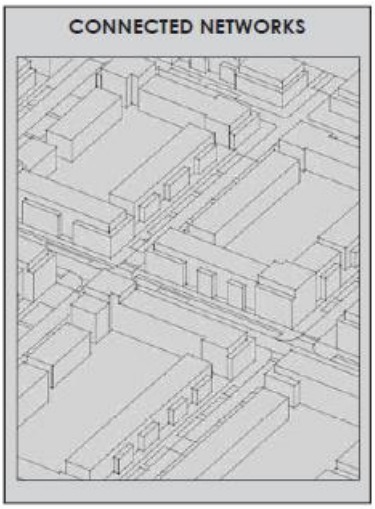
DMURS gives insight into the four core principles towards a balanced approach to road and street design. The four principles are

i. Connected Networks
ii. Multi-Functional Streets
iii. Pedestrian Focus
iv. Multidisciplinary Approach

Design Principle 1:

To support the creation of integrated street networks which promote higher levels of permeability and legibility for all users, and in particular more sustainable forms of transport.

Chapter 3 of this Manual is concerned with the creation and management of permeable and legible street networks.



i. Design Principle – Connected Networks

The proposed development consists of a few local streets which provide access to the dwellings, and throughout the design, careful consideration has been carried out to allow for the greatest connectivity between pedestrians and cyclists, promoting the different modes of transportation and reducing the usage of motorised transportation.

The proposed development is well-connected to the local road network, and allow for the ease of access between individuals and main roads.

The main point of entry / exit into the site is well demarcated and as provides a positive gateway and means of notification to all users and drivers, of the change of conditions, speeds etc.

ii. Design Principle – Multi-functional Streets

The roads, streets and proposed development layout have considered future potential development and networks to the east of the second field and a hierarchical approach to the design with the DMURS principles increasing the attractiveness of usage for pedestrians and vehicles.

A series of raised pedestrian crossings will also be accommodated into the site, to allow for enhanced flow of pedestrians, reduced traffic speeds and inclusivity of all persons within the residential estate.

Open spaces are also incorporated into the design ensuring the there are sufficient buffer zones to noise, providing areas of calm and enhancing the visibility of the proposed estate.

Incorporated footpaths provide cross site links and multi-functional usage, creating balance between all users and residents, creating a facilitated movements.

Design Principle 2:

The promotion of multi-functional, place-based streets that balance the needs of all users within a self-regulating environment.

Chapter 4 of this Manual is concerned with the creation of self-regulating streets that cater for the various place and movement functions of a street.

iii. Design Principle 3 – Pedestrian Focus

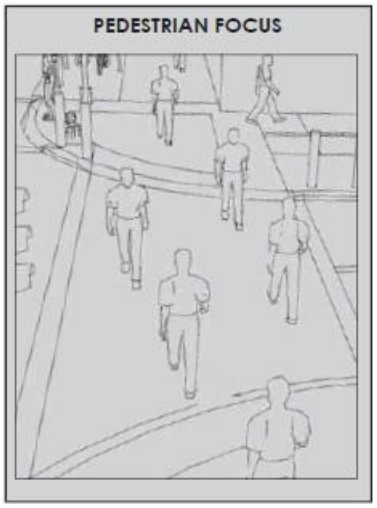
The pedestrian focus of the proposed development design, encourages connectivity throughout the site, heavily focused on pedestrians, along all lines of access.

The encompassing design provides an integrated sense of community and connectivity, providing passive observation of all persons within the estate and increased sense of safety and security.

Design Principle 3:

The quality of the street is measured by the quality of the pedestrian environment.

Chapter 4 of this Manual also provides design standards for the creation of a safe, comfortable and attractive pedestrian environment.



iv. Design Principle 4 – Multidisciplinary Approach

The design of the proposed development, has been developed through the incorporated workmanship of the design team, comprising of eml Architects, Ait Landscape Architects, working together with Hayes Higgins Partnership Consulting Civil and Structural Engineers, providing civil, structural, environmental and mechanical and electrical engineering collaborative approach to the highest standards of design and development of the proposal for the residential estate, that complies with the DMURS recommendations.

Design Principle 4:

Greater communication and co-operation between design professionals through the promotion of a plan-led, multidisciplinary approach to design.

Chapter 5 of this Manual is concerned with the implementation of a more integrated approach to street design.

5. Conclusion

Hayes Higgins Partnership, Consulting Engineers were appointed by Louth County Council to provide Civil and Structural, Mechanical and Electrical and Environmental advice for the proposed residential development at Mullavalley, Louth Village, Louth County.

The report aims to demonstrate that the proposed residential development achieves the objectives described in DMURS, in co-ordination with the client, various designers and consultants to encourage the use of non-motorised modes of transportation over the use of private vehicles.

With regard to the aforementioned, the proposed development is in keeping with the guidelines and objectives for the Design of Urban Roads and Streets.