	(chapter 13) aims to promote sustainability by enhancing public transport with regular and ongoing increases in the public transport capacity and to reduce dependency on the use of the private car.
Noise & Vibration	DKP_{EV} do not anticipate the requirement of any remedial measures but list the following recommendations mainly for the construction sites: • Ensure that the local authority guidelines or planning directives to noise levels and operational times are adhered too. • Prepare a construction phase operational plan with regards to limiting noise nuisance. • Ensure all construction vehicles and plant are regularly maintained including any noise • control measures such as attenuators, filters etc. • Limit any construction noise spreading to neighbouring site by erecting temporary noise barriers (site boundary hoarding). • Schedule particular high-level noise activities for times when increased noise levels are less sensitive or notify neighbouring residents or any sensitive sites.
Climate	There are no particular mitigation measures noted. All the recommended reduction measures at design stage and as applied in the CO_2 reduction tables are for the greater part mandatory to comply to the relevant regulations and standards. As each development/building can only be certified for compliance under the Building Control Amendment Regulations (BCaR) if the minimum criteria set at design stage is met in full it is very unlikely that non-compliance i.e., mitigation occurs. These can be summarised below: Construction Phase: • CO_2 reduction measures to minimise impacts from transport during the construction phase, such as reducing idle times for vehicles and turning off engines when not in use. • It is also proposed to reduce embodied CO2 in the use of materials and to maximise the reuse of materials or "green" materials in the construction stage. • The construction of the buildings will also be energy efficient and use energy efficient technology such as heat pumps, heating controls and timers. Reduction in thermal bridging shall be maximised. Operation Phase: • Reduce demand for transport based trips. • Encourage the use of electric vehicles and cycling/walking. • Encourage public transport as a preferred mode of transport.
Transportation	Construction Phase: It is considered that a Construction Management Plan (CMP) will be prepared by the appointed contractor in order to minimise the potential impact of the construction phase of each proposed development on the safety and amenity of other users of the public road. The CMP will consider the following aspects: • Dust and dirt control measures.

	• Noise assessment and control measures • Routes to be used by vehicles • Working hours of the site • Details of construction traffic forecasts • Time when vehicle movements and deliveries will be made to the site • Facilities for loading and unloading • Facilities for parking cars and other vehicles Further to the above, a detailed Traffic Management Plan (TMP) will be prepared by the main contractor. This document will outline proposals in relation to construction traffic and associated construction activities that impact the surrounding roads network. The document will be prepared in coordination and agreed with the local authority. Care will be taken to ensure existing pedestrian and cycling routes are suitably maintained or appropriately diverted as necessary during the construction period, and temporary car parking is provided within the site for contractor's vehicles. It is likely that construction will have an imperceptible impact on pedestrian and cycle infrastructure. Through the implementation of the CMP and TMP, it is anticipated that the effect of traffic during the construction phase will have a slight effect on the surrounding road network for short-term period. The proposed development is to be constructed in two stages which will include, in broad terms, the following: • Stage I: Site clearance and preparation work for the construction. • Stage II: Site development and construction. The development includes all associated site works and infrastructure which includes roads, utilities, foul and surface water drainage. The construction programme is intended to be an 18-month programme. An indicative phasing plan for all three concurrent planning submissions is shown in the Figure below. Each phase is designed to be delivered independently. The proposed phasing is to help further reduce the impact of construction on the local road network Operation Phase: The proposed developments are situated adjacent to suitable infrastructure and transport services for travel by sustainable modes. A key barrier to modal shift towards sustainable modes of travel is often a lack of information about potential alternatives to the car. As such, it is proposed that residents will be made aware of potential alternatives including information on walking, cycle routes and public transport.

	Residents will be encouraged to avail of these facilities for travel to and from work. Provision of this information would be made during the sales process and will be included in the new homeowner's pack upon the sale of each unit, as this represents the best opportunity to make residents aware and to secure travel behaviour change. It is anticipated that this measure may help to reduce the level of traffic at the proposed development, thus providing mitigation against any traffic and transport effects of the development. A Travel Plan has been included for each proposed development under separate cover for each respective planning application. These Plans sets out method to reduce the dependence on private car journeys and encourage residents within the development to avail of sustainable forms of transport such as walking, cycling and public transport. In addition, the proposed developments propose connectivity to existing facilities and public transport options. The proposed upgrades to the R107 Malahide Road / Back Road junction will improve pedestrian and cyclist connectivity between the proposed development and the surrounding public network. New internal footpaths connecting the access road to R107 Malahide Road provide safe access to public transport in the area.
Material Assets, Cultural & Archaeological Heritage	Construction Phase: Monitoring of topsoil stripping to be undertaken by archaeologist. Should any archaeological material be uncovered then this will be subject to further investigation under the appropriate licence. Operational Phase: No mitigation necessary
Material Assets – Utilities & Waste	Construction Phase: The site-specific Construction and Demolition Waste Management Plan (C&DWMP) shall be implemented. Operation Phase Operational waste management will be managed by a designated management company on site and the appointed licenced waste contractor which will ensure the sustainable management of domestic and commercial waste arising from the development in accordance with legislative requirements and best practice standards.
Landscape and Visual Impact	Construction Phase: It is proposed that careful attention will be paid to avoiding any potentially adverse construction-related effects on the adjacent residences and the wildlife associated with the estuaries wetlands. Operating a well-managed, organised and planned

	construction site, with adequate control of construction traffic and working activity, is key to avoiding/minimising such impacts. In addition, any lighting required during the construction phase should be located sensitively to avoid unnecessary light spill into the surrounding residential areas and into the woodlands.
	
	The construction works and the habitat protection measures will be carried out in accordance with measures outlined by the project ecologist and FCC.
	
	Operation Phase:
	
	The careful and considered approach to the layout of the proposed development is to minimise negative visual impact both locally and from the wider surrounding area. The landscape strategy below details the landscape proposals that will assist in mitigating the landscape and visual impacts of the proposed development: refer to landscape drawings and Landscape Development Reports. The key objectives included:
	
	• Retention and protection of the vegetation along existing field boundaries where possible.
	  ○ This helps to retain a mature, established character to the site and provide a unifying, cohesive landscape framework that relates it to the surrounding landscape and its historical context, as well as being of ecological benefit.
	  ○ Generally this will involve retention of mature good quality trees within the woodlands, tree belts and hedgerows, pruning and tiding of the retained hedgerow and replanting where the hedgerow is of poorer quality (as outlined in the Arboricultural Reports).

	○ The design of the development has, where possible, followed the pattern of exiting field boundaries to ensure the retention of the vegetation where possible and to retain the historical patterns of the landscape. • Integration of the development into the surrounding landscape, minimising landscape and visual impact in particular upon nearby residential dwellings, from Malahide Road and from Malahide Demesne. ○ This is largely to be achieved by an extensive planting programme within the site and along the site boundaries and working with the existing topography of the site as much as possible. • Roadway lighting and lighting of cycle/ pedestrian walkways will be by means of high quality, modern standing fixtures. They will include full cut-off (FCO) and energy efficient lighting where practicable to reduce the impacts of light pollution on the surrounding area and sky. Introduction of usable amenity spaces, as described within the Landscape Development Reports and indicated on landscape drawings and which will be planted with appropriate species as listed in the planting specifications within these reports. The planting proposals within the scheme will be employed to: • assist in the successful integration of the proposed scheme into its landscape setting • structured native tree planting is proposed within the spaces and along the new main central spine road which links into the amenity spaces. • create visual interest and a sense of place • act as a buffer and assist in partially screening and filtering views of the proposed development from the surrounding area e.g. adjoining residential areas, Malahide Road • assist in defining areas and reinforcing the character of the various spaces • provide visually attractive spaces for future residents and the local community to relax, move and/ or socialise within • open lawn and grassland meadows are proposed throughout the public spaces which provide space for informal play and passive recreation. • provide a sense of enclosure at the transitions between public areas to communal areas and the proposed buildings, while also permitting passive surveillance of the open space areas

	• compensate for any loss/ enhance biodiversity benefits with an emphasis on pollinator friendly plant species.
Cultural Heritage	Construction Phase: Monitoring of top-soil stripping to determine if any archaeological features or deposits are present.

Table 16.1 Summary of Mitigation Measures

DOWNEY
29 Merrion Square, D02RW64

ENVIRONMENTAL IMPACT ASSESSMENT REPORT (EIAR) Volume 2 - Appendices

Proposed Residential Development

on Lands at Auburn House and Little Auburn, Off Malahide Road and Carey's Lane, Streamstown, Malahide, Co. Dublin

October 2022

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S.I. Ltd Contract No: 5690

Client:	Hatley Homes
Engineer:	Waterman Moylan
Contractor:	Site Investigations Ltd

Auburn,
Malahide, Co. Dublin
Site Investigation Report

Prepared by:

.....

Stephen Letch

Issue Date:	27/02/2020
Status	Final
Revision	1

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1. Trial Pit and Dynamic Probe Logs and Photographs
2. Soakaway Test Results
3. Geotechnical Laboratory Test Data
4. Environmental Laboratory Test Data
5. Survey Data

1. Introduction

On the instructions of Waterman Moylan, Site Investigations Ltd (SIL) was appointed to complete a ground investigation at Malahide, Co. Dublin. The investigation was completed for a new residential development on the site and completed on behalf of the Client, Hollybrook Homes. The investigation was completed in February 2020.

2. Site Location

The site is located to the west of the Malahide Road in to the south of Malahide, Co. Dublin. Malahide is to the north of Dublin city and is shown on the map on the left and the location of the site in Malahide is shown on the right.

3. Fieldwork

The fieldworks comprised a programme of trial pits with dynamic probes and soakaway tests. All fieldwork was carried out in accordance with Eurocode 7: Geotechnical Design and IEI Specification & Related Documents for Ground Investigation in Ireland (2006).

The fieldworks comprised the following:

- 5 No. trial pits with dynamic probes
- 5 No. soakaway tests

3.1. Trial Pits with Dynamic Probes

5 No. trial pits were excavated using a wheeled excavator. The pits were logged and photographed by SIL geotechnical engineer and 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/m²

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 logs with the dynamic probe results are presented in Appendix 1 along with the photographs.

3.2. Soakaway Tests

Soakaway tests were scheduled at the trial pit locations but groundwater was encountered in three of the trial pits and therefore, these soils are already saturated and unsuitable for soakaway locations. Therefore, two soakaways were completed at TP04 and TP05 and logged by SIL geotechnical engineer. The soakaway test is used to identify possible areas for storm water drainage. The pit was filled with water and the level of the groundwater was recorded over time. As stipulated by BRE Special Digest 365, 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 test results are provided in Appendix 2.

3.3. 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 5.

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
- 5 No. pH, sulphate and chloride content

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

- 5 No. Rilta Suite analysis
- 5 No. loss on ignition tests

The geotechnical laboratory test results are presented in Appendix 3 with the environmental tests reported in Appendix 4.

5. Ground Conditions

5.1. Overburden

The natural ground conditions vary slightly with TP01, TP04 and TP05 encountered cohesive brown grey CLAY soils until termination of the pits. TP02 and TP03 recorded the cohesive CLAY soils but this was underlain by a dark grey silty sandy GRAVEL with the boundary between the CLAY and GRAVEL at 1.20mbgl and 1.10mbgl respectively.

The laboratory tests of the cohesive soils confirm that CLAY soils dominate the site with low plasticity indexes of 10 to 14% recorded. The particle size distribution curves were poorly sorted straight-line curves with 21% to 47% fines content.

5.2. Groundwater

Groundwater details in the trial pits during the fieldworks are noted on the logs in Appendix 1. Groundwater ingresses were recorded in three of the trial pits, TP01, TP02 and TP03, at 2.60mbgl, 1.20mbgl and 1.10mbgl respectively. The ingresses in TP02 and TP03 correspond with the boundary with the GRAVEL, with rapid ingress rates.

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. 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.

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 3.1. 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.

In granular soils, the N_{100} value is used as per Section 3.1. to correlate with the SPT N-value and this is SPT N-value = N_{100} x 2.5. The SPT N-value can then be used to calculate the allowable bearing capacity, as per Terzaghi and Peck, using the correlation of SPT N-value x 10 = ABC. All capacities shown below are in kN/m^2.

The table overleaf shows the allowable bearing capacities for N_{100} values 1 to 10 at 1.00mbgl.

N_{100} Value	Cohesive Soils			Granular Soils	
	C_u	ULS	ABC	SPT N-value	ABC
1	45	250	85	2.5	25
2	60	330	110	5	50
3	75	400	135	7.5	75
4	90	480	160	10	100
5	105	555	185	12.5	125
6	120	630	210	15	150
7	135	705	235	17.5	175
8	150	780	260	20	200
9	165	855	285	22.5	225
10	180	930	310	250	250

All capacities shown are in kN/m^2.

The probes generally are 3 or greater and for cohesive soils, this would indicate a shear strength of $75kN/m^2$ and an allowable bearing capacity of $135kN/m^2$. TP02 did record lower values of 2 and this indicates a shear strength of $60kN/m^2$ and an allowable bearing capacity of $110kN/m^2$.

If granular soils are recorded as at TP02 and TP03, the lower value of 3 recorded at TP03 indicates an allowable bearing capacity of $75kN/m^2$, however, this increases to 5 at 1.30mbgl and this indicates an allowable bearing capacity of $125kN/m^2$.

It would be recommended that a suitably qualified Engineer inspects the founding strata prior to pouring the foundations to ensure that the ground is suitable for the final foundation design.

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.

- The foundation is to be 1m wide.
- 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 $19kN/m^3$.
- Based on groundwater observations this analysis assumes the groundwater will not influence the construction or performance of these foundations.

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, nearby construction and tides.

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, groundwater was encountered in three of the trial pits during the fieldworks period. 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. However, based on this information at the exploratory hole locations to date, it is considered likely that any shallow ingress 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 increases.

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. Soakaway Tests

The two soakaway tests completed failed the specification as the water level did not fall sufficiently enough to complete the tests. The BRE Digest stipulates that the pit should half empty within 24hrs, and extrapolation indicates this condition would not be satisfied. The tests were 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.

6.4. Pavement Design

The CBR test results in Appendix 3 indicate CBR values ranging from 6.1% to 8.3%.

The CBR samples were recovered from 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.

6.5. Contamination

Environmental testing was carried out on five samples from the investigation and the results are shown in Appendix 4. For material to be removed from site, Rilta Suite 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.

Five 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 3 indicate a general pH value between 7.11 and 7.30, 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 126mg/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 151mg/l shows Class 1 conditions and no special precautions are required.

Appendix 1

Trial Pit and Dynamic Probe Logs and Photographs

Contract No: 5690	**Trial Pit and Dynamic Probe Log**				Trial Pit No: **TP01**
Contract:	Auburn	Easting:	720836.089	Date:	04/02/2020
Location:	Malahide, Co. Dublin	Northing:	745302.027	Excavator:	JCB 3CX
Client:	Hatley Homes	Elevation:	10.19	Logged By:	P. McGonagle
Engineer:	Waterman Moylan	Dimensions (LxWxD) (m):	3.50 x 0.60 x 3.00	Scale:	1:25

Level (mbgl) Scale:	Depth	Stratum Description	Legend	Level (mOD) Scale:	Depth:	Samples Depth	Type	Probe	Water Strike
0		TOPSOIL.		10.0				1	
	0.30				9.89			1	
0.5		Firm becoming stiff brown slightly sandy gravelly silty CLAY with high cobble and low boulder content. Sand is fine to coarse. Gravel is fine to coarse, subangular to subrounded of limestone. Cobbles and boulders are angular to subangular of limestone (up to 500mm diameter).				0.50	CBR	1 3 3 9	
				9.5		0.50	ES	23	
1.0						1.00	B	23 25 22 30	
				9.0				21 29	
1.5								32 28 35	
				8.5					
2.0									
				8.0					
2.5						2.50	B		▼
				7.5					
3.0	3.00	Pit terminated at 3.00m			7.19				
				7.0					
3.5									
				6.5					
4.0									
				6.0					
4.5									
				5.5					

Termination:	Pit Wall Stability:	Groundwater Rate:	Remarks:	Key:
Scheduled depth.	Minor pit wall collapse.	2.60 Rapid	Dynamic probe completed adjacent to pit	B = Bulk disturbed D = Small disturbed CBR = Undisturbed CBR ES = Environmental

Contract No: 5690	**Trial Pit and Dynamic Probe Log**				Trial Pit No: **TP02**
Contract:	Auburn	Easting:	720958.397	Date:	04/02/2020
Location:	Malahide, Co. Dublin	Northing:	745323.628	Excavator:	JCB 3CX
Client:	Hatley Homes	Elevation:	9.13	Logged By:	P. McGonagle
Engineer:	Waterman Moylan	Dimensions (LxWxD) (m):	3.50 x 0.60 x 2.30	Scale:	1:25

Level (mbgl) Scale:	Depth	Stratum Description	Legend	Level (mOD) Scale:	Depth:	Samples Depth	Samples Type	Probe	Water Strike
0		TOPSOIL.		9.0				1 2 2 2	
	0.30				8.83				
0.5		Firm brown grey slightly sandy slightly gravelly silty CLAY with low cobble content. Sand is fine to coarse. Gravel is fine to coarse, subangular to subrounded of limestone. Cobbles are angular to subangular of limestone.		8.5		0.50 0.50	CBR ES	3 3 4 4 4	
1.0						1.00	B	3 2 4	
	1.20			8.0	7.93				
1.5		Dark grey brown silty sandy fine to coarse, angular to subangular GRAVEL of limestone with high cobble content. Sand is fine to coarse. Cobbles are angular of limestone.		7.5				15 15 13 26 35	
2.0						2.00	B		
	2.30	Pit terminated due to pit wall instability. **Pit terminated at 2.30m**		7.0	6.83				
2.5				6.5					
3.0				6.0					
3.5				5.5					
4.0				5.0					
4.5				4.5					

Termination:	Pit Wall Stability:	Groundwater Rate:	Remarks:	Key:
Pit wall instability.	Major pit wall collapse forcing completion of pit.	1.20 Rapid	Dynamic probe completed adjacent to pit	B = Bulk disturbed D = Small disturbed CBR = Undisturbed CBR ES = Environmental

Contract No: 5690	**Trial Pit and Dynamic Probe Log**				Trial Pit No: **TP03**
Contract:	Auburn	Easting:	721023.024	Date:	04/02/2020
Location:	Malahide, Co. Dublin	Northing:	745208.740	Excavator:	JCB 3CX
Client:	Hatley Homes	Elevation:	8.89	Logged By:	P. McGonagle
Engineer:	Waterman Moylan	Dimensions (LxWxD) (m):	3.50 x 0.60 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	0.30	TOPSOIL.		8.5	8.59	0.50 0.50	CBR ES	1 1 1 2 1 2 2 2 2 2	
1.0	1.10	Firm brown grey sandy slightly gravelly silty CLAY with low cobble content. Sand is fine to coarse. Gravel is fine to coarse, subangular to subrounded of limestone. Cobbles are angular to subangular of limestone.		8.0	7.79	1.00	B	4 4 3 5 5 5 7 6 7 9	▼
1.5 2.0	2.20	Dark grey brown silty sandy fine to coarse, angular to subangular GRAVEL of limestone with high cobble content. Sand is fine to coarse. Cobbles are angular of limestone.		7.5 7.0	6.69	2.00	B	5 5 5 5 5 8 7 9 8 7 9 11 14 13 12 12 10 35	
2.5 3.0 3.5 4.0 4.5		Pit terminated due to pit wall instability. **Pit terminated at 2.20m**		6.5 6.0 5.5 5.0 4.5 4.0					

Termination:	Pit Wall Stability:	Groundwater Rate:	Remarks:	Key:
Pit wall instability.	Major pit wall collapse forcing completion of pit.	1.10 Rapid	Dynamic probe completed adjacent to pit	B = Bulk disturbed D = Small disturbed CBR = Undisturbed CBR ES = Environmental

Contract No: 5690	**Trial Pit and Dynamic Probe Log**				Trial Pit No: **TP04**
Contract:	Auburn	Easting:	720867.968	Date:	04/02/2020
Location:	Malahide, Co. Dublin	Northing:	744987.754	Excavator:	JCB 3CX
Client:	Hatley Homes	Elevation:	11.99	Logged By:	P. McGonagle
Engineer:	Waterman Moylan	Dimensions (LxWxD) (m):	3.50 x 0.60 x 2.20	Scale:	1:25

Level (mbgl) Scale:	Depth	Stratum Description	Legend	Level (mOD) Scale:	Depth:	Samples Depth	Type	Probe	Water Strike
0	0.20	TOPSOIL.		11.5	11.79	0.50	CBR	1 2 2 3 5	
0.5		Firm becoming stiff brown slightly sandy slightly gravelly silty CLAY with high cobble and low boulder content. Sand is fine to coarse. Gravel is fine to coarse, subangular to subrounded of limestone. Cobbles and boulders are angular to subangular of limestone (up to 500mm diameter).				0.50	ES	4 4 4	
1.0				11.0		1.00	B	9 9 10 12 14	
1.5				10.5				22 24 22 26 30 35	
2.0	2.20	Obstruction - possible boulders or bedrock. **Pit terminated at 2.20m**		10.0	9.79	2.00	B		
2.5				9.5					
3.0				9.0					
3.5				8.5					
4.0				8.0					
4.5				7.5					

Termination:	Pit Wall Stability:	Groundwater Rate:	Remarks:	Key:
Obstruction - possible boulders.	Pit walls stable.	Dry	Dynamic probe completed adjacent to pit	B = Bulk disturbed D = Small disturbed CBR = Undisturbed CBR ES = Environmental

Contract No: 5690	**Trial Pit and Dynamic Probe Log**				Trial Pit No: **TP05**
Contract:	Auburn	Easting:	721148.805	Date:	04/02/2020
Location:	Malahide, Co. Dublin	Northing:	745022.818	Excavator:	JCB 3CX
Client:	Hatley Homes	Elevation:	10.15	Logged By:	P. McGonagle
Engineer:	Waterman Moylan	Dimensions (LxWxD) (m):	3.50 x 0.60 x 3.00	Scale:	1:25

Level (mbgl) Scale:	Depth	Stratum Description	Legend	Level (mOD) Scale:	Depth:	Samples Depth	Samples Type	Probe	Water Strike
0.5	0.30	TOPSOIL.		10.0	9.85	0.50	CBR	1	
		Firm becoming stiff brown slightly sandy gravelly silty CLAY with high cobble and low boulder content. Sand is fine to coarse. Gravel is fine to coarse, subangular to subrounded of limestone. Cobbles and boulders are angular to subangular of limestone (up to 500mm diameter).		9.5		0.50	ES	1	
1.0						1.00	B	2	
1.5				9.0				3	
2.0								3	
2.5				8.5		2.50	B	4	
3.0	3.00	Pit terminated at 3.00m		8.0	7.15			7	
3.5				7.5				9	
4.0				7.0				12	
4.5				6.5				15	
				6.0				14	
				5.5				15	
								18	
								22	
								24	
								22	
								26	
								28	
								35	

Termination:	Pit Wall Stability:	Groundwater Rate:	Remarks:	Key:
Scheduled depth.	Pit walls stable.	Dry	Dynamic probe completed adjacent to pit	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

Appendix 2

Soakaway Test Results

SOAKAWAY TEST

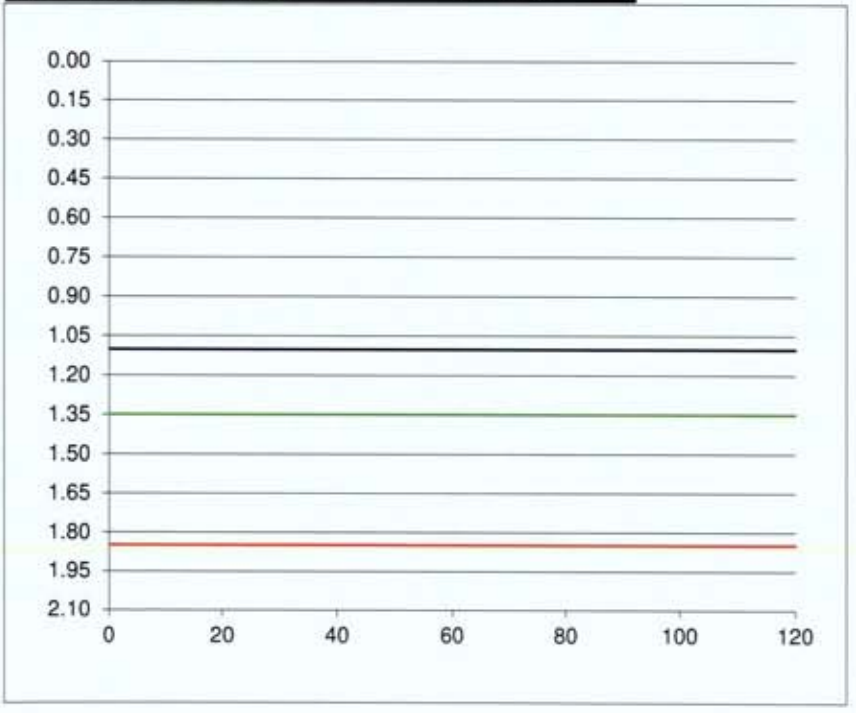
Project Reference:	5690
Contract name:	Auburn
Location:	Malahide, Co. Dublin
Test No:	TP04
Date:	04/02/2020

Ground Conditions

From	To	
0.00	0.20	TOPSOIL.
0.20	2.10	Firm becoming stiff brown slightly sandy slightly gravelly silty CLAY with high cobble and low boulder content.

Elapsed Time (mins)	Fall of Water (m)
0	1.10
0.5	1.10
1	1.10
1.5	1.10
2	1.10
2.5	1.10
3	1.10
3.5	1.10
4	1.10
4.5	1.10
5	1.10
6	1.10
7	1.10
8	1.10
9	1.10
10	1.10
12	1.10
14	1.10
16	1.10
18	1.10
20	1.10
25	1.10
30	1.10
40	1.10
50	1.10
60	1.10
75	1.10
90	1.10
120	1.10

Pit Dimensions (m)		
Length (m)	3.50	m
Width (m)	0.60	m
Depth	2.10	m
Water		
Start Depth of Water	1.10	m
Depth of Water	1.00	m
75% Full	1.35	m
25% Full	1.85	m
75%-25%	0.50	m
Volume of water (75%-25%)	**1.05**	m3
Area of Drainage	**17.22**	m2
Area of Drainage (75%-25%)	**6.20**	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

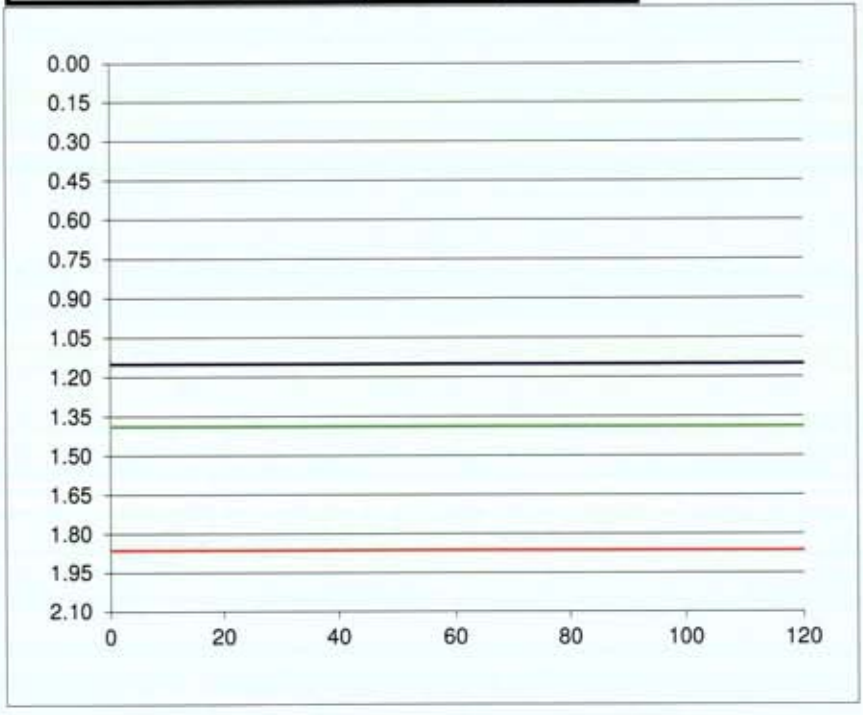
Project Reference:	5690
Contract name:	Auburn
Location:	Malahide, Co. Dublin
Test No:	TP05
Date:	04/02/2020

Ground Conditions

From	To	
0.00	0.30	TOPSOIL.
0.30	2.10	Firm becoming stiff brown slightly sandy gravelly silty CLAY with high cobble and low boulder content.

Elapsed Time (mins)	Fall of Water (m)
0	1.15
0.5	1.15
1	1.15
1.5	1.15
2	1.15
2.5	1.15
3	1.15
3.5	1.15
4	1.15
4.5	1.15
5	1.15
6	1.15
7	1.15
8	1.15
9	1.15
10	1.15
12	1.15
14	1.15
16	1.15
18	1.15
20	1.15
25	1.15
30	1.15
40	1.15
50	1.15
60	1.15
75	1.15
90	1.15
120	1.15

Pit Dimensions (m)		
Length (m)	3.50	m
Width (m)	0.60	m
Depth	2.10	m
Water		
Start Depth of Water	1.15	m
Depth of Water	0.95	m
75% Full	1.39	m
25% Full	1.86	m
75%-25%	0.48	m
Volume of water (75%-25%)	**1.00**	m3
Area of Drainage	**17.22**	m2
Area of Drainage (75%-25%)	**6.00**	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

Appendix 3

Geotechnical Laboratory Test Data

Classification Tests in accordance with BS1377: Part 4

Client	Hatley Homes
Site	Auburn, Malahide
S.I. File No	5690 / 20
Test Lab	Site Investigations Ltd., Carhugar The Grange, 12th Lock Rd., Lucan Co. Dublin. Tel (01) 6108768 Email info@siteinvestigations.ie
Report Date	18th February 2020

Hole ID	Depth	Sample No	Lab Ref No.	Sample Type	Natural Moisture Content %	Liquid Limit %	Plastic Limit %	Plastic Index %	Min. Dry Density Mg/m^3	Particle 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
TP01	1.00	PM03	20/241	B	11.6	32	20	12			44.9		CL
TP02	1.00	PM07	20/242	B	14.9	34	20	14			62.6		CL
TP03	1.00	PM11	20/243	B	30.7	33	19	14			60.7		CL
TP04	1.00	PM15	20/244	B	12.3	32	18	14			59.4		CL
TP05	1.00	PM19	20/245	B	10.5	34	24	10			39.3		ML/CL

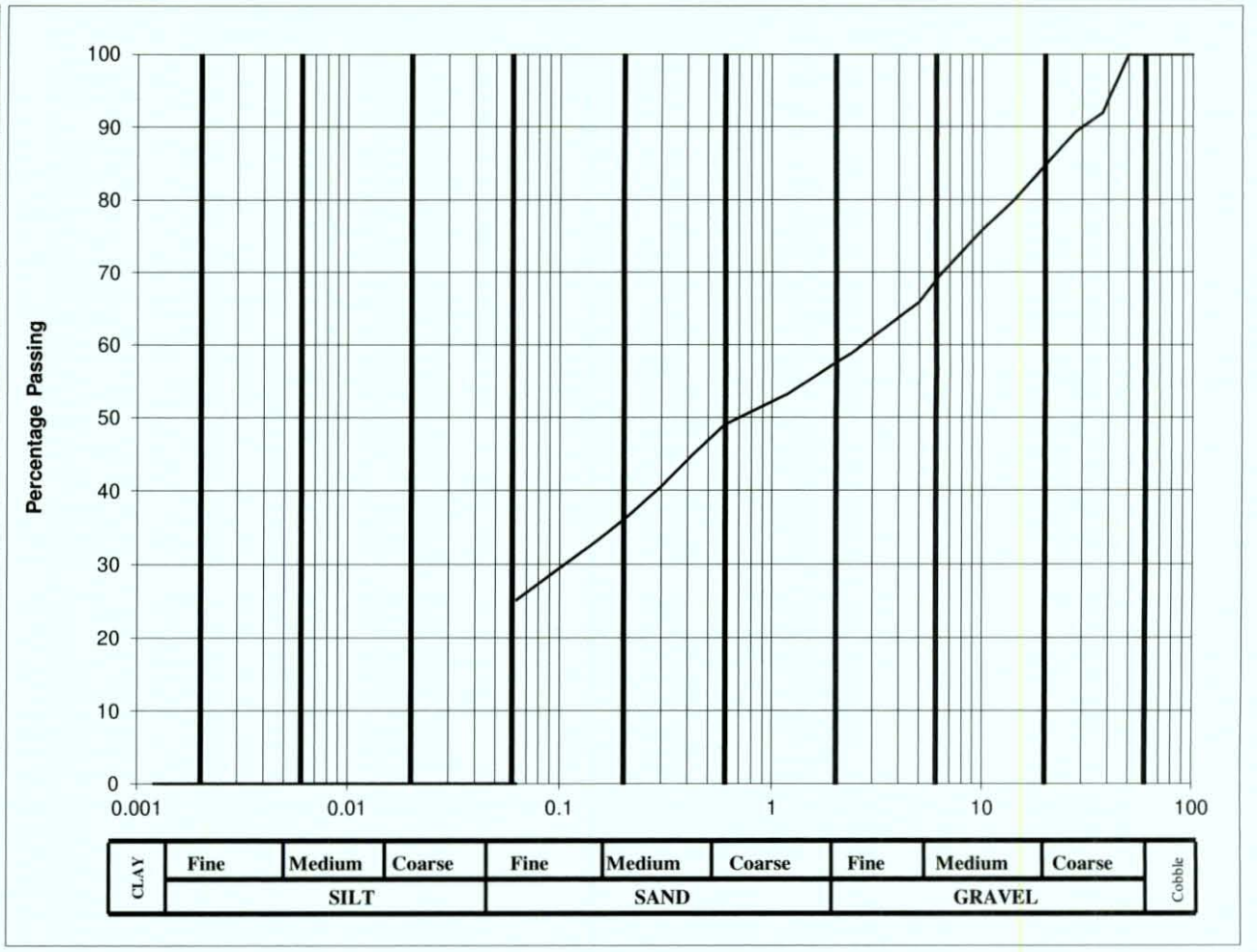
Paddy McGonagle
Site Investigations Ltd

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	91.9		
28	89.4		
20	84.6		
14	79.7		
10	75.8		
6.3	69.6		
5.0	65.9		
2.36	58.8		
2.00	57.5		
1.18	53.2		
0.600	49		
0.425	44.9		
0.300	40.5		
0.212	36.6		
0.150	33.2		
0.063	25		

Cobbles, %	0
Gravel, %	43
Sand, %	33
Clay / Silt, %	25



Client :	Hatley Homes
Project :	Auburn, Malahide

Lab. No :	20/241
Sample No :	PM03

Hole ID :	TP 01
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

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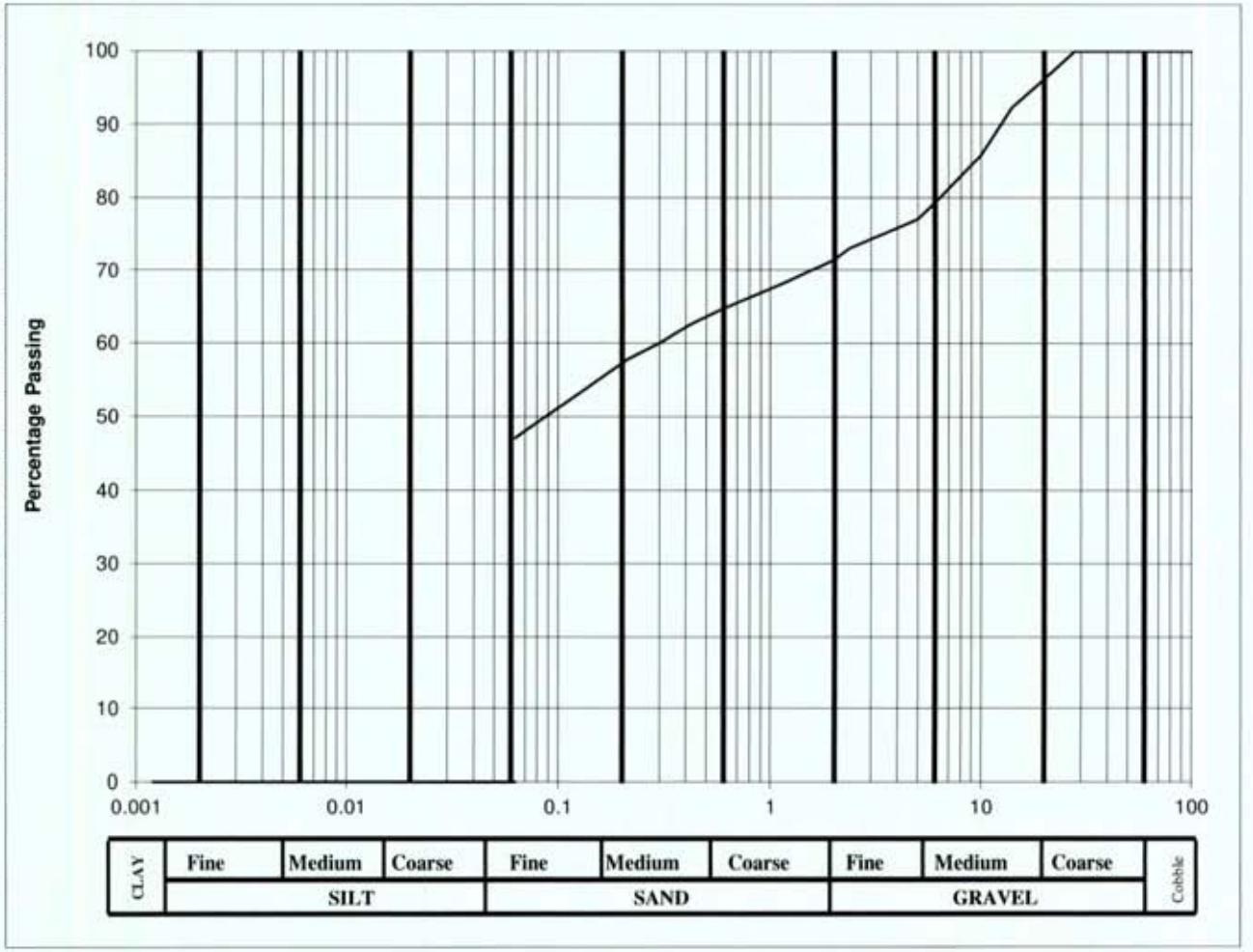
BS 1377 Particle Size Analysis

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	96.1		
14	92.2		
10	85.7		
6.3	79.8		
5.0	77		
2.36	73		
2.00	71.4		
1.18	68.3		
0.600	64.7		
0.425	62.6		
0.300	60		
0.212	57.8		
0.150	54.8		
0.063	47		

Cobbles, %	0
Gravel, %	29
Sand, %	24
Clay / Silt, %	47



Client :	Hatley Homes
Project :	Auburn, Malahide

Lab. No :	20/242
Sample No :	PM07

Hole ID :	TP 02
Depth, m :	1.00

Material description :	slightly sandy slightly 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

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BS 1377 Particle Size Analysis

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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	98.1		
14	94.1		
10	90.4		
6.3	88.2		
5.0	85.7		
2.36	80		
2.00	78.4		
1.18	73.6		
0.600	65.2		
0.425	60.7		
0.300	57.6		
0.212	53.2		
0.150	49.3		
0.063	40		

Cobbles, %	0
Gravel, %	22
Sand, %	38
Clay / Silt, %	40

Client :	Hatley Homes
Project :	Auburn, Malahide

Lab. No :	20/243
Sample No :	PM11

Hole ID :	TP 03
Depth, m :	1.00

Material description :	sandy slightly 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

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Site Investigati[illegible]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	95.7		
28	95.7		
20	92.6		
14	89		
10	84.9		
6.3	80		
5.0	76.6		
2.36	71.3		
2.00	70		
1.18	67.4		
0.600	62.3		
0.425	59.4		
0.300	56.1		
0.212	52.3		
0.150	48.3		
0.063	40		

Cobbles, %	0
Gravel, %	30
Sand, %	30
Clay / Silt, %	40

Client :	Hatley Homes
Project :	Auburn, Malahide

Lab. No :	20/244
Sample No :	PM15

Hole ID :	TP 04
Depth, m :	1.00

Material description :	slightly sandy slightly 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

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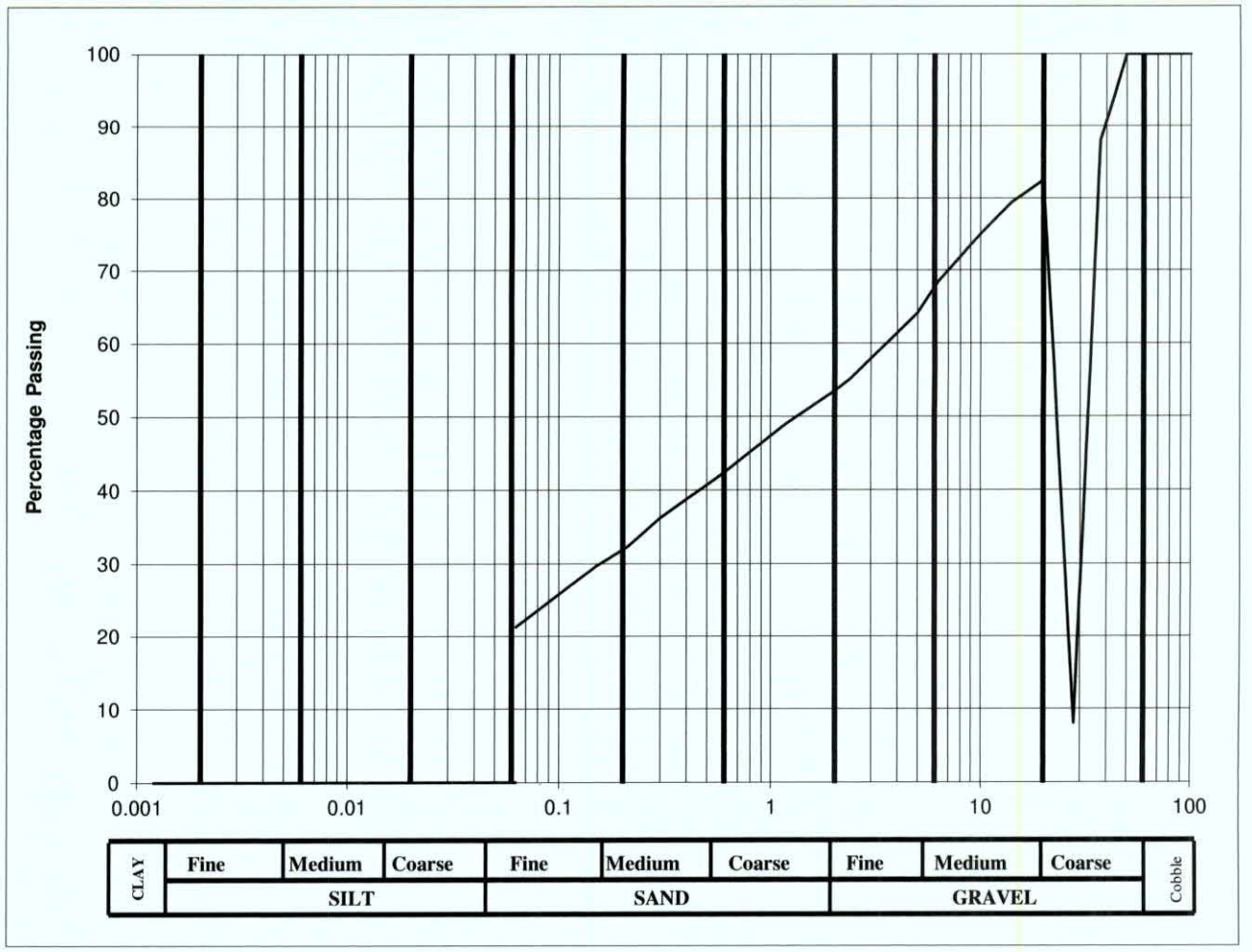
Site Investigations Ltd

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		
28	8		
20	82.5		
14	79.3		
10	74.9		
6.3	68.4		
5.0	64.1		
2.36	55		
2.00	53.4		
1.18	49		
0.600	42.3		
0.425	39.3		
0.300	36.2		
0.212	32.3		
0.150	29.6		
0.063	21		

Cobbles, %	0
Gravel, %	47
Sand, %	32
Clay / Silt, %	21



Client :	Hatley Homes
Project :	Auburn, Malahide

Lab. No :	20/245
Sample No :	PM19

Hole ID :	TP 05
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

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Paddy McGonagle

Site Investigati[redacted]Ltd

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

Client	Hatley Homes
Site	Auburn, Malahide
S.I. File No	5690 / 20
Test Lab	Site Investigations Ltd., Carhugar The Grange, 12th Lock Rd., Lucan Co. Dublin. Tel (01) 6108768 Email info@siteinvestigations.ie
Report Date	18th February 2020

CBR No	Depth (mBGL)	Sample No	Sample Type	Lab Ref	Moisture Content (%)	CBR Value (%)	Location / Remarks
TP01	0.50	PM01	CBR	20/246	10.6	6.1	Brown slightly sandy gravelly silty CLAY
TP02	0.50	PM05	CBR	20/247	13.2	6.7	Brown slightly sandy gravelly silty CLAY
TP03	0.50	PM09	CBR	20/248	16.4	6.3	Brown slightly sandy gravelly silty CLAY
TP04	0.50	PM13	CBR	20/249	11.8	7.5	Brown slightly sandy gravelly silty CLAY
TP05	0.50	PM17	CBR	20/250	9.9	8.3	Brown slightly sandy gravelly silty CLAY

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Site Investigations Ltd

Chemical Testing
In accordance with BS 1377: Part 3

Client	Hatley Homes
Site	Auburn, Malahide
S.I. File No	5690 / 20
Test Lab	Site Investigations Ltd., Carhugar The Grange, 12th Lock Rd., Lucan Co. Dublin. Tel (01) 6108768 Email:info@siteinvestigations.ie
Report Date	18th February 2020

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) %	Loss on Ignition (Organic Content) %	Chloride ion Content (water:soil ratio 2:1) %	% passing 2mm	Remarks
TP01	1.00	PM03	20/241	7.30	0.122	0.070		0.24	57.5	
TP02	1.00	PM07	20/242	7.29	0.126	0.090		0.24	71.4	
TP03	1.00	PM11	20/243	7.24	0.124	0.098		0.23	78.4	
TP04	1.00	PM15	20/244	7.11	0.123	0.086		0.26	70.0	
TP05	1.00	PM19	20/245	7.22	0.120	0.064		0.26	53.4	

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Site Investigations Ltd.

Appendix 4

Environmental Laboratory Test Data

Unit 7-8 Hawarden Business Park
Manor Road (off Manor Lane)
Hawarden
Deeside
CH5 3US
Tel: (01244) 528700
Fax: (01244) 528701
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:	18 February 2020
Customer:	Site Investigations Ltd
Sample Delivery Group (SDG):	200207-131
Your Reference:	5690
Location:	Auborn, Malahide
Report No:	541786

We received 10 samples on Friday February 07, 2020 and 10 of these samples were scheduled for analysis which was completed on Tuesday February 18, 2020. 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 Life Sciences Ltd Hawarden (Method codes TM) or ALS Life Sciences Ltd Aberdeen (Method codes S).

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.
The customer is not permitted to reproduce this report except in full without the approval of the laboratory.

Approved By:

Sonia McWhan
Operations Manager

Validated

CERTIFICATE OF ANALYSIS

SDG:	200207-131	**Client Reference:**	5690	**Report Number:**	541786
Location:	Auborn, Malahide	**Order Number:**	18/A/20	**Superseded Report:**	

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
21646608	TP01		0.50	05/02/2020
21646614	TP01		1.00	05/02/2020
21646609	TP02		0.50	05/02/2020
21646615	TP02		1.00	05/02/2020
21646610	TP03		0.50	05/02/2020
21646616	TP03		1.00	05/02/2020
21646612	TP04		0.50	05/02/2020
21646617	TP04		1.00	05/02/2020
21646613	TP05		0.50	05/02/2020
21646618	TP05		1.00	05/02/2020

Maximum Sample/Coolbox Temperature (°C) : **6**

ISO5667-3 Water quality - Sampling - Part3 -
During Transportation samples shall be stored in a cooling device capable of maintaining a temperature of (5±3)°C.

ALS have data which show that a cool box with 4 frozen icepacks is capable of maintaining pre-chilled samples at a temperature of (5±3)°C for a period of up to 24hrs.

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

Validated

CERTIFICATE OF ANALYSIS

SDG:	200207-131	**Client Reference:**	5690	**Report Number:**	541786
Location:	Auborn, Malahide	**Order Number:**	18/A/20	**Superseded Report:**	

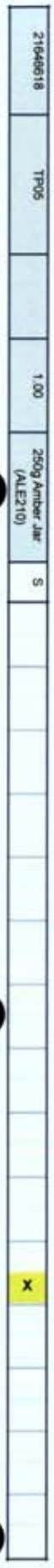
Results Legend

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

| | | | | |


21648618
TP05
1.00
250g Amber Jar (ALE210)
S
X

Validated

CERTIFICATE OF ANALYSIS

SDG:	200207-131	**Client Reference:**	5690	**Report Number:**	541786
Location:	Auborn, Malahide	**Order Number:**	18/A/20	**Superseded Report:**	

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

| | | | | |

21646618	TP05		1.00	250g Amber Jar (ALE210)	S			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
21646608	TP01	0.50	Dark Brown	Loamy Sand	Stones	Vegetation
21646614	TP01	1.00	Dark Brown	Loamy Sand	Stones	Vegetation
21646609	TP02	0.50	Dark Brown	Loamy Sand	Stones	Vegetation
21646615	TP02	1.00	Dark Brown	Loamy Sand	Stones	Vegetation
21646610	TP03	0.50	Dark Brown	Loamy Sand	Stones	Vegetation
21646616	TP03	1.00	Dark Brown	Loamy Sand	Stones	Vegetation
21646612	TP04	0.50	Dark Brown	Loamy Sand	Stones	Vegetation
21646617	TP04	1.00	Dark Brown	Loamy Sand	Stones	Vegetation
21646613	TP05	0.50	Light Brown	Loamy Sand	Stones	Vegetation
21646618	TP05	1.00	Dark Brown	Loamy Sand	Stones	Vegetation

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.

Validated

CERTIFICATE OF ANALYSIS

SDG:	200207-131	Client Reference:	5690	Report Number:	541786
Location:	Auborn, Malahide	Order Number:	18/A/20	Superseded Report:	

Results Legend

#	ISO17025 accredited
M	mCERTS accredited
aq	Aqueous / edited 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
^ (+)(-)(g)	Sample deviation (see appendix)

Customer Sample Ref	TP01	TP01	TP02	TP02	TP03	TP03
Depth (m)	0.50	1.00	0.50	1.00	0.50	1.00
Sample Type	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)
Date Sampled	05/02/2020	05/02/2020	05/02/2020	05/02/2020	05/02/2020	05/02/2020
Sample Time						
Date Received	07/02/2020	07/02/2020	07/02/2020	07/02/2020	07/02/2020	07/02/2020
SDG Ref	200207-131	200207-131	200207-131	200207-131	200207-131	200207-131
Lab Sample No.(s)	21646608	21646614	21646609	21646615	21646610	21646616
AGS Reference						

Component	LOD/Units	Method						
Moisture Content Ratio (% of as received sample)	%	PM024	17	12	11	15	15	26
Loss on ignition	<0.7 %	TM018	4.59 M	1.41 M	1.98 M	2.38 M	1.75 M	7.27 M
Mineral oil >C10-C40	<1 mg/kg	TM061	<1		<1		<1	
Organic Carbon, Total	<0.2 %	TM132	0.783 M		0.286 M		0.334 M	
Chromium, Hexavalent	<0.6 mg/kg	TM151	<0.6 #		<0.6 #		<0.6 #	
PCB congener 28	<3 µg/kg	TM168	<3 M		<3 M		<3 M	
PCB congener 52	<3 µg/kg	TM168	<3 M		<3 M		<3 M	
PCB congener 101	<3 µg/kg	TM168	<3 M		<3 M		<3 M	
PCB congener 118	<3 µg/kg	TM168	<3 M		<3 M		<3 M	
PCB congener 138	<3 µg/kg	TM168	<3 M		<3 M		<3 M	
PCB congener 153	<3 µg/kg	TM168	<3 M		<3 M		<3 M	
PCB congener 180	<3 µg/kg	TM168	<3 M		<3 M		<3 M	
Sum of detected PCB 7 Congeners	<21 µg/kg	TM168	<21		<21		<21	
Chromium, Trivalent	<0.9 mg/kg	TM181	22.6		13.6		13.7	
Antimony	<0.6 mg/kg	TM181	1.75 #		1.41 #		1.78 #	
Arsenic	<0.6 mg/kg	TM181	14 M		11.2 M		16.6 M	
Barium	<0.6 mg/kg	TM181	125 #		206 #		85.2 #	
Cadmium	<0.02 mg/kg	TM181	1.4 M		1.39 M		0.872 M	
Chromium	<0.9 mg/kg	TM181	22.6 M		13.6 M		13.7 M	
Copper	<1.4 mg/kg	TM181	21.6 M		18.4 M		15.7 M	
Lead	<0.7 mg/kg	TM181	29.1 M		14.6 M		12.5 M	
Mercury	<0.14 mg/kg	TM181	<0.14 M		<0.14 M		<0.14 M	
Molybdenum	<0.1 mg/kg	TM181	2.29 #		2.66 #		3.01 #	
Nickel	<0.2 mg/kg	TM181	50.7 M		36.4 M		32.1 M	
Selenium	<1 mg/kg	TM181	1.36 #		<1 #		<1 #	
Zinc	<1.9 mg/kg	TM181	112 M		62.8 M		53.9 M	
Coronene	<200 µg/kg	TM410	<200		<200		<200	

11 20 30 18/02/2020

Validated

CERTIFICATE OF ANALYSIS

SDG:	200207-131	**Client Reference:**	5690	**Report Number:**	541786
Location:	Auborn, Malahide	**Order Number:**	18/A/20	**Superseded Report:**	

Results Legend		Customer Sample Ref.	TP04	TP04	TP05	TP05		
#	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							
1-3+(4)	Sample deviation (see appendix)							
		Depth (m)	0.50	1.00	0.50	1.00		
		Sample Type	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)		
		Date Sampled	05/02/2020	05/02/2020	05/02/2020	05/02/2020		
		Sample Time	-	-	-	-		
		Date Received	07/02/2020	07/02/2020	07/02/2020	07/02/2020		
		SDG Ref	200207-131	200207-131	200207-131	200207-131		
		Lab Sample No.(s)	21646612	21646617	21646613	21646618		
		AGS Reference						

Component	LOD/Units	Method						
Moisture Content Ratio (% of as received sample)	%	PM024	13	12	17	12		
Loss on ignition	<0.7 %	TM018	3.31 M	2.19 M	3.9 M	1.88 M		
Mineral oil >C10-C40	<1 mg/kg	TM061	<1		<1			
Organic Carbon, Total	<0.2 %	TM132	0.661 M		0.664 M			
Chromium, Hexavalent	<0.6 mg/kg	TM151	<0.6 #		<0.6 #			
PCB congener 28	<3 µg/kg	TM168	<3 M		<3 M			
PCB congener 52	<3 µg/kg	TM168	<3 M		<3 M			
PCB congener 101	<3 µg/kg	TM168	<3 M		<3 M			
PCB congener 118	<3 µg/kg	TM168	<3 M		<3 M			
PCB congener 138	<3 µg/kg	TM168	<3 M		<3 M			
PCB congener 153	<3 µg/kg	TM168	<3 M		<3 M			
PCB congener 180	<3 µg/kg	TM168	<3 M		<3 M			
Sum of detected PCB 7 Congeners	<21 µg/kg	TM168	<21		<21			
Chromium, Trivalent	<0.9 mg/kg	TM181	17.8		23.8			
Antimony	<0.6 mg/kg	TM181	2.24 #		1.75 #			
Arsenic	<0.6 mg/kg	TM181	13.4 M		13.4 M			
Barium	<0.6 mg/kg	TM181	76.4 #		113 #			
Cadmium	<0.02 mg/kg	TM181	1.48 M		1.11 M			
Chromium	<0.9 mg/kg	TM181	17.8 M		23.8 M			
Copper	<1.4 mg/kg	TM181	28.2 M		21.5 M			
Lead	<0.7 mg/kg	TM181	28.5 M		28.3 M			
Mercury	<0.14 mg/kg	TM181	<0.14 M		<0.14 M			
Molybdenum	<0.1 mg/kg	TM181	2.95 #		1.76 #			
Nickel	<0.2 mg/kg	TM181	51.3 M		39.4 M			
Selenium	<1 mg/kg	TM181	<1 #		<1 #			
Zinc	<1.9 mg/kg	TM181	103 M		99.6 M			
Coronene	<200 µg/kg	TM410	<200		<200			

Validated

CERTIFICATE OF ANALYSIS

SDG:	200207-131	**Client Reference:**	5690	**Report Number:**	541786
Location:	Auborn, Malahide	**Order Number:**	18/A/20	**Superseded Report:**	

PAH by GCMS

Results Legend		Customer Sample Ref.	TP01	TP02	TP03	TP04	TP05	
#	ISO17025 accredited.							
M	mCERTS accredited.							
aq	Aqueous / settled sample.							
diss.filt	Dissolved / filtered sample.	Depth (m)	0.50	0.50	0.50	0.50	0.50	
tot.unfilt	Total / unfiltered sample.	Sample Type	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	
*	Subcontracted - refer to subcontractor report for accreditation status.	Date Sampled	05/02/2020	05/02/2020	05/02/2020	05/02/2020	05/02/2020	
**	% 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	Sample Time	-	-	-	-	-	
		Date Received	07/02/2020	07/02/2020	07/02/2020	07/02/2020	07/02/2020	
		SDG Ref	200207-131	200207-131	200207-131	200207-131	200207-131	
(F)	Trigger breach confirmed	Lab Sample No.(s)	21646608	21646609	21646610	21646612	21646613	
1-3+SD	Sample deviation (see appendix)	AGS Reference						

Component	LOD/Units	Method						
Naphthalene	<9 µg/kg	TM218	<9 M	<9 M	<9 M	<9 M	<9 M	
Acenaphthylene	<12 µg/kg	TM218	<12 M	<12 M	<12 M	<12 M	<12 M	
Acenaphthene	<8 µg/kg	TM218	<8 M	<8 M	<8 M	<8 M	<8 M	
Fluorene	<10 µg/kg	TM218	<10 M	<10 M	<10 M	<10 M	<10 M	
Phenanthrene	<15 µg/kg	TM218	<15 M	<15 M	<15 M	<15 M	<15 M	
Anthracene	<16 µg/kg	TM218	<16 M	<16 M	<16 M	<16 M	<16 M	
Fluoranthene	<17 µg/kg	TM218	<17 M	<17 M	<17 M	<17 M	<17 M	
Pyrene	<15 µg/kg	TM218	<15 M	<15 M	<15 M	<15 M	<15 M	
Benz(a)anthracene	<14 µg/kg	TM218	<14 M	<14 M	<14 M	<14 M	<14 M	
Chrysene	<10 µg/kg	TM218	<10 M	<10 M	<10 M	<10 M	<10 M	
Benzo(b)fluoranthene	<15 µg/kg	TM218	<15 M	<15 M	<15 M	<15 M	<15 M	
Benzo(k)fluoranthene	<14 µg/kg	TM218	<14 M	<14 M	<14 M	<14 M	<14 M	
Benzo(a)pyrene	<15 µg/kg	TM218	<15 M	<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	<18 M	
Dibenzo(a,h)anthracene	<23 µg/kg	TM218	<23 M	<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	<24 M	
PAH, Total Detected USEPA 16	<118 µg/kg	TM218	<118	<118	<118	<118	<118	

Validated

CERTIFICATE OF ANALYSIS

SDG:	200207-131	**Client Reference:**	5690	**Report Number:**	541786
Location:	Auborn, Malahide	**Order Number:**	18/A/20	**Superseded Report:**	

TPH CWG (S)

Results Legend		Customer Sample Ref.	TP01	TP02	TP03	TP04	TP05	
#	ISO17025 accredited.							
M	mCERTS accredited.							
aq	Aqueous / settled sample.							
diss.filt	Dissolved / filtered sample.	Depth (m)	0.50	0.50	0.50	0.50	0.50	
tot.unfilt	Total / unfiltered sample.	Sample Type	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	
*	Subcontracted - refer to subcontractor report for accreditation status.	Date Sampled	05/02/2020	05/02/2020	05/02/2020	05/02/2020	05/02/2020	
**	% 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	Sample Time	-	-	-	-	-	
		Date Received	07/02/2020	07/02/2020	07/02/2020	07/02/2020	07/02/2020	
		SDG Ref	200207-131	200207-131	200207-131	200207-131	200207-131	
(F)	Trigger breach confirmed	Lab Sample No.(s)	21646608	21646609	21646610	21646612	21646613	
1.0=(±2)	Sample deviation (see appendix)	AGS Reference						

Component	LOD/Units	Method						
GRO Surrogate % recovery**	%	TM089	101	97.7	115	102	96.2	
Aliphatics >C5-C6	<10 µg/kg	TM089	<10	<10	<10	<10	<10	
Aliphatics >C6-C8	<10 µg/kg	TM089	<10	<10	<10	<10	<10	
Aliphatics >C8-C10	<10 µg/kg	TM089	<10	<10	<10	<10	<10	
Aliphatics >C10-C12	<1000 µg/kg	TM414	<1000	<1000	<1000	<1000	<1000	
Aliphatics >C12-C16	<1000 µg/kg	TM414	<1000	<1000	<1000	<1000	<1000	
Aliphatics >C16-C21	<1000 µg/kg	TM414	<1000	<1000	<1000	<1000	<1000	
Aliphatics >C21-C35	<1000 µg/kg	TM414	1350	<1000	<1000	<1000	<1000	
Aliphatics >C35-C44	<1000 µg/kg	TM414	<1000	<1000	<1000	<1000	<1000	
Total Aliphatics >C10-C44	<5000 µg/kg	TM414	<5000	<5000	<5000	<5000	<5000	
Total Aliphatics & Aromatics >C10-C44	<10000 µg/kg	TM414	<10000	<10000	<10000	<10000	<10000	
Aromatics >EC5-EC7	<10 µg/kg	TM089	<10	<10	<10	<10	<10	
Aromatics >EC7-EC8	<10 µg/kg	TM089	<10	<10	<10	<10	<10	
Aromatics >EC8-EC10	<10 µg/kg	TM089	<10	<10	<10	<10	<10	
Aromatics > EC10-EC12	<1000 µg/kg	TM414	<1000	<1000	<1000	<1000	<1000	
Aromatics > EC12-EC16	<1000 µg/kg	TM414	<1000	<1000	<1000	<1000	<1000	
Aromatics > EC16-EC21	<1000 µg/kg	TM414	<1000	<1000	<1000	<1000	<1000	
Aromatics > EC21-EC35	<1000 µg/kg	TM414	2190	<1000	<1000	<1000	<1000	
Aromatics >EC35-EC44	<1000 µg/kg	TM414	<1000	<1000	<1000	<1000	<1000	
Aromatics > EC40-EC44	<1000 µg/kg	TM414	<1000	<1000	<1000	<1000	<1000	
Total Aromatics > EC10-EC44	<5000 µg/kg	TM414	<5000	<5000	<5000	<5000	<5000	
Total Aliphatics & Aromatics >C5-C44	<10000 µg/kg	TM414	<10000	<10000	<10000	<10000	<10000	
GRO >C5-C6	<20 µg/kg	TM089	<20	<20	<20	<20	<20	
GRO >C6-C7	<20 µg/kg	TM089	<20	<20	<20	<20	<20	
GRO >C7-C8	<20 µg/kg	TM089	<20	<20	<20	<20	<20	
GRO >C8-C10	<20 µg/kg	TM089	<20	<20	<20	<20	<20	
GRO >C10-C12	<20 µg/kg	TM089	<20	<20	<20	<20	<20	
Total Aliphatics >C5-C10	<50 µg/kg	TM089	<50	<50	<50	<50	<50	
Total Aromatics >EC5-EC10	<50 µg/kg	TM089	<50	<50	<50	<50	<50	
GRO >C5-C10	<20 µg/kg	TM089	<20	<20	<20	<20	<20	

Validated

CERTIFICATE OF ANALYSIS

SDG:	200207-131	**Client Reference:**	5690	**Report Number:**	541786
Location:	Auborn, Malahide	**Order Number:**	18/A/20	**Superseded Report:**	

VOC MS (S)

Results Legend		Customer Sample Ref.	TP01	TP02	TP03	TP04	TP05	
#	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.	Depth (m)	0.50	0.50	0.50	0.50	0.50	
		Sample Type	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	
		Date Sampled	05/02/2020	05/02/2020	05/02/2020	05/02/2020	05/02/2020	
		Sample Time	-	-	-	-	-	
		Date Received	07/02/2020	07/02/2020	07/02/2020	07/02/2020	07/02/2020	
		SDG Ref	200207-131	200207-131	200207-131	200207-131	200207-131	
(F)	Trigger breach confirmed	Lab Sample No.(s)	21646608	21646609	21646610	21646612	21646613	
1-3+[g]	Sample deviation (see appendix)	AGS Reference						

Component	LOD/Units	Method						
Dibromofluoromethane**	%	TM116	113	113	136	117	115	
Toluene-d8**	%	TM116	98.5	97.9	102	101	99.9	
4-Bromofluorobenzene**	%	TM116	83.8	91.6	96.8	84.6	83.3	
Methyl Tertiary Butyl Ether	<10 µg/kg	TM116	<10 M	<10 M	<10 M	<10 M	<10 M	
Benzene	<9 µg/kg	TM116	<9 M	<9 M	<9 M	<9 M	<9 M	
Toluene	<7 µg/kg	TM116	<7 M	<7 M	<7 M	<7 M	<7 M	
Ethylbenzene	<4 µg/kg	TM116	<4 M	<4 M	<4 M	<4 M	<4 M	
p/m-Xylene	<10 µg/kg	TM116	<10 #	<10 #	<10 #	<10 #	<10 #	
o-Xylene	<10 µg/kg	TM116	<10 M	<10 M	<10 M	<10 M	<10 M	

Validated

CERTIFICATE OF ANALYSIS

SDG:	200207-131	**Client Reference:**	5690	**Report Number:**	541786
Location:	Auborn, Malahide	**Order Number:**	18/A/20	**Superseded Report:**	

CEN 10:1 SINGLE STAGE LEACHATE TEST

WAC ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference		**Site Location**	Auborn, Malahide
Mass Sample taken (kg)	0.111	**Natural Moisture Content (%)**	23.1
Mass of dry sample (kg)	0.090	**Dry Matter Content (%)**	81.2
Particle Size <4mm	>95%		

Case	
SDG	200207-131
Lab Sample Number(s)	21646608
Sampled Date	05-Feb-2020
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 (%)	0.783	3	5	6
Loss on Ignition (%)	4.59	-	-	10
Sum of BTEX (mg/kg)	-	-	-	-
Sum of 7 PCBs (mg/kg)	<0.021	1	-	-
Mineral Oil (mg/kg)	<1	500	-	-
PAH Sum of 17 (mg/kg)	-	-	-	-
pH (pH Units)	-	-	-	-
ANC to pH 6 (mol/kg)	-	-	-	-
ANC to pH 4 (mol/kg)	-	-	-	-

Eluate Analysis	**C_2 Conc^n in 10:1 eluate (mg/l)**		**A_2 10:1 conc^n 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	0.00155	<0.0002	0.0155	<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	0.00225	<0.0003	0.0225	<0.003	2	50	100
Mercury Dissolved (CVAF)	0.0000118	<0.00001	0.000118	<0.0001	0.01	0.2	2
Molybdenum	<0.003	<0.003	<0.03	<0.03	0.5	10	30
Nickel	0.000736	<0.0004	0.00736	<0.004	0.4	10	40
Lead	0.000242	<0.0002	0.00242	<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	0.00348	<0.001	0.0348	<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	21.9	<10	219	<100	4000	60000	100000
Total Monohydric Phenols (W)	<0.016	<0.016	<0.16	<0.16	1	-	-
Dissolved Organic Carbon	4.56	<3	45.6	<30	500	800	1000

Leach Test Information

Date Prepared	09-Feb-2020
pH (pH Units)	8.26
Conductivity (µS/cm)	15.00
Temperature (°C)	17.50
Volume Leachant (Litres)	0.879

Solid Results are expressed on a dry weight basis, after correction for moisture content where applicable
Stated limits are for guidance only and ALS Environmental cannot be held responsible for any discrepancies with current legislation
Mcerts Certification does not apply to leachates
18/02/2020 11:20:49

11:20:30 18/02/2020

Validated

CERTIFICATE OF ANALYSIS

SDG:	200207-131	**Client Reference:**	5690	**Report Number:**	541786
Location:	Auborn, Malahide	**Order Number:**	18/A/20	**Superseded Report:**	

CEN 10:1 SINGLE STAGE LEACHATE TEST

WAC ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference		**Site Location**	Auborn, Malahide
Mass Sample taken (kg)	0.103	**Natural Moisture Content (%)**	14.4
Mass of dry sample (kg)	0.090	**Dry Matter Content (%)**	87.4
Particle Size <4mm	>95%		

Case	
SDG	200207-131
Lab Sample Number(s)	21646609
Sampled Date	05-Feb-2020
Customer Sample Ref.	TP02
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 (%)	0.286	3	5	6
Loss on Ignition (%)	1.98	-	-	10
Sum of BTEX (mg/kg)	-	-	-	-
Sum of 7 PCBs (mg/kg)	<0.021	1	-	-
Mineral Oil (mg/kg)	<1	500	-	-
PAH Sum of 17 (mg/kg)	-	-	-	-
pH (pH Units)	-	-	-	-
ANC to pH 6 (mol/kg)	-	-	-	-
ANC to pH 4 (mol/kg)	-	-	-	-

Eluate Analysis	**C_2 Conc^n in 10:1 eluate (mg/l)**		**A_2 10:1 conc^n 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	0.251	<0.0002	2.51	<0.002	20	100	300
Cadmium	<0.00008	<0.00008	<0.0008	<0.0008	0.04	1	5
Chromium	0.00245	<0.001	0.0245	<0.01	0.5	10	70
Copper	0.0014	<0.0003	0.014	<0.003	2	50	100
Mercury Dissolved (CVAF)	<0.00001	<0.00001	<0.0001	<0.0001	0.01	0.2	2
Molybdenum	0.00497	<0.003	0.0497	<0.03	0.5	10	30
Nickel	0.000473	<0.0004	0.00473	<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	0.00122	<0.001	0.0122	<0.01	4	50	200
Chloride	<2	<2	<20	<20	800	15000	25000
Fluoride	0.538	<0.5	5.38	<5	10	150	500
Sulphate (soluble)	<2	<2	<20	<20	1000	20000	50000
Total Dissolved Solids	75.1	<10	751	<100	4000	60000	100000
Total Monohydric Phenols (W)	<0.016	<0.016	<0.16	<0.16	1	-	-
Dissolved Organic Carbon	3.54	<3	35.4	<30	500	800	1000

Leach Test Information

Date Prepared	09-Feb-2020
pH (pH Units)	8.63
Conductivity (µS/cm)	97.10
Temperature (°C)	17.50
Volume Leachant (Litres)	0.887

Solid Results are expressed on a dry weight basis, after correction for moisture content where applicable
Stated limits are for guidance only and ALS Environmental cannot be held responsible for any discrepancies with current legislation
Mcerts Certification does not apply to leachates
18/02/2020 11:20:49

11:20:30 18/02/2020

Validated

CERTIFICATE OF ANALYSIS

SDG:	200207-131	**Client Reference:**	5690	**Report Number:**	541786
Location:	Auborn, Malahide	**Order Number:**	18/A/20	**Superseded Report:**	

CEN 10:1 SINGLE STAGE LEACHATE TEST

WAC ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference		**Site Location**	Auborn, Malahide
Mass Sample taken (kg)	0.108	**Natural Moisture Content (%)**	19.4
Mass of dry sample (kg)	0.090	**Dry Matter Content (%)**	83.7
Particle Size <4mm	>95%		

Case	
SDG	200207-131
Lab Sample Number(s)	21646610
Sampled Date	05-Feb-2020
Customer Sample Ref.	TP03
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 (%)	0.334	3	5	6
Loss on Ignition (%)	1.75	-	-	10
Sum of BTEX (mg/kg)	-	-	-	-
Sum of 7 PCBs (mg/kg)	<0.021	1	-	-
Mineral Oil (mg/kg)	<1	500	-	-
PAH Sum of 17 (mg/kg)	-	-	-	-
pH (pH Units)	-	-	-	-
ANC to pH 6 (mol/kg)	-	-	-	-
ANC to pH 4 (mol/kg)	-	-	-	-

Eluate Analysis	**C_2 Conc^n in 10:1 eluate (mg/l)**		**A_2 10:1 conc^n 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	0.000579	<0.0005	0.00579	<0.005	0.5	2	25
Barium	0.0206	<0.0002	0.206	<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	0.00368	<0.0003	0.0368	<0.003	2	50	100
Mercury Dissolved (CVAF)	0.0000114	<0.00001	0.000114	<0.0001	0.01	0.2	2
Molybdenum	0.00342	<0.003	0.0342	<0.03	0.5	10	30
Nickel	0.00163	<0.0004	0.0163	<0.004	0.4	10	40
Lead	0.000635	<0.0002	0.00635	<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	0.00153	<0.001	0.0153	<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	110	<10	1100	<100	4000	60000	100000
Total Monohydric Phenols (W)	<0.016	<0.016	<0.16	<0.16	1	-	-
Dissolved Organic Carbon	6.48	<3	64.8	<30	500	800	1000

Leach Test Information

Date Prepared	09-Feb-2020
pH (pH Units)	8.33
Conductivity (µS/cm)	139.00
Temperature (°C)	15.50
Volume Leachant (Litres)	0.883

Solid Results are expressed on a dry weight basis, after correction for moisture content where applicable
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CERTIFICATE OF ANALYSIS

SDG:	200207-131	**Client Reference:**	5690	**Report Number:**	541786
Location:	Auborn, Malahide	**Order Number:**	18/A/20	**Superseded Report:**	

CEN 10:1 SINGLE STAGE LEACHATE TEST

WAC ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference		**Site Location**	Auborn, Malahide
Mass Sample taken (kg)	0.101	**Natural Moisture Content (%)**	12.9
Mass of dry sample (kg)	0.090	**Dry Matter Content (%)**	88.5
Particle Size <4mm	>95%		

Case	
SDG	200207-131
Lab Sample Number(s)	21646612
Sampled Date	05-Feb-2020
Customer Sample Ref.	TP04
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 (%)	0.661	3	5	6
Loss on Ignition (%)	3.31	-	-	10
Sum of BTEX (mg/kg)	-	-	-	-
Sum of 7 PCBs (mg/kg)	<0.021	1	-	-
Mineral Oil (mg/kg)	<1	500	-	-
PAH Sum of 17 (mg/kg)	-	-	-	-
pH (pH Units)	-	-	-	-
ANC to pH 6 (mol/kg)	-	-	-	-
ANC to pH 4 (mol/kg)	-	-	-	-

Eluate Analysis	**C_2 Conc^n in 10:1 eluate (mg/l)**		**A_2 10:1 conc^n 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	0.00273	<0.0002	0.0273	<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	0.000815	<0.0003	0.00815	<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	65.7	<10	657	<100	4000	60000	100000
Total Monohydric Phenols (W)	<0.016	<0.016	<0.16	<0.16	1	-	-
Dissolved Organic Carbon	3.7	<3	37	<30	500	800	1000

Leach Test Information

Date Prepared	09-Feb-2020
pH (pH Units)	8.34
Conductivity (µS/cm)	86.30
Temperature (°C)	14.50
Volume Leachant (Litres)	0.889

Solid Results are expressed on a dry weight basis, after correction for moisture content where applicable
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CERTIFICATE OF ANALYSIS

SDG:	200207-131	**Client Reference:**	5690	**Report Number:**	541786
Location:	Auborn, Malahide	**Order Number:**	18/A/20	**Superseded Report:**	

CEN 10:1 SINGLE STAGE LEACHATE TEST

WAC ANALYTICAL RESULTS

REF : BS EN 12457/2

Client Reference		**Site Location**	Auborn, Malahide
Mass Sample taken (kg)	0.109	**Natural Moisture Content (%)**	20.3
Mass of dry sample (kg)	0.090	**Dry Matter Content (%)**	83.1
Particle Size <4mm	>95%		

Case	
SDG	200207-131
Lab Sample Number(s)	21646613
Sampled Date	05-Feb-2020
Customer Sample Ref.	TP05
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 (%)	0.664	3	5	6
Loss on Ignition (%)	3.9	-	-	10
Sum of BTEX (mg/kg)	-	-	-	-
Sum of 7 PCBs (mg/kg)	<0.021	1	-	-
Mineral Oil (mg/kg)	<1	500	-	-
PAH Sum of 17 (mg/kg)	-	-	-	-
pH (pH Units)	-	-	-	-
ANC to pH 6 (mol/kg)	-	-	-	-
ANC to pH 4 (mol/kg)	-	-	-	-

Eluate Analysis	**C_2 Conc^n in 10:1 eluate (mg/l)**		**A_2 10:1 conc^n 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	0.002	<0.0002	0.02	<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	0.00158	<0.0003	0.0158	<0.003	2	50	100
Mercury Dissolved (CVAF)	0.0000104	<0.00001	0.000104	<0.0001	0.01	0.2	2
Molybdenum	<0.003	<0.003	<0.03	<0.03	0.5	10	30
Nickel	0.000742	<0.0004	0.00742	<0.004	0.4	10	40
Lead	0.000239	<0.0002	0.00239	<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	0.00119	<0.001	0.0119	<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	24.3	<10	243	<100	4000	60000	100000
Total Monohydric Phenols (W)	<0.016	<0.016	<0.16	<0.16	1	-	-
Dissolved Organic Carbon	4.05	<3	40.5	<30	500	800	1000

Leach Test Information

Date Prepared	09-Feb-2020
pH (pH Units)	7.99
Conductivity (µS/cm)	25.10
Temperature (°C)	17.70
Volume Leachant (Litres)	0.882

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18/02/2020 11:20:49

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CERTIFICATE OF ANALYSIS

SDG:	200207-131	**Client Reference:**	5690	**Report Number:**	541786
Location:	Auborn, Malahide	**Order Number:**	18/A/20	**Superseded Report:**	

Table of Results - Appendix

Method No	Reference	Description
PM024	Modified BS 1377	Soil preparation including homogenisation, moisture screens of soils for Asbestos Containing Material
PM115		Leaching Procedure for CEN One Stage Leach Test 2:1 & 10:1 1 Step
TM018	BS 1377: Part 3 1990	Determination of Loss on Ignition
TM061	Method for the Determination of EPH,Massachusetts Dept.of EP, 1998	Determination of Extractable Petroleum Hydrocarbons by GC-FID (C10-C40)
TM089	Modified: US EPA Methods 8020 & 602	Determination of Gasoline Range Hydrocarbons (GRO) by Headspace GC-FID (C4-C12)
TM090	Method 5310, AWWA/APHA, 20th Ed., 1999 / Modified: US EPA Method 415.1 & 9060	Determination of Total Organic Carbon/Total Inorganic Carbon in Water and Waste Water
TM104	Method 4500F, AWWA/APHA, 20th Ed., 1999	Determination of Fluoride using the Kone Analyser
TM116	Modified: US EPA Method 8260, 8120, 8020, 624, 610 & 602	Determination of Volatile Organic Compounds by Headspace / GC-MS
TM123	BS 2690: Part 121:1981	The Determination of Total Dissolved Solids in Water
TM132	In - house Method	ELTRA CS800 Operators Guide
TM151	Method 3500D, AWWA/APHA, 20th Ed., 1999	Determination of Hexavalent Chromium using Kone analyser
TM152	Method 3125B, AWWA/APHA, 20th Ed., 1999	Analysis of Aqueous Samples by ICP-MS
TM168	EPA Method 8082, Polychlorinated Biphenyls by Gas Chromatography	Determination of WHO12 and EC7 Polychlorinated Biphenyl Congeners by GC-MS in Soils
TM181	US EPA Method 6010B	Determination of Routine Metals in Soil by iCap 6500 Duo ICP-OES
TM183	BS EN 23506:2002, (BS 6068-2.74:2002) ISBN 0 580 38924 3	Determination of Trace Level Mercury in Waters and Leachates by PSA Cold Vapour Atomic Fluorescence Spectrometry
TM184	EPA Methods 325.1 & 325.2,	The Determination of Anions in Aqueous Matrices using the Kone Spectrophotometric Analysers
TM218	Shaker extraction - EPA method 3546.	The determination of PAH in soil samples by GC-MS
TM259	by HPLC	Determination of Phenols in Waters and Leachates by HPLC
TM410	Shaker extraction-In house coronene method	Determination of Coronene in soils by GCMS
TM414	Analysis of Petroleum Hydrocarbons in Environmental Media – Total Petroleum Hydrocarbon Criteria	Determination of Speciated Extractable Petroleum Hydrocarbons in Soils by GCxGC-FID

NA = not applicable.

Chemical testing (unless subcontracted) performed at ALS Life Sciences Ltd Hawarden (Method codes TM) or ALS Life Sciences Ltd Aberdeen (Method codes S).

Validated

CERTIFICATE OF ANALYSIS

SDG:	200207-131	**Client Reference:**	5690	**Report Number:**	541786
Location:	Auborn, Malahide	**Order Number:**	18/A/20	**Superseded Report:**	

Test Completion Dates

Lab Sample No(s)	21646608	21646614	21646609	21646615	21646610	21646616	21646612	21646617	21646613	21646618
Customer Sample Ref.	TP01	TP01	TP02	TP02	TP03	TP03	TP04	TP04	TP05	TP05
AGS Ref.										
Depth	0.50	1.00	0.50	1.00	0.50	1.00	0.50	1.00	0.50	1.00
Type	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)
Anions by Kone (w)	12-Feb-2020		12-Feb-2020		12-Feb-2020		12-Feb-2020		12-Feb-2020	
CEN 10:1 Leachate (1 Stage)	10-Feb-2020		10-Feb-2020		10-Feb-2020		10-Feb-2020		10-Feb-2020	
CEN Readings	12-Feb-2020		12-Feb-2020		11-Feb-2020		11-Feb-2020		12-Feb-2020	
Chromium III	17-Feb-2020		14-Feb-2020		14-Feb-2020		14-Feb-2020		17-Feb-2020	
Coronene	12-Feb-2020		12-Feb-2020		12-Feb-2020		12-Feb-2020		12-Feb-2020	
Dissolved Metals by ICP-MS	13-Feb-2020		13-Feb-2020		12-Feb-2020		13-Feb-2020		13-Feb-2020	
Dissolved Organic/Inorganic Carbon	14-Feb-2020		14-Feb-2020		14-Feb-2020		14-Feb-2020		14-Feb-2020	
EPH CWG GC (S)	14-Feb-2020		14-Feb-2020		14-Feb-2020		14-Feb-2020		13-Feb-2020	
Fluoride	12-Feb-2020		12-Feb-2020		12-Feb-2020		12-Feb-2020		12-Feb-2020	
GRO by GC-FID (S)	13-Feb-2020		15-Feb-2020		13-Feb-2020		13-Feb-2020		13-Feb-2020	
Hexavalent Chromium (s)	17-Feb-2020		13-Feb-2020		13-Feb-2020		13-Feb-2020		13-Feb-2020	
Loss on Ignition in soils	13-Feb-2020	13-Feb-2020	13-Feb-2020	13-Feb-2020	13-Feb-2020	13-Feb-2020	13-Feb-2020	13-Feb-2020	13-Feb-2020	13-Feb-2020
Mercury Dissolved	13-Feb-2020		13-Feb-2020		13-Feb-2020		13-Feb-2020		13-Feb-2020	
Metals in solid samples by OES	14-Feb-2020		14-Feb-2020		14-Feb-2020		14-Feb-2020		17-Feb-2020	
Mineral Oil	12-Feb-2020		12-Feb-2020		12-Feb-2020		12-Feb-2020		12-Feb-2020	
Moisture at 105C	09-Feb-2020		09-Feb-2020		09-Feb-2020		09-Feb-2020		09-Feb-2020	
PAH by GCMS	13-Feb-2020		13-Feb-2020		18-Feb-2020		13-Feb-2020		13-Feb-2020	
PCBs by GCMS	14-Feb-2020		14-Feb-2020		14-Feb-2020		14-Feb-2020		14-Feb-2020	
Phenols by HPLC (W)	13-Feb-2020		13-Feb-2020		13-Feb-2020		13-Feb-2020		13-Feb-2020	
Sample description	08-Feb-2020	08-Feb-2020	08-Feb-2020	08-Feb-2020	08-Feb-2020	08-Feb-2020	08-Feb-2020	08-Feb-2020	08-Feb-2020	08-Feb-2020
Total Dissolved Solids on Leachates	12-Feb-2020		12-Feb-2020		12-Feb-2020		12-Feb-2020		12-Feb-2020	
Total Organic Carbon	13-Feb-2020		14-Feb-2020		13-Feb-2020		13-Feb-2020		14-Feb-2020	
TPH CWG GC (S)	14-Feb-2020		15-Feb-2020		14-Feb-2020		14-Feb-2020		13-Feb-2020	
VOC MS (S)	12-Feb-2020		13-Feb-2020		12-Feb-2020		12-Feb-2020		12-Feb-2020	

Appendix

General

1. Results are expressed on a dry weight basis (dried at 35°C) 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 30 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 one month 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 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. Mercury results quoted on soils will not include volatile mercury as the analysis is performed on a dried and crushed sample.

13. 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. **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.

18. **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**
§	**Sampled on date not provided**
♦	**Sample holding time exceeded in laboratory**
@	**Sample holding time exceeded due to late arrival of instructions or samples**

19. **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 (2005), 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

Identification of Asbestos in Bulk Materials & Soils

The results for identification of asbestos in bulk materials are obtained from supplied bulk materials 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 (2005).

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, based on HSG 248 (2005).

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.
Standing Committee of Analysts, *The Quantification of Asbestos in Soil (2107).*

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.

Waste Classification Report

P46J8-E3V4N-7WMVS

Job name

5690

Description/Comments

Client: Hatley Homes
Engineer: Waterman Moylan

Project

Auburn

Site

Malahide, Co. Dublin

Related Documents

#	Name	Description
1	200207-131.hwol	.hwol file used to create the Job

Waste Stream Template

Rilta Suite NEW

Classified by

Name:
Stephen Letch
Date:
26 Feb 2020 15:04 GMT
Telephone:
353 1 6108 768

Company:
Site Investigations Ltd
Carhugar, The Grange
12th Lock Road, Lucan
Dublin

HazWasteOnline™ Training Record:

Course	Date
Hazardous Waste Classification	09 Apr 2019
Advanced Hazardous Waste Classification	09 Oct 2019

Report

Created by: Stephen Letch
Created date: 26 Feb 2020 15:04 GMT

Job summary

#	Sample Name	Depth [m]	Classification Result	Hazard properties	Page
1	TP01-050220--0.50	0.50	Non Hazardous		2
2	TP02-050220--0.50	0.50	Non Hazardous		5
3	TP03-050220--0.50	0.50	Non Hazardous		8
4	TP04-050220--0.50	0.50	Non Hazardous		11
5	TP05-050220--0.50	0.50	Non Hazardous		14

Appendices	Page
Appendix A: Classifier defined and non CLP determinands	17
Appendix B: Rationale for selection of metal species	19
Appendix C: Version	19

Classification of sample: TP01-050220--0.50

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

Sample details

Sample Name:
TP01-050220--0.50
Sample Depth:
0.50 m
Moisture content:
17%
(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: 17% Wet Weight Moisture Correction applied (MC)

#	Determinand	CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
	CLP index number / EC Number / CAS Number							
1	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		1.75 mg/kg	1.197	1.739 mg/kg	0.000174 %	✓	
4	arsenic { arsenic pentoxide } 033-004-00-6 / 215-116-9 / 1303-28-2		14 mg/kg	1.534	17.824 mg/kg	0.00178 %	✓	
5	barium { * barium sulphide } 016-002-00-X / 244-214-4 / 21109-95-5		125 mg/kg	1.233	127.975 mg/kg	0.0128 %	✓	
6	cadmium { cadmium sulfate } 048-009-00-9 / 233-331-6 / 10124-36-4		1.4 mg/kg	1.855	2.155 mg/kg	0.000216 %	✓	
7	copper { dicopper oxide; copper (I) oxide } 029-002-00-X / 215-270-7 / 1317-39-1		21.6 mg/kg	1.126	20.185 mg/kg	0.00202 %	✓	
8	lead { * lead compounds with the exception of those specified elsewhere in this Annex (worst case) } 082-001-00-6	1	29.1 mg/kg		24.153 mg/kg	0.00242 %	✓	
9	mercury { mercury dichloride } 080-010-00-X / 231-299-8 / 7487-94-7		<0.14 mg/kg	1.353	<0.189 mg/kg	<0.0000189 %		<LOD
10	molybdenum { molybdenum(VI) oxide } 042-001-00-9 / 215-204-7 / 1313-27-5		2.29 mg/kg	1.5	2.851 mg/kg	0.000285 %	✓	
11	nickel { nickel sulfate } 028-009-00-5 / 232-104-9 / 7786-81-4		50.7 mg/kg	2.637	110.954 mg/kg	0.0111 %	✓	
12	selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex } 034-002-00-8		1.36 mg/kg	2.554	2.883 mg/kg	0.000288 %	✓	
13	zinc { zinc sulphate } 030-006-00-9 / 231-793-3 [1] / 231-793-3 [2] / 7446-19-7 [1] / 7733-02-0 [2]		112 mg/kg	2.469	229.546 mg/kg	0.023 %	✓	

#		Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
		CLP index number	EC Number	CAS Number									
14		chromium in chromium(III) compounds { • chromium(III) oxide }				22.6	mg/kg	1.462	27.416	mg/kg	0.00274 %	✓	
			215-160-9	1308-38-9									
15		chromium in chromium(VI) compounds { chromium(VI) oxide }				<0.6	mg/kg	1.923	<1.154	mg/kg	<0.000115 %		<LOD
		024-001-00-0	215-607-8	1333-82-0									
16		naphthalene				<0.009	mg/kg		<0.009	mg/kg	<0.0000009 %		<LOD
		601-052-00-2	202-049-5	91-20-3									
17	•	acenaphthylene				<0.012	mg/kg		<0.012	mg/kg	<0.0000012 %		<LOD
			205-917-1	208-96-8									
18	•	acenaphthene				<0.008	mg/kg		<0.008	mg/kg	<0.0000008 %		<LOD
			201-469-6	83-32-9									
19	•	fluorene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
			201-695-5	86-73-7									
20	•	phenanthrene				<0.015	mg/kg		<0.015	mg/kg	<0.0000015 %		<LOD
			201-581-5	85-01-8									
21	•	anthracene				<0.016	mg/kg		<0.016	mg/kg	<0.0000016 %		<LOD
			204-371-1	120-12-7									
22	•	fluoranthene				<0.017	mg/kg		<0.017	mg/kg	<0.0000017 %		<LOD
			205-912-4	206-44-0									
23	•	pyrene				<0.015	mg/kg		<0.015	mg/kg	<0.0000015 %		<LOD
			204-927-3	129-00-0									
24		benzo[a]anthracene				<0.014	mg/kg		<0.014	mg/kg	<0.0000014 %		<LOD
		601-033-00-9	200-280-6	56-55-3									
25		chrysene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
		601-048-00-0	205-923-4	218-01-9									
26		benzo[b]fluoranthene				<0.015	mg/kg		<0.015	mg/kg	<0.0000015 %		<LOD
		601-034-00-4	205-911-9	205-99-2									
27		benzo[k]fluoranthene				<0.014	mg/kg		<0.014	mg/kg	<0.0000014 %		<LOD
		601-036-00-5	205-916-6	207-08-9									
28		benzo[a]pyrene; benzo[def]chrysene				<0.015	mg/kg		<0.015	mg/kg	<0.0000015 %		<LOD
		601-032-00-3	200-028-5	50-32-8									
29	•	indeno[123-cd]pyrene				<0.018	mg/kg		<0.018	mg/kg	<0.0000018 %		<LOD
			205-893-2	193-39-5									
30		dibenz[a,h]anthracene				<0.023	mg/kg		<0.023	mg/kg	<0.0000023 %		<LOD
		601-041-00-2	200-181-8	53-70-3									
31	•	benzo[ghi]perylene				<0.024	mg/kg		<0.024	mg/kg	<0.0000024 %		<LOD
			205-883-8	191-24-2									
32	•	polychlorobiphenyls; PCB				<0.021	mg/kg		<0.021	mg/kg	<0.0000021 %		<LOD
		602-039-00-4	215-648-1	1336-36-3									
33		tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
		603-181-00-X	216-653-1	1634-04-4									
34		benzene				<0.009	mg/kg		<0.009	mg/kg	<0.0000009 %		<LOD
		601-020-00-8	200-753-7	71-43-2									
35		toluene				<0.007	mg/kg		<0.007	mg/kg	<0.0000007 %		<LOD
		601-021-00-3	203-625-9	108-88-3									
36	•	ethylbenzene				<0.004	mg/kg		<0.004	mg/kg	<0.0000004 %		<LOD
		601-023-00-4	202-849-4	100-41-4									
37	•	coronene				<0.2	mg/kg		<0.2	mg/kg	<0.00002 %		<LOD
			205-881-7	191-07-1									
38		o-xylene; [1] p-xylene; [2] m-xylene; [3] xylene [4]				<0.02	mg/kg		<0.02	mg/kg	<0.000002 %		<LOD
		601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]									
										Total:	0.058 %		

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 Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
ND	Not detected
CLP: Note 1	Only the metal concentration has been used for classification

Classification of sample: TP02-050220--0.50

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

Sample details

Sample Name:
TP02-050220--0.50
Sample Depth:
0.50 m
Moisture content:
11%
(wet weight correction)

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

Hazard properties

None identified

Determinands

Moisture content: 11% Wet Weight Moisture Correction applied (MC)

#		Determinand	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
		CLP index number / EC Number / CAS Number									
1	●	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		1.41	mg/kg	1.197	1.502	mg/kg	0.00015 %	✓	
4		arsenic { arsenic pentoxide } 033-004-00-6 / 215-116-9 / 1303-28-2		11.2	mg/kg	1.534	15.29	mg/kg	0.00153 %	✓	
5		barium { ● barium sulphide } 016-002-00-X / 244-214-4 / 21109-95-5		206	mg/kg	1.233	226.149	mg/kg	0.0226 %	✓	
6		cadmium { cadmium sulfate } 048-009-00-9 / 233-331-6 / 10124-36-4		1.39	mg/kg	1.855	2.294	mg/kg	0.000229 %	✓	
7		copper { dicopper oxide; copper (I) oxide } 029-002-00-X / 215-270-7 / 1317-39-1		18.4	mg/kg	1.126	18.438	mg/kg	0.00184 %	✓	
8		lead { ● lead compounds with the exception of those specified elsewhere in this Annex (worst case) } 082-001-00-6	1	14.6	mg/kg		12.994	mg/kg	0.0013 %	✓	
9		mercury { mercury dichloride } 080-010-00-X / 231-299-8 / 7487-94-7		<0.14	mg/kg	1.353	<0.189	mg/kg	<0.0000189 %		<LOD
10		molybdenum { molybdenum(VI) oxide } 042-001-00-9 / 215-204-7 / 1313-27-5		2.66	mg/kg	1.5	3.552	mg/kg	0.000355 %	✓	
11		nickel { nickel sulfate } 028-009-00-5 / 232-104-9 / 7786-81-4		36.4	mg/kg	2.637	85.418	mg/kg	0.00854 %	✓	
12		selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex } 034-002-00-8		<1	mg/kg	2.554	<2.554	mg/kg	<0.000255 %		<LOD
13		zinc { zinc sulphate } 030-006-00-9 / 231-793-3 [1] / 7446-19-7 [1] / 231-793-3 [2] / 7733-02-0 [2]		62.8	mg/kg	2.469	138.014	mg/kg	0.0138 %	✓	

#		Determinand	CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
		CLP index number / EC Number / CAS Number							
14		chromium in chromium(III) compounds { * chromium(III) oxide } 215-160-9 / 1308-38-9		13.6 mg/kg	1.462	17.691 mg/kg	0.00177 %	✓	
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		<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
34		benzene 601-020-00-8 / 200-753-7 / 71-43-2		<0.009 mg/kg		<0.009 mg/kg	<0.0000009 %		<LOD
35		toluene 601-021-00-3 / 203-625-9 / 108-88-3		<0.007 mg/kg		<0.007 mg/kg	<0.0000007 %		<LOD
36	*	ethylbenzene 601-023-00-4 / 202-849-4 / 100-41-4		<0.004 mg/kg		<0.004 mg/kg	<0.0000004 %		<LOD
37	*	coronene 205-881-7 / 191-07-1		<0.2 mg/kg		<0.2 mg/kg	<0.00002 %		<LOD
38		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]		<0.02 mg/kg		<0.02 mg/kg	<0.000002 %		<LOD
						Total:	0.0536 %		

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 Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
ND	Not detected
CLP: Note 1	Only the metal concentration has been used for classification

Classification of sample: TP03-050220--0.50

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

Sample details

Sample Name:
TP03-050220--0.50
Sample Depth:
0.50 m
Moisture content:
15%
(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: 15% Wet Weight Moisture Correction applied (MC)

#	Determinand	CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
1	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		1.78	mg/kg	1.197	1.811	mg/kg	0.000181 %	✓	
4	arsenic { arsenic pentoxide }	033-004-00-6	215-116-9	1303-28-2		16.6	mg/kg	1.534	21.643	mg/kg	0.00216 %	✓	
5	barium { * barium sulphide }	016-002-00-X	244-214-4	21109-95-5		85.2	mg/kg	1.233	89.33	mg/kg	0.00893 %	✓	
6	cadmium { cadmium sulfate }	048-009-00-9	233-331-6	10124-36-4		0.872	mg/kg	1.855	1.375	mg/kg	0.000137 %	✓	
7	copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		15.7	mg/kg	1.126	15.025	mg/kg	0.0015 %	✓	
8	lead { * lead compounds with the exception of those specified elsewhere in this Annex (worst case) }	082-001-00-6			1	12.5	mg/kg		10.625	mg/kg	0.00106 %	✓	
9	mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		<0.14	mg/kg	1.353	<0.189	mg/kg	<0.0000189 %		<LOD
10	molybdenum { molybdenum(VI) oxide }	042-001-00-9	215-204-7	1313-27-5		3.01	mg/kg	1.5	3.838	mg/kg	0.000384 %	✓	
11	nickel { nickel sulfate }	028-009-00-5	232-104-9	7786-81-4		32.1	mg/kg	2.637	71.942	mg/kg	0.00719 %	✓	
12	selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }	034-002-00-8				<1	mg/kg	2.554	<2.554	mg/kg	<0.000255 %		<LOD
13	zinc { zinc sulphate }	030-006-00-9	231-793-3 [1] 231-793-3 [2]	7446-19-7 [1] 7733-02-0 [2]		53.9	mg/kg	2.469	113.131	mg/kg	0.0113 %	✓	

#		Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
		CLP index number	EC Number	CAS Number									
14		chromium in chromium(III) compounds { * chromium(III) oxide }				13.7	mg/kg	1.462	17.02	mg/kg	0.0017 %	✓	
			215-160-9	1308-38-9									
15		chromium in chromium(VI) compounds { chromium(VI) oxide }				<0.6	mg/kg	1.923	<1.154	mg/kg	<0.000115 %		<LOD
		024-001-00-0	215-607-8	1333-82-0									
16		naphthalene				<0.009	mg/kg		<0.009	mg/kg	<0.0000009 %		<LOD
		601-052-00-2	202-049-5	91-20-3									
17	*	acenaphthylene				<0.012	mg/kg		<0.012	mg/kg	<0.0000012 %		<LOD
			205-917-1	208-96-8									
18	*	acenaphthene				<0.008	mg/kg		<0.008	mg/kg	<0.0000008 %		<LOD
			201-469-6	83-32-9									
19	*	fluorene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
			201-695-5	86-73-7									
20	*	phenanthrene				<0.015	mg/kg		<0.015	mg/kg	<0.0000015 %		<LOD
			201-581-5	85-01-8									
21	*	anthracene				<0.016	mg/kg		<0.016	mg/kg	<0.0000016 %		<LOD
			204-371-1	120-12-7									
22	*	fluoranthene				<0.017	mg/kg		<0.017	mg/kg	<0.0000017 %		<LOD
			205-912-4	206-44-0									
23	*	pyrene				<0.015	mg/kg		<0.015	mg/kg	<0.0000015 %		<LOD
			204-927-3	129-00-0									
24		benzo[a]anthracene				<0.014	mg/kg		<0.014	mg/kg	<0.0000014 %		<LOD
		601-033-00-9	200-280-6	56-55-3									
25		chrysene				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
		601-048-00-0	205-923-4	218-01-9									
26		benzo[b]fluoranthene				<0.015	mg/kg		<0.015	mg/kg	<0.0000015 %		<LOD
		601-034-00-4	205-911-9	205-99-2									
27		benzo[k]fluoranthene				<0.014	mg/kg		<0.014	mg/kg	<0.0000014 %		<LOD
		601-036-00-5	205-916-6	207-08-9									
28		benzo[a]pyrene; benzo[def]chrysene				<0.015	mg/kg		<0.015	mg/kg	<0.0000015 %		<LOD
		601-032-00-3	200-028-5	50-32-8									
29	*	indeno[123-cd]pyrene				<0.018	mg/kg		<0.018	mg/kg	<0.0000018 %		<LOD
			205-893-2	193-39-5									
30		dibenz[a,h]anthracene				<0.023	mg/kg		<0.023	mg/kg	<0.0000023 %		<LOD
		601-041-00-2	200-181-8	53-70-3									
31	*	benzo[ghi]perylene				<0.024	mg/kg		<0.024	mg/kg	<0.0000024 %		<LOD
			205-883-8	191-24-2									
32	*	polychlorobiphenyls; PCB				<0.021	mg/kg		<0.021	mg/kg	<0.0000021 %		<LOD
		602-039-00-4	215-648-1	1336-36-3									
33		tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane				<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
		603-181-00-X	216-653-1	1634-04-4									
34		benzene				<0.009	mg/kg		<0.009	mg/kg	<0.0000009 %		<LOD
		601-020-00-8	200-753-7	71-43-2									
35		toluene				<0.007	mg/kg		<0.007	mg/kg	<0.0000007 %		<LOD
		601-021-00-3	203-625-9	108-88-3									
36	*	ethylbenzene				<0.004	mg/kg		<0.004	mg/kg	<0.0000004 %		<LOD
		601-023-00-4	202-849-4	100-41-4									
37	*	coronene				<0.2	mg/kg		<0.2	mg/kg	<0.00002 %		<LOD
			205-881-7	191-07-1									
38		o-xylene; [1] p-xylene; [2] m-xylene; [3] xylene [4]				<0.02	mg/kg		<0.02	mg/kg	<0.000002 %		<LOD
		601-022-00-9	202-422-2 [1] 203-396-5 [2] 203-576-3 [3] 215-535-7 [4]	95-47-6 [1] 106-42-3 [2] 108-38-3 [3] 1330-20-7 [4]									
										Total:	0.036 %		

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 Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
ND	Not detected
CLP: Note 1	Only the metal concentration has been used for classification

Classification of sample: TP04-050220--0.50

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

Sample details

Sample Name:
TP04-050220--0.50
Sample Depth:
0.50 m
Moisture content:
13%
(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: 13% Wet Weight Moisture Correction applied (MC)

#	Determinand	CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
1	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		2.24	mg/kg	1.197	2.333	mg/kg	0.000233 %	✓	
4	arsenic { arsenic pentoxide }	033-004-00-6	215-116-9	1303-28-2		13.4	mg/kg	1.534	17.882	mg/kg	0.00179 %	✓	
5	barium { * barium sulphide }	016-002-00-X	244-214-4	21109-95-5		76.4	mg/kg	1.233	81.988	mg/kg	0.0082 %	✓	
6	cadmium { cadmium sulfate }	048-009-00-9	233-331-6	10124-36-4		1.48	mg/kg	1.855	2.388	mg/kg	0.000239 %	✓	
7	copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		28.2	mg/kg	1.126	27.623	mg/kg	0.00276 %	✓	
8	lead { * lead compounds with the exception of those specified elsewhere in this Annex (worst case) }	082-001-00-6			1	28.5	mg/kg		24.795	mg/kg	0.00248 %	✓	
9	mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		<0.14	mg/kg	1.353	<0.189	mg/kg	<0.0000189 %		<LOD
10	molybdenum { molybdenum(VI) oxide }	042-001-00-9	215-204-7	1313-27-5		2.95	mg/kg	1.5	3.85	mg/kg	0.000385 %	✓	
11	nickel { nickel sulfate }	028-009-00-5	232-104-9	7786-81-4		51.3	mg/kg	2.637	117.678	mg/kg	0.0118 %	✓	
12	selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }	034-002-00-8				<1	mg/kg	2.554	<2.554	mg/kg	<0.000255 %		<LOD
13	zinc { zinc sulphate }	030-006-00-9	231-793-3 [1] 231-793-3 [2]	7446-19-7 [1] 7733-02-0 [2]		103	mg/kg	2.469	221.274	mg/kg	0.0221 %	✓	

#		Determinand	CLP Note	User entered data	Conv. Factor	Compound conc.	Classification value	MC Applied	Conc. Not Used
		CLP index number / EC Number / CAS Number							
14		chromium in chromium(III) compounds { * chromium(III) oxide }		17.8 mg/kg	1.462	22.634 mg/kg	0.00226 %	✓	
		215-160-9 / 1308-38-9							
15		chromium in chromium(VI) compounds { chromium(VI) oxide }		<0.6 mg/kg	1.923	<1.154 mg/kg	<0.000115 %		<LOD
		024-001-00-0 / 215-607-8 / 1333-82-0							
16		naphthalene		<0.009 mg/kg		<0.009 mg/kg	<0.0000009 %		<LOD
		601-052-00-2 / 202-049-5 / 91-20-3							
17	*	acenaphthylene		<0.012 mg/kg		<0.012 mg/kg	<0.0000012 %		<LOD
		205-917-1 / 208-96-8							
18	*	acenaphthene		<0.008 mg/kg		<0.008 mg/kg	<0.0000008 %		<LOD
		201-469-6 / 83-32-9							
19	*	fluorene		<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
		201-695-5 / 86-73-7							
20	*	phenanthrene		<0.015 mg/kg		<0.015 mg/kg	<0.0000015 %		<LOD
		201-581-5 / 85-01-8							
21	*	anthracene		<0.016 mg/kg		<0.016 mg/kg	<0.0000016 %		<LOD
		204-371-1 / 120-12-7							
22	*	fluoranthene		<0.017 mg/kg		<0.017 mg/kg	<0.0000017 %		<LOD
		205-912-4 / 206-44-0							
23	*	pyrene		<0.015 mg/kg		<0.015 mg/kg	<0.0000015 %		<LOD
		204-927-3 / 129-00-0							
24		benzo[a]anthracene		<0.014 mg/kg		<0.014 mg/kg	<0.0000014 %		<LOD
		601-033-00-9 / 200-280-6 / 56-55-3							
25		chrysene		<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
		601-048-00-0 / 205-923-4 / 218-01-9							
26		benzo[b]fluoranthene		<0.015 mg/kg		<0.015 mg/kg	<0.0000015 %		<LOD
		601-034-00-4 / 205-911-9 / 205-99-2							
27		benzo[k]fluoranthene		<0.014 mg/kg		<0.014 mg/kg	<0.0000014 %		<LOD
		601-036-00-5 / 205-916-6 / 207-08-9							
28		benzo[a]pyrene; benzo[def]chrysene		<0.015 mg/kg		<0.015 mg/kg	<0.0000015 %		<LOD
		601-032-00-3 / 200-028-5 / 50-32-8							
29	*	indeno[123-cd]pyrene		<0.018 mg/kg		<0.018 mg/kg	<0.0000018 %		<LOD
		205-893-2 / 193-39-5							
30		dibenz[a,h]anthracene		<0.023 mg/kg		<0.023 mg/kg	<0.0000023 %		<LOD
		601-041-00-2 / 200-181-8 / 53-70-3							
31	*	benzo[ghi]perylene		<0.024 mg/kg		<0.024 mg/kg	<0.0000024 %		<LOD
		205-883-8 / 191-24-2							
32	*	polychlorobiphenyls; PCB		<0.021 mg/kg		<0.021 mg/kg	<0.0000021 %		<LOD
		602-039-00-4 / 215-648-1 / 1336-36-3							
33		tert-butyl methyl ether; MTBE; 2-methoxy-2-methylpropane		<0.01 mg/kg		<0.01 mg/kg	<0.000001 %		<LOD
		603-181-00-X / 216-653-1 / 1634-04-4							
34		benzene		<0.009 mg/kg		<0.009 mg/kg	<0.0000009 %		<LOD
		601-020-00-8 / 200-753-7 / 71-43-2							
35		toluene		<0.007 mg/kg		<0.007 mg/kg	<0.0000007 %		<LOD
		601-021-00-3 / 203-625-9 / 108-88-3							
36	*	ethylbenzene		<0.004 mg/kg		<0.004 mg/kg	<0.0000004 %		<LOD
		601-023-00-4 / 202-849-4 / 100-41-4							
37	*	coronene		<0.2 mg/kg		<0.2 mg/kg	<0.00002 %		<LOD
		205-881-7 / 191-07-1							
38		o-xylene; [1] p-xylene; [2] m-xylene; [3] xylene [4]		<0.02 mg/kg		<0.02 mg/kg	<0.000002 %		<LOD
		601-022-00-9 / 202-422-2 [1] / 203-396-5 [2] / 203-576-3 [3] / 215-535-7 [4] / 95-47-6 [1] / 106-42-3 [2] / 108-38-3 [3] / 1330-20-7 [4]							
						Total:	0.0537 %		

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
ND	Not detected
CLP: Note 1	Only the metal concentration has been used for classification

Classification of sample: TP05-050220--0.50

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

Sample details

Sample Name:
TP05-050220--0.50
Sample Depth:
0.50 m
Moisture content:
17%
(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: 17% Wet Weight Moisture Correction applied (MC)

#	Determinand	CLP index number	EC Number	CAS Number	CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
1	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		1.75	mg/kg	1.197	1.739	mg/kg	0.000174 %	✓	
4	arsenic { arsenic pentoxide }	033-004-00-6	215-116-9	1303-28-2		13.4	mg/kg	1.534	17.06	mg/kg	0.00171 %	✓	
5	barium { * barium sulphide }	016-002-00-X	244-214-4	21109-95-5		113	mg/kg	1.233	115.689	mg/kg	0.0116 %	✓	
6	cadmium { cadmium sulfate }	048-009-00-9	233-331-6	10124-36-4		1.11	mg/kg	1.855	1.709	mg/kg	0.000171 %	✓	
7	copper { dicopper oxide; copper (I) oxide }	029-002-00-X	215-270-7	1317-39-1		21.5	mg/kg	1.126	20.091	mg/kg	0.00201 %	✓	
8	lead { * lead compounds with the exception of those specified elsewhere in this Annex (worst case) }	082-001-00-6			1	28.3	mg/kg		23.489	mg/kg	0.00235 %	✓	
9	mercury { mercury dichloride }	080-010-00-X	231-299-8	7487-94-7		<0.14	mg/kg	1.353	<0.189	mg/kg	<0.0000189 %		<LOD
10	molybdenum { molybdenum(VI) oxide }	042-001-00-9	215-204-7	1313-27-5		1.76	mg/kg	1.5	2.191	mg/kg	0.000219 %	✓	
11	nickel { nickel sulfate }	028-009-00-5	232-104-9	7786-81-4		39.4	mg/kg	2.637	86.225	mg/kg	0.00862 %	✓	
12	selenium { selenium compounds with the exception of cadmium sulphoselenide and those specified elsewhere in this Annex }	034-002-00-8				<1	mg/kg	2.554	<2.554	mg/kg	<0.000255 %		<LOD
13	zinc { zinc sulphate }	030-006-00-9	231-793-3 [1] 231-793-3 [2]	7446-19-7 [1] 7733-02-0 [2]		99.6	mg/kg	2.469	204.132	mg/kg	0.0204 %	✓	

#		Determinand			CLP Note	User entered data		Conv. Factor	Compound conc.		Classification value	MC Applied	Conc. Not Used
		CLP index number	EC Number	CAS Number									
14		chromium in chromium(III) compounds { chromium(III) oxide }	215-160-9	1308-38-9		23.8	mg/kg	1.462	28.872	mg/kg	0.00289 %	✓	
15		chromium in chromium(VI) compounds { chromium(VI) oxide }	215-607-8	1333-82-0		<0.6	mg/kg	1.923	<1.154	mg/kg	<0.000115 %		<LOD
16		naphthalene	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	200-280-6	56-55-3		<0.014	mg/kg		<0.014	mg/kg	<0.0000014 %		<LOD
25		chrysene	205-923-4	218-01-9		<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
26		benzo[b]fluoranthene	205-911-9	205-99-2		<0.015	mg/kg		<0.015	mg/kg	<0.0000015 %		<LOD
27		benzo[k]fluoranthene	205-916-6	207-08-9		<0.014	mg/kg		<0.014	mg/kg	<0.0000014 %		<LOD
28		benzo[a]pyrene; benzo[def]chrysene	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	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	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	216-653-1	1634-04-4		<0.01	mg/kg		<0.01	mg/kg	<0.000001 %		<LOD
34		benzene	200-753-7	71-43-2		<0.009	mg/kg		<0.009	mg/kg	<0.0000009 %		<LOD
35		toluene	203-625-9	108-88-3		<0.007	mg/kg		<0.007	mg/kg	<0.0000007 %		<LOD
36	•	ethylbenzene	202-849-4	100-41-4		<0.004	mg/kg		<0.004	mg/kg	<0.0000004 %		<LOD
37	•	coronene	205-881-7	191-07-1		<0.2	mg/kg		<0.2	mg/kg	<0.00002 %		<LOD
38		o-xylene; [1] p-xylene; [2] m-xylene; [3] xylene [4]	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]		<0.02	mg/kg		<0.02	mg/kg	<0.000002 %		<LOD
										Total:	0.0516 %		

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 Determinand - Unless the Determinand is Note 1, the Conversion Factor is used to calculate the compound concentration
<LOD	Below limit of detection
ND	Not detected
CLP: Note 1	Only the metal concentration has been used for classification

Appendix A: Classifier defined and non 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: Aquatic Chronic 2 H411 , Repr. 2 H361d , Carc. 1B H350 , Muta. 1B H340 , STOT RE 2 H373 , Asp. Tox. 1 H304 , Flam. Liq. 3 H226

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)

CLP index number: 016-002-00-X
Description/Comments:
Data source: Regulation 1272/2008/EC - Classification, labelling and packaging of substances and mixtures. (CLP)
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)

CLP index number: 082-001-00-6
Description/Comments: Worst Case: IARC considers lead compounds Group 1; Carcinogenic to humans; Lead REACH Consortium considers some lead compounds Carcinogenic category 1A
Data source: Regulation 1272/2008/EC - Classification, labelling and packaging of substances and mixtures. (CLP)
Additional Hazard Statement(s): Carc. 1A H350
Reason for additional Hazards Statement(s):
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 (EC Number: 215-160-9, CAS Number: 1308-38-9)

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

CLP index number: 601-023-00-4
Description/Comments:
Data source: Commission Regulation (EU) No 605/2014 – 6th Adaptation to Technical Progress for Regulation (EC) No 1272/2008. (ATP6)
Additional Hazard Statement(s): Carc. 2 H351
Reason for additional Hazards Statement(s):
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

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

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

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

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, May 2018
HazWasteOnline Classification Engine Version: 2020.52.4178.8324 (21 Feb 2020)
HazWasteOnline Database: 2020.52.4178.8324 (21 Feb 2020)

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

Appendix 5
Survey Data

Survey Data

Location	Irish Transverse Mercator		Elevation	Irish National Grid	
	Easting	Northing		Easting	Northing
Trial Pits					
TP01	720836.089	745302.027	10.19	320911.425	245278.203
TP02	720958.397	745323.628	9.13	321033.758	245299.809
TP03	721023.024	745208.740	8.89	321098.400	245184.897
TP04	720867.968	744987.754	11.99	320943.314	244963.862
TP05	721148.805	745022.818	10.15	321224.210	244998.936

Legend Key

Locations By Type - TP

Contract No:	5690
Contract Name:	Auburn
Location:	Malahide, Co. Dublin
Client:	Hatley Homes
Engineer:	Waterman Moylan
Title:	Site Plan
Scale:	1:2750
Drawn By:	SL

Site Investigations Ltd
The Grange
12th Lock Road
Lucan
Co. Dublin
T: 01 6108768
e: info@siteinvestigations.ie

Calculation Reference: AUDIT-561501-220916-0904

TRIP RATE CALCULATION SELECTION PARAMETERS:

Land Use : 03 - RESIDENTIAL
Category : K - MIXED PRIV HOUS (FLATS AND HOUSES)
TOTAL VEHICLES

Selected regions and areas:

13	**MUNSTER**		
	CR	CORK	2 days
14	**LEINSTER**		
	KK	KILKENNY	2 days
15	**GREATER DUBLIN**		
	DL	DUBLIN	1 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: 27 to 116 (units:)
Range Selected by User: 21 to 322 (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: 01/01/14 to 23/09/20

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	1 days
Tuesday	2 days
Friday	2 days

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

Selected survey types:

Manual count	5 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
Edge of Town	2

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	5

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.

Secondary Filtering selection:

Use Class:

C3	5 days

This data displays the number of surveys per Use Class classification within the selected set. The Use Classes Order 2005 has been used for this purpose, which can be found within the Library module of TRICS®.

Population within 500m Range:

All Surveys Included

Population within 1 mile:

5,001 to 10,000	2 days
10,001 to 15,000	2 days
25,001 to 50,000	1 days

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

Population within 5 miles:

25,001 to 50,000	2 days
100,001 to 125,000	1 days
125,001 to 250,000	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	2 days
1.1 to 1.5	3 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	5 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	5 days

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

LIST OF SITES relevant to selection parameters

1 **CR-03-K-02** **SEMI-DET. & FLATS** **CORK**
SKEHARD ROAD
CORK
BALLINURE
Edge of Town
Residential Zone
Total No of Dwellings: 116
Survey date: FRIDAY *20/06/14* *Survey Type: MANUAL*

2 **CR-03-K-03** **TERRACED & FLATS** **CORK**
SKEHARD ROAD
CORK
LAHARN
Suburban Area (PPS6 Out of Centre)
Residential Zone
Total No of Dwellings: 47
Survey date: FRIDAY *23/03/18* *Survey Type: MANUAL*

3 **DL-03-K-04** **FLATS AND DUPLEXES** **DUBLIN**
ALL HALLOWS SQUARE
DUBLIN
DRUMCONDRA
Suburban Area (PPS6 Out of Centre)
Residential Zone
Total No of Dwellings: 76
Survey date: TUESDAY *22/11/16* *Survey Type: MANUAL*

4 **KK-03-K-01** **HOUSES & FLATS** **KILKENNY**
BENNETTS BRIDGE ROAD
KILKENNY

Edge of Town
Residential Zone
Total No of Dwellings: 35
Survey date: TUESDAY *30/09/14* *Survey Type: MANUAL*

5 **KK-03-K-02** **DETACHED & FLATS** **KILKENNY**
BOTHAR AN CHOLAISTE
KILKENNY

Suburban Area (PPS6 Out of Centre)
Residential Zone
Total No of Dwellings: 27
Survey date: MONDAY *29/09/14* *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/K - MIXED PRIV HOUS (FLATS AND 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	5	60	0.043	5	60	0.216	5	60	0.259
08:00 - 09:00	5	60	0.103	**5**	**60**	**0.432**	**5**	**60**	**0.535**
09:00 - 10:00	5	60	0.113	5	60	0.163	5	60	0.276
10:00 - 11:00	5	60	0.123	5	60	0.123	5	60	0.246
11:00 - 12:00	5	60	0.116	5	60	0.146	5	60	0.262
12:00 - 13:00	5	60	0.150	5	60	0.123	5	60	0.273
13:00 - 14:00	5	60	0.196	5	60	0.173	5	60	0.369
14:00 - 15:00	5	60	0.136	5	60	0.153	5	60	0.289
15:00 - 16:00	5	60	0.176	5	60	0.103	5	60	0.279
16:00 - 17:00	5	60	0.219	5	60	0.183	5	60	0.402
17:00 - 18:00	**5**	**60**	**0.302**	5	60	0.123	5	60	0.425
18:00 - 19:00	5	60	0.206	5	60	0.130	5	60	0.336
19:00 - 20:00									
20:00 - 21:00									
21:00 - 22:00									
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			1.883			2.068			3.951

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.*

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Parameter summary

Trip rate parameter range selected:	27 - 116 (units:)
Survey date date range:	01/01/14 - 23/09/20
Number of weekdays (Monday-Friday):	5
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.

TRIP RATE for Land Use 03 - RESIDENTIAL/K - MIXED PRIV HOUS (FLATS AND HOUSES)

CARS

Calculation factor: 1 DWELLS

BOLD print indicates peak (busiest) period

Time Range	ARRIVALS			DEPARTURES			TOTALS		
	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	5	60	0.033	5	60	0.186	5	60	0.219
08:00 - 09:00	5	60	0.083	**5**	**60**	**0.402**	**5**	**60**	**0.485**
09:00 - 10:00	5	60	0.100	5	60	0.143	5	60	0.243
10:00 - 11:00	5	60	0.110	5	60	0.110	5	60	0.220
11:00 - 12:00	5	60	0.100	5	60	0.123	5	60	0.223
12:00 - 13:00	5	60	0.130	5	60	0.103	5	60	0.233
13:00 - 14:00	5	60	0.176	5	60	0.156	5	60	0.332
14:00 - 15:00	5	60	0.123	5	60	0.143	5	60	0.266
15:00 - 16:00	5	60	0.153	5	60	0.083	5	60	0.236
16:00 - 17:00	5	60	0.193	5	60	0.156	5	60	0.349
17:00 - 18:00	**5**	**60**	**0.282**	5	60	0.116	5	60	0.398
18:00 - 19:00	5	60	0.193	5	60	0.126	5	60	0.319
19:00 - 20:00									
20:00 - 21:00									
21:00 - 22:00									
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			1.676			1.847			3.523

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.*

Stephen Dent-Neville
Waterman Moylan
Block S
Eastpoint Business Park,
Block S, Alfie Byrne Road
Dublin 3
Co. Dublin
D03H3F4

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

13 September 2021

Re: CDS20005975 pre-connection enquiry - Subject to contract | Contract denied

Connection for Multi/Mixed Use Development of 440 unit(s) at Malahide Road, Fingal, Co. Dublin

Dear Sir/Madam,

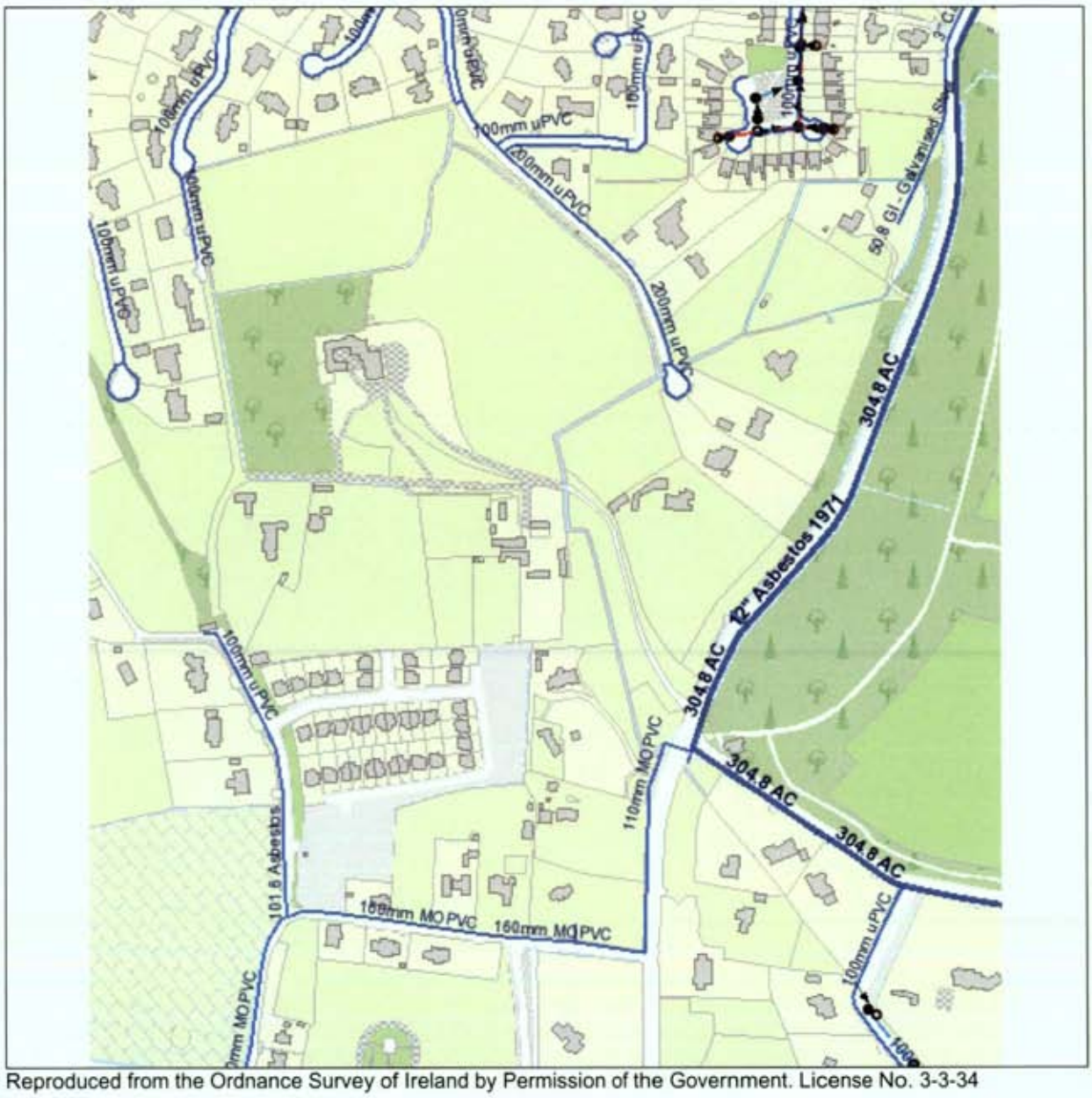
Irish Water has reviewed your pre-connection enquiry in relation to a Water & Wastewater connection at Malahide Road, Fingal, Co. Dublin (the **Premises**). Based upon the details you have provided with your pre-connection enquiry and on our desk top analysis of the capacity currently available in the Irish Water network(s) as assessed by Irish Water, we wish to advise you that your proposed connection to the Irish Water network(s) can be facilitated at this moment in time.

SERVICE	OUTCOME OF PRE-CONNECTION ENQUIRY THIS IS NOT A CONNECTION OFFER. YOU MUST APPLY FOR A CONNECTION(S) TO THE IRISH WATER NETWORK(S) IF YOU WISH TO PROCEED.
Water Connection	Feasible without infrastructure upgrade by Irish Water
Wastewater Connection	Feasible subject to upgrades
SITE SPECIFIC COMMENTS	
Water Connection	New connection to the existing network is feasible without upgrade
Wastewater Connection	Feasible subject to the delivery of the following: A new Kinsealy Lane Pumping Station (Castleway Pumping Station): a) Delivery of a new pumping station to serve the existing and future Connolly Avenue pumping station catchment. b) Procurement of additional lands to facilitate the provision of a total storage volume of 530m3. This includes 362m3of existing storage at the site. An additional 168m3 storage volume and associated area is required. c) Identification of the required changes to the Malahide discharge licence. d) All environmental (assimilative capacity of receiving water), archaeological and statutory assessments.

Stiúrthóirí / Directors: Cathal Marley (Chairman), Niall Gleeson, Eamon Gallen, Yvonne Harris, Brendan Murphy, Maria O'Dwyer
Oifig Chláraithe / Registered Office: Teach Colvill, 24-26 Sráid Thalbóid, Baile Átha Cliath 1, D01 NP86 / Colvill House, 24-26 Talbot Street, Dublin 1, D01 NP86
Is cuideachta ghníomhaíochta ainmnithe atá faoi theorainn scaireanna é Uisce Éireann / Irish Water is a designated activity company, limited by shares.
Uimhir Chláraithe in Éirinn / Registered in Ireland No.: 530363

	e) Increase the capacity of the new Chapel Lane pumping station (Capital Investment Plan project) from 53l/s to 94l/s. f) Upgrade to the gravity network to the new Castleway Pumping Station. g) Upgrade the foul network downstream of the new Castleway Pumping Station to connect to the new Chapel Lane Pumping Station. h) Provision of Mechanical Electrical and Instrumentation, Control and Automation (MEICA). i) Scope of works requirements to incorporate existing MEICA operational requirements (FCC/Irish Water). **Interim Solution:** • New Rising Main from the proposed site to the Floraville Pumping Station bypass (subject to the delivery of the Chapel Lane Pumping Station (CIP, Local Network Reinforcement Project) • The overall design to allow the proposed Rising Main on Kinsealy Lane to be transferred to a new Kinsealy Lane Pumping Station (Castleway Pumping Station) upon its completion • Rising Main design to provide for flows from the Castleway Pumping Station and also septicity issues. Irish Water does not have any plans, in the current Capital Investment Programme (CIP), to undertake these upgrades to facilitate this connection. Should you wish to progress upgrades and associated works, Irish Water may require you to provide a contribution of a relevant portion of the costs for the required upgrades. Engagement with Irish Water will be required to agree the delivery mechanism for the upgrades Completion of the Chapel Lane Pumping Station (CIP, Local Network Reinforcement Project) and rising main to the North Fringe Sewer. This upgrade project is currently in progress and scheduled to be completed by Q4 2021 (this may be subject to change).
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 that are available on the Irish Water website. Irish Water reserves the right to supplement these requirements with Codes of Practice and these will be issued with the connection agreement.	

The map included below outlines the current Irish Water infrastructure adjacent to your site:



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

Whilst every care has been taken in its compilation Irish Water gives this information as to the position of its underground network as a general guide only on the strict understanding that it is based on the best available information provided by each Local Authority in Ireland to Irish Water. Irish Water can assume no responsibility for and give no guarantees, undertakings or warranties concerning the accuracy, completeness or up to date nature of the information provided and does not accept any liability whatsoever arising from any errors or omissions. This information should not be relied upon in the event of excavations or any other works being carried out in the vicinity of the Irish Water underground network. The onus is on the parties carrying out excavations or any other works to ensure the exact location of the Irish Water underground network 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.

General Notes:

1) The initial assessment referred to above is carried out taking into account water demand and wastewater discharge volumes and infrastructure details on the date of the assessment. **The availability of capacity may change at any date after this assessment.**
2) This feedback does not constitute a contract in whole or in part to provide a connection to any Irish Water infrastructure. All feasibility assessments are subject to the constraints of the Irish Water Capital Investment Plan.
3) The feedback provided is subject to a Connection Agreement/contract being signed at a later date.
4) A Connection Agreement will be required to commencing the connection works associated with the enquiry this can be applied for at https://www.water.ie/connections/get-connected/
5) A Connection Agreement cannot be issued until all statutory approvals are successfully in place.
6) Irish Water Connection Policy/ Charges can be found at https://www.water.ie/connections/information/connection-charges/
7) Please note the Confirmation of Feasibility does not extend to your fire flow requirements.
8) Irish Water is not responsible for the management or disposal of storm water or ground waters. You are advised to contact the relevant Local Authority to discuss the management or disposal of proposed storm water or ground water discharges
9) To access Irish Water Maps email datarequests@water.ie
10) All works to the Irish Water infrastructure, including works in the Public Space, shall have to be carried out by Irish Water.

If you have any further questions, please contact James O'Sullivan from the design team on 022 52269 or email jameosull@water.ie For further information, visit **www.water.ie/connections.**

Yours sincerely,

Yvonne Harris

Yvonne Harris

Head of Customer Operations

Uisce Éireann
Bosca OP 6000
Baile Átha Cliath 1
Éire

Irish Water
PO Box 6000
Dublin 1
Ireland

T: +353 1 89 25000
F: +353 1 89 25001
www.water.ie

Your Ref: ABP-313360-22
Our Ref: CDS20005975

An Bord Pleanála,
64 Marlborough Street,
Dublin.

23rd May 2022

Dear Sir/ Madam,

Re: Strategic Housing Development – Preservation of Auburn House (a Protected Structure) and stables as 1 no. residential dwelling, conversion of stables to provide storage space for Auburn House, construction of 368 no. residential units (87 no. houses, 281 no. apartments), creche and associated site works. Lands at Auburn House (Protected Structure), Little Auburn and Streamstown, Off Malahide Road and Carey's Lane, Back Road, and Kinsealy Lane, Malahide, Co. Dublin.

Irish Water has reviewed the plans and particulars submitted for this Strategic Housing Development Application and based on the details provided by the applicant to Irish Water as part of their Pre-Connection Enquiry, and on the capacity available in the local networks, Irish Water has the following observations:

In respect of Wastewater:

At pre consultation Irish Water confirmed to the board in order to facilitate wastewater connection(s) for this and other proposals in the area, Irish Water is progressing a high-level strategy for the area which includes the delivery of a new pumping station to serve the existing and future Connolly Avenue pumping station catchment. Irish Water has recently completed these Capital Investment Plan works in order to support growth in this area.

The following site specific and localised upgrades are required to service this proposal:

- New Rising Main from the proposed site to the Floraville Pumping Station bypass.

- The overall design to allow the proposed Rising Main on Kinsealy Lane to be transferred to a new Kinsealy Lane Pumping Station (Castleway

Pumping Station; recently granted permission by Fingal County Council under F21A/0451) upon its completion.

- Rising Main design to provide for flows from the Castleway Pumping Station and also septicity issues.

Irish Water does not have any plans in the current Capital Investment Programme (CIP), to undertake these upgrades to facilitate this connection. The applicant will be required to fund these upgrades and associated works as part of a connection agreement with Irish Water. The applicant is required to engage with Irish Water to agree the delivery mechanism for the upgrades ahead of any connection application.

In respect of Water:

A connection is feasible without infrastructure upgrade by Irish Water.

Design Acceptance:

The applicant (including any designers/contractors or other related parties appointed by the applicant) is entirely responsible for the design and construction of all water and/or wastewater infrastructure within the Development redline boundary which is necessary to facilitate connection(s) from the boundary of the Development to Irish Water's network(s) (the "Self-Lay Works"), as reflected in the applicants Design Submission. The applicant has been issued a SoDA by Irish Water for their proposed designs and layouts within their site red line boundary

Planning Recommendation:

Irish Water respectfully requests the board condition(s) any grant as follows:

1. The applicant shall sign a connection agreement with Irish Water prior to any works commencing and connecting to the Irish Water network.

2. Irish Water does not permit any build over of its assets and separation distances as per Irish Waters Standards Codes and Practices shall be achieved.

   (a) Any proposals by the applicant to build over/near or divert existing water or wastewater services subsequently occurs, the applicant shall submit details to Irish Water for assessment of feasibility and have written confirmation of feasibility of diversion(s) from Irish Water prior to connection agreement.

3. All development shall be carried out in compliance with Irish Water Standards codes and practices.

Queries relating to the observations above should be sent to planning@water.ie

PP. Ali Robinson

Yvonne Harris
Connections and Developer Services

Hatley Homes,
Kinvara House,
Northumberland Rd,
Ballsbridge,
Dublin 4

To Whom It May Concern,

This is a letter to confirm that GoCar intends to provide 4-6 shared car club vehicles in the proposed SHD scheme by Auburn House in Malahide. GoCar representatives have discussed the project with representatives of the transport engineers of the scheme at Waterman Moylan and are excited to provide a car club service at this location.

It is understood that the vehicle will be shared between residents of the scheme and residents of the surrounding areas. GoCar will work with the management company of the development to identify a need for greater numbers of vehicles if and when this might arise.

GoCar is Ireland's leading car sharing service with over 60,000 members and over 750 cars and vans on fleet. Each GoCar which is placed in a community has the potential to replace the journeys of up to 15 private cars. The Department of Housing's Design Standards for New Apartments - Guidelines for Planning Authorities 2018 outline: "For all types of location, where it is sought to eliminate or reduce car parking provision, it is necessary to ensure... provision is also to be made for alternative mobility solutions including facilities for car sharing club vehicles."

Carsharing is a sustainable service. By allowing multiple people to use the same vehicle at different times, car sharing reduces car ownership, car dependency, congestion, noise and air pollution. It frees up land which would otherwise be used for additional parking spaces. Most GoCar users only use a car when necessary, and walk and use public transport more often than car owners.

By having GoCar car club vehicles in a residential development such as this, residents will have access to pay-as-you-go driving, in close proximity to their homes, which will increase usership of the service.

I trust that this information is satisfactory. For any queries, please do not hesitate to contact me.

Rob Kearns
Head of Growth
GoCar Carsharing Limited
M: 083 822 3924
E: rob.kearns@gocar.ie

Junctions 9

PICADY 9 - Priority Intersection Module

Version: 9.5.1.7462
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The users of this computer program for the solution of an engineering problem are in no way relieved of their responsibility for the correctness of the solution

Filename: Junction 1 - DO NOTHING - AM-PM.j9
Path: M:\Projects\19\19-020 - Malahide Road\Design\Traffic\Auburn Masterplan - 2022\Junction Analysis\Junction 1
Report generation date: 05/10/2022 16:45:58

»JUNCTION 1 - DO NOTHING - 2022, AM
»JUNCTION 1 - DO NOTHING - 2022, PM
»JUNCTION 1 - DO NOTHING - 2026, AM
»JUNCTION 1 - DO NOTHING - 2026, PM
»JUNCTION 1 - DO NOTHING - 2031, AM
»JUNCTION 1 - DO NOTHING - 2031, PM
»JUNCTION 1 - DO NOTHING - 2041, AM
»JUNCTION 1 - DO NOTHING - 2041, PM

Summary of junction performance

	AM		PM	
	Queue (Veh)	RFC	Queue (Veh)	RFC
	JUNCTION 1 - DO NOTHING - 2022			
Stream B-C	0.5	0.35	0.3	0.21
Stream B-A	0.9	0.48	0.6	0.40
Stream C-AB	0.8	0.38	0.9	0.37
	JUNCTION 1 - DO NOTHING - 2026			
Stream B-C	0.6	0.40	0.3	0.24
Stream B-A	1.1	0.53	0.8	0.44
Stream C-AB	1.0	0.41	1.0	0.40
	JUNCTION 1 - DO NOTHING - 2031			
Stream B-C	0.8	0.46	0.4	0.27
Stream B-A	1.4	0.60	0.9	0.49
Stream C-AB	1.2	0.46	1.2	0.44
	JUNCTION 1 - DO NOTHING - 2041			
Stream B-C	1.0	0.51	0.4	0.29
Stream B-A	1.8	0.66	1.1	0.53
Stream C-AB	1.3	0.49	1.4	0.48

Values shown are the highest values encountered over all time segments. Delay is the maximum value of average delay per arriving vehicle.

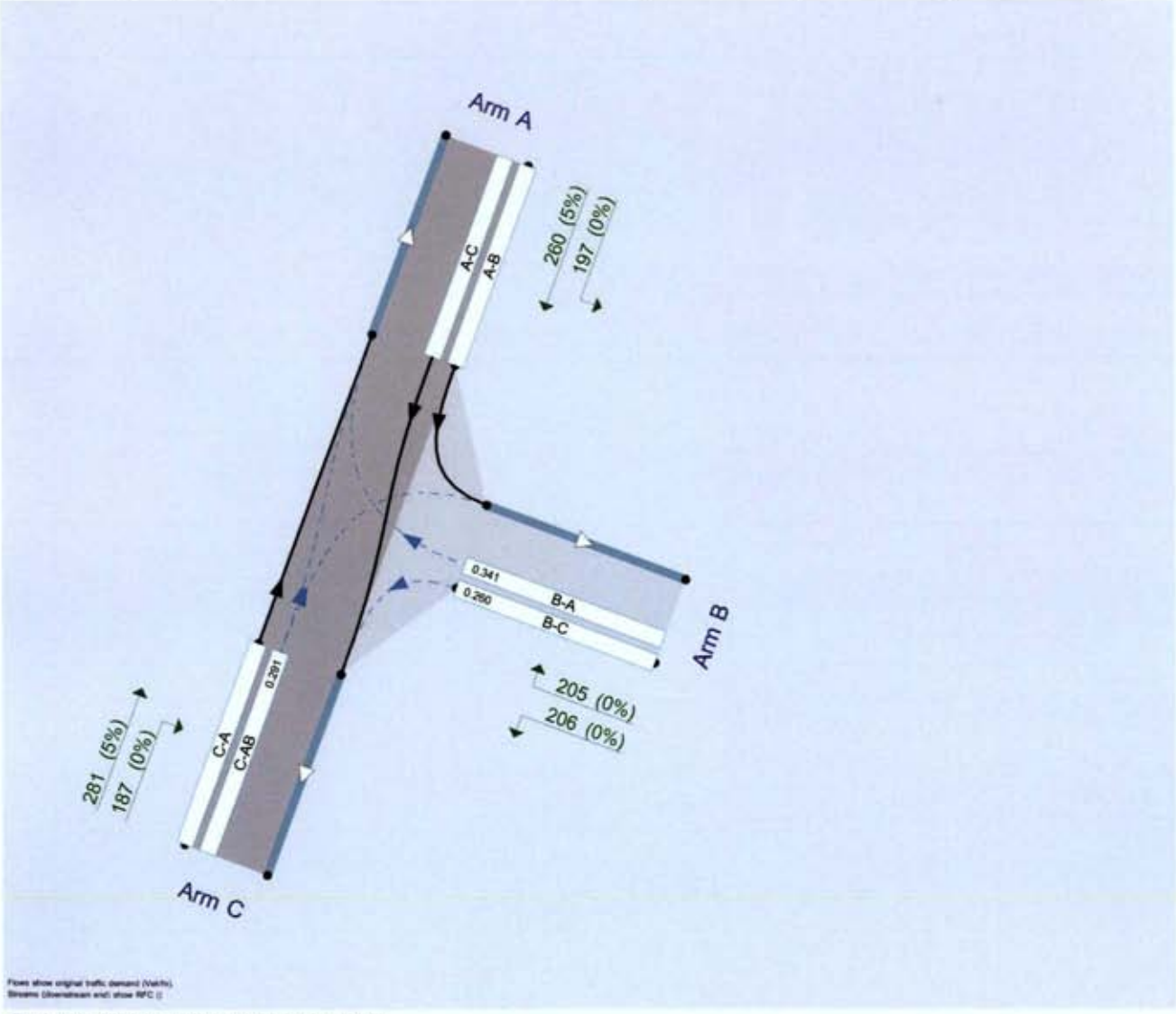
File summary

File Description

Title	
Location	
Site number	
Date	27/02/2020
Version	
Status	(new file)
Identifier	
Client	
Jobnumber	
Enumerator	DOMAIN\f.silva
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



The junction diagram reflects the last run of Junctions.

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	Relationship type	Relationship
D1	2022	AM	ONE HOUR	08:00	09:30	15	✓		
D2	2022	PM	ONE HOUR	18:00	19:30	15	✓		
D3	2026	AM	ONE HOUR	08:00	09:30	15	✓	Simple	D1*1.066
D4	2026	PM	ONE HOUR	18:00	19:30	15	✓	Simple	D2*1.066
D5	2031	AM	ONE HOUR	08:00	09:30	15	✓	Simple	D1*1.143
D6	2031	PM	ONE HOUR	18:00	19:30	15	✓	Simple	D2*1.143
D7	2041	AM	ONE HOUR	08:00	09:30	15	✓	Simple	D1*1.196
D8	2041	PM	ONE HOUR	18:00	19:30	15	✓	Simple	D2*1.196

Analysis Set Details

ID	Name	Include in report	Network flow scaling factor (%)	Network capacity scaling factor (%)
A1	JUNCTION 1 - DO NOTHING	✓	100.000	100.000

JUNCTION 1 - DO NOTHING - 2022, 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		5.84	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Arms

Arms

Arm	Name	Description	Arm type
A	R107 - Malahide Road (N)		Major
B	Back Road (E)		Minor
C	R107 - Malahide Road (S)		Major

Major Arm Geometry

Arm	Width of carriageway (m)	Has kerbed central reserve	Has right turn bay	Visibility for right turn (m)	Blocks?	Blocking queue (PCU)
C	9.40			85.0	✓	0.00

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

Minor Arm Geometry

Arm	Minor arm type	Width at give-way (m)	Width at 5m (m)	Width at 10m (m)	Width at 15m (m)	Width at 20m (m)	Estimate flare length	Flare length (PCU)	Visibility to left (m)	Visibility to right (m)
B	One lane plus flare	10.00	10.00	8.00	4.00	3.30		1.00	50	50

Slope / Intercept / Capacity

Priority Intersection Slopes and Intercepts

Stream	Intercept (Veh/hr)	Slope for A-B	Slope for A-C	Slope for C-A	Slope for C-B
B-A	605	0.094	0.237	0.149	0.339
B-C	738	0.096	0.244	-	-
C-B	623	0.206	0.206	-	-

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	2022	AM	ONE HOUR	08:00	09:30	15	✓

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	✓	382	100.000
B		ONE HOUR	✓	343	100.000
C		ONE HOUR	✓	391	100.000

Origin-Destination Data

Demand (Veh/hr)

		To		
		A	B	C
From	A	0	165	217
	B	171	0	172
	C	235	156	0

Vehicle Mix

Heavy Vehicle Percentages

		To		
		A	B	C
From	A	0	0	5
	B	0	0	0
	C	5	0	0

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-C	0.35	10.35	0.5	B	158	237
B-A	0.48	17.35	0.9	C	157	235
C-AB	0.38	8.17	0.8	A	211	316
C-A					148	222
A-B					151	227
A-C					199	299

Main Results for each time segment

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-C	129	32	627	0.207	128	0.0	0.3	7.206	A
B-A	129	32	480	0.268	127	0.0	0.4	10.177	B
C-AB	159	40	681	0.233	157	0.0	0.4	6.858	A
C-A	136	34			136				
A-B	124	31			124				
A-C	163	41			163				

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-C	155	39	594	0.260	154	0.3	0.3	8.183	A
B-A	154	38	451	0.341	153	0.4	0.5	12.044	B
C-AB	202	51	694	0.291	202	0.4	0.5	7.305	A
C-A	149	37			149				
A-B	148	37			148				
A-C	195	49			195				

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-C	189	47	536	0.354	189	0.3	0.5	10.351	B
B-A	188	47	409	0.460	187	0.5	0.8	16.119	C
C-AB	271	68	713	0.380	269	0.5	0.8	8.117	A
C-A	160	40			160				
A-B	182	45			182				
A-C	239	60			239				

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-C	189	47	546	0.347	189	0.5	0.5	10.096	B
B-A	188	47	395	0.477	188	0.8	0.9	17.354	C
C-AB	271	68	713	0.380	271	0.8	0.8	8.173	A
C-A	159	40			159				
A-B	182	45			182				
A-C	239	60			239				

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-C	155	39	609	0.254	155	0.5	0.3	7.950	A
B-A	154	38	436	0.353	155	0.9	0.6	12.894	B
C-AB	203	51	695	0.292	204	0.8	0.6	7.384	A
C-A	149	37			149				
A-B	148	37			148				
A-C	195	49			195				

09:15 - 09:30

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-C	129	32	645	0.201	130	0.3	0.3	6.992	A
B-A	129	32	463	0.278	129	0.6	0.4	10.828	B
C-AB	159	40	682	0.234	160	0.6	0.4	6.930	A
C-A	135	34			135				
A-B	124	31			124				
A-C	163	41			163				

JUNCTION 1 - DO NOTHING - 2022, PM

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction type	Major road direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	untitled	T-Junction	Two-way		4.34	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	2022	PM	ONE HOUR	18:00	19:30	15	✓

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	✓	379	100.000
B		ONE HOUR	✓	259	100.000
C		ONE HOUR	✓	445	100.000

Origin-Destination Data

Demand (Veh/hr)

		To		
		A	B	C
From	A	0	182	197
	B	147	0	112
	C	302	143	0

Vehicle Mix

Heavy Vehicle Percentages

		To		
		A	B	C
From	A	0	0	5
	B	0	0	0
	C	5	0	0

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-C	0.21	7.97	0.3	A	103	154
B-A	0.40	14.58	0.6	B	135	202
C-AB	0.37	7.47	0.9	A	214	322
C-A					194	291
A-B					167	251
A-C					181	271

Main Results for each time segment

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-C	84	21	652	0.129	84	0.0	0.1	6.331	A
B-A	111	28	469	0.236	109	0.0	0.3	9.977	A
C-AB	158	39	716	0.220	156	0.0	0.4	6.427	A
C-A	177	44			177				
A-B	137	34			137				
A-C	148	37			148				

18:15 - 18:30

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-C	101	25	624	0.161	101	0.1	0.2	6.882	A
B-A	132	33	444	0.298	132	0.3	0.4	11.503	B
C-AB	204	51	736	0.278	204	0.4	0.5	6.767	A
C-A	196	49			196				
A-B	164	41			164				
A-C	177	44			177				

18:30 - 18:45

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-C	123	31	576	0.214	123	0.2	0.3	7.943	A
B-A	162	40	409	0.396	161	0.4	0.6	14.458	B
C-AB	280	70	764	0.366	279	0.5	0.9	7.412	A
C-A	210	53			210				
A-B	200	50			200				
A-C	217	54			217				

18:45 - 19:00

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-C	123	31	575	0.215	123	0.3	0.3	7.972	A
B-A	162	40	409	0.396	162	0.6	0.6	14.576	B
C-AB	280	70	765	0.367	280	0.9	0.9	7.467	A
C-A	210	52			210				
A-B	200	50			200				
A-C	217	54			217				

19:00 - 19:15

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-C	101	25	622	0.162	101	0.3	0.2	6.912	A
B-A	132	33	444	0.298	133	0.6	0.4	11.619	B
C-AB	205	51	736	0.278	206	0.9	0.6	6.839	A
C-A	195	49			195				
A-B	164	41			164				
A-C	177	44			177				

19:15 - 19:30

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-C	84	21	650	0.130	84	0.2	0.2	6.362	A
B-A	111	28	468	0.236	111	0.4	0.3	10.088	B
C-AB	158	40	716	0.221	159	0.6	0.4	6.492	A
C-A	177	44			177				
A-B	137	34			137				
A-C	148	37			148				

JUNCTION 1 - DO NOTHING - 2026, AM

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction type	Major road direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	untitled	T-Junction	Two-way		6.59	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	Relationship type	Relationship
D3	2026	AM	ONE HOUR	08:00	09:30	15	✓	Simple	D1*1.066

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	✓	407	100.000
B		ONE HOUR	✓	366	100.000
C		ONE HOUR	✓	417	100.000

Origin-Destination Data

Demand (Veh/hr)

		To		
		A	B	C
From	A	0	176	231
	B	182	0	183
	C	251	166	0

Vehicle Mix

Heavy Vehicle Percentages

		To		
		A	B	C
From	A	0	0	5
	B	0	0	0
	C	5	0	0

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-C	0.40	11.63	0.6	B	168	252
B-A	0.53	20.11	1.1	C	167	251
C-AB	0.41	8.58	1.0	A	231	346
C-A					152	227
A-B					161	242
A-C					212	318

Main Results for each time segment

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-C	138	35	617	0.224	137	0.0	0.3	7.477	A
B-A	137	34	470	0.292	136	0.0	0.4	10.701	B
C-AB	173	43	685	0.252	171	0.0	0.4	6.984	A
C-A	141	35			141				
A-B	132	33			132				
A-C	174	44			174				

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-C	165	41	579	0.285	164	0.3	0.4	8.682	A
B-A	164	41	440	0.373	163	0.4	0.6	12.992	B
C-AB	221	55	700	0.316	220	0.4	0.6	7.509	A
C-A	154	38			154				
A-B	158	40			158				
A-C	208	52			208				

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-C	202	50	509	0.396	201	0.4	0.6	11.632	B
B-A	201	50	392	0.512	199	0.6	1.0	18.469	C
C-AB	298	75	720	0.414	297	0.6	1.0	8.507	A
C-A	161	40			161				
A-B	194	48			194				
A-C	255	64			255				

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-C	202	50	516	0.391	202	0.6	0.6	11.449	B
B-A	201	50	379	0.530	200	1.0	1.1	20.113	C
C-AB	299	75	720	0.415	299	1.0	1.0	8.580	A
C-A	160	40			160				
A-B	194	48			194				
A-C	255	64			255				

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-C	165	41	592	0.279	166	0.6	0.4	8.475	A
B-A	164	41	424	0.387	166	1.1	0.6	14.029	B
C-AB	222	55	700	0.317	223	1.0	0.6	7.608	A
C-A	153	38			153				
A-B	158	40			158				
A-C	208	52			208				

09:15 - 09:30

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-C	138	35	634	0.218	138	0.4	0.3	7.273	A
B-A	137	34	454	0.303	138	0.6	0.4	11.440	B
C-AB	173	43	686	0.253	174	0.6	0.5	7.069	A
C-A	140	35			140				
A-B	132	33			132				
A-C	174	44			174				

JUNCTION 1 - DO NOTHING - 2026, PM

Data Errors and Warnings

No errors or warnings

Junction Network

Junctions

Junction	Name	Junction type	Major road direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	untitled	T-Junction	Two-way		4.74	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	Relationship type	Relationship
D4	2026	PM	ONE HOUR	18:00	19:30	15	✓	Simple	D2*1.066

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	✓	404	100.000
B		ONE HOUR	✓	276	100.000
C		ONE HOUR	✓	474	100.000

Origin-Destination Data

Demand (Veh/hr)

		To		
		A	B	C
From	A	0	194	210
	B	157	0	119
	C	322	152	0

Vehicle Mix

Heavy Vehicle Percentages

		To		
		A	B	C
From	A	0	0	5
	B	0	0	0
	C	5	0	0

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-C	0.24	8.53	0.3	A	110	164
B-A	0.44	16.13	0.8	C	144	216
C-AB	0.40	7.80	1.0	A	237	355
C-A					199	298
A-B					178	267
A-C					193	289

Main Results for each time segment

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-C	90	22	643	0.140	89	0.0	0.2	6.495	A
B-A	118	29	461	0.256	117	0.0	0.3	10.420	B
C-AB	173	43	722	0.239	171	0.0	0.4	6.521	A
C-A	184	46			184				
A-B	146	37			146				
A-C	158	40			158				

18:15 - 18:30

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-C	107	27	611	0.176	107	0.2	0.2	7.142	A
B-A	141	35	434	0.325	140	0.3	0.5	12.236	B
C-AB	225	56	744	0.303	224	0.4	0.6	6.925	A
C-A	201	50			201				
A-B	174	44			174				
A-C	189	47			189				

18:30 - 18:45

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-C	131	33	555	0.237	131	0.2	0.3	8.486	A
B-A	173	43	396	0.436	171	0.5	0.7	15.955	C
C-AB	311	78	775	0.401	309	0.6	1.0	7.737	A
C-A	211	53			211				
A-B	214	53			214				
A-C	231	58			231				

18:45 - 19:00

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-C	131	33	553	0.238	131	0.3	0.3	8.531	A
B-A	173	43	396	0.436	172	0.7	0.8	16.132	C
C-AB	312	78	776	0.402	311	1.0	1.0	7.801	A
C-A	211	53			211				
A-B	214	53			214				
A-C	231	58			231				

19:00 - 19:15

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-C	107	27	609	0.176	108	0.3	0.2	7.185	A
B-A	141	35	433	0.325	142	0.8	0.5	12.393	B
C-AB	226	56	745	0.303	227	1.0	0.7	7.018	A
C-A	201	50			201				
A-B	174	44			174				
A-C	189	47			189				

19:15 - 19:30

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-C	90	22	641	0.140	90	0.2	0.2	6.531	A
B-A	118	29	460	0.256	119	0.5	0.4	10.557	B
C-AB	174	43	723	0.240	174	0.7	0.5	6.596	A
C-A	184	46			184				
A-B	146	37			146				
A-C	158	40			158				

JUNCTION 1 - DO NOTHING - 2031, 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		7.84	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	Relationship type	Relationship
D5	2031	AM	ONE HOUR	08:00	09:30	15	✓	Simple	D1*1.143

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	✓	437	100.000
B		ONE HOUR	✓	392	100.000
C		ONE HOUR	✓	447	100.000

Origin-Destination Data

Demand (Veh/hr)

		To		
		A	B	C
From	A	0	189	248
	B	195	0	197
	C	269	178	0

Vehicle Mix

Heavy Vehicle Percentages

		To		
		A	B	C
From	A	0	0	5
	B	0	0	0
	C	5	0	0

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-C	0.46	13.89	0.8	B	180	271
B-A	0.60	24.90	1.4	C	179	269
C-AB	0.46	9.16	1.2	A	256	384
C-A					154	231
A-B					173	260
A-C					228	341

Main Results for each time segment

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-C	148	37	604	0.245	147	0.0	0.3	7.848	A
B-A	147	37	459	0.320	145	0.0	0.5	11.394	B
C-AB	190	47	691	0.275	188	0.0	0.5	7.146	A
C-A	147	37			147				
A-B	142	35			142				
A-C	187	47			187				

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-C	177	44	559	0.316	176	0.3	0.5	9.391	A
B-A	176	44	425	0.413	175	0.5	0.7	14.331	B
C-AB	244	61	706	0.346	244	0.5	0.7	7.785	A
C-A	157	39			157				
A-B	170	42			170				
A-C	223	56			223				

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-C	216	54	474	0.457	215	0.5	0.8	13.829	B
B-A	215	54	371	0.580	213	0.7	1.3	22.366	C
C-AB	332	83	728	0.456	330	0.7	1.2	9.055	A
C-A	160	40			160				
A-B	208	52			208				
A-C	273	68			273				

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-C	216	54	475	0.455	216	0.8	0.8	13.893	B
B-A	215	54	358	0.600	215	1.3	1.4	24.901	C
C-AB	333	83	729	0.457	333	1.2	1.2	9.156	A
C-A	159	40			159				
A-B	208	52			208				
A-C	273	68			273				

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-C	177	44	568	0.311	178	0.8	0.5	9.260	A
B-A	176	44	410	0.429	178	1.4	0.8	15.727	C
C-AB	245	61	707	0.347	247	1.2	0.7	7.908	A
C-A	157	39			157				
A-B	170	42			170				
A-C	223	56			223				

09:15 - 09:30

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-C	148	37	619	0.239	149	0.5	0.3	7.654	A
B-A	147	37	443	0.332	148	0.8	0.5	12.259	B
C-AB	191	48	691	0.276	192	0.7	0.5	7.246	A
C-A	146	36			146				
A-B	142	35			142				
A-C	187	47			187				

JUNCTION 1 - DO NOTHING - 2031, 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		5.32	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	Relationship type	Relationship
D6	2031	PM	ONE HOUR	18:00	19:30	15	✓	Simple	D2*1.143

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	✓	433	100.000
B		ONE HOUR	✓	296	100.000
C		ONE HOUR	✓	509	100.000

Origin-Destination Data

Demand (Veh/hr)

		To		
		A	B	C
From	A	0	208	225
	B	168	0	128
	C	345	163	0

Vehicle Mix

Heavy Vehicle Percentages

		To		
		A	B	C
From	A	0	0	5
	B	0	0	0
	C	5	0	0

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-C	0.27	9.38	0.4	A	117	176
B-A	0.49	18.47	0.9	C	154	231
C-AB	0.44	8.29	1.2	A	264	397
C-A					202	304
A-B					191	286
A-C					207	310

Main Results for each time segment

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-C	96	24	632	0.152	96	0.0	0.2	6.702	A
B-A	126	32	451	0.280	125	0.0	0.4	10.988	B
C-AB	191	48	730	0.262	189	0.0	0.5	6.642	A
C-A	192	48			192				
A-B	157	39			157				
A-C	170	42			170				

18:15 - 18:30

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-C	115	29	595	0.193	115	0.2	0.2	7.498	A
B-A	151	38	422	0.358	150	0.4	0.5	13.221	B
C-AB	251	63	754	0.333	250	0.5	0.7	7.143	A
C-A	206	52			206				
A-B	187	47			187				
A-C	202	51			202				

18:30 - 18:45

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-C	141	35	527	0.267	140	0.2	0.4	9.302	A
B-A	185	46	380	0.487	184	0.5	0.9	18.163	C
C-AB	350	87	788	0.444	348	0.7	1.2	8.194	A
C-A	210	53			210				
A-B	229	57			229				
A-C	248	62			248				

18:45 - 19:00

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-C	141	35	525	0.269	141	0.4	0.4	9.381	A
B-A	185	46	380	0.487	185	0.9	0.9	18.467	C
C-AB	351	88	788	0.445	351	1.2	1.2	8.286	A
C-A	209	52			209				
A-B	229	57			229				
A-C	248	62			248				

19:00 - 19:15

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-C	115	29	592	0.194	116	0.4	0.2	7.559	A
B-A	151	38	421	0.359	152	0.9	0.6	13.462	B
C-AB	252	63	755	0.334	254	1.2	0.8	7.257	A
C-A	205	51			205				
A-B	187	47			187				
A-C	202	51			202				

19:15 - 19:30

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-C	96	24	630	0.153	97	0.2	0.2	6.749	A
B-A	126	32	450	0.281	127	0.6	0.4	11.166	B
C-AB	192	48	731	0.263	193	0.8	0.5	6.736	A
C-A	191	48			191				
A-B	157	39			157				
A-C	170	42			170				

JUNCTION 1 - DO NOTHING - 2041, 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		9.17	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	Relationship type	Relationship
D7	2041	AM	ONE HOUR	08:00	09:30	15	✓	Simple	D1*1.196

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	✓	457	100.000
B		ONE HOUR	✓	410	100.000
C		ONE HOUR	✓	468	100.000

Origin-Destination Data

Demand (Veh/hr)

		To		
		A	B	C
From	A	0	197	260
	B	205	0	206
	C	281	187	0

Vehicle Mix

Heavy Vehicle Percentages

		To		
		A	B	C
From	A	0	0	5
	B	0	0	0
	C	5	0	0

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-C	0.51	16.65	1.0	C	189	283
B-A	0.66	30.00	1.8	D	188	282
C-AB	0.49	9.63	1.3	A	274	411
C-A					155	233
A-B					181	272
A-C					238	357

Main Results for each time segment

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-C	155	39	595	0.260	153	0.0	0.3	8.133	A
B-A	154	38	452	0.341	152	0.0	0.5	11.929	B
C-AB	202	51	694	0.291	200	0.0	0.5	7.270	A
C-A	150	37			150				
A-B	149	37			149				
A-C	195	49			195				

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-C	185	46	544	0.340	184	0.3	0.5	9.987	A
B-A	184	46	415	0.443	183	0.5	0.8	15.472	C
C-AB	261	65	710	0.368	260	0.5	0.8	7.997	A
C-A	159	40			159				
A-B	177	44			177				
A-C	233	58			233				

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-C	226	57	446	0.508	225	0.5	1.0	16.128	C
B-A	225	56	356	0.633	222	0.8	1.6	26.251	D
C-AB	357	89	734	0.487	355	0.8	1.3	9.505	A
C-A	158	39			158				
A-B	217	54			217				
A-C	286	71			286				

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-C	226	57	442	0.512	226	1.0	1.0	16.645	C
B-A	225	56	343	0.656	224	1.6	1.8	29.997	D
C-AB	358	89	734	0.487	358	1.3	1.3	9.634	A
C-A	157	39			157				
A-B	217	54			217				
A-C	286	71			286				

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-C	185	46	550	0.336	187	1.0	0.5	9.966	A
B-A	184	46	399	0.460	188	1.8	0.9	17.262	C
C-AB	262	66	711	0.369	264	1.3	0.8	8.145	A
C-A	158	40			158				
A-B	177	44			177				
A-C	233	58			233				

09:15 - 09:30

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-C	155	39	609	0.254	156	0.5	0.3	7.957	A
B-A	154	38	435	0.354	155	0.9	0.6	12.911	B
C-AB	203	51	695	0.292	204	0.8	0.6	7.382	A
C-A	149	37			149				
A-B	149	37			149				
A-C	195	49			195				

JUNCTION 1 - DO NOTHING - 2041, 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		5.83	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	Relationship type	Relationship
D8	2041	PM	ONE HOUR	18:00	19:30	15	✓	Simple	D2*1.196

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	✓	453	100.000
B		ONE HOUR	✓	310	100.000
C		ONE HOUR	✓	532	100.000

Origin-Destination Data

Demand (Veh/hr)

		To		
		A	B	C
From	A	0	218	236
	B	176	0	134
	C	361	171	0

Vehicle Mix

Heavy Vehicle Percentages

		To		
		A	B	C
From	A	0	0	5
	B	0	0	0
	C	5	0	0

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-C	0.29	10.15	0.4	B	123	184
B-A	0.53	20.54	1.1	C	161	242
C-AB	0.48	8.70	1.4	A	285	427
C-A					204	305
A-B					200	300
A-C					216	324

Main Results for each time segment

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-C	101	25	624	0.162	100	0.0	0.2	6.857	A
B-A	132	33	444	0.298	131	0.0	0.4	11.418	B
C-AB	204	51	736	0.278	202	0.0	0.5	6.736	A
C-A	196	49			196				
A-B	164	41			164				
A-C	177	44			177				

18:15 - 18:30

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-C	120	30	583	0.207	120	0.2	0.3	7.776	A
B-A	158	40	414	0.382	157	0.4	0.6	14.004	B
C-AB	270	67	761	0.354	268	0.5	0.8	7.314	A
C-A	209	52			209				
A-B	196	49			196				
A-C	212	53			212				

18:30 - 18:45

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-C	147	37	505	0.292	147	0.3	0.4	10.032	B
B-A	194	48	369	0.524	192	0.6	1.1	20.092	C
C-AB	379	95	796	0.475	376	0.8	1.4	8.579	A
C-A	207	52			207				
A-B	240	60			240				
A-C	259	65			259				

18:45 - 19:00

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-C	147	37	502	0.294	147	0.4	0.4	10.152	B
B-A	194	48	368	0.525	193	1.1	1.1	20.544	C
C-AB	380	95	797	0.476	380	1.4	1.4	8.696	A
C-A	206	52			206				
A-B	240	60			240				
A-C	259	65			259				

19:00 - 19:15

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-C	120	30	580	0.208	121	0.4	0.3	7.859	A
B-A	158	40	413	0.383	160	1.1	0.6	14.333	B
C-AB	271	68	762	0.355	273	1.4	0.8	7.454	A
C-A	208	52			208				
A-B	196	49			196				
A-C	212	53			212				

19:15 - 19:30

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-C	101	25	622	0.162	101	0.3	0.2	6.917	A
B-A	132	33	444	0.298	133	0.6	0.4	11.632	B
C-AB	205	51	737	0.279	207	0.8	0.6	6.839	A
C-A	195	49			195				
A-B	164	41			164				
A-C	177	44			177				

TRANSYT 15

Version: 15.5.2.7994
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Filename: Junction 1 - DO SOMETHING - AM.t16
Path: M:\Projects\19\19-020 - Malahide Road\Design\Traffic\Auburn Masterplan - 2022\Junction Analysis\Junction 1
Report generation date: 05/10/2022 16:34:00

»A1 - DO SOMETHING - 2026 (OPENING YEAR) : D1 - DO SOMETHING - 2026 (OPENING YEAR), * :
»A2 - DO SOMETHING - 2031 (OPENING YEAR + 5 YEARS) : D2 - DO SOMETHING - 2031 (OPENING YEAR + 5 YEARS), * :
»A3 - DO SOMETHING - 2041 (OPENING YEAR + 15 YEARS) : D3 - DO SOMETHING - 2041 (OPENING YEAR + 15 YEARS), * :

File summary

File description

File title	(untitled)
Location	
Site number	
UTCRegion	
Driving side	Left
Date	06/12/2011
Version	
Status	(new file)
Identifier	
Client	
Jobnumber	
Enumerator	DOMAIN\f.silva
Description	

Model and Results

Enable controller offsets	Enable fuel consumption	Enable quick flares	Display journey time results	Display level of service results	Display blocking and starvation results	Display end of red and green queue results	Display excess queue results	Display separate uniform and random results	Display unweighted results	Display TRANSYT 12 style timings	Display effective greens in results	Display Red-With-Amber	Display End-Of-Green Amber
			✓		✓		✓	✓					

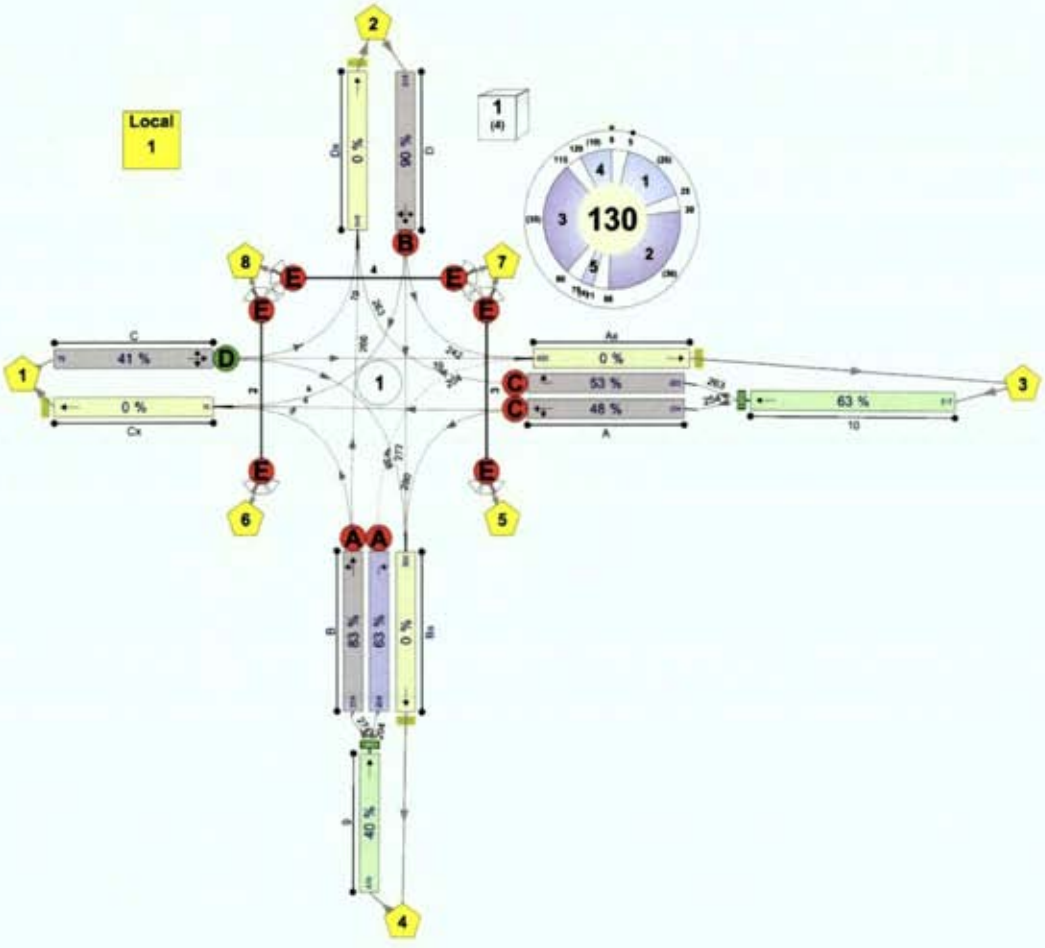
Units

Cost units	Speed units	Distance units	Fuel economy units	Fuel rate units	Mass units	Traffic units input	Traffic units results	Flow units	Average delay units	Total delay units	Rate of delay units
£	kph	m	mpg	l/h	kg	Veh	Veh	perHour	s	-Hour	perHour

Sorting

Show names instead of IDs	Sorting direction	Sorting type	Ignore prefixes when sorting	Analysis/demand set sorting	Link grouping	Source grouping	Colour Analysis/Demand Sets
	Ascending	Numerical		ID	Normal	Normal	✓

Network Diagrams



(untitled)
Diagram produced using TRANSYT 15.5.2.7994

A1 - DO SOMETHING - 2026 (OPENING YEAR)
D1 - DO SOMETHING - 2026 (OPENING YEAR), *

Summary

Data Errors and Warnings

No errors or warnings

Run Summary

Analysis set used	Run start time	Run finish time	Modelling start time (HH:mm)	Network Cycle Time (s)	Performance Index (£ per hr)	Total network delay (Veh-hr/hr)	Highest DOS (%)	Item with highest DOS	Number of oversaturated items	Percentage of oversaturated items (%)	Item with worst signalised PRC	Item with worst unsignalised PRC	Ite wit wor over PR
1	05/10/2022 16:33:30	05/10/2022 16:33:30	08:00	130	507.28	34.36	81.09	D/1	0	0	D/1	10/1	D/

Analysis Set Details

Name	Description	Demand set	Include in report	Locked
DO SOMETHING - 2026 (OPENING YEAR)		D1	✓	

Demand Set Details

Name	Description	Composite	Demand sets	Start time (HH:mm)	Locked
DO SOMETHING - 2026 (OPENING YEAR),				08:00	

Arms and Traffic Streams

Arms

Arm	Name	Description	Traffic node
A	(untitled)		1
Ax	(untitled)		
B	(untitled)		1
Bx	(untitled)		
C	(untitled)		1
Cx	(untitled)		
D	(untitled)		1
Dx	(untitled)		
9			1
10			1

Traffic Streams

Arm	Traffic Stream	Name	Description	Auto length	Length (m)	Has Saturation Flow	Saturation flow source	Saturation flow (PCU/hr)	Auto-calculate cell saturation flow	Cell saturation flow (PCU/hr)	Is signal controlled	Is give way	Traffic type	Allow Nearside Turn On Red
A	1	(untitled)			100.00	✓	Sum of lanes	1898	✓	1800	✓		Normal	
	2				14.00	✓	Sum of lanes	1800			✓		Normal	
Ax	1	(untitled)		✓	135.51								Normal	
B	1	(untitled)			100.00	✓	Sum of lanes	2053			✓		Normal	
	2				18.00	✓	Sum of lanes	1993			✓	✓	Normal	
Bx	1	(untitled)		✓	139.32								Normal	
C	1	(untitled)			100.00	✓	Sum of lanes	1999			✓		Normal	
Cx	1	(untitled)		✓	138.83								Normal	
D	1	(untitled)			100.00	✓	Sum of lanes	2019			✓		Normal	
Dx	1	(untitled)		✓	134.44								Normal	
9	1			✓	43.24	✓	Sum of lanes	1800					Normal	
10	1			✓	63.04	✓	Sum of lanes	1800					Normal	

Lanes

Arm	Traffic Stream	Lane	Name	Description	Use RR67	Surface condition	Site quality factor	Gradient (%)	Width (m)	Use connector turning radius	Proportion that turn (%)	Turning radius (m)	Nearside lane	Saturation flow (PCU/hr)
A	1	1	(untitled)		✓	N/A	N/A	2	3.00	✓	98	38.14		1898
	2	1	(untitled)											1800
Ax	1	1	(untitled)											
B	1	1	(untitled)		✓	N/A	N/A	-2	3.00	✓	3	43.56		2053
	2	1	(untitled)		✓	N/A	N/A	-2	3.00	✓	100	48.44		1993
Bx	1	1	(untitled)											
C	1	1	(untitled)		✓	N/A	N/A	-10	3.00	✓	75	40.00		1999
Cx	1	1	(untitled)											
D	1	1	(untitled)		✓	N/A	N/A	-2	3.00	✓	48	40.00		2019
Dx	1	1	(untitled)											
9	1	1	(untitled)											1800
10	1	1	(untitled)											1800

Modelling

Arm	Traffic Stream	Traffic model	Stop weighting multiplier (%)	Delay weighting multiplier (%)	Assignment Cost Weighting (%)	Exclude from results calculation	Max queue storage (PCU)	Has queue limit	Queue limit (PCU)	Excess queue penalty (£)	Has degree of saturation limit
A	1	CTM	100	100	100		0.00				
	2	Flare	100	100	100		2.00				
Ax	1	NetworkDefault	100	100	100		0.00				
B	1	PDM	100	100	100		0.00	✓	0.00	0.00	
	2	Flare	100	100	100		4.00				
Bx	1	NetworkDefault	100	100	100		0.00				
C	1	PDM	100	100	100		0.00				
Cx	1	NetworkDefault	100	100	100		0.00				
D	1	PDM	100	100	100		0.00				
Dx	1	NetworkDefault	100	100	100		0.00				
9	1	NetworkDefault	100	100	100		0.00				
10	1	NetworkDefault	100	100	100		0.00				

Modelling - Advanced

Arm	Traffic Stream	Initial queue (PCU)	Type of Vehicle-in-Service	Vehicle-in-Service	Type of random parameter	Random parameter	Auto cycle time	Cycle time
A	1	0.00	NetworkDefault	Not-Included	NetworkDefault	0.50	✓	130
	2	2.00	NetworkDefault	Not-Included	NetworkDefault	0.50	✓	130
Ax	1	0.00	NetworkDefault	Not-Included	NetworkDefault	0.50	✓	130
B	1	0.00	NetworkDefault	Not-Included	NetworkDefault	0.50	✓	130
	2	4.00	NetworkDefault	Not-Included	NetworkDefault	0.50	✓	130
Bx	1	0.00	NetworkDefault	Not-Included	NetworkDefault	0.50	✓	130
C	1	0.00	NetworkDefault	Not-Included	NetworkDefault	0.50	✓	130
Cx	1	0.00	NetworkDefault	Not-Included	NetworkDefault	0.50	✓	130
D	1	0.00	NetworkDefault	Not-Included	NetworkDefault	0.50	✓	130
Dx	1	0.00	NetworkDefault	Not-Included	NetworkDefault	0.50	✓	130
9	1	0.00	NetworkDefault	Not-Included	NetworkDefault	0.50	✓	130
10	1	0.00	NetworkDefault	Not-Included	NetworkDefault	0.50	✓	130

Normal traffic - Modelling

Arm	Traffic Stream	Stop weighting (%)	Delay weighting (%)
(ALL)	(ALL)	100	100

Normal traffic - Advanced

Arm	Traffic Stream	Dispersion type for Normal Traffic
(ALL)	(ALL)	NetworkDefault

Flows

Arm	Traffic Stream	Total Flow (Veh/hr)	Normal Flow (Veh/hr)
A	1	243	243
	2	235	235
Ax	1	421	421
B	1	246	246
	2	183	183
Bx	1	520	520
C	1	76	76
Cx	1	16	16
D	1	466	466
Dx	1	492	492
9	1	429	429
10	1	478	478

Signals

Arm	Traffic Stream	Controller stream	Phase	Second phase enabled
A	1	1	C	
	2	1	C	
B	1	1	A	
	2	1	A	
C	1	1	D	
D	1	1	B	

Entry Sources

Arm	Traffic Stream	Cruise time for Normal Traffic (s)	Cruise speed for Normal Traffic (kph)
C	1	12.00	30.00
D	1	12.00	30.00
9	1	5.19	30.00
10	1	7.56	30.00

Sources

Arm	Traffic Stream	Source	Source traffic stream	Destination traffic stream	Cruise time for Normal Traffic (s)	Cruise speed for Normal Traffic (kph)	Auto turning radius	Traffic turn style	Turning radius (m)
A	1	1	10/1	A/1	12.00	30.00	✓	Straight	Straight Movement
	2	1	10/1	A/2	1.68	30.00	✓	Straight	Straight Movement
Ax	1	1	C/1	Ax/1	16.26	30.00	✓	Straight	Straight Movement
B	1	1	9/1	B/1	12.00	30.00	✓	Straight	Straight Movement
	2	1	9/1	B/2	2.16	30.00	✓	Straight	Straight Movement
Bx	1	1	A/1	Bx/1	16.72	30.00	✓	Nearside	38.14
Cx	1	1	A/1	Cx/1	16.66	30.00	✓	Straight	Straight Movement
Dx	1	1	C/1	Dx/1	16.13	30.00	✓	Nearside	40.00
Ax	1	2	D/1	Ax/1	16.26	30.00	✓	Nearside	40.00
Bx	1	2	D/1	Bx/1	16.72	30.00	✓	Straight	Straight Movement
Cx	1	2	B/1	Cx/1	16.66	30.00	✓	Nearside	43.56
Dx	1	2	B/1	Dx/1	16.13	30.00	✓	Straight	Straight Movement
Ax	1	3	B/2	Ax/1	16.26	30.00	✓	Offside	48.44
Bx	1	3	C/1	Bx/1	16.72	30.00	✓	Offside	60.00
Cx	1	3	D/1	Cx/1	16.66	30.00	✓	Offside	55.00
Dx	1	3	A/2	Dx/1	16.13	30.00	✓	Offside	47.67

Give Way Data

Arm	Traffic Stream	Opposed traffic	Use Step-wise Opposed Turn Model	Visibility restricted
B	2	AllTraffic		

Give Way Data - All Movements - Conflicts

Traffic Stream	Description	Controlling type	Controlling traffic stream	Percentage opposing (%)	Slope coefficient	Upstream signals visible	Conflict shift	Conflict duration
2		TrafficStream	A/2	100	0.00		0	0

Pedestrian Crossings

Pedestrian Crossings

Crossing	Name	Description	Traffic node	Allow walk on red	Crossing type	Length (m)	Cruise time (seconds)	Cruise speed (kph)
2	(untitled)		1		Farside	8.00	5.33	5.40
3	(untitled)		1		Farside	8.00	5.33	5.40
4	(untitled)		1		Farside	7.00	4.67	5.40

Pedestrian Crossings - Signals

Crossing	Controller stream	Phase	Second phase enabled
(ALL)	1	E	

Pedestrian Crossings - Sides

Crossing	Side	Saturation flow (Ped/hr)
(ALL)	(ALL)	11000

Pedestrian Crossings - Modelling

Crossing	Side	Delay weighting (%)	Assignment Cost Weighting (%)	Exclude from results calculation	Max queue storage (Ped)	Has queue limit	Has degree of saturation limit
(ALL)	(ALL)	100	100		0.00		

Signal Timings

Network Default: 130s cycle time; 130 steps

Controller Stream 1

Controller Stream	Name	Description	Use sequence	Cycle time source	Cycle time (s)
1	(untitled)		1	NetworkDefault	130

Controller Stream 1 - Properties

Controller Stream	Manufacturer name	Type	Model number	(Telephone) Line Number	Site number	Grid reference	Gaining delay type
1	Unspecified						Relative

Controller Stream 1 - Optimisation

Controller Stream	Allow offset optimisation	Allow green split optimisation	Optimisation level	Auto redistribute	Enable stage constraint
1	✓	✓	Offsets And Green Splits	✓	

Phases

Controller Stream	Phase	Name	Minimum green (s)	Maximum green (s)	Relative start displacement (s)	Relative end displacement (s)	Type	Blackout Time (s)
1	A	(untitled)	20	300	0	0	Traffic	
	B	(untitled)	36	300	0	0	Traffic	
	C	(untitled)	35	300	0	0	Traffic	
	D	(untitled)	10	10	0	1	Traffic	
	E	(untitled)	4	4	0	0	Pedestrian	0

Library Stages

Controller Stream	Library Stage	Phases in stage	User stage minimum (s)
1	1	A	1
	2	B	1
	3	C	1
	4	D	1
	5	E	1

Stage Sequences

Controller Stream	Sequence	Name	Multiple cycling	Stage IDs	Stage ends
1	1	(untitled)	Single	1, 2, 3, 4, 5	25, 66, 106, 121, 0
	2	(untitled)	Single	1, 2, 3, 5, 4	20, 54, 98, 111, 125
	3	(untitled)	Single	1, 2, 4, 3, 5	20, 54, 68, 112, 125
	4	(untitled)	Single	1, 2, 4, 5, 3	20, 54, 68, 81, 125
	5	(untitled)	Single	1, 2, 5, 3, 4	20, 54, 67, 111, 125
	6	(untitled)	Single	1, 2, 5, 4, 3	20, 54, 67, 81, 125
	7	(untitled)	Single	1, 3, 2, 4, 5	20, 64, 99, 113, 125
	8	(untitled)	Single	1, 3, 2, 5, 4	20, 64, 99, 112, 125
	9	(untitled)	Single	1, 3, 4, 2, 5	20, 64, 78, 112, 125
	10	(untitled)	Single	1, 3, 4, 5, 2	20, 64, 78, 91, 125

Intergreen Matrix for Controller Stream 1

		To				
		A	B	C	D	E
From	A		5	5	9	5
	B	5		5	5	5
	C	5	6		5	5
	D	5	5	5		5
	E	5	5	5	5	

Banned Stage transitions for Controller Stream 1

		To				
		1	2	3	4	5
From	1					
	2					
	3					
	4					
	5					

Interstage Matrix for Controller Stream 1

		To				
		1	2	3	4	5
From	1	0	5	5	9	5
	2	5	0	5	5	5
	3	5	6	0	5	5
	4	5	5	5	0	5
	5	5	5	5	5	0

Resultant Stages

Controller Stream	Resultant Stage	Is base stage	Library Stage ID	Phases in this stage	Stage start (s)	Stage end (s)	Stage duration (s)	User stage minimum (s)	Stage minimum (s)
1	1	✓	1	A	5	25	20	1	20
	2	✓	2	B	30	66	36	1	36
	3	✓	3	C	71	106	35	1	35
	4	✓	4	D	111	121	10	1	10
	5	✓	5	E	126	0	4	1	4

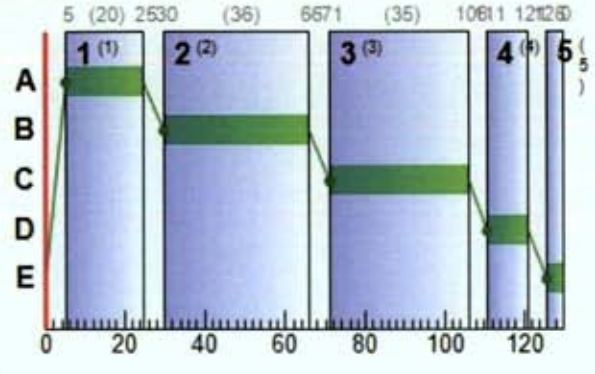
Resultant Phase Green Periods

Controller Stream	Phase	Green period	Is base green period	Start time (s)	End time (s)	Duration (s)
1	A	1	✓	5	25	20
	B	1	✓	30	66	36
	C	1	✓	71	106	35
	D	1	✓	111	121	10
	E	1	✓	126	0	4

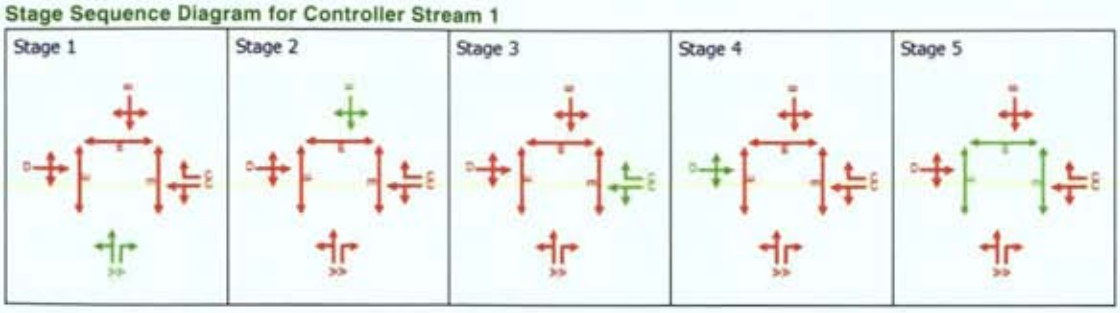
Traffic Stream Green Times

Arm	Traffic Stream	Traffic Node	Controller Stream	Phase	Green Period 1		
					Start	End	Duration
A	1	1	1	C	71	106	35
A	2	1	1	C	71	106	35
B	1	1	1	A	5	25	20
B	2	1	1	A	5	25	20
C	1	1	1	D	111	121	10
D	1	1	1	B	30	66	36

Phase Timings Diagram for Controller Stream 1



Stage Sequence Diagram for Controller Stream 1



Resultant penalties

Time Segment	Controller stream	Phase min max penalty (£ per hr)	Intergreen broken penalty (£ per hr)	Stage constraint broken penalty (£ per hr)	Cost of controller stream penalties (£ per hr)
08:00-09:00	1	0.00	0.00	0.00	0.00

Traffic Stream Results

Traffic Stream Results: Vehicle summary

Time Segment	Arm	Traffic Stream	Degree of saturation (%)	Practical reserve capacity (%)	Calculated flow entering (Veh/hr)	Calculated sat flow (Veh/hr)	Actual green (s (per cycle))	Mean Delay per Veh (s)	Mean max queue (Veh)	Utilised storage (%)	Weighted cost of delay (£ per hr)	Weighted cost of stops (£ per hr)	Performance Index (£ per hr)
08:00-09:00	A	1	46	116	243	1898	35	31.56	3.38	19.44	30.25	1.17	31.43
		2	47	112	235	1800	35	22.36	2.21	110.57	20.73	0.80	21.53
	Ax	1	0	Unrestricted	421	Unrestricted	130	0.00	0.00	0.00	0.00	0.00	0.00
	B	1	74	35	246	2053	20	73.29	8.00	45.99	71.12	2.76	73.87
		2	57	76	183	1993	20	53.09	4.38	109.49	38.33	1.79	40.11
	Bx	1	0	Unrestricted	520	Unrestricted	130	0.00	0.00	0.00	0.00	0.00	0.00
	C	1	41	143	76	1999	10	62.45	2.72	15.63	18.72	0.93	19.66
	Cx	1	0	Unrestricted	16	Unrestricted	130	0.00	0.00	0.00	0.00	0.00	0.00
	D	1	81	23	466	2019	36	56.10	17.20	98.88	103.12	5.89	109.01
	Dx	1	0	Unrestricted	492	Unrestricted	130	0.00	0.00	0.00	0.00	0.00	0.00
	9	1	32	210	429	1800	130	6.46	5.32	70.75	10.93	1.78	12.71
	10	1	55	83	478	1800	130	25.88	12.41	113.22	48.79	4.20	52.99

Traffic Stream Results: Flows and signals

Time Segment	Arm	Traffic Stream	Calculated flow entering (Veh/hr)	Calculated flow out (Veh/hr)	Flow discrepancy (Veh/hr)	Adjusted flow warning	Calculated sat flow (Veh/hr)	Calculated capacity (Veh/hr)	Degree of saturation (%)	DOS Threshold exceeded	Practical reserve capacity (%)	Mean modulus of error	Actual green (s (per cycle))
08:00-09:00	A	1	243	243	0		1898	526	46		116	1.03	35
		2	235	235	0		1800	498	47		112	1.02	35
	Ax	1	421	421	0		Unrestricted	Unrestricted	0		Unrestricted	0.93	130
	B	1	246	246	0		2053	332	74		35	0.47	20
		2	183	183	0		1993	322	57		76	0.51	20
	Bx	1	520	520	0		Unrestricted	Unrestricted	0		Unrestricted	0.66	130
	C	1	76	76	0		1999	185	41		143	0.00	10
	Cx	1	16	16	0		Unrestricted	Unrestricted	0		Unrestricted	0.59	130
	D	1	466	466	0		2019	575	81		23	0.00	36
	Dx	1	492	492	0		Unrestricted	Unrestricted	0		Unrestricted	0.89	130
	9	1	429	429	0		1800	1330	32		210	0.00	130
	10	1	478	478	0		1800	873	55		83	0.00	130

Traffic Stream Results: Stops and delays

Time Segment	Arm	Traffic Stream	Mean Cruise Time per Veh (s)	Mean Delay per Veh (s)	Uniform delay (Veh-hr/hr)	Random plus oversat delay (Veh-hr/hr)	Weighted cost of delay (£ per hr)	Mean stops per Veh (%)	Uniform stops (Stops per hr)	Random stops (Stops per hr)	Weighted cost of stops (£ per hr)
08:00-09:00	A	1	12.00	31.56	1.93	0.20	30.25	38.52	88.16	5.45	1.17
		2	1.68	22.36	1.24	0.22	20.73	27.12	57.92	5.82	0.80
	Ax	1	16.26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	B	1	12.00	73.29	3.98	1.02	71.12	89.37	192.31	27.54	2.76
		2	2.16	53.09	2.27	0.43	38.33	77.92	132.24	10.36	1.79
	Bx	1	16.72	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	C	1	12.00	62.45	1.18	0.14	18.72	98.07	70.63	3.90	0.93
	Cx	1	16.66	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	D	1	12.00	56.10	5.60	1.66	103.12	100.88	425.13	44.95	5.89
	Dx	1	16.13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	9	1	5.19	6.46	0.69	0.08	10.93	33.09	139.82	2.12	1.78
	10	1	7.56	25.88	3.11	0.33	48.79	70.12	326.09	9.09	4.20

Traffic Stream Results: Queues and blocking

Time Segment	Arm	Traffic Stream	Initial queue (Veh)	Mean max queue (Veh)	Max queue storage (Veh)	Utilised storage (%)	Average storage excess queue (Veh)	Average limit excess queue (Veh)	Excess queue penalty (£ per hr)	Wasted time starvation (s (per cycle))	Wasted time blocking back (s (per cycle))	Wasted time total (s (per cycle))	Estimated blocking
08:00-09:00	A	1	0.00	3.38	17.39	19.44	0.00	0.00	0.00	7.00	0.00	7.00	
		2	2.00	2.21	2.00	110.57	0.11	0.00	0.00	0.00	0.00	0.00	
	Ax	1	0.00	0.00	23.57	0.00	0.00	0.00	0.00	47.00	0.00	47.00	
	B	1	0.00	8.00	17.39	45.99	0.00	5.35	0.00	0.00	0.00	0.00	
		2	4.00	4.38	4.00	109.49	0.10	0.00	0.00	0.00	0.00	0.00	
	Bx	1	0.00	0.00	24.23	0.00	0.00	0.00	0.00	31.00	0.00	31.00	
	C	1	0.00	2.72	17.39	15.63	0.00	0.00	0.00	0.00	0.00	0.00	
	Cx	1	0.00	0.00	24.14	0.00	0.00	0.00	0.00	129.00	0.00	129.00	
	D	1	0.00	17.20	17.39	98.88	0.00	0.00	0.00	0.00	0.00	0.00	
	Dx	1	0.00	0.00	23.38	0.00	0.00	0.00	0.00	41.00	0.00	41.00	
	9	1	0.00	5.32	7.52	70.75	0.00	0.00	0.00	0.00	39.00	39.00	
	10	1	0.00	12.41	10.96	113.22	0.07	0.00	0.00	0.00	69.00	69.00	

Traffic Stream Results: Journey times

Time Segment	Arm	Traffic Stream	Distance travelled (PCU-km/hr)	Time spent (PCU-hr/hr)	Mean journey speed (kph)	JourneyTime (s)
08:00-09:00	A	1	24.30	2.94	8.26	43.56
		2	3.29	1.56	2.10	23.95
	Ax	1	57.05	1.90	30.00	16.26
	B	1	24.60	5.83	4.22	85.29
		2	3.29	2.76	1.19	54.34
	Bx	1	72.45	2.41	30.00	16.72
	C	1	7.60	1.57	4.84	74.45
	Cx	1	2.22	0.07	30.00	16.66
	D	1	46.60	8.82	5.29	68.10
	Dx	1	66.14	2.20	30.00	16.13
	9	1	18.55	1.39	13.37	11.65
	10	1	30.13	4.44	6.79	33.44

Traffic Stream Results: Advanced

Time Segment	Arm	Traffic Stream	Degree of saturation penalty (£ per hr)	Ped gap accepting penalty (£ per hr)	Warmed up	Mean Max Queue EoTS (Veh)	Max End of Green Queue EoTS (Veh)	Max End of Red Queue EoTS (Veh)	PCU Factor	Cost of traffic penalties (£ per hr)	Performance Index (£ per hr)
08:00-09:00	A	1	0.00	0.00	✓	3.38	0.20	3.38	1.00	0.00	31.43
		2	0.00	0.00	✓	2.21	0.21	2.21	1.00	0.00	21.53
	Ax	1	0.00	0.00	✓	0.00			1.00	0.00	0.00
	B	1	0.00	0.00	✓	8.02	1.04	7.95	1.00	0.00	73.87
		2	0.00	0.00	✓	4.38	0.38	4.38	1.00	0.00	40.11
	Bx	1	0.00	0.00	✓	0.00			1.00	0.00	0.00
	C	1	0.00	0.00	✓	2.72	0.14	2.63	1.00	0.00	19.66
	Cx	1	0.00	0.00	✓	0.00			1.00	0.00	0.00
	D	1	0.00	0.00	✓	17.23	1.70	13.74	1.00	0.00	109.01
	Dx	1	0.00	0.00	✓	0.00			1.00	0.00	0.00
	9	1	0.00	0.00	✓	5.32			1.00	0.00	12.71
	10	1	0.00	0.00	✓	12.41			1.00	0.00	52.99

Pedestrian Crossing Results

Pedestrian Crossings: Pedestrian summary

Time Segment	Crossing	Side	Degree of saturation (%)	Calculated Flow Entering (Ped/hr)	Calculated sat flow (Ped/hr)	Actual green (s (per cycle))	Mean Delay Per Ped (s)	Mean max queue (Ped)	Weighted cost of delay (£ per hr)	Performance Index (£ per hr)
08:00-09:00	(ALL)	(ALL)	30	100	11000	4	61.68	3.50	24.33	24.33

Pedestrian Crossings: Flows and signals

Time Segment	Crossing	Side	Calculated flow entering (Ped/hr)	Calculated flow out (Ped/hr)	Flow discrepancy (Ped/hr)	Adjusted flow warning	Calculated sat flow (Ped/hr)	Calculated capacity (Ped/hr)	Degree of saturation (%)	DOS Threshold exceeded	Practical reserve capacity (%)	Mean modulus of error	Actual green (s (per cycle))
08:00-09:00	(ALL)	(ALL)	100	100	0		11000	338	30		238	0.00	4

Pedestrian Crossings: Stops and delays

Time Segment	Crossing	Side	Mean Cruise Time per Ped (s)	Mean Delay per Ped (s)	Uniform delay (Ped-hr/hr)	Random plus oversat delay (Ped-hr/hr)	Weighted cost of delay (£ per hr)
08:00-09:00	2	1	6.33	61.68	1.71	0.00	24.33
		2	6.33	61.68	1.71	0.00	24.33
	3	1	6.33	61.68	1.71	0.00	24.33
		2	6.33	61.68	1.71	0.00	24.33
	4	1	5.67	61.68	1.71	0.00	24.33
		2	5.67	61.68	1.71	0.00	24.33

Pedestrian Crossings: Queues and blocking

Time Segment	Crossing	Side	Mean max queue (Ped)	Max queue storage (Ped)	Utilised storage (%)	Average storage excess queue (Ped)	Average limit excess queue (Ped)	Excess queue penalty (£ per hr)
08:00-09:00	(ALL)	(ALL)	3.50	10.00	35.00	0.00	0.00	0.00

Pedestrian Crossings: Journey times

Time Segment	Crossing	Side	Distance travelled (Ped-km/hr)	Time spent (Ped-hr/hr)	Mean journey speed (kph)	JourneyTime (s)
08:00-09:00	2	1	0.90	1.89	0.48	68.01
		2	0.90	1.89	0.48	68.01
	3	1	0.90	1.89	0.48	68.01
		2	0.90	1.89	0.48	68.01
	4	1	0.80	1.87	0.43	67.34
		2	0.80	1.87	0.43	67.34

Pedestrian Crossings: Advanced

Time Segment	Crossing	Side	Degree of saturation penalty (£ per hr)	Ped gap accepting penalty (£ per hr)	Mean Max Queue EoTS (Ped)	Ped Factor	Cost of traffic penalties (£ per hr)	Performance Index (£ per hr)
08:00-09:00	(ALL)	(ALL)	0.00	0.00	3.50	1.00	0.00	24.33

Network Results

Run Summary

Analysis set used	Run start time	Run finish time	Modelling start time (HH:mm)	Network Cycle Time (s)	Performance Index (£ per hr)	Total network delay (Veh-hr/hr)	Highest DOS (%)	Item with highest DOS	Number of oversaturated items	Percentage of oversaturated items (%)	Item with worst signalised PRC	Item with worst unsignalised PRC	Ite wit wor over PR
1	05/10/2022 16:33:30	05/10/2022 16:33:30	08:00	130	507.28	34.36	81.09	D/1	0	0	D/1	10/1	D/

Network Results: Vehicle summary

Time Segment	Degree of saturation (%)	Practical reserve capacity (%)	Calculated flow entering (Veh/hr)	Actual green (s (per cycle))	Mean Delay per Veh (s)	Weighted cost of delay (£ per hr)	Weighted cost of stops (£ per hr)	Performance Index (£ per hr)
08:00-09:00	81	0	3805	936	22.79	341.98	19.33	361.31

Network Results: Pedestrian summary

Time Segment	Degree of saturation (%)	Calculated Flow Entering (Ped/hr)	Actual green (s (per cycle))	Mean Delay Per Ped (s)	Weighted cost of delay (£ per hr)	Performance Index (£ per hr)
08:00-09:00	30	600	24	61.68	145.97	145.97

Network Results: Flows and signals

Time Segment	Calculated flow entering (Veh/hr)	Calculated flow out (Veh/hr)	Flow discrepancy (Veh/hr)	Adjusted flow warning	Degree of saturation (%)	DOS Threshold exceeded	Practical reserve capacity (%)	Actual green (s (per cycle))
08:00-09:00	4405	4405	0		81		23	960

Network Results: Stops and delays

Time Segment	Mean Cruise Time per Veh (s)	Mean Delay per Veh (s)	Uniform delay (Veh-hr/hr)	Random plus oversat delay (Veh-hr/hr)	Weighted cost of delay (£ per hr)	Mean stops per Veh (%)	Uniform stops (Stops per hr)	Random stops (Stops per hr)	Weighted cost of stops (£ per hr)
08:00-09:00	10.54	28.08	30.28	4.08	487.95	34.99	1432.30	109.23	19.33

Network Results: Queues and blocking

Time Segment	Utilised storage (%)	Excess queue penalty (£ per hr)	Wasted time starvation (s (per cycle))	Wasted time blocking back (s (per cycle))	Wasted time total (s (per cycle))
08:00-09:00	113.22	0.00	255.00	108.00	363.00

Network Results: Journey times

Time Segment	Distance travelled (PCU-km/hr)	Time spent (PCU-hr/hr)	Mean journey speed (kph)
08:00-09:00	361.43	47.20	7.66

Network Results: Advanced

Time Segment	Degree of saturation penalty (£ per hr)	Ped gap accepting penalty (£ per hr)	Warmed up	PCU Factor	Cost of traffic penalties (£ per hr)	Controller stream penalties (£ per hr)	Performance Index (£ per hr)
08:00-09:00	0.00	0.00	✓	1.00	0.00	0.00	507.28

Point to Point Journey Time

Average Journey Time (s) for Local Matrix: 1

		To							
		1	2	3	4	5	6	7	8
From	1	0.0	90.6	90.7	91.2	0.0	0.0	0.0	0.0
	2	84.8	0.0	84.4	84.8	0.0	0.0	0.0	0.0
	3	93.7	73.5	0.0	93.7	0.0	0.0	0.0	0.0
	4	113.6	113.1	82.2	0.0	0.0	0.0	0.0	0.0
	5	0.0	0.0	0.0	0.0	0.0	0.0	68.0	0.0
	6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	68.0
	7	0.0	0.0	0.0	0.0	68.0	0.0	0.0	67.3
	8	0.0	0.0	0.0	0.0	0.0	68.0	67.3	0.0

Path Journey Time

Path	From Location	To Location	Normal Calculated Flow (Veh/hr)	Pedestrian calculated flow (Ped/hr)	Normal journey time (s)	Pedestrian journey time (s)	Calculated Total Flow (Veh/hr)	Avg journey time (s)
1	1	2	19		90.59		19	90.59
2	1	3	19		90.72		19	90.72
3	1	4	38		91.17		38	91.17
5	2	3	219		84.36		219	84.36
6	2	4	243		84.82		243	84.82
7	2	1	4		84.76		4	84.76
16	4	2	238		113.07		238	113.07
17	8	7		100		67.34	100	67.34
18	8	6		100		68.01	100	68.01
22	5	7		100		68.01	100	68.01
34	6	8		100		68.01	100	68.01
41	7	8		100		67.34	100	67.34
42	7	5		100		68.01	100	68.01
49	4	1	8		113.60		8	113.60
50	4	3	183		82.25		183	82.25
51	3	2	235		73.52		235	73.52
52	3	4	239		93.72		239	93.72
53	3	1	4		93.67		4	93.67

Final Prediction Table

Traffic Stream Results

				SIGNALS		FLOWS		PERFORMANCE				PER PCU			QUEUES
Arm	Traffic Stream	Name	Traffic node	Controller stream	Phase	Calculated flow entering (Veh/hr)	Calculated sat flow (Veh/hr)	Actual green (s (per cycle))	Wasted time total (s (per cycle))	Degree of saturation (%)	Practical reserve capacity (%)	JourneyTime (s)	Mean Delay per Veh (s)	Mean stops per Veh (%)	Mean max queue (Veh)
A	1	(untitled)	1	1	C	243	1898	35	7.00	46	116	43.56	31.56	38.52	3.38
	2		1	1	C	235 <	1800	35	0.00	47	112	23.95	22.36	27.12	2.21 +
Ax	1	(untitled)				421	Unrestricted	130	47.00	0	Unrestricted	16.26	0.00	0.00	0.00
B	1	(untitled)	1	1	A	246	2053	20	0.00	74	35	85.29	73.29	89.37	8.00
	2		1	1	A	183 <	1993	20	0.00	57	76	54.34	53.09	77.92	4.38 +
Bx	1	(untitled)				520	Unrestricted	130	31.00	0	Unrestricted	16.72	0.00	0.00	0.00
C	1	(untitled)	1	1	D	76	1999	10	0.00	41	143	74.45	62.45	98.07	2.72
Cx	1	(untitled)				16	Unrestricted	130	129.00	0	Unrestricted	16.66	0.00	0.00	0.00
D	1	(untitled)	1	1	B	466	2019	36	0.00	81	23	68.10	56.10	100.88	17.20
Dx	1	(untitled)				492	Unrestricted	130	41.00	0	Unrestricted	16.13	0.00	0.00	0.00
9	1		1			429	1800	130	39.00	32	210	11.65	6.46	33.09	5.32
10	1		1			478 <	1800	130	69.00	55	83	33.44	25.88	70.12	12.41 +

Pedestrian Crossing Results

				SIGNALS		FLOWS		PERFORMANCE			PER PED		QUEUES	WEIGHTS	PEN
Pedestrian	Side	Name	Traffic node	Controller stream	Phase	Calculated Flow Entering (Ped/hr)	Calculated sat flow (Ped/hr)	Actual green (s (per cycle))	Degree of saturation (%)	Practical reserve capacity (%)	JourneyTime (s)	Mean Delay per Ped (s)	Mean max queue (Ped)	Delay weighting (%)	Co tra pen (£ p
2	1	(untitled)	1	1	E	100	11000	4	30	238	68.01	61.68	3.50	100	0
	2	(untitled)	1	1	E	100	11000	4	30	238	68.01	61.68	3.50	100	0
3	1	(untitled)	1	1	E	100	11000	4	30	238	68.01	61.68	3.50	100	0
	2	(untitled)	1	1	E	100	11000	4	30	238	68.01	61.68	3.50	100	0
4	1	(untitled)	1	1	E	100	11000	4	30	238	67.34	61.68	3.50	100	0
	2	(untitled)	1	1	E	100	11000	4	30	238	67.34	61.68	3.50	100	0

Network Results

	Distance travelled (PCU-km/hr)	Time spent (PCU-hr/hr)	Mean journey speed (kph)	Uniform delay (Veh-hr/hr)	Random plus oversat delay (Veh-hr/hr)	Weighted cost of delay (£ per hr)	Weighted cost of stops (£ per hr)	Excess queue penalty (£ per hr)	Performance Index (£ per hr)
Normal traffic	356.23	35.90	9.92	20.01	4.08	341.98	19.33	0.00	361.31
Bus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tram	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pedestrians	5.20	11.30	0.46	10.28	0.00	145.97	0.00	0.00	145.97
TOTAL	361.43	47.20	7.66	30.28	4.08	487.95	19.33	0.00	507.28

- *< = adjusted flow warning (upstream links/traffic streams are over-saturated)*
- ** = Traffic Stream - Normal, Bus or Tram Stop or Delay weighting has been set to a value other than 100%*
- *^ = Traffic Stream - Normal, Bus or Tram Stop or Delay Path weighting has been set to a value other than 100%*
- *+ = average link/traffic stream excess queue is greater than 0*
- ***P.I. = PERFORMANCE INDEX***

A2 - DO SOMETHING - 2031 (OPENING YEAR + 5 YEARS)
D2 - DO SOMETHING - 2031 (OPENING YEAR + 5 YEARS), *

Summary

Data Errors and Warnings

No errors or warnings

Run Summary

Analysis set used	Run start time	Run finish time	Modelling start time (HH:mm)	Network Cycle Time (s)	Performance Index (£ per hr)	Total network delay (Veh-hr/hr)	Highest DOS (%)	Item with highest DOS	Number of oversaturated items	Percentage of oversaturated items (%)	Item with worst signalised PRC	Item with worst unsignalised PRC	Ite wit
2	05/10/2022 16:33:30	05/10/2022 16:33:31	08:00	130	615.32	41.66	88.10	D/1	0	0	D/1	10/1	D/

Analysis Set Details

Name	Description	Demand set	Include in report	Locked
DO SOMETHING - 2031 (OPENING YEAR + 5 YEARS)		D2	✓	

Demand Set Details

Name	Description	Composite	Demand sets	Start time (HH:mm)	Locked
DO SOMETHING - 2031 (OPENING YEAR + 5 YEARS),				08:00	

Arms and Traffic Streams

Arms

Arm	Name	Description	Traffic node
A	(untitled)		1
Ax	(untitled)		
B	(untitled)		1
Bx	(untitled)		
C	(untitled)		1
Cx	(untitled)		
D	(untitled)		1
Dx	(untitled)		
9			1
10			1

Traffic Streams

Arm	Traffic Stream	Name	Description	Auto length	Length (m)	Has Saturation Flow	Saturation flow source	Saturation flow (PCU/hr)	Auto-calculate cell saturation flow	Cell saturation flow (PCU/hr)	Is signal controlled	Is give way	Traffic type	Allow Nearside Turn On Red
A	1	(untitled)			100.00	✓	Sum of lanes	1897	✓	1800	✓		Normal	
	2				14.00	✓	Sum of lanes	1800			✓		Normal	
Ax	1	(untitled)		✓	135.51								Normal	
B	1	(untitled)			100.00	✓	Sum of lanes	2053			✓		Normal	
	2				18.00	✓	Sum of lanes	1993			✓	✓	Normal	
Bx	1	(untitled)		✓	139.32								Normal	
C	1	(untitled)			100.00	✓	Sum of lanes	1999			✓		Normal	
Cx	1	(untitled)		✓	138.83								Normal	
D	1	(untitled)			100.00	✓	Sum of lanes	2018			✓		Normal	
Dx	1	(untitled)		✓	134.44								Normal	
9	1			✓	43.24	✓	Sum of lanes	1800					Normal	
10	1			✓	63.04	✓	Sum of lanes	1800					Normal	

Lanes

Arm	Traffic Stream	Lane	Name	Description	Use RR67	Surface condition	Site quality factor	Gradient (%)	Width (m)	Use connector turning radius	Proportion that turn (%)	Turning radius (m)	Nearside lane	Saturation flow (PCU/hr)
A	1	1	(untitled)		✓	N/A	N/A	2	3.00	✓	99	38.14		1897
	2	1	(untitled)											1800
Ax	1	1	(untitled)											
B	1	1	(untitled)		✓	N/A	N/A	-2	3.00	✓	3	43.56		2053
	2	1	(untitled)		✓	N/A	N/A	-2	3.00	✓	100	48.44		1993
Bx	1	1	(untitled)											
C	1	1	(untitled)		✓	N/A	N/A	-10	3.00	✓	75	40.00		1999
Cx	1	1	(untitled)											
D	1	1	(untitled)		✓	N/A	N/A	-2	3.00	✓	49	40.00		2018
Dx	1	1	(untitled)											
9	1	1	(untitled)											1800
10	1	1	(untitled)											1800

Modelling

Arm	Traffic Stream	Traffic model	Stop weighting multiplier (%)	Delay weighting multiplier (%)	Assignment Cost Weighting (%)	Exclude from results calculation	Max queue storage (PCU)	Has queue limit	Queue limit (PCU)	Excess queue penalty (£)	Has degree of saturation limit
A	1	CTM	100	100	100		0.00				
	2	Flare	100	100	100		2.00				
Ax	1	NetworkDefault	100	100	100		0.00				
B	1	PDM	100	100	100		0.00	✓	0.00	0.00	
	2	Flare	100	100	100		4.00				
Bx	1	NetworkDefault	100	100	100		0.00				
C	1	PDM	100	100	100		0.00				
Cx	1	NetworkDefault	100	100	100		0.00				
D	1	PDM	100	100	100		0.00				
Dx	1	NetworkDefault	100	100	100		0.00				
9	1	NetworkDefault	100	100	100		0.00				
10	1	NetworkDefault	100	100	100		0.00				

Modelling - Advanced

Arm	Traffic Stream	Initial queue (PCU)	Type of Vehicle-in-Service	Vehicle-in-Service	Type of random parameter	Random parameter	Auto cycle time	Cycle time
A	1	0.00	NetworkDefault	Not-Included	NetworkDefault	0.50	✓	130
	2	2.00	NetworkDefault	Not-Included	NetworkDefault	0.50	✓	130
Ax	1	0.00	NetworkDefault	Not-Included	NetworkDefault	0.50	✓	130
B	1	0.00	NetworkDefault	Not-Included	NetworkDefault	0.50	✓	130
	2	4.00	NetworkDefault	Not-Included	NetworkDefault	0.50	✓	130
Bx	1	0.00	NetworkDefault	Not-Included	NetworkDefault	0.50	✓	130
C	1	0.00	NetworkDefault	Not-Included	NetworkDefault	0.50	✓	130
Cx	1	0.00	NetworkDefault	Not-Included	NetworkDefault	0.50	✓	130
D	1	0.00	NetworkDefault	Not-Included	NetworkDefault	0.50	✓	130
Dx	1	0.00	NetworkDefault	Not-Included	NetworkDefault	0.50	✓	130
9	1	0.00	NetworkDefault	Not-Included	NetworkDefault	0.50	✓	130
10	1	0.00	NetworkDefault	Not-Included	NetworkDefault	0.50	✓	130

Normal traffic - Modelling

Arm	Traffic Stream	Stop weighting (%)	Delay weighting (%)
(ALL)	(ALL)	100	100

Normal traffic - Advanced

Arm	Traffic Stream	Dispersion type for Normal Traffic
(ALL)	(ALL)	NetworkDefault

Flows

Arm	Traffic Stream	Total Flow (Veh/hr)	Normal Flow (Veh/hr)
A	1	326	326
	2	251	251
Ax	1	456	456
B	1	263	263
	2	195	195
Bx	1	620	620
C	1	76	76
Cx	1	16	16
D	1	506	506
Dx	1	525	525
9	1	458	458
10	1	577	577

Signals

Arm	Traffic Stream	Controller stream	Phase	Second phase enabled
A	1	1	C	
	2	1	C	
B	1	1	A	
	2	1	A	
C	1	1	D	
D	1	1	B	

Entry Sources

Arm	Traffic Stream	Cruise time for Normal Traffic (s)	Cruise speed for Normal Traffic (kph)
C	1	12.00	30.00
D	1	12.00	30.00
9	1	5.19	30.00
10	1	7.56	30.00

Sources

Arm	Traffic Stream	Source	Source traffic stream	Destination traffic stream	Cruise time for Normal Traffic (s)	Cruise speed for Normal Traffic (kph)	Auto turning radius	Traffic turn style	Turning radius (m)
A	1	1	10/1	A/1	12.00	30.00	✓	Straight	Straight Movement
	2	1	10/1	A/2	1.68	30.00	✓	Straight	Straight Movement
Ax	1	1	C/1	Ax/1	16.26	30.00	✓	Straight	Straight Movement
B	1	1	9/1	B/1	12.00	30.00	✓	Straight	Straight Movement
	2	1	9/1	B/2	2.16	30.00	✓	Straight	Straight Movement
Bx	1	1	A/1	Bx/1	16.72	30.00	✓	Nearside	38.14
Cx	1	1	A/1	Cx/1	16.66	30.00	✓	Straight	Straight Movement
Dx	1	1	C/1	Dx/1	16.13	30.00	✓	Nearside	40.00
Ax	1	2	D/1	Ax/1	16.26	30.00	✓	Nearside	40.00
Bx	1	2	D/1	Bx/1	16.72	30.00	✓	Straight	Straight Movement
Cx	1	2	B/1	Cx/1	16.66	30.00	✓	Nearside	43.56
Dx	1	2	B/1	Dx/1	16.13	30.00	✓	Straight	Straight Movement
Ax	1	3	B/2	Ax/1	16.26	30.00	✓	Offside	48.44
Bx	1	3	C/1	Bx/1	16.72	30.00	✓	Offside	60.00
Cx	1	3	D/1	Cx/1	16.66	30.00	✓	Offside	55.00
Dx	1	3	A/2	Dx/1	16.13	30.00	✓	Offside	47.67

Give Way Data

Arm	Traffic Stream	Opposed traffic	Use Step-wise Opposed Turn Model	Visibility restricted
B	2	AllTraffic		

Give Way Data - All Movements - Conflicts

Traffic Stream	Description	Controlling type	Controlling traffic stream	Percentage opposing (%)	Slope coefficient	Upstream signals visible	Conflict shift	Conflict duration
2		TrafficStream	A/2	100	0.00		0	0

Pedestrian Crossings

Pedestrian Crossings

Crossing	Name	Description	Traffic node	Allow walk on red	Crossing type	Length (m)	Cruise time (seconds)	Cruise speed (kph)
2	(untitled)		1		Farside	8.00	5.33	5.40
3	(untitled)		1		Farside	8.00	5.33	5.40
4	(untitled)		1		Farside	7.00	4.67	5.40

Pedestrian Crossings - Signals

Crossing	Controller stream	Phase	Second phase enabled
(ALL)	1	E	

Pedestrian Crossings - Sides

Crossing	Side	Saturation flow (Ped/hr)
(ALL)	(ALL)	11000

Pedestrian Crossings - Modelling

Crossing	Side	Delay weighting (%)	Assignment Cost Weighting (%)	Exclude from results calculation	Max queue storage (Ped)	Has queue limit	Has degree of saturation limit
(ALL)	(ALL)	100	100		0.00		

Signal Timings

Network Default: 130s cycle time; 130 steps

Controller Stream 1

Controller Stream	Name	Description	Use sequence	Cycle time source	Cycle time (s)
1	(untitled)		1	NetworkDefault	130

Controller Stream 1 - Properties

Controller Stream	Manufacturer name	Type	Model number	(Telephone) Line Number	Site number	Grid reference	Gaining delay type
1	Unspecified						Relative

Controller Stream 1 - Optimisation

Controller Stream	Allow offset optimisation	Allow green split optimisation	Optimisation level	Auto redistribute	Enable stage constraint
1	✓	✓	Offsets And Green Splits	✓	

Phases

Controller Stream	Phase	Name	Minimum green (s)	Maximum green (s)	Relative start displacement (s)	Relative end displacement (s)	Type	Blackout Time (s)
1	A	(untitled)	20	300	0	0	Traffic	
	B	(untitled)	36	300	0	0	Traffic	
	C	(untitled)	35	300	0	0	Traffic	
	D	(untitled)	10	10	0	1	Traffic	
	E	(untitled)	4	4	0	0	Pedestrian	0

Library Stages

Controller Stream	Library Stage	Phases in stage	User stage minimum (s)
1	1	A	1
	2	B	1
	3	C	1
	4	D	1
	5	E	1

Stage Sequences

Controller Stream	Sequence	Name	Multiple cycling	Stage IDs	Stage ends
1	1	(untitled)	Single	1, 2, 3, 4, 5	25, 66, 106, 121, 0
	2	(untitled)	Single	1, 2, 3, 5, 4	20, 54, 98, 111, 125
	3	(untitled)	Single	1, 2, 4, 3, 5	20, 54, 68, 112, 125
	4	(untitled)	Single	1, 2, 4, 5, 3	20, 54, 68, 81, 125
	5	(untitled)	Single	1, 2, 5, 3, 4	20, 54, 67, 111, 125
	6	(untitled)	Single	1, 2, 5, 4, 3	20, 54, 67, 81, 125
	7	(untitled)	Single	1, 3, 2, 4, 5	20, 64, 99, 113, 125
	8	(untitled)	Single	1, 3, 2, 5, 4	20, 64, 99, 112, 125
	9	(untitled)	Single	1, 3, 4, 2, 5	20, 64, 78, 112, 125
	10	(untitled)	Single	1, 3, 4, 5, 2	20, 64, 78, 91, 125

Intergreen Matrix for Controller Stream 1

		To				
		A	B	C	D	E
From	A		5	5	9	5
	B	5		5	5	5
	C	5	6		5	5
	D	5	5	5		5
	E	5	5	5	5	

Banned Stage transitions for Controller Stream 1

		To				
		1	2	3	4	5
From	1					
	2					
	3					
	4					
	5					

Interstage Matrix for Controller Stream 1

		To				
		1	2	3	4	5
From	1	0	5	5	9	5
	2	5	0	5	5	5
	3	5	6	0	5	5
	4	5	5	5	0	5
	5	5	5	5	5	0

Resultant Stages

Controller Stream	Resultant Stage	Is base stage	Library Stage ID	Phases in this stage	Stage start (s)	Stage end (s)	Stage duration (s)	User stage minimum (s)	Stage minimum (s)
1	1	✓	1	A	5	25	20	1	20
	2	✓	2	B	30	66	36	1	36
	3	✓	3	C	71	106	35	1	35
	4	✓	4	D	111	121	10	1	10
	5	✓	5	E	126	0	4	1	4

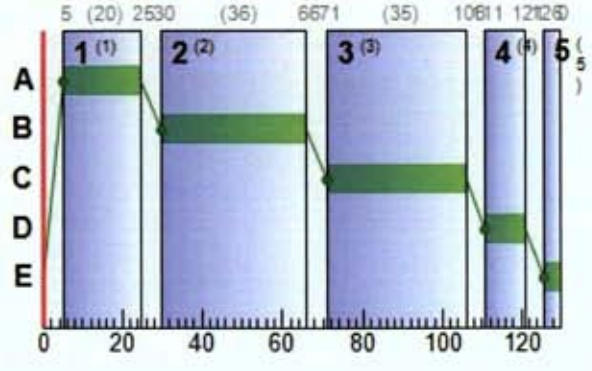
Resultant Phase Green Periods

Controller Stream	Phase	Green period	Is base green period	Start time (s)	End time (s)	Duration (s)
1	A	1	✓	5	25	20
	B	1	✓	30	66	36
	C	1	✓	71	106	35
	D	1	✓	111	121	10
	E	1	✓	126	0	4

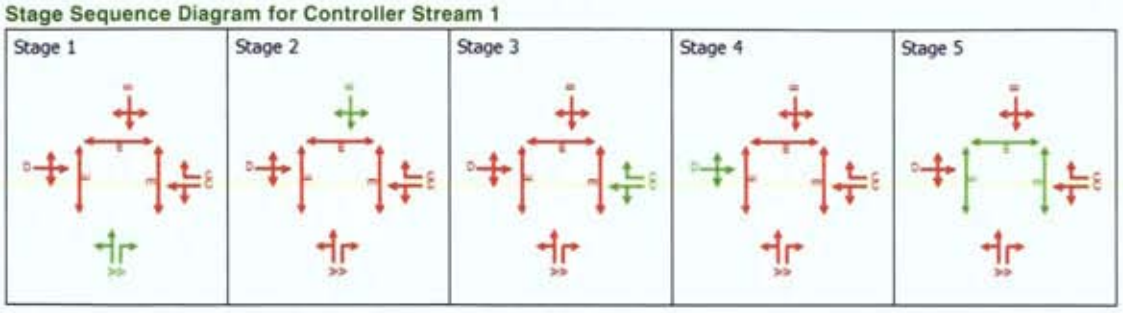
Traffic Stream Green Times

Arm	Traffic Stream	Traffic Node	Controller Stream	Phase	Green Period 1		
					Start	End	Duration
A	1	1	1	C	71	106	35
A	2	1	1	C	71	106	35
B	1	1	1	A	5	25	20
B	2	1	1	A	5	25	20
C	1	1	1	D	111	121	10
D	1	1	1	B	30	66	36

Phase Timings Diagram for Controller Stream 1



Stage Sequence Diagram for Controller Stream 1



Resultant penalties

Time Segment	Controller stream	Phase min max penalty (£ per hr)	Intergreen broken penalty (£ per hr)	Stage constraint broken penalty (£ per hr)	Cost of controller stream penalties (£ per hr)
08:00-09:00	1	0.00	0.00	0.00	0.00

Traffic Stream Results

Traffic Stream Results: Vehicle summary

Time Segment	Arm	Traffic Stream	Degree of saturation (%)	Practical reserve capacity (%)	Calculated flow entering (Veh/hr)	Calculated sat flow (Veh/hr)	Actual green (s (per cycle))	Mean Delay per Veh (s)	Mean max queue (Veh)	Utilised storage (%)	Weighted cost of delay (£ per hr)	Weighted cost of stops (£ per hr)	Performance Index (£ per hr)
08:00-09:00	A	1	62	61	326	1897	35	45.85	6.06	34.84	58.96	2.10	61.06
		2	50	99	251	1800	35	22.00	2.26	112.85	21.78	0.81	22.59
	Ax	1	0	Unrestricted	456	Unrestricted	130	0.00	0.00	0.00	0.00	0.00	0.00
	B	1	79	26	263	2053	20	82.89	9.13	52.49	85.99	3.13	89.11
		2	61	65	195	1993	20	52.97	4.47	111.83	40.74	1.82	42.56
	Bx	1	0	Unrestricted	620	Unrestricted	130	0.00	0.00	0.00	0.00	0.00	0.00
	C	1	41	143	76	1999	10	62.45	2.72	15.63	18.72	0.93	19.66
	Cx	1	0	Unrestricted	16	Unrestricted	130	0.00	0.00	0.00	0.00	0.00	0.00
	D	1	88	14	506	2018	36	65.27	20.36	117.09	130.28	6.92	137.20
	Dx	1	0	Unrestricted	525	Unrestricted	130	0.00	0.00	0.00	0.00	0.00	0.00
	9	1	36	175	458	1800	130	8.57	6.72	89.35	15.49	2.24	17.72
	10	1	69	44	577	1800	130	32.34	17.12	156.19	73.61	5.83	79.45

Traffic Stream Results: Flows and signals

Time Segment	Arm	Traffic Stream	Calculated flow entering (Veh/hr)	Calculated flow out (Veh/hr)	Flow discrepancy (Veh/hr)	Adjusted flow warning	Calculated sat flow (Veh/hr)	Calculated capacity (Veh/hr)	Degree of saturation (%)	DOS Threshold exceeded	Practical reserve capacity (%)	Mean modulus of error	Actual green (s (per cycle))
08:00-09:00	A	1	326	326	0		1897	525	62		61	1.07	35
		2	251	251	0		1800	498	50		99	1.07	35
	Ax	1	456	456	0		Unrestricted	Unrestricted	0		Unrestricted	0.91	130
	B	1	263	263	0		2053	332	79		26	0.55	20
		2	195	195	0		1993	322	61		65	0.59	20
	Bx	1	620	620	0		Unrestricted	Unrestricted	0		Unrestricted	0.65	130
	C	1	76	76	0		1999	185	41		143	0.00	10
	Cx	1	16	16	0		Unrestricted	Unrestricted	0		Unrestricted	0.57	130
	D	1	506	506	0		2018	574	88		14	0.00	36
	Dx	1	525	525	0		Unrestricted	Unrestricted	0		Unrestricted	0.84	130
	9	1	458	458	0		1800	1261	36		175	0.00	130
	10	1	577	577	0		1800	832	69		44	0.00	130

Traffic Stream Results: Stops and delays

Time Segment	Arm	Traffic Stream	Mean Cruise Time per Veh (s)	Mean Delay per Veh (s)	Uniform delay (Veh-hr/hr)	Random plus oversat delay (Veh-hr/hr)	Weighted cost of delay (£ per hr)	Mean stops per Veh (%)	Uniform stops (Stops per hr)	Random stops (Stops per hr)	Weighted cost of stops (£ per hr)
08:00-09:00	A	1	12.00	45.85	3.65	0.50	58.96	51.42	153.89	13.75	2.10
		2	1.68	22.00	1.27	0.26	21.78	25.77	57.63	7.07	0.81
	Ax	1	16.26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	B	1	12.00	82.89	4.63	1.43	85.99	94.82	211.30	38.07	3.13
		2	2.16	52.97	2.35	0.52	40.74	74.39	132.17	12.89	1.82
	Bx	1	16.72	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	C	1	12.00	62.45	1.18	0.14	18.72	98.07	70.63	3.90	0.93
	Cx	1	16.66	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	D	1	12.00	65.27	6.24	2.93	130.28	109.14	474.17	78.07	6.92
	Dx	1	16.13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	9	1	5.19	8.57	0.99	0.10	15.49	38.93	175.44	2.86	2.24
	10	1	7.56	32.34	4.41	0.78	73.61	80.65	444.08	21.27	5.83

Traffic Stream Results: Queues and blocking

Time Segment	Arm	Traffic Stream	Initial queue (Veh)	Mean max queue (Veh)	Max queue storage (Veh)	Utilised storage (%)	Average storage excess queue (Veh)	Average limit excess queue (Veh)	Excess queue penalty (£ per hr)	Wasted time starvation (s (per cycle))	Wasted time blocking back (s (per cycle))	Wasted time total (s (per cycle))	Estimated blocking
08:00-09:00	A	1	0.00	6.06	17.39	34.84	0.00	0.00	0.00	3.00	0.00	3.00	
		2	2.00	2.26	2.00	112.85	0.14	0.00	0.00	0.00	0.00	0.00	
	Ax	1	0.00	0.00	23.57	0.00	0.00	0.00	0.00	45.00	0.00	45.00	
	B	1	0.00	9.13	17.39	52.49	0.00	6.45	0.00	0.00	0.00	0.00	
		2	4.00	4.47	4.00	111.83	0.15	0.00	0.00	0.00	0.00	0.00	
	Bx	1	0.00	0.00	24.23	0.00	0.00	0.00	0.00	31.00	0.00	31.00	
	C	1	0.00	2.72	17.39	15.63	0.00	0.00	0.00	0.00	0.00	0.00	
	Cx	1	0.00	0.00	24.14	0.00	0.00	0.00	0.00	130.00	0.00	130.00	
	D	1	0.00	20.36	17.39	117.09	0.25	0.00	0.00	0.00	0.00	0.00	
	Dx	1	0.00	0.00	23.38	0.00	0.00	0.00	0.00	40.00	0.00	40.00	
	9	1	0.00	6.72	7.52	89.35	0.00	0.00	0.00	0.00	45.00	45.00	
	10	1	0.00	17.12	10.96	156.19	0.93	0.00	0.00	0.00	72.00	72.00	

Traffic Stream Results: Journey times

Time Segment	Arm	Traffic Stream	Distance travelled (PCU-km/hr)	Time spent (PCU-hr/hr)	Mean journey speed (kph)	JourneyTime (s)
08:00-09:00	A	1	32.60	5.24	6.22	57.85
		2	3.51	1.64	2.14	23.59
	Ax	1	61.79	2.06	30.00	16.26
	B	1	26.30	6.93	3.79	94.89
		2	3.51	2.94	1.19	54.24
	Bx	1	86.38	2.88	30.00	16.72
	C	1	7.60	1.57	4.84	74.45
	Cx	1	2.22	0.07	30.00	16.66
	D	1	50.60	10.86	4.66	77.27
	Dx	1	70.58	2.35	30.00	16.13
	9	1	19.80	1.75	11.31	13.76
	10	1	36.37	6.40	5.69	39.91

Traffic Stream Results: Advanced

Time Segment	Arm	Traffic Stream	Degree of saturation penalty (£ per hr)	Ped gap accepting penalty (£ per hr)	Warmed up	Mean Max Queue EoTS (Veh)	Max End of Green Queue EoTS (Veh)	Max End of Red Queue EoTS (Veh)	PCU Factor	Cost of traffic penalties (£ per hr)	Performance Index (£ per hr)
08:00-09:00	A	1	0.00	0.00	✓	6.06	0.50	6.06	1.00	0.00	61.06
		2	0.00	0.00	✓	2.26	0.26	2.26	1.00	0.00	22.59
	Ax	1	0.00	0.00	✓	0.00			1.00	0.00	0.00
	B	1	0.00	0.00	✓	9.17	1.47	8.99	1.00	0.00	89.11
		2	0.00	0.00	✓	4.47	0.47	4.47	1.00	0.00	42.56
	Bx	1	0.00	0.00	✓	0.00			1.00	0.00	0.00
	C	1	0.00	0.00	✓	2.72	0.14	2.63	1.00	0.00	19.66
	Cx	1	0.00	0.00	✓	0.00			1.00	0.00	0.00
	D	1	0.00	0.00	✓	20.51	3.08	16.15	1.00	0.00	137.20
	Dx	1	0.00	0.00	✓	0.00			1.00	0.00	0.00
	9	1	0.00	0.00	✓	6.72			1.00	0.00	17.72
	10	1	0.00	0.00	✓	17.13			1.00	0.00	79.45

Pedestrian Crossing Results

Pedestrian Crossings: Pedestrian summary

Time Segment	Crossing	Side	Degree of saturation (%)	Calculated Flow Entering (Ped/hr)	Calculated sat flow (Ped/hr)	Actual green (s (per cycle))	Mean Delay Per Ped (s)	Mean max queue (Ped)	Weighted cost of delay (£ per hr)	Performance Index (£ per hr)
08:00-09:00	(ALL)	(ALL)	30	100	11000	4	61.68	3.50	24.33	24.33

Pedestrian Crossings: Flows and signals

Time Segment	Crossing	Side	Calculated flow entering (Ped/hr)	Calculated flow out (Ped/hr)	Flow discrepancy (Ped/hr)	Adjusted flow warning	Calculated sat flow (Ped/hr)	Calculated capacity (Ped/hr)	Degree of saturation (%)	DOS Threshold exceeded	Practical reserve capacity (%)	Mean modulus of error	Actual green (s (per cycle))
08:00-09:00	(ALL)	(ALL)	100	100	0		11000	338	30		238	0.00	4

Pedestrian Crossings: Stops and delays

Time Segment	Crossing	Side	Mean Cruise Time per Ped (s)	Mean Delay per Ped (s)	Uniform delay (Ped-hr/hr)	Random plus oversat delay (Ped-hr/hr)	Weighted cost of delay (£ per hr)
08:00-09:00	2	1	6.33	61.68	1.71	0.00	24.33
		2	6.33	61.68	1.71	0.00	24.33
	3	1	6.33	61.68	1.71	0.00	24.33
		2	6.33	61.68	1.71	0.00	24.33
	4	1	5.67	61.68	1.71	0.00	24.33
		2	5.67	61.68	1.71	0.00	24.33

Pedestrian Crossings: Queues and blocking

Time Segment	Crossing	Side	Mean max queue (Ped)	Max queue storage (Ped)	Utilised storage (%)	Average storage excess queue (Ped)	Average limit excess queue (Ped)	Excess queue penalty (£ per hr)
08:00-09:00	(ALL)	(ALL)	3.50	10.00	35.00	0.00	0.00	0.00

Pedestrian Crossings: Journey times

Time Segment	Crossing	Side	Distance travelled (Ped-km/hr)	Time spent (Ped-hr/hr)	Mean journey speed (kph)	JourneyTime (s)
08:00-09:00	2	1	0.90	1.89	0.48	68.01
		2	0.90	1.89	0.48	68.01
	3	1	0.90	1.89	0.48	68.01
		2	0.90	1.89	0.48	68.01
	4	1	0.80	1.87	0.43	67.34
		2	0.80	1.87	0.43	67.34

Pedestrian Crossings: Advanced

Time Segment	Crossing	Side	Degree of saturation penalty (£ per hr)	Ped gap accepting penalty (£ per hr)	Mean Max Queue EoTS (Ped)	Ped Factor	Cost of traffic penalties (£ per hr)	Performance Index (£ per hr)
08:00-09:00	(ALL)	(ALL)	0.00	0.00	3.50	1.00	0.00	24.33

Network Results

Run Summary

Analysis set used	Run start time	Run finish time	Modelling start time (HH:mm)	Network Cycle Time (s)	Performance Index (£ per hr)	Total network delay (Veh-hr/hr)	Highest DOS (%)	Item with highest DOS	Number of oversaturated items	Percentage of oversaturated items (%)	Item with worst signalised PRC	Item with worst unsignalised PRC	Ite wit wor over PR
2	05/10/2022 16:33:30	05/10/2022 16:33:31	08:00	130	615.32	41.66	88.10	D/1	0	0	D/1	10/1	D/

Network Results: Vehicle summary

Time Segment	Degree of saturation (%)	Practical reserve capacity (%)	Calculated flow entering (Veh/hr)	Actual green (s (per cycle))	Mean Delay per Veh (s)	Weighted cost of delay (£ per hr)	Weighted cost of stops (£ per hr)	Performance Index (£ per hr)
08:00-09:00	88	0	4269	936	26.46	445.56	23.79	469.35

Network Results: Pedestrian summary

Time Segment	Degree of saturation (%)	Calculated Flow Entering (Ped/hr)	Actual green (s (per cycle))	Mean Delay Per Ped (s)	Weighted cost of delay (£ per hr)	Performance Index (£ per hr)
08:00-09:00	30	600	24	61.68	145.97	145.97

Network Results: Flows and signals

Time Segment	Calculated flow entering (Veh/hr)	Calculated flow out (Veh/hr)	Flow discrepancy (Veh/hr)	Adjusted flow warning	Degree of saturation (%)	DOS Threshold exceeded	Practical reserve capacity (%)	Actual green (s (per cycle))
08:00-09:00	4869	4869	0		88		14	960

Network Results: Stops and delays

Time Segment	Mean Cruise Time per Veh (s)	Mean Delay per Veh (s)	Uniform delay (Veh-hr/hr)	Random plus oversat delay (Veh-hr/hr)	Weighted cost of delay (£ per hr)	Mean stops per Veh (%)	Uniform stops (Stops per hr)	Random stops (Stops per hr)	Weighted cost of stops (£ per hr)
08:00-09:00	10.64	30.80	34.99	6.67	591.53	38.96	1719.31	177.89	23.79

Network Results: Queues and blocking

Time Segment	Utilised storage (%)	Excess queue penalty (£ per hr)	Wasted time starvation (s (per cycle))	Wasted time blocking back (s (per cycle))	Wasted time total (s (per cycle))
08:00-09:00	156.19	0.00	249.00	117.00	366.00

Network Results: Journey times

Time Segment	Distance travelled (PCU-km/hr)	Time spent (PCU-hr/hr)	Mean journey speed (kph)
08:00-09:00	406.48	56.00	7.26

Network Results: Advanced

Time Segment	Degree of saturation penalty (£ per hr)	Ped gap accepting penalty (£ per hr)	Warmed up	PCU Factor	Cost of traffic penalties (£ per hr)	Controller stream penalties (£ per hr)	Performance Index (£ per hr)
08:00-09:00	0.00	0.00	✓	1.00	0.00	0.00	615.32

Point to Point Journey Time

Average Journey Time (s) for Local Matrix: 1

		To							
		1	2	3	4	5	6	7	8
From	1	0.0	90.6	90.7	91.2	0.0	0.0	0.0	0.0
	2	93.9	0.0	93.5	94.0	0.0	0.0	0.0	0.0
	3	114.4	79.6	0.0	114.5	0.0	0.0	0.0	0.0
	4	125.3	124.8	84.3	0.0	0.0	0.0	0.0	0.0
	5	0.0	0.0	0.0	0.0	0.0	0.0	68.0	0.0
	6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	68.0
	7	0.0	0.0	0.0	0.0	68.0	0.0	0.0	67.3
	8	0.0	0.0	0.0	0.0	0.0	68.0	67.3	0.0

Path Journey Time

Path	From Location	To Location	Normal Calculated Flow (Veh/hr)	Pedestrian calculated flow (Ped/hr)	Normal journey time (s)	Pedestrian journey time (s)	Calculated Total Flow (Veh/hr)	Avg journey time (s)
1	1	2	19		90.59		19	90.59
2	1	3	19		90.72		19	90.72
3	1	4	38		91.17		38	91.17
5	2	3	242		93.53		242	93.53
6	2	4	260		93.99		260	93.99
7	2	1	4		93.93		4	93.93
16	4	2	255		124.78		255	124.78
17	8	7		100		67.34	100	67.34
18	8	6		100		68.01	100	68.01
22	5	7		100		68.01	100	68.01
34	6	8		100		68.01	100	68.01
41	7	8		100		67.34	100	67.34
42	7	5		100		68.01	100	68.01
49	4	1	8		125.31		8	125.31
50	4	3	195		84.27		195	84.27
51	3	2	251		79.63		251	79.63
52	3	4	322		114.48		322	114.48
53	3	1	4		114.42		4	114.42

Final Prediction Table

Traffic Stream Results

				SIGNALS		FLOWS		PERFORMANCE				PER PCU			QUEUES
Arm	Traffic Stream	Name	Traffic node	Controller stream	Phase	Calculated flow entering (Veh/hr)	Calculated sat flow (Veh/hr)	Actual green (s (per cycle))	Wasted time total (s (per cycle))	Degree of saturation (%)	Practical reserve capacity (%)	JourneyTime (s)	Mean Delay per Veh (s)	Mean stops per Veh (%)	Mean max queue (Veh)
A	1	(untitled)	1	1	C	326	1897	35	3.00	62	61	57.85	45.85	51.42	6.06
	2		1	1	C	251 <	1800	35	0.00	50	99	23.59	22.00	25.77	2.26 +
Ax	1	(untitled)				456	Unrestricted	130	45.00	0	Unrestricted	16.26	0.00	0.00	0.00
B	1	(untitled)	1	1	A	263	2053	20	0.00	79	26	94.89	82.89	94.82	9.13
	2		1	1	A	195 <	1993	20	0.00	61	65	54.24	52.97	74.39	4.47 +
Bx	1	(untitled)				620	Unrestricted	130	31.00	0	Unrestricted	16.72	0.00	0.00	0.00
C	1	(untitled)	1	1	D	76	1999	10	0.00	41	143	74.45	62.45	98.07	2.72
Cx	1	(untitled)				16	Unrestricted	130	130.00	0	Unrestricted	16.66	0.00	0.00	0.00
D	1	(untitled)	1	1	B	506 <	2018	36	0.00	88	14	77.27	65.27	109.14	20.36 +
Dx	1	(untitled)				525	Unrestricted	130	40.00	0	Unrestricted	16.13	0.00	0.00	0.00
9	1		1			458	1800	130	45.00	36	175	13.76	8.57	38.93	6.72
10	1		1			577 <	1800	130	72.00	69	44	39.91	32.34	80.65	17.12 +

Pedestrian Crossing Results

				SIGNALS		FLOWS		PERFORMANCE			PER PED		QUEUES	WEIGHTS	PEN
Pedestrian	Side	Name	Traffic node	Controller stream	Phase	Calculated Flow Entering (Ped/hr)	Calculated sat flow (Ped/hr)	Actual green (s (per cycle))	Degree of saturation (%)	Practical reserve capacity (%)	JourneyTime (s)	Mean Delay per Ped (s)	Mean max queue (Ped)	Delay weighting (%)	Co tra pen (£ p
2	1	(untitled)	1	1	E	100	11000	4	30	238	68.01	61.68	3.50	100	0
	2	(untitled)	1	1	E	100	11000	4	30	238	68.01	61.68	3.50	100	0
3	1	(untitled)	1	1	E	100	11000	4	30	238	68.01	61.68	3.50	100	0
	2	(untitled)	1	1	E	100	11000	4	30	238	68.01	61.68	3.50	100	0
4	1	(untitled)	1	1	E	100	11000	4	30	238	67.34	61.68	3.50	100	0
	2	(untitled)	1	1	E	100	11000	4	30	238	67.34	61.68	3.50	100	0

Network Results

	Distance travelled (PCU-km/hr)	Time spent (PCU-hr/hr)	Mean journey speed (kph)	Uniform delay (Veh-hr/hr)	Random plus oversat delay (Veh-hr/hr)	Weighted cost of delay (£ per hr)	Weighted cost of stops (£ per hr)	Excess queue penalty (£ per hr)	Performance Index (£ per hr)
Normal traffic	401.28	44.70	8.98	24.71	6.67	445.56	23.79	0.00	469.35
Bus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tram	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pedestrians	5.20	11.30	0.46	10.28	0.00	145.97	0.00	0.00	145.97
TOTAL	406.48	56.00	7.26	34.99	6.67	591.53	23.79	0.00	615.32

- *< = adjusted flow warning (upstream links/traffic streams are over-saturated)*
- ** = Traffic Stream - Normal, Bus or Tram Stop or Delay weighting has been set to a value other than 100%*
- *^ = Traffic Stream - Normal, Bus or Tram Stop or Delay Path weighting has been set to a value other than 100%*
- *+ = average link/traffic stream excess queue is greater than 0*
- ***P.I. = PERFORMANCE INDEX***

A3 - DO SOMETHING - 2041 (OPENING YEAR + 15 YEARS)
D3 - DO SOMETHING - 2041 (OPENING YEAR + 15 YEARS), *

Summary

Data Errors and Warnings

No errors or warnings

Run Summary

Analysis set used	Run start time	Run finish time	Modelling start time (HH:mm)	Network Cycle Time (s)	Performance Index (£ per hr)	Total network delay (Veh-hr/hr)	Highest DOS (%)	Item with highest DOS	Number of oversaturated items	Percentage of oversaturated items (%)	Item with worst signalised PRC	Item with worst unsignalised PRC	Ite wit
3	05/10/2022 16:33:31	05/10/2022 16:33:32	08:00	130	610.95	41.38	90.14	D/1	0	0	D/1	10/1	D/

Analysis Set Details

Name	Description	Demand set	Include in report	Locked
DO SOMETHING - 2041 (OPENING YEAR + 15 YEARS)		D3	✓	

Demand Set Details

Name	Description	Composite	Demand sets	Start time (HH:mm)	Locked
DO SOMETHING - 2041 (OPENING YEAR + 15 YEARS),				08:00	

Arms and Traffic Streams

Arms

Arm	Name	Description	Traffic node
A	(untitled)		1
Ax	(untitled)		
B	(untitled)		1
Bx	(untitled)		
C	(untitled)		1
Cx	(untitled)		
D	(untitled)		1
Dx	(untitled)		
9			1
10			1

Traffic Streams

Arm	Traffic Stream	Name	Description	Auto length	Length (m)	Has Saturation Flow	Saturation flow source	Saturation flow (PCU/hr)	Auto-calculate cell saturation flow	Cell saturation flow (PCU/hr)	Is signal controlled	Is give way	Traffic type	Allow Nearside Turn On Red
A	1	(untitled)			100.00	✓	Sum of lanes	1898	✓	1800	✓		Normal	
	2				14.00	✓	Sum of lanes	1800			✓		Normal	
Ax	1	(untitled)		✓	135.51								Normal	
B	1	(untitled)			100.00	✓	Sum of lanes	2053			✓		Normal	
	2				18.00	✓	Sum of lanes	1993			✓	✓	Normal	
Bx	1	(untitled)		✓	139.32								Normal	
C	1	(untitled)			100.00	✓	Sum of lanes	1999			✓		Normal	
Cx	1	(untitled)		✓	138.83								Normal	
D	1	(untitled)			100.00	✓	Sum of lanes	2019			✓		Normal	
Dx	1	(untitled)		✓	134.44								Normal	
9	1			✓	43.24	✓	Sum of lanes	1800					Normal	
10	1			✓	63.04	✓	Sum of lanes	1800					Normal	

Lanes

Arm	Traffic Stream	Lane	Name	Description	Use RR67	Surface condition	Site quality factor	Gradient (%)	Width (m)	Use connector turning radius	Proportion that turn (%)	Turning radius (m)	Nearside lane	Saturation flow (PCU/hr)
A	1	1	(untitled)		✓	N/A	N/A	2	3.00	✓	98	38.14		1898
	2	1	(untitled)											1800
Ax	1	1	(untitled)											
B	1	1	(untitled)		✓	N/A	N/A	-2	3.00	✓	3	43.56		2053
	2	1	(untitled)		✓	N/A	N/A	-2	3.00	✓	100	48.44		1993
Bx	1	1	(untitled)											
C	1	1	(untitled)		✓	N/A	N/A	-10	3.00	✓	75	40.00		1999
Cx	1	1	(untitled)											
D	1	1	(untitled)		✓	N/A	N/A	-2	3.00	✓	47	40.00		2019
Dx	1	1	(untitled)											
9	1	1	(untitled)											1800
10	1	1	(untitled)											1800

Modelling

Arm	Traffic Stream	Traffic model	Stop weighting multiplier (%)	Delay weighting multiplier (%)	Assignment Cost Weighting (%)	Exclude from results calculation	Max queue storage (PCU)	Has queue limit	Queue limit (PCU)	Excess queue penalty (£)	Has degree of saturation limit
A	1	CTM	100	100	100		0.00				
	2	Flare	100	100	100		2.00				
Ax	1	NetworkDefault	100	100	100		0.00				
B	1	PDM	100	100	100		0.00	✓	0.00	0.00	
	2	Flare	100	100	100		4.00				
Bx	1	NetworkDefault	100	100	100		0.00				
C	1	PDM	100	100	100		0.00				
Cx	1	NetworkDefault	100	100	100		0.00				
D	1	PDM	100	100	100		0.00				
Dx	1	NetworkDefault	100	100	100		0.00				
9	1	NetworkDefault	100	100	100		0.00				
10	1	NetworkDefault	100	100	100		0.00				

Modelling - Advanced

Arm	Traffic Stream	Initial queue (PCU)	Type of Vehicle-in-Service	Vehicle-in-Service	Type of random parameter	Random parameter	Auto cycle time	Cycle time
A	1	0.00	NetworkDefault	Not-Included	NetworkDefault	0.50	✓	130
	2	2.00	NetworkDefault	Not-Included	NetworkDefault	0.50	✓	130
Ax	1	0.00	NetworkDefault	Not-Included	NetworkDefault	0.50	✓	130
B	1	0.00	NetworkDefault	Not-Included	NetworkDefault	0.50	✓	130
	2	4.00	NetworkDefault	Not-Included	NetworkDefault	0.50	✓	130
Bx	1	0.00	NetworkDefault	Not-Included	NetworkDefault	0.50	✓	130
C	1	0.00	NetworkDefault	Not-Included	NetworkDefault	0.50	✓	130
Cx	1	0.00	NetworkDefault	Not-Included	NetworkDefault	0.50	✓	130
D	1	0.00	NetworkDefault	Not-Included	NetworkDefault	0.50	✓	130
Dx	1	0.00	NetworkDefault	Not-Included	NetworkDefault	0.50	✓	130
9	1	0.00	NetworkDefault	Not-Included	NetworkDefault	0.50	✓	130
10	1	0.00	NetworkDefault	Not-Included	NetworkDefault	0.50	✓	130

Normal traffic - Modelling

Arm	Traffic Stream	Stop weighting (%)	Delay weighting (%)
(ALL)	(ALL)	100	100

Normal traffic - Advanced

Arm	Traffic Stream	Dispersion type for Normal Traffic
(ALL)	(ALL)	NetworkDefault

Flows

Arm	Traffic Stream	Total Flow (Veh/hr)	Normal Flow (Veh/hr)
A	1	254	254
	2	263	263
Ax	1	465	465
B	1	274	274
	2	204	204
Bx	1	560	560
C	1	76	76
Cx	1	16	16
D	1	518	518
Dx	1	548	548
9	1	478	478
10	1	517	517

Signals

Arm	Traffic Stream	Controller stream	Phase	Second phase enabled
A	1	1	C	
	2	1	C	
B	1	1	A	
	2	1	A	
C	1	1	D	
D	1	1	B	

Entry Sources

Arm	Traffic Stream	Cruise time for Normal Traffic (s)	Cruise speed for Normal Traffic (kph)
C	1	12.00	30.00
D	1	12.00	30.00
9	1	5.19	30.00
10	1	7.56	30.00

Sources

Arm	Traffic Stream	Source	Source traffic stream	Destination traffic stream	Cruise time for Normal Traffic (s)	Cruise speed for Normal Traffic (kph)	Auto turning radius	Traffic turn style	Turning radius (m)
A	1	1	10/1	A/1	12.00	30.00	✓	Straight	Straight Movement
	2	1	10/1	A/2	1.68	30.00	✓	Straight	Straight Movement
Ax	1	1	C/1	Ax/1	16.26	30.00	✓	Straight	Straight Movement
B	1	1	9/1	B/1	12.00	30.00	✓	Straight	Straight Movement
	2	1	9/1	B/2	2.16	30.00	✓	Straight	Straight Movement
Bx	1	1	A/1	Bx/1	16.72	30.00	✓	Nearside	38.14
Cx	1	1	A/1	Cx/1	16.66	30.00	✓	Straight	Straight Movement
Dx	1	1	C/1	Dx/1	16.13	30.00	✓	Nearside	40.00
Ax	1	2	D/1	Ax/1	16.26	30.00	✓	Nearside	40.00
Bx	1	2	D/1	Bx/1	16.72	30.00	✓	Straight	Straight Movement
Cx	1	2	B/1	Cx/1	16.66	30.00	✓	Nearside	43.56
Dx	1	2	B/1	Dx/1	16.13	30.00	✓	Straight	Straight Movement
Ax	1	3	B/2	Ax/1	16.26	30.00	✓	Offside	48.44
Bx	1	3	C/1	Bx/1	16.72	30.00	✓	Offside	60.00
Cx	1	3	D/1	Cx/1	16.66	30.00	✓	Offside	55.00
Dx	1	3	A/2	Dx/1	16.13	30.00	✓	Offside	47.67

Give Way Data

Arm	Traffic Stream	Opposed traffic	Use Step-wise Opposed Turn Model	Visibility restricted
B	2	AllTraffic		

Give Way Data - All Movements - Conflicts

Traffic Stream	Description	Controlling type	Controlling traffic stream	Percentage opposing (%)	Slope coefficient	Upstream signals visible	Conflict shift	Conflict duration
2		TrafficStream	A/2	100	0.00		0	0

Pedestrian Crossings

Pedestrian Crossings

Crossing	Name	Description	Traffic node	Allow walk on red	Crossing type	Length (m)	Cruise time (seconds)	Cruise speed (kph)
2	(untitled)		1		Farside	8.00	5.33	5.40
3	(untitled)		1		Farside	8.00	5.33	5.40
4	(untitled)		1		Farside	7.00	4.67	5.40

Pedestrian Crossings - Signals

Crossing	Controller stream	Phase	Second phase enabled
(ALL)	1	E	

Pedestrian Crossings - Sides

Crossing	Side	Saturation flow (Ped/hr)
(ALL)	(ALL)	11000

Pedestrian Crossings - Modelling

Crossing	Side	Delay weighting (%)	Assignment Cost Weighting (%)	Exclude from results calculation	Max queue storage (Ped)	Has queue limit	Has degree of saturation limit
(ALL)	(ALL)	100	100		0.00		

Signal Timings

Network Default: 130s cycle time; 130 steps

Controller Stream 1

Controller Stream	Name	Description	Use sequence	Cycle time source	Cycle time (s)
1	(untitled)		5	NetworkDefault	130

Controller Stream 1 - Properties

Controller Stream	Manufacturer name	Type	Model number	(Telephone) Line Number	Site number	Grid reference	Gaining delay type
1	Unspecified						Relative

Controller Stream 1 - Optimisation

Controller Stream	Allow offset optimisation	Allow green split optimisation	Optimisation level	Auto redistribute	Enable stage constraint
1	✓	✓	Offsets And Green Splits	✓	

Phases

Controller Stream	Phase	Name	Minimum green (s)	Maximum green (s)	Relative start displacement (s)	Relative end displacement (s)	Type	Blackout Time (s)
1	A	(untitled)	20	300	0	0	Traffic	
	B	(untitled)	36	300	0	0	Traffic	
	C	(untitled)	35	300	0	0	Traffic	
	D	(untitled)	10	10	0	1	Traffic	
	E	(untitled)	4	4	0	0	Pedestrian	0

Library Stages

Controller Stream	Library Stage	Phases in stage	User stage minimum (s)
1	1	A	1
	2	B	1
	3	C	1
	4	D	1
	5	E	1

Stage Sequences

Controller Stream	Sequence	Name	Multiple cycling	Stage IDs	Stage ends
1	1	(untitled)	Single	1, 2, 3, 4, 5	20, 54, 98, 112, 125
	2	(untitled)	Single	1, 2, 3, 5, 4	20, 54, 98, 111, 125
	3	(untitled)	Single	1, 2, 4, 3, 5	20, 54, 68, 112, 125
	4	(untitled)	Single	1, 2, 4, 5, 3	20, 54, 68, 81, 125
	5	(untitled)	Single	1, 2, 5, 3, 4	25, 66, 75, 115, 0
	6	(untitled)	Single	1, 2, 5, 4, 3	20, 54, 67, 81, 125
	7	(untitled)	Single	1, 3, 2, 4, 5	20, 64, 99, 113, 125
	8	(untitled)	Single	1, 3, 2, 5, 4	20, 64, 99, 112, 125
	9	(untitled)	Single	1, 3, 4, 2, 5	20, 64, 78, 112, 125
	10	(untitled)	Single	1, 3, 4, 5, 2	20, 64, 78, 91, 125

Intergreen Matrix for Controller Stream 1

		To				
		A	B	C	D	E
From	A		5	5	9	5
	B	5		5	5	5
	C	5	6		5	5
	D	5	5	5		5
	E	5	5	5	5	

Banned Stage transitions for Controller Stream 1

		To				
		1	2	3	4	5
From	1					
	2					
	3					
	4					
	5					

Interstage Matrix for Controller Stream 1

		To				
		1	2	3	4	5
From	1	0	5	5	9	5
	2	5	0	5	5	5
	3	5	6	0	5	5
	4	5	5	5	0	5
	5	5	5	5	5	0

Resultant Stages

Controller Stream	Resultant Stage	Is base stage	Library Stage ID	Phases in this stage	Stage start (s)	Stage end (s)	Stage duration (s)	User stage minimum (s)	Stage minimum (s)
1	1	✓	1	A	5	25	20	1	20
	2	✓	2	B	30	66	36	1	36
	3	✓	5	E	71	75	4	1	4
	4	✓	3	C	80	115	35	1	35
	5	✓	4	D	120	0	10	1	10

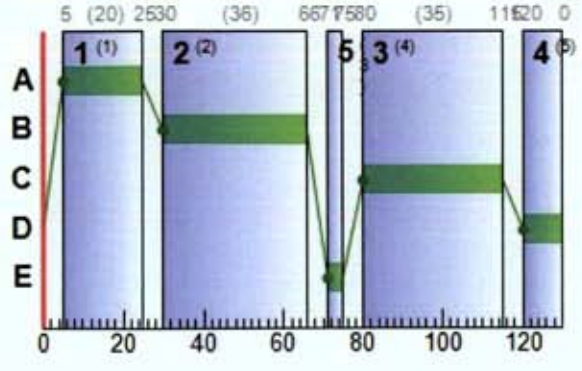
Resultant Phase Green Periods

Controller Stream	Phase	Green period	Is base green period	Start time (s)	End time (s)	Duration (s)
1	A	1	✓	5	25	20
	B	1	✓	30	66	36
	C	1	✓	80	115	35
	D	1	✓	120	0	10
	E	1	✓	71	75	4

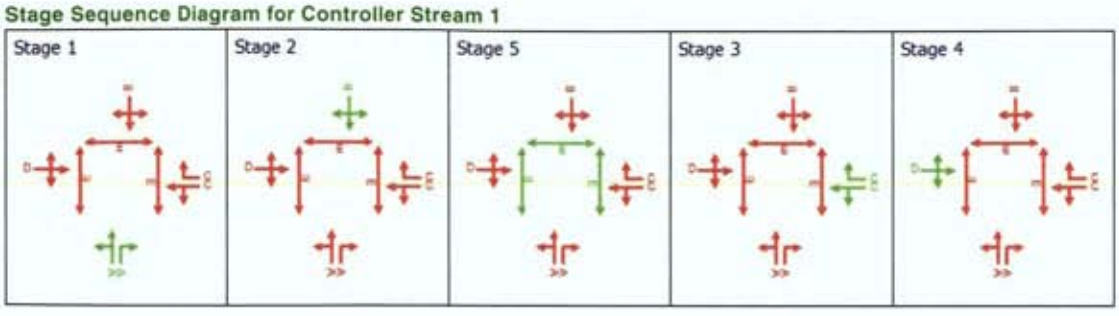
Traffic Stream Green Times

Arm	Traffic Stream	Traffic Node	Controller Stream	Phase	Green Period 1		
					Start	End	Duration
A	1	1	1	C	80	115	35
A	2	1	1	C	80	115	35
B	1	1	1	A	5	25	20
B	2	1	1	A	5	25	20
C	1	1	1	D	120	0	10
D	1	1	1	B	30	66	36

Phase Timings Diagram for Controller Stream 1



Stage Sequence Diagram for Controller Stream 1



Resultant penalties

Time Segment	Controller stream	Phase min max penalty (£ per hr)	Intergreen broken penalty (£ per hr)	Stage constraint broken penalty (£ per hr)	Cost of controller stream penalties (£ per hr)
08:00-09:00	1	0.00	0.00	0.00	0.00

Traffic Stream Results

Traffic Stream Results: Vehicle summary

Time Segment	Arm	Traffic Stream	Degree of saturation (%)	Practical reserve capacity (%)	Calculated flow entering (Veh/hr)	Calculated sat flow (Veh/hr)	Actual green (s (per cycle))	Mean Delay per Veh (s)	Mean max queue (Veh)	Utilised storage (%)	Weighted cost of delay (£ per hr)	Weighted cost of stops (£ per hr)	Performance Index (£ per hr)
08:00-09:00	A	1	48	107	254	1898	35	37.39	3.99	22.96	37.46	1.39	38.85
		2	53	90	263	1800	35	21.49	2.30	114.84	22.30	0.83	23.13
	Ax	1	0	Unrestricted	465	Unrestricted	130	0.00	0.00	0.00	0.00	0.00	0.00
	B	1	83	21	274	2053	20	90.17	10.06	57.83	97.46	3.42	100.88
		2	63	58	204	1993	20	53.10	4.56	113.98	42.73	1.85	44.58
	Bx	1	0	Unrestricted	560	Unrestricted	130	0.00	0.00	0.00	0.00	0.00	0.00
	C	1	41	143	76	1999	10	62.45	2.72	15.63	18.72	0.93	19.66
	Cx	1	0	Unrestricted	16	Unrestricted	130	0.00	0.00	0.00	0.00	0.00	0.00
	D	1	90	11	518	2019	36	69.50	21.55	123.90	142.00	7.31	149.31
	Dx	1	0	Unrestricted	548	Unrestricted	130	0.00	0.00	0.00	0.00	0.00	0.00
	9	1	40	153	478	1800	130	10.28	7.83	104.13	19.38	2.59	21.96
	10	1	63	59	517	1800	130	30.23	14.75	134.54	61.64	4.97	66.61

Traffic Stream Results: Flows and signals

Time Segment	Arm	Traffic Stream	Calculated flow entering (Veh/hr)	Calculated flow out (Veh/hr)	Flow discrepancy (Veh/hr)	Adjusted flow warning	Calculated sat flow (Veh/hr)	Calculated capacity (Veh/hr)	Degree of saturation (%)	DOS Threshold exceeded	Practical reserve capacity (%)	Mean modulus of error	Actual green (s (per cycle))
08:00-09:00	A	1	254	254	0		1898	526	48		107	1.08	35
		2	263	263	0		1800	498	53		90	1.07	35
	Ax	1	465	465	0		Unrestricted	Unrestricted	0		Unrestricted	0.91	130
	B	1	274	274	0		2053	332	83		21	0.60	20
		2	204	204	0		1993	322	63		58	0.64	20
	Bx	1	560	560	0		Unrestricted	Unrestricted	0		Unrestricted	0.62	130
	C	1	76	76	0		1999	185	41		143	0.00	10
	Cx	1	16	16	0		Unrestricted	Unrestricted	0		Unrestricted	0.57	130
	D	1	518	518	0		2019	575	90		11	0.00	36
	Dx	1	548	548	0		Unrestricted	Unrestricted	0		Unrestricted	0.88	130
	9	1	478	478	0		1800	1208	40		153	0.00	130
	10	1	517	517	0		1800	821	63		59	0.00	130

Traffic Stream Results: Stops and delays

Time Segment	Arm	Traffic Stream	Mean Cruise Time per Veh (s)	Mean Delay per Veh (s)	Uniform delay (Veh-hr/hr)	Random plus oversat delay (Veh-hr/hr)	Weighted cost of delay (£ per hr)	Mean stops per Veh (%)	Uniform stops (Stops per hr)	Random stops (Stops per hr)	Weighted cost of stops (£ per hr)
08:00-09:00	A	1	12.00	37.39	2.41	0.22	37.46	43.52	104.34	6.19	1.39
		2	1.68	21.49	1.27	0.30	22.30	25.16	58.01	8.15	0.83
	Ax	1	16.26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	B	1	12.00	90.17	5.06	1.80	97.46	99.61	225.28	47.65	3.42
		2	2.16	53.10	2.40	0.61	42.73	72.28	132.26	15.20	1.85
	Bx	1	16.72	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	C	1	12.00	62.45	1.18	0.14	18.72	98.07	70.63	3.90	0.93
	Cx	1	16.66	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	D	1	12.00	69.50	6.44	3.56	142.00	112.59	489.12	94.08	7.31
	Dx	1	16.13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	9	1	5.19	10.28	1.24	0.13	19.38	43.16	202.73	3.58	2.59
	10	1	7.56	30.23	3.81	0.53	61.64	76.69	381.84	14.64	4.97

Traffic Stream Results: Queues and blocking

Time Segment	Arm	Traffic Stream	Initial queue (Veh)	Mean max queue (Veh)	Max queue storage (Veh)	Utilised storage (%)	Average storage excess queue (Veh)	Average limit excess queue (Veh)	Excess queue penalty (£ per hr)	Wasted time starvation (s (per cycle))	Wasted time blocking back (s (per cycle))	Wasted time total (s (per cycle))	Estimated blocking
08:00-09:00	A	1	0.00	3.99	17.39	22.96	0.00	0.00	0.00	6.00	0.00	6.00	
		2	2.00	2.30	2.00	114.84	0.16	0.00	0.00	0.00	0.00	0.00	
	Ax	1	0.00	0.00	23.57	0.00	0.00	0.00	0.00	45.00	0.00	45.00	
	B	1	0.00	10.06	17.39	57.83	0.00	7.32	0.00	0.00	0.00	0.00	
		2	4.00	4.56	4.00	113.98	0.19	0.00	0.00	0.00	0.00	0.00	
	Bx	1	0.00	0.00	24.23	0.00	0.00	0.00	0.00	24.00	0.00	24.00	
	C	1	0.00	2.72	17.39	15.63	0.00	0.00	0.00	0.00	0.00	0.00	
	Cx	1	0.00	0.00	24.14	0.00	0.00	0.00	0.00	130.00	0.00	130.00	
	D	1	0.00	21.55	17.39	123.90	0.48	0.00	0.00	0.00	0.00	0.00	
	Dx	1	0.00	0.00	23.38	0.00	0.00	0.00	0.00	41.00	0.00	41.00	
	9	1	0.00	7.83	7.52	104.13	0.00	0.00	0.00	0.00	50.00	50.00	
	10	1	0.00	14.75	10.96	134.54	0.40	0.00	0.00	0.00	73.00	73.00	

Traffic Stream Results: Journey times

Time Segment	Arm	Traffic Stream	Distance travelled (PCU-km/hr)	Time spent (PCU-hr/hr)	Mean journey speed (kph)	JourneyTime (s)
08:00-09:00	A	1	25.40	3.48	7.29	49.39
		2	3.68	1.69	2.18	23.09
	Ax	1	63.01	2.10	30.00	16.26
	B	1	27.40	7.78	3.52	102.17
		2	3.67	3.08	1.19	54.41
	Bx	1	78.02	2.60	30.00	16.72
	C	1	7.60	1.57	4.84	74.45
	Cx	1	2.22	0.07	30.00	16.66
	D	1	51.80	11.73	4.42	81.50
	Dx	1	73.67	2.46	30.00	16.13
	9	1	20.67	2.05	10.06	15.47
	10	1	32.59	5.43	6.01	37.79

Traffic Stream Results: Advanced

Time Segment	Arm	Traffic Stream	Degree of saturation penalty (£ per hr)	Ped gap accepting penalty (£ per hr)	Warmed up	Mean Max Queue EoTS (Veh)	Max End of Green Queue EoTS (Veh)	Max End of Red Queue EoTS (Veh)	PCU Factor	Cost of traffic penalties (£ per hr)	Performance Index (£ per hr)
08:00-09:00	A	1	0.00	0.00	✓	3.99	0.23	3.99	1.00	0.00	38.85
		2	0.00	0.00	✓	2.30	0.30	2.30	1.00	0.00	23.13
	Ax	1	0.00	0.00	✓	0.00			1.00	0.00	0.00
	B	1	0.00	0.00	✓	10.13	1.88	9.80	1.00	0.00	100.88
		2	0.00	0.00	✓	4.55	0.55	4.55	1.00	0.00	44.58
	Bx	1	0.00	0.00	✓	0.00			1.00	0.00	0.00
	C	1	0.00	0.00	✓	2.72	0.14	2.63	1.00	0.00	19.66
	Cx	1	0.00	0.00	✓	0.00			1.00	0.00	0.00
	D	1	0.00	0.00	✓	21.79	3.81	17.19	1.00	0.00	149.31
	Dx	1	0.00	0.00	✓	0.00			1.00	0.00	0.00
	9	1	0.00	0.00	✓	7.83			1.00	0.00	21.96
	10	1	0.00	0.00	✓	14.75			1.00	0.00	66.61

Pedestrian Crossing Results

Pedestrian Crossings: Pedestrian summary

Time Segment	Crossing	Side	Degree of saturation (%)	Calculated Flow Entering (Ped/hr)	Calculated sat flow (Ped/hr)	Actual green (s (per cycle))	Mean Delay Per Ped (s)	Mean max queue (Ped)	Weighted cost of delay (£ per hr)	Performance Index (£ per hr)
08:00-09:00	(ALL)	(ALL)	30	100	11000	4	61.68	3.50	24.33	24.33

Pedestrian Crossings: Flows and signals

Time Segment	Crossing	Side	Calculated flow entering (Ped/hr)	Calculated flow out (Ped/hr)	Flow discrepancy (Ped/hr)	Adjusted flow warning	Calculated sat flow (Ped/hr)	Calculated capacity (Ped/hr)	Degree of saturation (%)	DOS Threshold exceeded	Practical reserve capacity (%)	Mean modulus of error	Actual green (s (per cycle))
08:00-09:00	(ALL)	(ALL)	100	100	0		11000	338	30		238	0.00	4

Pedestrian Crossings: Stops and delays

Time Segment	Crossing	Side	Mean Cruise Time per Ped (s)	Mean Delay per Ped (s)	Uniform delay (Ped-hr/hr)	Random plus oversat delay (Ped-hr/hr)	Weighted cost of delay (£ per hr)
08:00-09:00	2	1	6.33	61.68	1.71	0.00	24.33
		2	6.33	61.68	1.71	0.00	24.33
	3	1	6.33	61.68	1.71	0.00	24.33
		2	6.33	61.68	1.71	0.00	24.33
	4	1	5.67	61.68	1.71	0.00	24.33
		2	5.67	61.68	1.71	0.00	24.33

Pedestrian Crossings: Queues and blocking

Time Segment	Crossing	Side	Mean max queue (Ped)	Max queue storage (Ped)	Utilised storage (%)	Average storage excess queue (Ped)	Average limit excess queue (Ped)	Excess queue penalty (£ per hr)
08:00-09:00	(ALL)	(ALL)	3.50	10.00	35.00	0.00	0.00	0.00

Pedestrian Crossings: Journey times

Time Segment	Crossing	Side	Distance travelled (Ped-km/hr)	Time spent (Ped-hr/hr)	Mean journey speed (kph)	JourneyTime (s)
08:00-09:00	2	1	0.90	1.89	0.48	68.01
		2	0.90	1.89	0.48	68.01
	3	1	0.90	1.89	0.48	68.01
		2	0.90	1.89	0.48	68.01
	4	1	0.80	1.87	0.43	67.34
		2	0.80	1.87	0.43	67.34

Pedestrian Crossings: Advanced

Time Segment	Crossing	Side	Degree of saturation penalty (£ per hr)	Ped gap accepting penalty (£ per hr)	Mean Max Queue EoTS (Ped)	Ped Factor	Cost of traffic penalties (£ per hr)	Performance Index (£ per hr)
08:00-09:00	(ALL)	(ALL)	0.00	0.00	3.50	1.00	0.00	24.33

Network Results

Run Summary

Analysis set used	Run start time	Run finish time	Modelling start time (HH:mm)	Network Cycle Time (s)	Performance Index (£ per hr)	Total network delay (Veh-hr/hr)	Highest DOS (%)	Item with highest DOS	Number of oversaturated items	Percentage of oversaturated items (%)	Item with worst signalised PRC	Item with worst unsignalised PRC	Ite wit wor over PR
3	05/10/2022 16:33:31	05/10/2022 16:33:32	08:00	130	610.95	41.38	90.14	D/1	0	0	D/1	10/1	D/

Network Results: Vehicle summary

Time Segment	Degree of saturation (%)	Practical reserve capacity (%)	Calculated flow entering (Veh/hr)	Actual green (s (per cycle))	Mean Delay per Veh (s)	Weighted cost of delay (£ per hr)	Weighted cost of stops (£ per hr)	Performance Index (£ per hr)
08:00-09:00	90	0	4173	936	26.83	441.69	23.29	464.98

Network Results: Pedestrian summary

Time Segment	Degree of saturation (%)	Calculated Flow Entering (Ped/hr)	Actual green (s (per cycle))	Mean Delay Per Ped (s)	Weighted cost of delay (£ per hr)	Performance Index (£ per hr)
08:00-09:00	30	600	24	61.68	145.97	145.97

Network Results: Flows and signals

Time Segment	Calculated flow entering (Veh/hr)	Calculated flow out (Veh/hr)	Flow discrepancy (Veh/hr)	Adjusted flow warning	Degree of saturation (%)	DOS Threshold exceeded	Practical reserve capacity (%)	Actual green (s (per cycle))
08:00-09:00	4773	4773	0		90		11	960

Network Results: Stops and delays

Time Segment	Mean Cruise Time per Veh (s)	Mean Delay per Veh (s)	Uniform delay (Veh-hr/hr)	Random plus oversat delay (Veh-hr/hr)	Weighted cost of delay (£ per hr)	Mean stops per Veh (%)	Uniform stops (Stops per hr)	Random stops (Stops per hr)	Weighted cost of stops (£ per hr)
08:00-09:00	10.57	31.21	34.08	7.30	587.65	38.92	1664.21	193.39	23.29

Network Results: Queues and blocking

Time Segment	Utilised storage (%)	Excess queue penalty (£ per hr)	Wasted time starvation (s (per cycle))	Wasted time blocking back (s (per cycle))	Wasted time total (s (per cycle))
08:00-09:00	134.54	0.00	246.00	123.00	369.00

Network Results: Journey times

Time Segment	Distance travelled (PCU-km/hr)	Time spent (PCU-hr/hr)	Mean journey speed (kph)
08:00-09:00	394.94	55.34	7.14

Network Results: Advanced

Time Segment	Degree of saturation penalty (£ per hr)	Ped gap accepting penalty (£ per hr)	Warmed up	PCU Factor	Cost of traffic penalties (£ per hr)	Controller stream penalties (£ per hr)	Performance Index (£ per hr)
08:00-09:00	0.00	0.00	✓	1.00	0.00	0.00	610.95

Point to Point Journey Time

Average Journey Time (s) for Local Matrix: 1

		To							
		1	2	3	4	5	6	7	8
	1	0.0	90.6	90.7	91.2	0.0	0.0	0.0	0.0
	2	98.2	0.0	97.8	98.2	0.0	0.0	0.0	0.0
From	4	134.3	133.8	86.1	0.0	0.0	0.0	0.0	0.0
	5	0.0	0.0	0.0	0.0	0.0	0.0	68.0	0.0
	6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	68.0
	7	0.0	0.0	0.0	0.0	68.0	0.0	0.0	67.3
	8	0.0	0.0	0.0	0.0	0.0	68.0	67.3	0.0

Path Journey Time

Path	From Location	To Location	Normal Calculated Flow (Veh/hr)	Pedestrian calculated flow (Ped/hr)	Normal journey time (s)	Pedestrian journey time (s)	Calculated Total Flow (Veh/hr)	Avg journey time (s)
1	1	2	19		90.59		19	90.59
2	1	3	19		90.72		19	90.72
3	1	4	38		91.17		38	91.17
5	2	3	242		97.76		242	97.76
6	2	4	272		98.22		272	98.22
7	2	1	4		98.16		4	98.16
16	4	2	266		133.77		266	133.77
17	8	7		100		67.34	100	67.34
18	8	6		100		68.01	100	68.01
22	5	7		100		68.01	100	68.01
34	6	8		100		68.01	100	68.01
41	7	8		100		67.34	100	67.34
42	7	5		100		68.01	100	68.01
49	4	1	8		134.30		8	134.30
50	4	3	204		86.13		204	86.13
51	3	2	263		77.02		263	77.02
52	3	4	250		103.90		250	103.90
53	3	1	4		103.84		4	103.84

Final Prediction Table

Traffic Stream Results

				SIGNALS		FLOWS		PERFORMANCE				PER PCU			QUEUES
Arm	Traffic Stream	Name	Traffic node	Controller stream	Phase	Calculated flow entering (Veh/hr)	Calculated sat flow (Veh/hr)	Actual green (s (per cycle))	Wasted time total (s (per cycle))	Degree of saturation (%)	Practical reserve capacity (%)	JourneyTime (s)	Mean Delay per Veh (s)	Mean stops per Veh (%)	Mean max queue (Veh)
A	1	(untitled)	1	1	C	254	1898	35	6.00	48	107	49.39	37.39	43.52	3.99
	2		1	1	C	263 <	1800	35	0.00	53	90	23.09	21.49	25.16	2.30 +
Ax	1	(untitled)				465	Unrestricted	130	45.00	0	Unrestricted	16.26	0.00	0.00	0.00
B	1	(untitled)	1	1	A	274	2053	20	0.00	83	21	102.17	90.17	99.61	10.06
	2		1	1	A	204 <	1993	20	0.00	63	58	54.41	53.10	72.28	4.56 +
Bx	1	(untitled)				560	Unrestricted	130	24.00	0	Unrestricted	16.72	0.00	0.00	0.00
C	1	(untitled)	1	1	D	76	1999	10	0.00	41	143	74.45	62.45	98.07	2.72
Cx	1	(untitled)				16	Unrestricted	130	130.00	0	Unrestricted	16.66	0.00	0.00	0.00
D	1	(untitled)	1	1	B	518 <	2019	36	0.00	90	11	81.50	69.50	112.59	21.55 +
Dx	1	(untitled)				548	Unrestricted	130	41.00	0	Unrestricted	16.13	0.00	0.00	0.00
9	1		1			478 <	1800	130	50.00	40	153	15.47	10.28	43.16	7.83 +
10	1		1			517 <	1800	130	73.00	63	59	37.79	30.23	76.69	14.75 +

Pedestrian Crossing Results

				SIGNALS		FLOWS		PERFORMANCE			PER PED		QUEUES	WEIGHTS	PEN
Pedestrian	Side	Name	Traffic node	Controller stream	Phase	Calculated Flow Entering (Ped/hr)	Calculated sat flow (Ped/hr)	Actual green (s (per cycle))	Degree of saturation (%)	Practical reserve capacity (%)	JourneyTime (s)	Mean Delay per Ped (s)	Mean max queue (Ped)	Delay weighting (%)	Co tra pen (£ p
2	1	(untitled)	1	1	E	100	11000	4	30	238	68.01	61.68	3.50	100	0
	2	(untitled)	1	1	E	100	11000	4	30	238	68.01	61.68	3.50	100	0
3	1	(untitled)	1	1	E	100	11000	4	30	238	68.01	61.68	3.50	100	0
	2	(untitled)	1	1	E	100	11000	4	30	238	68.01	61.68	3.50	100	0
4	1	(untitled)	1	1	E	100	11000	4	30	238	67.34	61.68	3.50	100	0
	2	(untitled)	1	1	E	100	11000	4	30	238	67.34	61.68	3.50	100	0

Network Results

	Distance travelled (PCU-km/hr)	Time spent (PCU-hr/hr)	Mean journey speed (kph)	Uniform delay (Veh-hr/hr)	Random plus oversat delay (Veh-hr/hr)	Weighted cost of delay (£ per hr)	Weighted cost of stops (£ per hr)	Excess queue penalty (£ per hr)	Performance Index (£ per hr)
Normal traffic	389.74	44.04	8.85	23.80	7.30	441.69	23.29	0.00	464.98
Bus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tram	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pedestrians	5.20	11.30	0.46	10.28	0.00	145.97	0.00	0.00	145.97
TOTAL	394.94	55.34	7.14	34.08	7.30	587.65	23.29	0.00	610.95

- *< = adjusted flow warning (upstream links/traffic streams are over-saturated)*
- ** = Traffic Stream - Normal, Bus or Tram Stop or Delay weighting has been set to a value other than 100%*
- *^ = Traffic Stream - Normal, Bus or Tram Stop or Delay Path weighting has been set to a value other than 100%*
- *+ = average link/traffic stream excess queue is greater than 0*
- ***P.I. = PERFORMANCE INDEX***

TRANSYT 15

Version: 15.5.2.7994
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Filename: Junction 1 - DO SOMETHING - PM.t16
Path: M:\Projects\19\19-020 - Malahide Road\Design\Traffic\Auburn Masterplan - 2022\Junction Analysis\Junction 1
Report generation date: 05/10/2022 16:42:35

»A1 - DO SOMETHING - 2026 (OPENING YEAR) : D1 - DO SOMETHING - 2026 (OPENING YEAR), * :
»A2 - DO SOMETHING - 2031 (OPENING YEAR + 5 YEARS) : D2 - DO SOMETHING - 2031 (OPENING YEAR + 5 YEARS), * :
»A3 - DO SOMETHING - 2041 (OPENING YEAR + 15 YEARS) : D3 - DO SOMETHING - 2041 (OPENING YEAR + 15 YEARS), * :

File summary

File description

File title	(untitled)
Location	
Site number	
UTCRegion	
Driving side	Left
Date	06/12/2011
Version	
Status	(new file)
Identifier	
Client	
Jobnumber	
Enumerator	DOMAIN\f.silva
Description	

Model and Results

Enable controller offsets	Enable fuel consumption	Enable quick flares	Display journey time results	Display level of service results	Display blocking and starvation results	Display end of red and green queue results	Display excess queue results	Display separate uniform and random results	Display unweighted results	Display TRANSYT 12 style timings	Display effective greens in results	Display Red-With-Amber	Display End-Of-Green Amber
			✓		✓		✓	✓					

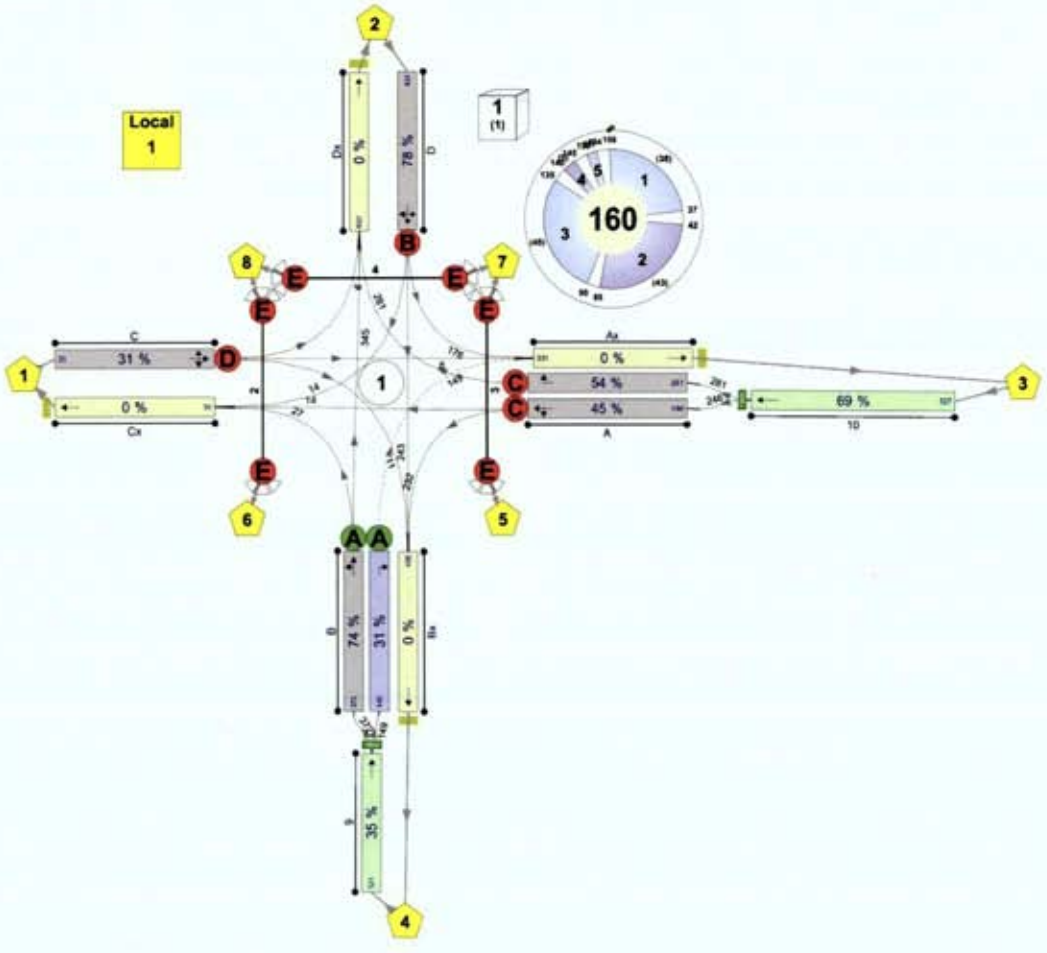
Units

Cost units	Speed units	Distance units	Fuel economy units	Fuel rate units	Mass units	Traffic units input	Traffic units results	Flow units	Average delay units	Total delay units	Rate of delay units
£	kph	m	mpg	l/h	kg	Veh	Veh	perHour	s	-Hour	perHour

Sorting

Show names instead of IDs	Sorting direction	Sorting type	Ignore prefixes when sorting	Analysis/demand set sorting	Link grouping	Source grouping	Colour Analysis/Demand Sets
	Ascending	Numerical		ID	Normal	Normal	✓

Network Diagrams



(untitled)
Diagram produced using TRANSYT 15.5.2.7994

A1 - DO SOMETHING - 2026 (OPENING YEAR)
D1 - DO SOMETHING - 2026 (OPENING YEAR), *

Summary

Data Errors and Warnings

No errors or warnings

Run Summary

Analysis set used	Run start time	Run finish time	Modelling start time (HH:mm)	Network Cycle Time (s)	Performance Index (£ per hr)	Total network delay (Veh-hr/hr)	Highest DOS (%)	Item with highest DOS	Number of oversaturated items	Percentage of oversaturated items (%)	Item with worst signalised PRC	Item with worst unsignalised PRC	Ite wit wor over PR
1	05/10/2022 16:40:13	05/10/2022 16:40:14	17:00	160	526.58	35.89	71.25	D/1	0	0	D/1	10/1	D/

Analysis Set Details

Name	Description	Demand set	Include in report	Locked
DO SOMETHING - 2026 (OPENING YEAR)		D1	✓	

Demand Set Details

Name	Description	Composite	Demand sets	Start time (HH:mm)	Locked
DO SOMETHING - 2026 (OPENING YEAR),				17:00	

Arms and Traffic Streams

Arms

Arm	Name	Description	Traffic node
A	(untitled)		1
Ax	(untitled)		
B	(untitled)		1
Bx	(untitled)		
C	(untitled)		1
Cx	(untitled)		
D	(untitled)		1
Dx	(untitled)		
9			1
10			1

Traffic Streams

Arm	Traffic Stream	Name	Description	Auto length	Length (m)	Has Saturation Flow	Saturation flow source	Saturation flow (PCU/hr)	Auto-calculate cell saturation flow	Cell saturation flow (PCU/hr)	Is signal controlled	Is give way	Traffic type	Allow Nearside Turn On Red
A	1	(untitled)			100.00	✓	Sum of lanes	1901	✓	1800	✓		Normal	
	2				14.00	✓	Sum of lanes	1800			✓		Normal	
Ax	1	(untitled)		✓	135.51								Normal	
B	1	(untitled)			100.00	✓	Sum of lanes	2049			✓		Normal	
	2				18.00	✓	Sum of lanes	1994			✓	✓	Normal	
Bx	1	(untitled)		✓	139.32								Normal	
C	1	(untitled)			100.00	✓	Sum of lanes	1999			✓		Normal	
Cx	1	(untitled)		✓	138.82								Normal	
D	1	(untitled)			100.00	✓	Sum of lanes	2021			✓		Normal	
Dx	1	(untitled)		✓	133.75								Normal	
9	1			✓	43.24	✓	Sum of lanes	1800					Normal	
10	1			✓	63.04	✓	Sum of lanes	1800					Normal	

Lanes

Arm	Traffic Stream	Lane	Name	Description	Use RR67	Surface condition	Site quality factor	Gradient (%)	Width (m)	Use connector turning radius	Proportion that turn (%)	Turning radius (m)	Nearside lane	Saturation flow (PCU/hr)
A	1	1	(untitled)		✓	N/A	N/A	2	3.00	✓	94	38.14		1901
	2	1	(untitled)											1800
Ax	1	1	(untitled)											
B	1	1	(untitled)		✓	N/A	N/A	-2	3.00	✓	8	43.06		2049
	2	1	(untitled)		✓	N/A	N/A	-2	3.00	✓	100	48.94		1994
Bx	1	1	(untitled)											
C	1	1	(untitled)		✓	N/A	N/A	-10	3.00	✓	74	39.69		1999
Cx	1	1	(untitled)											
D	1	1	(untitled)		✓	N/A	N/A	-2	3.00	✓	45	40.00		2021
Dx	1	1	(untitled)											
9	1	1	(untitled)											1800
10	1	1	(untitled)											1800

Modelling

Arm	Traffic Stream	Traffic model	Stop weighting multiplier (%)	Delay weighting multiplier (%)	Assignment Cost Weighting (%)	Exclude from results calculation	Max queue storage (PCU)	Has queue limit	Queue limit (PCU)	Excess queue penalty (£)	Has degree of saturation limit
A	1	CTM	100	100	100		0.00				
	2	Flare	100	100	100		2.00				
Ax	1	NetworkDefault	100	100	100		0.00				
B	1	PDM	100	100	100		0.00	✓	0.00	0.00	
	2	Flare	100	100	100		4.00				
Bx	1	NetworkDefault	100	100	100		0.00				
C	1	PDM	100	100	100		0.00				
Cx	1	NetworkDefault	100	100	100		0.00				
D	1	PDM	100	100	100		0.00				
Dx	1	NetworkDefault	100	100	100		0.00				
9	1	NetworkDefault	100	100	100		0.00				
10	1	NetworkDefault	100	100	100		0.00				

Modelling - Advanced

Arm	Traffic Stream	Initial queue (PCU)	Type of Vehicle-in-Service	Vehicle-in-Service	Type of random parameter	Random parameter	Auto cycle time	Cycle time
A	1	0.00	NetworkDefault	Not-Included	NetworkDefault	0.50	✓	160
	2	2.00	NetworkDefault	Not-Included	NetworkDefault	0.50	✓	160
Ax	1	0.00	NetworkDefault	Not-Included	NetworkDefault	0.50	✓	160
B	1	0.00	NetworkDefault	Not-Included	NetworkDefault	0.50	✓	160
	2	4.00	NetworkDefault	Not-Included	NetworkDefault	0.50	✓	160
Bx	1	0.00	NetworkDefault	Not-Included	NetworkDefault	0.50	✓	160
C	1	0.00	NetworkDefault	Not-Included	NetworkDefault	0.50	✓	160
Cx	1	0.00	NetworkDefault	Not-Included	NetworkDefault	0.50	✓	160
D	1	0.00	NetworkDefault	Not-Included	NetworkDefault	0.50	✓	160
Dx	1	0.00	NetworkDefault	Not-Included	NetworkDefault	0.50	✓	160
9	1	0.00	NetworkDefault	Not-Included	NetworkDefault	0.50	✓	160
10	1	0.00	NetworkDefault	Not-Included	NetworkDefault	0.50	✓	160

Normal traffic - Modelling

Arm	Traffic Stream	Stop weighting (%)	Delay weighting (%)
(ALL)	(ALL)	100	100

Normal traffic - Advanced

Arm	Traffic Stream	Dispersion type for Normal Traffic
(ALL)	(ALL)	NetworkDefault

Flows

Arm	Traffic Stream	Total Flow (Veh/hr)	Normal Flow (Veh/hr)
A	1	230	230
	2	251	251
Ax	1	305	305
B	1	336	336
	2	134	134
Bx	1	444	444
C	1	23	23
Cx	1	55	55
D	1	396	396
Dx	1	566	566
9	1	470	470
10	1	481	481

Signals

Arm	Traffic Stream	Controller stream	Phase	Second phase enabled
A	1	1	C	
	2	1	C	
B	1	1	A	
	2	1	A	
C	1	1	D	
D	1	1	B	

Entry Sources

Arm	Traffic Stream	Cruise time for Normal Traffic (s)	Cruise speed for Normal Traffic (kph)
C	1	12.00	30.00
D	1	12.00	30.00
9	1	5.19	30.00
10	1	7.56	30.00

Sources

Arm	Traffic Stream	Source	Source traffic stream	Destination traffic stream	Cruise time for Normal Traffic (s)	Cruise speed for Normal Traffic (kph)	Auto turning radius	Traffic turn style	Turning radius (m)
A	1	1	10/1	A/1	12.00	30.00	✓	Straight	Straight Movement
	2	1	10/1	A/2	1.68	30.00	✓	Straight	Straight Movement
Ax	1	1	C/1	Ax/1	16.26	30.00	✓	Straight	Straight Movement
B	1	1	9/1	B/1	12.00	30.00	✓	Straight	Straight Movement
	2	1	9/1	B/2	2.16	30.00	✓	Straight	Straight Movement
Bx	1	1	A/1	Bx/1	16.72	30.00	✓	Nearside	38.14
Cx	1	1	A/1	Cx/1	16.66	30.00	✓	Straight	Straight Movement
Dx	1	1	C/1	Dx/1	16.05	30.00	✓	Nearside	39.69
Ax	1	2	D/1	Ax/1	16.26	30.00	✓	Nearside	40.00
Bx	1	2	D/1	Bx/1	16.72	30.00	✓	Straight	Straight Movement
Cx	1	2	B/1	Cx/1	16.66	30.00	✓	Nearside	43.06
Dx	1	2	B/1	Dx/1	16.05	30.00	✓	Straight	Straight Movement
Ax	1	3	B/2	Ax/1	16.26	30.00	✓	Offside	48.94
Bx	1	3	C/1	Bx/1	16.72	30.00	✓	Offside	60.00
Cx	1	3	D/1	Cx/1	16.66	30.00	✓	Offside	55.00
Dx	1	3	A/2	Dx/1	16.05	30.00	✓	Offside	47.36

Give Way Data

Arm	Traffic Stream	Opposed traffic	Use Step-wise Opposed Turn Model	Visibility restricted
B	2	AllTraffic		

Give Way Data - All Movements - Conflicts

Traffic Stream	Description	Controlling type	Controlling traffic stream	Percentage opposing (%)	Slope coefficient	Upstream signals visible	Conflict shift	Conflict duration
2		TrafficStream	A/2	100	0.00		0	0

Pedestrian Crossings

Pedestrian Crossings

Crossing	Name	Description	Traffic node	Allow walk on red	Crossing type	Length (m)	Cruise time (seconds)	Cruise speed (kph)
2	(untitled)		1		Farside	8.00	5.33	5.40
3	(untitled)		1		Farside	8.00	5.33	5.40
4	(untitled)		1		Farside	7.00	4.67	5.40

Pedestrian Crossings - Signals

Crossing	Controller stream	Phase	Second phase enabled
(ALL)	1	E	

Pedestrian Crossings - Sides

Crossing	Side	Saturation flow (Ped/hr)
(ALL)	(ALL)	11000

Pedestrian Crossings - Modelling

Crossing	Side	Delay weighting (%)	Assignment Cost Weighting (%)	Exclude from results calculation	Max queue storage (Ped)	Has queue limit	Has degree of saturation limit
(ALL)	(ALL)	100	100		0.00		

Signal Timings

Network Default: 160s cycle time; 160 steps

Controller Stream 1

Controller Stream	Name	Description	Use sequence	Cycle time source	Cycle time (s)
1	(untitled)		1	NetworkDefault	160

Controller Stream 1 - Properties

Controller Stream	Manufacturer name	Type	Model number	(Telephone) Line Number	Site number	Grid reference	Gaining delay type
1	Unspecified						Relative

Controller Stream 1 - Optimisation

Controller Stream	Allow offset optimisation	Allow green split optimisation	Optimisation level	Auto redistribute	Enable stage constraint
1	✓	✓	Offsets And Green Splits	✓	

Phases

Controller Stream	Phase	Name	Minimum green (s)	Maximum green (s)	Relative start displacement (s)	Relative end displacement (s)	Type	Blackout Time (s)
1	A	(untitled)	30	300	0	0	Traffic	
	B	(untitled)	25	300	0	0	Traffic	
	C	(untitled)	45	300	0	0	Traffic	
	D	(untitled)	5	5	0	0	Traffic	
	E	(untitled)	4	4	0	0	Pedestrian	0

Library Stages

Controller Stream	Library Stage	Phases in stage	User stage minimum (s)
1	1	A	1
	2	B	1
	3	C	1
	4	D	1
	5	E	1

Stage Sequences

Controller Stream	Sequence	Name	Multiple cycling	Stage IDs	Stage ends
1	1	(untitled)	Single	1, 2, 3, 4, 5	37, 85, 135, 145, 154
	2	(untitled)	Single	1, 2, 3, 5, 4	20, 54, 98, 111, 125
	3	(untitled)	Single	1, 2, 4, 3, 5	20, 54, 68, 112, 125
	4	(untitled)	Single	1, 2, 4, 5, 3	20, 54, 68, 81, 125
	5	(untitled)	Single	1, 2, 5, 3, 4	20, 54, 67, 111, 125
	6	(untitled)	Single	1, 2, 5, 4, 3	20, 54, 67, 81, 125
	7	(untitled)	Single	1, 3, 2, 4, 5	20, 64, 99, 113, 125
	8	(untitled)	Single	1, 3, 2, 5, 4	20, 64, 99, 112, 125
	9	(untitled)	Single	1, 3, 4, 2, 5	20, 64, 78, 112, 125
	10	(untitled)	Single	1, 3, 4, 5, 2	20, 64, 78, 91, 125

Intergreen Matrix for Controller Stream 1

		To				
		A	B	C	D	E
From	A		5	5	9	5
	B	5		5	5	5
	C	5	6		5	5
	D	5	5	5		5
	E	5	5	5	5	

Banned Stage transitions for Controller Stream 1

		To				
		1	2	3	4	5
From	1					
	2					
	3					
	4					
	5					

Interstage Matrix for Controller Stream 1

		To				
		1	2	3	4	5
From	1	0	5	5	9	5
	2	5	0	5	5	5
	3	5	6	0	5	5
	4	5	5	5	0	5
	5	5	5	5	5	0

Resultant Stages

Controller Stream	Resultant Stage	Is base stage	Library Stage ID	Phases in this stage	Stage start (s)	Stage end (s)	Stage duration (s)	User stage minimum (s)	Stage minimum (s)
1	1	✓	1	A	159	37	38	1	30
	2	✓	2	B	42	85	43	1	25
	3	✓	3	C	90	135	45	1	45
	4	✓	4	D	140	145	5	1	5
	5	✓	5	E	150	154	4	1	4

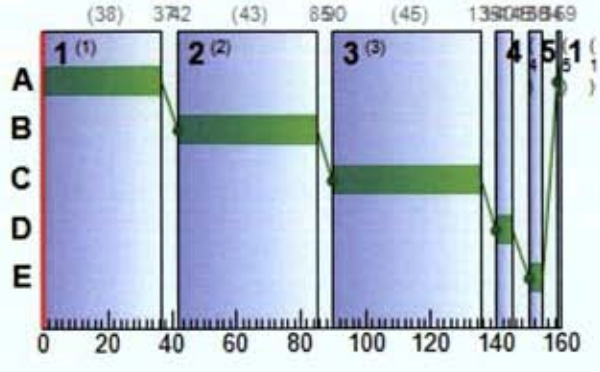
Resultant Phase Green Periods

Controller Stream	Phase	Green period	Is base green period	Start time (s)	End time (s)	Duration (s)
1	A	1	✓	159	37	38
	B	1	✓	42	85	43
	C	1	✓	90	135	45
	D	1	✓	140	145	5
	E	1	✓	150	154	4

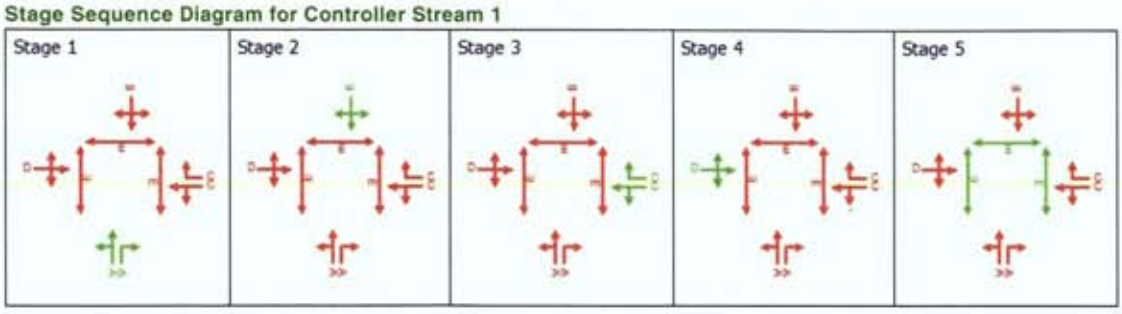
Traffic Stream Green Times

Arm	Traffic Stream	Traffic Node	Controller Stream	Phase	Green Period 1		
					Start	End	Duration
A	1	1	1	C	90	135	45
A	2	1	1	C	90	135	45
B	1	1	1	A	159	37	38
B	2	1	1	A	159	37	38
C	1	1	1	D	140	145	5
D	1	1	1	B	42	85	43

Phase Timings Diagram for Controller Stream 1



Stage Sequence Diagram for Controller Stream 1



Resultant penalties

Time Segment	Controller stream	Phase min max penalty (£ per hr)	Intergreen broken penalty (£ per hr)	Stage constraint broken penalty (£ per hr)	Cost of controller stream penalties (£ per hr)
17:00-18:00	1	0.00	0.00	0.00	0.00

Traffic Stream Results

Traffic Stream Results: Vehicle summary

Time Segment	Arm	Traffic Stream	Degree of saturation (%)	Practical reserve capacity (%)	Calculated flow entering (Veh/hr)	Calculated sat flow (Veh/hr)	Actual green (s (per cycle))	Mean Delay per Veh (s)	Mean max queue (Veh)	Utilised storage (%)	Weighted cost of delay (£ per hr)	Weighted cost of stops (£ per hr)	Performance Index (£ per hr)
17:00-18:00	A	1	42	138	230	1901	45	26.87	2.72	15.66	24.38	0.77	25.14
		2	49	106	251	1800	45	21.62	2.23	111.48	21.40	0.66	22.06
	Ax	1	0	Unrestricted	305	Unrestricted	160	0.00	0.00	0.00	0.00	0.00	0.00
	B	1	67	49	336	2049	38	60.83	13.99	80.42	80.61	3.86	84.47
		2	28	263	134	1994	38	49.84	4.05	101.31	26.34	1.27	27.61
	Bx	1	0	Unrestricted	444	Unrestricted	160	0.00	0.00	0.00	0.00	0.00	0.00
	C	1	31	226	23	1999	5	85.50	1.06	6.08	7.76	0.30	8.05
	Cx	1	0	Unrestricted	55	Unrestricted	160	0.00	0.00	0.00	0.00	0.00	0.00
	D	1	71	40	396	2021	43	60.17	16.71	96.06	93.99	4.66	98.65
	Dx	1	0	Unrestricted	566	Unrestricted	160	0.00	0.00	0.00	0.00	0.00	0.00
	9	1	29	240	470	1800	160	1.71	3.19	42.48	3.17	0.78	3.96
	10	1	60	66	481	1800	160	37.00	16.62	151.58	70.20	4.61	74.81

Traffic Stream Results: Flows and signals

Time Segment	Arm	Traffic Stream	Calculated flow entering (Veh/hr)	Calculated flow out (Veh/hr)	Flow discrepancy (Veh/hr)	Adjusted flow warning	Calculated sat flow (Veh/hr)	Calculated capacity (Veh/hr)	Degree of saturation (%)	DOS Threshold exceeded	Practical reserve capacity (%)	Mean modulus of error	Actual green (s (per cycle))
17:00-18:00	A	1	230	230	0		1901	547	42		138	1.11	45
		2	251	251	0		1800	518	49		106	1.10	45
	Ax	1	305	305	0		Unrestricted	Unrestricted	0		Unrestricted	1.01	160
	B	1	336	336	0		2049	499	67		49	0.17	38
		2	134	134	0		1994	486	28		263	0.21	38
	Bx	1	444	444	0		Unrestricted	Unrestricted	0		Unrestricted	0.78	160
	C	1	23	23	0		1999	75	31		226	0.00	5
	Cx	1	55	55	0		Unrestricted	Unrestricted	0		Unrestricted	0.56	160
	D	1	396	396	0		2021	556	71		40	0.00	43
	Dx	1	566	566	0		Unrestricted	Unrestricted	0		Unrestricted	0.89	160
	9	1	470	470	0		1800	1600	29		240	0.00	160
	10	1	481	481	0		1800	799	60		66	0.00	160

Traffic Stream Results: Stops and delays

Time Segment	Arm	Traffic Stream	Mean Cruise Time per Veh (s)	Mean Delay per Veh (s)	Uniform delay (Veh-hr/hr)	Random plus oversat delay (Veh-hr/hr)	Weighted cost of delay (£ per hr)	Mean stops per Veh (%)	Uniform stops (Stops per hr)	Random stops (Stops per hr)	Weighted cost of stops (£ per hr)
17:00-18:00	A	1	12.00	26.87	1.56	0.15	24.38	26.64	57.86	3.41	0.77
		2	1.68	21.62	1.27	0.24	21.40	20.85	47.19	5.14	0.66
	Ax	1	16.26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	B	1	12.00	60.83	5.00	0.68	80.61	91.53	292.42	15.13	3.86
		2	2.16	49.84	1.78	0.07	26.34	75.37	99.82	1.18	1.27
	Bx	1	16.72	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	C	1	12.00	85.50	0.48	0.07	7.76	102.58	22.11	1.48	0.30
	Cx	1	16.66	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	D	1	12.00	60.17	5.75	0.87	93.99	93.81	352.23	19.24	4.66
	Dx	1	16.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	9	1	5.19	1.71	0.16	0.06	3.17	13.30	61.14	1.37	0.78
	10	1	7.56	37.00	4.49	0.45	70.20	76.47	357.72	10.11	4.61

Traffic Stream Results: Queues and blocking

Time Segment	Arm	Traffic Stream	Initial queue (Veh)	Mean max queue (Veh)	Max queue storage (Veh)	Utilised storage (%)	Average storage excess queue (Veh)	Average limit excess queue (Veh)	Excess queue penalty (£ per hr)	Wasted time starvation (s (per cycle))	Wasted time blocking back (s (per cycle))	Wasted time total (s (per cycle))	Estimated blocking
17:00-18:00	A	1	0.00	2.72	17.39	15.66	0.00	0.00	0.00	9.00	0.00	9.00	
		2	2.00	2.23	2.00	111.48	0.13	0.00	0.00	0.00	0.00	0.00	
	Ax	1	0.00	0.00	23.57	0.00	0.00	0.00	0.00	62.00	0.00	62.00	
	B	1	0.00	13.99	17.39	80.42	0.00	6.66	0.00	0.00	0.00	0.00	
		2	4.00	4.05	4.00	101.31	0.00	0.00	0.00	0.00	0.00	0.00	
	Bx	1	0.00	0.00	24.23	0.00	0.00	0.00	0.00	49.00	0.00	49.00	
	C	1	0.00	1.06	17.39	6.08	0.00	0.00	0.00	4.00	0.00	4.00	
	Cx	1	0.00	0.00	24.14	0.00	0.00	0.00	0.00	108.00	0.00	108.00	
	D	1	0.00	16.71	17.39	96.06	0.00	0.00	0.00	0.00	0.00	0.00	
	Dx	1	0.00	0.00	23.26	0.00	0.00	0.00	0.00	53.00	0.00	53.00	
	9	1	0.00	3.19	7.52	42.48	0.00	0.00	0.00	0.00	17.78	17.78	
	10	1	0.00	16.62	10.96	151.58	0.77	0.00	0.00	0.00	91.00	91.00	

Traffic Stream Results: Journey times

Time Segment	Arm	Traffic Stream	Distance travelled (PCU-km/hr)	Time spent (PCU-hr/hr)	Mean journey speed (kph)	JourneyTime (s)
17:00-18:00	A	1	23.00	2.48	9.26	38.87
		2	3.51	1.62	2.17	23.21
	Ax	1	41.33	1.38	30.00	16.26
	B	1	33.60	6.80	4.94	72.83
		2	2.41	1.91	1.26	51.41
	Bx	1	61.86	2.06	30.00	16.72
	C	1	2.30	0.62	3.69	97.50
	Cx	1	7.64	0.25	30.00	16.66
	D	1	39.60	7.94	4.99	72.17
	Dx	1	75.70	2.52	30.00	16.05
	9	1	20.32	0.90	22.56	6.90
	10	1	30.32	5.95	5.09	44.56

Traffic Stream Results: Advanced

Time Segment	Arm	Traffic Stream	Degree of saturation penalty (£ per hr)	Ped gap accepting penalty (£ per hr)	Warmed up	Mean Max Queue EoTS (Veh)	Max End of Green Queue EoTS (Veh)	Max End of Red Queue EoTS (Veh)	PCU Factor	Cost of traffic penalties (£ per hr)	Performance Index (£ per hr)
17:00-18:00	A	1	0.00	0.00	✓	2.72	0.15	2.72	1.00	0.00	25.14
		2	0.00	0.00	✓	2.23	0.23	2.23	1.00	0.00	22.06
	Ax	1	0.00	0.00	✓	0.00			1.00	0.00	0.00
	B	1	0.00	0.00	✓	13.99	0.69	11.66	1.00	0.00	84.47
		2	0.00	0.00	✓	4.05	0.05	4.05	1.00	0.00	27.61
	Bx	1	0.00	0.00	✓	0.00			1.00	0.00	0.00
	C	1	0.00	0.00	✓	1.06	0.07	1.05	1.00	0.00	8.05
	Cx	1	0.00	0.00	✓	0.00			1.00	0.00	0.00
	D	1	0.00	0.00	✓	16.71	0.87	13.63	1.00	0.00	98.65
	Dx	1	0.00	0.00	✓	0.00			1.00	0.00	0.00
	9	1	0.00	0.00	✓	3.19			1.00	0.00	3.96
	10	1	0.00	0.00	✓	16.62			1.00	0.00	74.81

Pedestrian Crossing Results

Pedestrian Crossings: Pedestrian summary

Time Segment	Crossing	Side	Degree of saturation (%)	Calculated Flow Entering (Ped/hr)	Calculated sat flow (Ped/hr)	Actual green (s (per cycle))	Mean Delay Per Ped (s)	Mean max queue (Ped)	Weighted cost of delay (£ per hr)	Performance Index (£ per hr)
17:00-18:00	(ALL)	(ALL)	36	100	11000	4	76.83	4.33	30.31	30.31

Pedestrian Crossings: Flows and signals

Time Segment	Crossing	Side	Calculated flow entering (Ped/hr)	Calculated flow out (Ped/hr)	Flow discrepancy (Ped/hr)	Adjusted flow warning	Calculated sat flow (Ped/hr)	Calculated capacity (Ped/hr)	Degree of saturation (%)	DOS Threshold exceeded	Practical reserve capacity (%)	Mean modulus of error	Actual green (s (per cycle))
17:00-18:00	(ALL)	(ALL)	100	100	0		11000	275	36		175	0.00	4

Pedestrian Crossings: Stops and delays

Time Segment	Crossing	Side	Mean Cruise Time per Ped (s)	Mean Delay per Ped (s)	Uniform delay (Ped-hr/hr)	Random plus oversat delay (Ped-hr/hr)	Weighted cost of delay (£ per hr)
17:00-18:00	2	1	6.33	76.83	2.13	0.00	30.31
		2	6.33	76.83	2.13	0.00	30.31
	3	1	6.33	76.83	2.13	0.00	30.31
		2	6.33	76.83	2.13	0.00	30.31
	4	1	5.67	76.83	2.13	0.00	30.31
		2	5.67	76.83	2.13	0.00	30.31

Pedestrian Crossings: Queues and blocking

Time Segment	Crossing	Side	Mean max queue (Ped)	Max queue storage (Ped)	Utilised storage (%)	Average storage excess queue (Ped)	Average limit excess queue (Ped)	Excess queue penalty (£ per hr)
17:00-18:00	(ALL)	(ALL)	4.33	10.00	43.33	0.00	0.00	0.00

Pedestrian Crossings: Journey times

Time Segment	Crossing	Side	Distance travelled (Ped-km/hr)	Time spent (Ped-hr/hr)	Mean journey speed (kph)	JourneyTime (s)
17:00-18:00	2	1	0.90	2.31	0.39	83.16
		2	0.90	2.31	0.39	83.16
	3	1	0.90	2.31	0.39	83.16
		2	0.90	2.31	0.39	83.16
	4	1	0.80	2.29	0.35	82.50
		2	0.80	2.29	0.35	82.50

Pedestrian Crossings: Advanced

Time Segment	Crossing	Side	Degree of saturation penalty (£ per hr)	Ped gap accepting penalty (£ per hr)	Mean Max Queue EoTS (Ped)	Ped Factor	Cost of traffic penalties (£ per hr)	Performance Index (£ per hr)
17:00-18:00	(ALL)	(ALL)	0.00	0.00	4.33	1.00	0.00	30.31

Network Results

Run Summary

Analysis set used	Run start time	Run finish time	Modelling start time (HH:mm)	Network Cycle Time (s)	Performance Index (£ per hr)	Total network delay (Veh-hr/hr)	Highest DOS (%)	Item with highest DOS	Number of oversaturated items	Percentage of oversaturated items (%)	Item with worst signalised PRC	Item with worst unsignalised PRC	Ite wit wor over PR
1	05/10/2022 16:40:13	05/10/2022 16:40:14	17:00	160	526.58	35.89	71.25	D/1	0	0	D/1	10/1	D/

Network Results: Vehicle summary

Time Segment	Degree of saturation (%)	Practical reserve capacity (%)	Calculated flow entering (Veh/hr)	Actual green (s (per cycle))	Mean Delay per Veh (s)	Weighted cost of delay (£ per hr)	Weighted cost of stops (£ per hr)	Performance Index (£ per hr)
17:00-18:00	71	0	3691	1174	22.52	327.85	16.90	344.74

Network Results: Pedestrian summary

Time Segment	Degree of saturation (%)	Calculated Flow Entering (Ped/hr)	Actual green (s (per cycle))	Mean Delay Per Ped (s)	Weighted cost of delay (£ per hr)	Performance Index (£ per hr)
17:00-18:00	36	600	24	76.83	181.83	181.83

Network Results: Flows and signals

Time Segment	Calculated flow entering (Veh/hr)	Calculated flow out (Veh/hr)	Flow discrepancy (Veh/hr)	Adjusted flow warning	Degree of saturation (%)	DOS Threshold exceeded	Practical reserve capacity (%)	Actual green (s (per cycle))
17:00-18:00	4291	4291	0		71		40	1198

Network Results: Stops and delays

Time Segment	Mean Cruise Time per Veh (s)	Mean Delay per Veh (s)	Uniform delay (Veh-hr/hr)	Random plus oversat delay (Veh-hr/hr)	Weighted cost of delay (£ per hr)	Mean stops per Veh (%)	Uniform stops (Stops per hr)	Random stops (Stops per hr)	Weighted cost of stops (£ per hr)
17:00-18:00	10.41	30.11	33.30	2.59	509.68	31.40	1290.49	57.07	16.90

Network Results: Queues and blocking

Time Segment	Utilised storage (%)	Excess queue penalty (£ per hr)	Wasted time starvation (s (per cycle))	Wasted time blocking back (s (per cycle))	Wasted time total (s (per cycle))
17:00-18:00	151.58	0.00	285.00	108.78	393.78

Network Results: Journey times

Time Segment	Distance travelled (PCU-km/hr)	Time spent (PCU-hr/hr)	Mean journey speed (kph)
17:00-18:00	346.80	48.27	7.18

Network Results: Advanced

Time Segment	Degree of saturation penalty (£ per hr)	Ped gap accepting penalty (£ per hr)	Warmed up	PCU Factor	Cost of traffic penalties (£ per hr)	Controller stream penalties (£ per hr)	Performance Index (£ per hr)
17:00-18:00	0.00	0.00	✓	1.00	0.00	0.00	526.58

Point to Point Journey Time

Average Journey Time (s) for Local Matrix: 1

		To							
		1	2	3	4	5	6	7	8
From	1	0.0	113.5	113.8	114.2	0.0	0.0	0.0	0.0
	2	88.8	0.0	88.4	88.9	0.0	0.0	0.0	0.0
	3	100.1	83.8	0.0	100.2	0.0	0.0	0.0	0.0
	4	96.4	95.8	74.6	0.0	0.0	0.0	0.0	0.0
	5	0.0	0.0	0.0	0.0	0.0	0.0	83.2	0.0
	6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	83.2
	7	0.0	0.0	0.0	0.0	83.2	0.0	0.0	82.5
	8	0.0	0.0	0.0	0.0	0.0	83.2	82.5	0.0

Path Journey Time

Path	From Location	To Location	Normal Calculated Flow (Veh/hr)	Pedestrian calculated flow (Ped/hr)	Normal journey time (s)	Pedestrian journey time (s)	Calculated Total Flow (Veh/hr)	Avg journey time (s)
1	1	2	6		113.55		6	113.55
2	1	3	6		113.76		6	113.76
3	1	4	11		114.22		11	114.22
5	2	3	165		88.43		165	88.43
6	2	4	217		88.89		217	88.89
7	2	1	14		88.83		14	88.83
16	4	2	309		95.78		309	95.78
17	8	7		100		82.50	100	82.50
18	8	6		100		83.16	100	83.16
22	5	7		100		83.16	100	83.16
34	6	8		100		83.16	100	83.16
41	7	8		100		82.50	100	82.50
42	7	5		100		83.16	100	83.16
49	4	1	27		96.38		27	96.38
50	4	3	134		74.57		134	74.57
51	3	2	251		83.83		251	83.83
52	3	4	216		100.15		216	100.15
53	3	1	14		100.09		14	100.09

Final Prediction Table

Traffic Stream Results

				SIGNALS		FLOWS		PERFORMANCE				PER PCU			QUEUES
Arm	Traffic Stream	Name	Traffic node	Controller stream	Phase	Calculated flow entering (Veh/hr)	Calculated sat flow (Veh/hr)	Actual green (s (per cycle))	Wasted time total (s (per cycle))	Degree of saturation (%)	Practical reserve capacity (%)	JourneyTime (s)	Mean Delay per Veh (s)	Mean stops per Veh (%)	Mean max queue (Veh)
A	1	(untitled)	1	1	C	230	1901	45	9.00	42	138	38.87	26.87	26.64	2.72
	2		1	1	C	251 <	1800	45	0.00	49	106	23.21	21.62	20.85	2.23 +
Ax	1	(untitled)				305	Unrestricted	160	62.00	0	Unrestricted	16.26	0.00	0.00	0.00
B	1	(untitled)	1	1	A	336	2049	38	0.00	67	49	72.83	60.83	91.53	13.99
	2		1	1	A	134 <	1994	38	0.00	28	263	51.41	49.84	75.37	4.05 +
Bx	1	(untitled)				444	Unrestricted	160	49.00	0	Unrestricted	16.72	0.00	0.00	0.00
C	1	(untitled)	1	1	D	23	1999	5	4.00	31	226	97.50	85.50	102.58	1.06
Cx	1	(untitled)				55	Unrestricted	160	108.00	0	Unrestricted	16.66	0.00	0.00	0.00
D	1	(untitled)	1	1	B	396	2021	43	0.00	71	40	72.17	60.17	93.81	16.71
Dx	1	(untitled)				566	Unrestricted	160	53.00	0	Unrestricted	16.05	0.00	0.00	0.00
9	1		1			470	1800	160	17.78	29	240	6.90	1.71	13.30	3.19
10	1		1			481 <	1800	160	91.00	60	66	44.56	37.00	76.47	16.62 +

Pedestrian Crossing Results

				SIGNALS		FLOWS		PERFORMANCE			PER PED		QUEUES	WEIGHTS	PEN
Pedestrian	Side	Name	Traffic node	Controller stream	Phase	Calculated Flow Entering (Ped/hr)	Calculated sat flow (Ped/hr)	Actual green (s (per cycle))	Degree of saturation (%)	Practical reserve capacity (%)	JourneyTime (s)	Mean Delay per Ped (s)	Mean max queue (Ped)	Delay weighting (%)	Co tra pen (£ p
2	1	(untitled)	1	1	E	100	11000	4	36	175	83.16	76.83	4.33	100	0
	2	(untitled)	1	1	E	100	11000	4	36	175	83.16	76.83	4.33	100	0
3	1	(untitled)	1	1	E	100	11000	4	36	175	83.16	76.83	4.33	100	0
	2	(untitled)	1	1	E	100	11000	4	36	175	83.16	76.83	4.33	100	0
4	1	(untitled)	1	1	E	100	11000	4	36	175	82.50	76.83	4.33	100	0
	2	(untitled)	1	1	E	100	11000	4	36	175	82.50	76.83	4.33	100	0

Network Results

	Distance travelled (PCU-km/hr)	Time spent (PCU-hr/hr)	Mean journey speed (kph)	Uniform delay (Veh-hr/hr)	Random plus oversat delay (Veh-hr/hr)	Weighted cost of delay (£ per hr)	Weighted cost of stops (£ per hr)	Excess queue penalty (£ per hr)	Performance Index (£ per hr)
Normal traffic	341.60	34.45	9.92	20.50	2.59	327.85	16.90	0.00	344.74
Bus	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tram	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pedestrians	5.20	13.82	0.38	12.81	0.00	181.83	0.00	0.00	181.83
TOTAL	346.80	48.27	7.18	33.30	2.59	509.68	16.90	0.00	526.58

- *< = adjusted flow warning (upstream links/traffic streams are over-saturated)*
- ** = Traffic Stream - Normal, Bus or Tram Stop or Delay weighting has been set to a value other than 100%*
- *^ = Traffic Stream - Normal, Bus or Tram Stop or Delay Path weighting has been set to a value other than 100%*
- *+ = average link/traffic stream excess queue is greater than 0*
- ***P.I. = PERFORMANCE INDEX***

A2 - DO SOMETHING - 2031 (OPENING YEAR + 5 YEARS)
D2 - DO SOMETHING - 2031 (OPENING YEAR + 5 YEARS), *

Summary

Data Errors and Warnings

No errors or warnings

Run Summary

Analysis set used	Run start time	Run finish time	Modelling start time (HH:mm)	Network Cycle Time (s)	Performance Index (£ per hr)	Total network delay (Veh-hr/hr)	Highest DOS (%)	Item with highest DOS	Number of oversaturated items	Percentage of oversaturated items (%)	Item with worst signalised PRC	Item with worst unsignalised PRC	Ite wit
2	05/10/2022 16:40:14	05/10/2022 16:40:16	17:00	160	594.90	40.50	78.54	D/1	0	0	D/1	10/1	D/

Analysis Set Details

Name	Description	Demand set	Include in report	Locked
DO SOMETHING - 2031 (OPENING YEAR + 5 YEARS)		D2	✓	

Demand Set Details

Name	Description	Composite	Demand sets	Start time (HH:mm)	Locked
DO SOMETHING - 2031 (OPENING YEAR + 5 YEARS),				17:00	

Arms and Traffic Streams

Arms

Arm	Name	Description	Traffic node
A	(untitled)		1
Ax	(untitled)		
B	(untitled)		1
Bx	(untitled)		
C	(untitled)		1
Cx	(untitled)		
D	(untitled)		1
Dx	(untitled)		
9			1
10			1

Traffic Streams

Arm	Traffic Stream	Name	Description	Auto length	Length (m)	Has Saturation Flow	Saturation flow source	Saturation flow (PCU/hr)	Auto-calculate cell saturation flow	Cell saturation flow (PCU/hr)	Is signal controlled	Is give way	Traffic type	Allow Nearside Turn On Red
A	1	(untitled)			100.00	✓	Sum of lanes	1900	✓	1800	✓		Normal	
	2				14.00	✓	Sum of lanes	1800			✓		Normal	
Ax	1	(untitled)		✓	135.51								Normal	
B	1	(untitled)			100.00	✓	Sum of lanes	2049			✓		Normal	
	2				18.00	✓	Sum of lanes	1994			✓	✓	Normal	
Bx	1	(untitled)		✓	139.32								Normal	
C	1	(untitled)			100.00	✓	Sum of lanes	1999			✓		Normal	
Cx	1	(untitled)		✓	138.82								Normal	
D	1	(untitled)			100.00	✓	Sum of lanes	2019			✓		Normal	
Dx	1	(untitled)		✓	133.75								Normal	
9	1			✓	43.24	✓	Sum of lanes	1800					Normal	
10	1			✓	63.04	✓	Sum of lanes	1800					Normal	

Lanes

Arm	Traffic Stream	Lane	Name	Description	Use RR67	Surface condition	Site quality factor	Gradient (%)	Width (m)	Use connector turning radius	Proportion that turn (%)	Turning radius (m)	Nearside lane	Saturation flow (PCU/hr)
A	1	1	(untitled)		✓	N/A	N/A	2	3.00	✓	95	38.14		1900
	2	1	(untitled)											1800
Ax	1	1	(untitled)											
B	1	1	(untitled)		✓	N/A	N/A	-2	3.00	✓	8	43.06		2049
	2	1	(untitled)		✓	N/A	N/A	-2	3.00	✓	100	48.94		1994
Bx	1	1	(untitled)											
C	1	1	(untitled)		✓	N/A	N/A	-10	3.00	✓	74	39.69		1999
Cx	1	1	(untitled)											
D	1	1	(untitled)		✓	N/A	N/A	-2	3.00	✓	48	40.00		2019
Dx	1	1	(untitled)											
9	1	1	(untitled)											1800
10	1	1	(untitled)											1800

Modelling

Arm	Traffic Stream	Traffic model	Stop weighting multiplier (%)	Delay weighting multiplier (%)	Assignment Cost Weighting (%)	Exclude from results calculation	Max queue storage (PCU)	Has queue limit	Queue limit (PCU)	Excess queue penalty (£)	Has degree of saturation limit
A	1	CTM	100	100	100		0.00				
	2	Flare	100	100	100		2.00				
Ax	1	NetworkDefault	100	100	100		0.00				
B	1	PDM	100	100	100		0.00	✓	0.00	0.00	
	2	Flare	100	100	100		4.00				
Bx	1	NetworkDefault	100	100	100		0.00				
C	1	PDM	100	100	100		0.00				
Cx	1	NetworkDefault	100	100	100		0.00				
D	1	PDM	100	100	100		0.00				
Dx	1	NetworkDefault	100	100	100		0.00				
9	1	NetworkDefault	100	100	100		0.00				
10	1	NetworkDefault	100	100	100		0.00				

Modelling - Advanced

Arm	Traffic Stream	Initial queue (PCU)	Type of Vehicle-in-Service	Vehicle-in-Service	Type of random parameter	Random parameter	Auto cycle time	Cycle time
A	1	0.00	NetworkDefault	Not-Included	NetworkDefault	0.50	✓	160
	2	2.00	NetworkDefault	Not-Included	NetworkDefault	0.50	✓	160
Ax	1	0.00	NetworkDefault	Not-Included	NetworkDefault	0.50	✓	160
B	1	0.00	NetworkDefault	Not-Included	NetworkDefault	0.50	✓	160
	2	4.00	NetworkDefault	Not-Included	NetworkDefault	0.50	✓	160
Bx	1	0.00	NetworkDefault	Not-Included	NetworkDefault	0.50	✓	160
C	1	0.00	NetworkDefault	Not-Included	NetworkDefault	0.50	✓	160
Cx	1	0.00	NetworkDefault	Not-Included	NetworkDefault	0.50	✓	160
D	1	0.00	NetworkDefault	Not-Included	NetworkDefault	0.50	✓	160
Dx	1	0.00	NetworkDefault	Not-Included	NetworkDefault	0.50	✓	160
9	1	0.00	NetworkDefault	Not-Included	NetworkDefault	0.50	✓	160
10	1	0.00	NetworkDefault	Not-Included	NetworkDefault	0.50	✓	160

Normal traffic - Modelling

Arm	Traffic Stream	Stop weighting (%)	Delay weighting (%)
(ALL)	(ALL)	100	100

Normal traffic - Advanced

Arm	Traffic Stream	Dispersion type for Normal Traffic
(ALL)	(ALL)	NetworkDefault

Flows

Arm	Traffic Stream	Total Flow (Veh/hr)	Normal Flow (Veh/hr)
A	1	264	264
	2	269	269
Ax	1	349	349
B	1	358	358
	2	143	143
Bx	1	493	493
C	1	23	23
Cx	1	55	55
D	1	446	446
Dx	1	606	606
9	1	501	501
10	1	533	533

Signals

Arm	Traffic Stream	Controller stream	Phase	Second phase enabled
A	1	1	C	
	2	1	C	
B	1	1	A	
	2	1	A	
C	1	1	D	
D	1	1	B	

Entry Sources

Arm	Traffic Stream	Cruise time for Normal Traffic (s)	Cruise speed for Normal Traffic (kph)
C	1	12.00	30.00
D	1	12.00	30.00
9	1	5.19	30.00
10	1	7.56	30.00

Sources

Arm	Traffic Stream	Source	Source traffic stream	Destination traffic stream	Cruise time for Normal Traffic (s)	Cruise speed for Normal Traffic (kph)	Auto turning radius	Traffic turn style	Turning radius (m)
A	1	1	10/1	A/1	12.00	30.00	✓	Straight	Straight Movement
	2	1	10/1	A/2	1.68	30.00	✓	Straight	Straight Movement
Ax	1	1	C/1	Ax/1	16.26	30.00	✓	Straight	Straight Movement
B	1	1	9/1	B/1	12.00	30.00	✓	Straight	Straight Movement
	2	1	9/1	B/2	2.16	30.00	✓	Straight	Straight Movement
Bx	1	1	A/1	Bx/1	16.72	30.00	✓	Nearside	38.14
Cx	1	1	A/1	Cx/1	16.66	30.00	✓	Straight	Straight Movement
Dx	1	1	C/1	Dx/1	16.05	30.00	✓	Nearside	39.69
Ax	1	2	D/1	Ax/1	16.26	30.00	✓	Nearside	40.00
Bx	1	2	D/1	Bx/1	16.72	30.00	✓	Straight	Straight Movement
Cx	1	2	B/1	Cx/1	16.66	30.00	✓	Nearside	43.06
Dx	1	2	B/1	Dx/1	16.05	30.00	✓	Straight	Straight Movement
Ax	1	3	B/2	Ax/1	16.26	30.00	✓	Offside	48.94
Bx	1	3	C/1	Bx/1	16.72	30.00	✓	Offside	60.00
Cx	1	3	D/1	Cx/1	16.66	30.00	✓	Offside	55.00
Dx	1	3	A/2	Dx/1	16.05	30.00	✓	Offside	47.36

Give Way Data

Arm	Traffic Stream	Opposed traffic	Use Step-wise Opposed Turn Model	Visibility restricted
B	2	AllTraffic		

Give Way Data - All Movements - Conflicts

Traffic Stream	Description	Controlling type	Controlling traffic stream	Percentage opposing (%)	Slope coefficient	Upstream signals visible	Conflict shift	Conflict duration
2		TrafficStream	A/2	100	0.00		0	0

Pedestrian Crossings

Pedestrian Crossings

Crossing	Name	Description	Traffic node	Allow walk on red	Crossing type	Length (m)	Cruise time (seconds)	Cruise speed (kph)
2	(untitled)		1		Farside	8.00	5.33	5.40
3	(untitled)		1		Farside	8.00	5.33	5.40
4	(untitled)		1		Farside	7.00	4.67	5.40

Pedestrian Crossings - Signals

Crossing	Controller stream	Phase	Second phase enabled
(ALL)	1	E	

Pedestrian Crossings - Sides

Crossing	Side	Saturation flow (Ped/hr)
(ALL)	(ALL)	11000

Pedestrian Crossings - Modelling

Crossing	Side	Delay weighting (%)	Assignment Cost Weighting (%)	Exclude from results calculation	Max queue storage (Ped)	Has queue limit	Has degree of saturation limit
(ALL)	(ALL)	100	100		0.00		

Signal Timings

Network Default: 160s cycle time; 160 steps

Controller Stream 1

Controller Stream	Name	Description	Use sequence	Cycle time source	Cycle time (s)
1	(untitled)		1	NetworkDefault	160

Controller Stream 1 - Properties

Controller Stream	Manufacturer name	Type	Model number	(Telephone) Line Number	Site number	Grid reference	Gaining delay type
1	Unspecified						Relative

Controller Stream 1 - Optimisation

Controller Stream	Allow offset optimisation	Allow green split optimisation	Optimisation level	Auto redistribute	Enable stage constraint
1	✓	✓	Offsets And Green Splits	✓	

Phases

Controller Stream	Phase	Name	Minimum green (s)	Maximum green (s)	Relative start displacement (s)	Relative end displacement (s)	Type	Blackout Time (s)
1	A	(untitled)	30	300	0	0	Traffic	
	B	(untitled)	25	300	0	0	Traffic	
	C	(untitled)	45	300	0	0	Traffic	
	D	(untitled)	5	5	0	0	Traffic	
	E	(untitled)	4	4	0	0	Pedestrian	0

Library Stages

Controller Stream	Library Stage	Phases in stage	User stage minimum (s)
1	1	A	1
	2	B	1
	3	C	1
	4	D	1
	5	E	1

Stage Sequences

Controller Stream	Sequence	Name	Multiple cycling	Stage IDs	Stage ends
1	1	(untitled)	Single	1, 2, 3, 4, 5	36, 85, 135, 145, 154
	2	(untitled)	Single	1, 2, 3, 5, 4	20, 54, 98, 111, 125
	3	(untitled)	Single	1, 2, 4, 3, 5	20, 54, 68, 112, 125
	4	(untitled)	Single	1, 2, 4, 5, 3	20, 54, 68, 81, 125
	5	(untitled)	Single	1, 2, 5, 3, 4	20, 54, 67, 111, 125
	6	(untitled)	Single	1, 2, 5, 4, 3	20, 54, 67, 81, 125
	7	(untitled)	Single	1, 3, 2, 4, 5	20, 64, 99, 113, 125
	8	(untitled)	Single	1, 3, 2, 5, 4	20, 64, 99, 112, 125
	9	(untitled)	Single	1, 3, 4, 2, 5	20, 64, 78, 112, 125
	10	(untitled)	Single	1, 3, 4, 5, 2	20, 64, 78, 91, 125

Intergreen Matrix for Controller Stream 1

		To				
		A	B	C	D	E
From	A		5	5	9	5
	B	5		5	5	5
	C	5	6		5	5
	D	5	5	5		5
	E	5	5	5	5	

Banned Stage transitions for Controller Stream 1

		To				
		1	2	3	4	5
From	1					
	2					
	3					
	4					
	5					

Interstage Matrix for Controller Stream 1

		To				
		1	2	3	4	5
From	1	0	5	5	9	5
	2	5	0	5	5	5
	3	5	6	0	5	5
	4	5	5	5	0	5
	5	5	5	5	5	0

Resultant Stages

Controller Stream	Resultant Stage	Is base stage	Library Stage ID	Phases in this stage	Stage start (s)	Stage end (s)	Stage duration (s)	User stage minimum (s)	Stage minimum (s)
1	1	✓	1	A	159	36	37	1	30
	2	✓	2	B	41	85	44	1	25
	3	✓	3	C	90	135	45	1	45
	4	✓	4	D	140	145	5	1	5
	5	✓	5	E	150	154	4	1	4

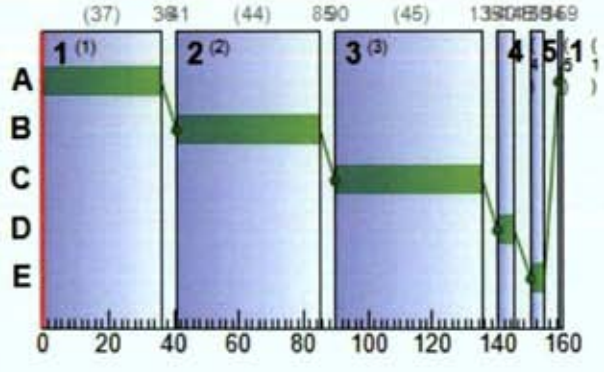
Resultant Phase Green Periods

Controller Stream	Phase	Green period	Is base green period	Start time (s)	End time (s)	Duration (s)
1	A	1	✓	159	36	37
	B	1	✓	41	85	44
	C	1	✓	90	135	45
	D	1	✓	140	145	5
	E	1	✓	150	154	4

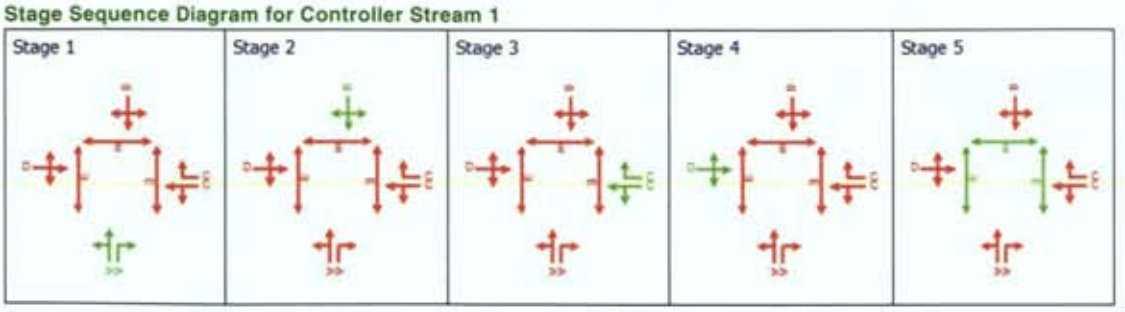
Traffic Stream Green Times

Arm	Traffic Stream	Traffic Node	Controller Stream	Phase	Green Period 1		
					Start	End	Duration
A	1	1	1	C	90	135	45
A	2	1	1	C	90	135	45
B	1	1	1	A	159	36	37
B	2	1	1	A	159	36	37
C	1	1	1	D	140	145	5
D	1	1	1	B	41	85	44

Phase Timings Diagram for Controller Stream 1



Stage Sequence Diagram for Controller Stream 1



Resultant penalties

Time Segment	Controller stream	Phase min max penalty (£ per hr)	Intergreen broken penalty (£ per hr)	Stage constraint broken penalty (£ per hr)	Cost of controller stream penalties (£ per hr)
17:00-18:00	1	0.00	0.00	0.00	0.00

Traffic Stream Results

Traffic Stream Results: Vehicle summary

Time Segment	Arm	Traffic Stream	Degree of saturation (%)	Practical reserve capacity (%)	Calculated flow entering (Veh/hr)	Calculated sat flow (Veh/hr)	Actual green (s (per cycle))	Mean Delay per Veh (s)	Mean max queue (Veh)	Utilised storage (%)	Weighted cost of delay (£ per hr)	Weighted cost of stops (£ per hr)	Performance Index (£ per hr)
17:00-18:00	A	1	48	107	264	1900	45	36.63	4.03	23.19	38.14	1.14	39.28
		2	52	92	269	1800	45	21.05	2.28	114.16	22.33	0.67	23.00
	Ax	1	0	Unrestricted	349	Unrestricted	160	0.00	0.00	0.00	0.00	0.00	0.00
	B	1	74	36	358	2049	37	63.83	15.38	88.42	90.13	4.18	94.31
		2	30	231	143	1994	37	49.82	4.07	101.64	28.10	1.27	29.37
	Bx	1	0	Unrestricted	493	Unrestricted	160	0.00	0.00	0.00	0.00	0.00	0.00
	C	1	31	226	23	1999	5	85.50	1.06	6.08	7.76	0.30	8.05
	Cx	1	0	Unrestricted	55	Unrestricted	160	0.00	0.00	0.00	0.00	0.00	0.00
	D	1	79	27	446	2019	44	64.25	19.60	112.70	113.03	5.47	118.50
	Dx	1	0	Unrestricted	606	Unrestricted	160	0.00	0.00	0.00	0.00	0.00	0.00
	9	1	33	203	501	1800	160	3.27	4.81	64.00	6.46	1.29	7.75
	10	1	69	46	533	1800	160	41.53	19.84	180.95	87.31	5.49	92.80

Traffic Stream Results: Flows and signals

Time Segment	Arm	Traffic Stream	Calculated flow entering (Veh/hr)	Calculated flow out (Veh/hr)	Flow discrepancy (Veh/hr)	Adjusted flow warning	Calculated sat flow (Veh/hr)	Calculated capacity (Veh/hr)	Degree of saturation (%)	DOS Threshold exceeded	Practical reserve capacity (%)	Mean modulus of error	Actual green (s (per cycle))
17:00-18:00	A	1	264	264	0		1900	546	48		107	1.13	45
		2	269	269	0		1800	518	52		92	1.13	45
	Ax	1	349	349	0		Unrestricted	Unrestricted	0		Unrestricted	0.99	160
	B	1	358	358	0		2049	487	74		36	0.27	37
		2	143	143	0		1994	474	30		231	0.30	37
	Bx	1	493	493	0		Unrestricted	Unrestricted	0		Unrestricted	0.75	160
	C	1	23	23	0		1999	75	31		226	0.00	5
	Cx	1	55	55	0		Unrestricted	Unrestricted	0		Unrestricted	0.53	160
	D	1	446	446	0		2019	568	79		27	0.00	44
	Dx	1	606	606	0		Unrestricted	Unrestricted	0		Unrestricted	0.85	160
	9	1	501	501	0		1800	1519	33		203	0.00	160
	10	1	533	533	0		1800	777	69		46	0.00	160

Traffic Stream Results: Stops and delays

Time Segment	Arm	Traffic Stream	Mean Cruise Time per Veh (s)	Mean Delay per Veh (s)	Uniform delay (Veh-hr/hr)	Random plus oversat delay (Veh-hr/hr)	Weighted cost of delay (£ per hr)	Mean stops per Veh (%)	Uniform stops (Stops per hr)	Random stops (Stops per hr)	Weighted cost of stops (£ per hr)
17:00-18:00	A	1	12.00	36.63	2.46	0.22	38.14	34.37	85.69	5.04	1.14
		2	1.68	21.05	1.28	0.29	22.33	19.87	47.11	6.33	0.67
	Ax	1	16.26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	B	1	12.00	63.83	5.35	1.00	90.13	93.16	311.44	22.08	4.18
		2	2.16	49.82	1.89	0.09	28.10	70.84	99.83	1.47	1.27
	Bx	1	16.72	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	C	1	12.00	85.50	0.48	0.07	7.76	102.58	22.11	1.48	0.30
	Cx	1	16.66	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	D	1	12.00	64.25	6.57	1.39	113.03	97.81	405.56	30.69	5.47
	Dx	1	16.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	9	1	5.19	3.27	0.37	0.08	6.46	20.51	100.92	1.82	1.29
	10	1	7.56	41.53	5.41	0.74	87.31	82.13	421.21	16.51	5.49

Traffic Stream Results: Queues and blocking

Time Segment	Arm	Traffic Stream	Initial queue (Veh)	Mean max queue (Veh)	Max queue storage (Veh)	Utilised storage (%)	Average storage excess queue (Veh)	Average limit excess queue (Veh)	Excess queue penalty (£ per hr)	Wasted time starvation (s (per cycle))	Wasted time blocking back (s (per cycle))	Wasted time total (s (per cycle))	Estimated blocking
17:00-18:00	A	1	0.00	4.03	17.39	23.19	0.00	0.00	0.00	6.00	0.00	6.00	
		2	2.00	2.28	2.00	114.16	0.16	0.00	0.00	0.00	0.00	0.00	
	Ax	1	0.00	0.00	23.57	0.00	0.00	0.00	0.00	60.00	0.00	60.00	
	B	1	0.00	15.38	17.39	88.42	0.00	7.50	0.00	0.00	0.00	0.00	
		2	4.00	4.07	4.00	101.64	0.01	0.00	0.00	0.00	0.00	0.00	
	Bx	1	0.00	0.00	24.23	0.00	0.00	0.00	0.00	48.00	0.00	48.00	
	C	1	0.00	1.06	17.39	6.08	0.00	0.00	0.00	4.00	0.00	4.00	
	Cx	1	0.00	0.00	24.14	0.00	0.00	0.00	0.00	106.00	0.00	106.00	
	D	1	0.00	19.60	17.39	112.70	0.13	0.00	0.00	0.00	0.00	0.00	
	Dx	1	0.00	0.00	23.26	0.00	0.00	0.00	0.00	52.00	0.00	52.00	
	9	1	0.00	4.81	7.52	64.00	0.00	0.00	0.00	0.00	24.97	24.97	
	10	1	0.00	19.84	10.96	180.95	1.69	0.00	0.00	0.00	94.00	94.00	

Traffic Stream Results: Journey times

Time Segment	Arm	Traffic Stream	Distance travelled (PCU-km/hr)	Time spent (PCU-hr/hr)	Mean journey speed (kph)	JourneyTime (s)
17:00-18:00	A	1	26.40	3.57	7.40	48.63
		2	3.77	1.69	2.23	22.65
	Ax	1	47.29	1.58	30.00	16.26
	B	1	35.80	7.54	4.75	75.83
		2	2.57	2.04	1.26	51.39
	Bx	1	68.69	2.29	30.00	16.72
	C	1	2.30	0.62	3.69	97.50
	Cx	1	7.64	0.25	30.00	16.66
	D	1	44.60	9.45	4.72	76.25
	Dx	1	81.05	2.70	30.00	16.05
	9	1	21.66	1.18	18.40	8.46
	10	1	33.60	7.27	4.62	49.09

Traffic Stream Results: Advanced

Time Segment	Arm	Traffic Stream	Degree of saturation penalty (£ per hr)	Ped gap accepting penalty (£ per hr)	Warmed up	Mean Max Queue EoTS (Veh)	Max End of Green Queue EoTS (Veh)	Max End of Red Queue EoTS (Veh)	PCU Factor	Cost of traffic penalties (£ per hr)	Performance Index (£ per hr)
17:00-18:00	A	1	0.00	0.00	✓	4.03	0.23	4.03	1.00	0.00	39.28
		2	0.00	0.00	✓	2.28	0.28	2.28	1.00	0.00	23.00
	Ax	1	0.00	0.00	✓	0.00			1.00	0.00	0.00
	B	1	0.00	0.00	✓	15.39	1.01	12.09	1.00	0.00	94.31
		2	0.00	0.00	✓	4.07	0.07	4.07	1.00	0.00	29.37
	Bx	1	0.00	0.00	✓	0.00			1.00	0.00	0.00
	C	1	0.00	0.00	✓	1.06	0.07	1.05	1.00	0.00	8.05
	Cx	1	0.00	0.00	✓	0.00			1.00	0.00	0.00
	D	1	0.00	0.00	✓	19.62	1.41	15.66	1.00	0.00	118.50
	Dx	1	0.00	0.00	✓	0.00			1.00	0.00	0.00
	9	1	0.00	0.00	✓	4.81			1.00	0.00	7.75
	10	1	0.00	0.00	✓	19.84			1.00	0.00	92.80

Pedestrian Crossing Results

Pedestrian Crossings: Pedestrian summary

Time Segment	Crossing	Side	Degree of saturation (%)	Calculated Flow Entering (Ped/hr)	Calculated sat flow (Ped/hr)	Actual green (s (per cycle))	Mean Delay Per Ped (s)	Mean max queue (Ped)	Weighted cost of delay (£ per hr)	Performance Index (£ per hr)
17:00-18:00	(ALL)	(ALL)	36	100	11000	4	76.83	4.33	30.31	30.31

Pedestrian Crossings: Flows and signals

Time Segment	Crossing	Side	Calculated flow entering (Ped/hr)	Calculated flow out (Ped/hr)	Flow discrepancy (Ped/hr)	Adjusted flow warning	Calculated sat flow (Ped/hr)	Calculated capacity (Ped/hr)	Degree of saturation (%)	DOS Threshold exceeded	Practical reserve capacity (%)	Mean modulus of error	Actual green (s (per cycle))
17:00-18:00	(ALL)	(ALL)	100	100	0		11000	275	36		175	0.00	4

Pedestrian Crossings: Stops and delays

Time Segment	Crossing	Side	Mean Cruise Time per Ped (s)	Mean Delay per Ped (s)	Uniform delay (Ped-hr/hr)	Random plus oversat delay (Ped-hr/hr)	Weighted cost of delay (£ per hr)
17:00-18:00	2	1	6.33	76.83	2.13	0.00	30.31
		2	6.33	76.83	2.13	0.00	30.31
	3	1	6.33	76.83	2.13	0.00	30.31
		2	6.33	76.83	2.13	0.00	30.31
	4	1	5.67	76.83	2.13	0.00	30.31
		2	5.67	76.83	2.13	0.00	30.31

Pedestrian Crossings: Queues and blocking

Time Segment	Crossing	Side	Mean max queue (Ped)	Max queue storage (Ped)	Utilised storage (%)	Average storage excess queue (Ped)	Average limit excess queue (Ped)	Excess queue penalty (£ per hr)
17:00-18:00	(ALL)	(ALL)	4.33	10.00	43.33	0.00	0.00	0.00

Pedestrian Crossings: Journey times

Time Segment	Crossing	Side	Distance travelled (Ped-km/hr)	Time spent (Ped-hr/hr)	Mean journey speed (kph)	JourneyTime (s)
17:00-18:00	2	1	0.90	2.31	0.39	83.16
		2	0.90	2.31	0.39	83.16
	3	1	0.90	2.31	0.39	83.16
		2	0.90	2.31	0.39	83.16
	4	1	0.80	2.29	0.35	82.50
		2	0.80	2.29	0.35	82.50

Pedestrian Crossings: Advanced

Time Segment	Crossing	Side	Degree of saturation penalty (£ per hr)	Ped gap accepting penalty (£ per hr)	Mean Max Queue EoTS (Ped)	Ped Factor	Cost of traffic penalties (£ per hr)	Performance Index (£ per hr)
17:00-18:00	(ALL)	(ALL)	0.00	0.00	4.33	1.00	0.00	30.31

Network Results

Run Summary

Analysis set used	Run start time	Run finish time	Modelling start time (HH:mm)	Network Cycle Time (s)	Performance Index (£ per hr)	Total network delay (Veh-hr/hr)	Highest DOS (%)	Item with highest DOS	Number of oversaturated items	Percentage of oversaturated items (%)	Item with worst signalised PRC	Item with worst unsignalised PRC	Ite wit wor over PR
2	05/10/2022 16:40:14	05/10/2022 16:40:16	17:00	160	594.90	40.50	78.54	D/1	0	0	D/1	10/1	D/

Network Results: Vehicle summary

Time Segment	Degree of saturation (%)	Practical reserve capacity (%)	Calculated flow entering (Veh/hr)	Actual green (s (per cycle))	Mean Delay per Veh (s)	Weighted cost of delay (£ per hr)	Weighted cost of stops (£ per hr)	Performance Index (£ per hr)
17:00-18:00	79	0	4040	1173	24.68	393.27	19.80	413.07

Network Results: Pedestrian summary

Time Segment	Degree of saturation (%)	Calculated Flow Entering (Ped/hr)	Actual green (s (per cycle))	Mean Delay Per Ped (s)	Weighted cost of delay (£ per hr)	Performance Index (£ per hr)
17:00-18:00	36	600	24	76.83	181.83	181.83

Network Results: Flows and signals

Time Segment	Calculated flow entering (Veh/hr)	Calculated flow out (Veh/hr)	Flow discrepancy (Veh/hr)	Adjusted flow warning	Degree of saturation (%)	DOS Threshold exceeded	Practical reserve capacity (%)	Actual green (s (per cycle))
17:00-18:00	4640	4640	0		79		27	1197

Network Results: Stops and delays

Time Segment	Mean Cruise Time per Veh (s)	Mean Delay per Veh (s)	Uniform delay (Veh-hr/hr)	Random plus oversat delay (Veh-hr/hr)	Weighted cost of delay (£ per hr)	Mean stops per Veh (%)	Uniform stops (Stops per hr)	Random stops (Stops per hr)	Weighted cost of stops (£ per hr)
17:00-18:00	10.50	31.42	36.62	3.88	575.10	34.04	1493.88	85.43	19.80

Network Results: Queues and blocking

Time Segment	Utilised storage (%)	Excess queue penalty (£ per hr)	Wasted time starvation (s (per cycle))	Wasted time blocking back (s (per cycle))	Wasted time total (s (per cycle))
17:00-18:00	180.95	0.00	276.00	118.97	394.97

Network Results: Journey times

Time Segment	Distance travelled (PCU-km/hr)	Time spent (PCU-hr/hr)	Mean journey speed (kph)
17:00-18:00	380.57	54.00	7.05

Network Results: Advanced

Time Segment	Degree of saturation penalty (£ per hr)	Ped gap accepting penalty (£ per hr)	Warmed up	PCU Factor	Cost of traffic penalties (£ per hr)	Controller stream penalties (£ per hr)	Performance Index (£ per hr)
17:00-18:00	0.00	0.00	✓	1.00	0.00	0.00	594.90