For official use only (date received): 25/11/2024 10:00:49

The Planning Inspectorate

QUESTIONNAIRE (s78) and (s20) PLANNING AND LISTED BUILDING CONSENT (Online Version)

You must ensure that a copy of the completed questionnaire, together with any attachments, are sent to the appellant/agent by the date given in the start letter. You must include details of the statutory development plan, even if you intend to rely more heavily on some other emerging plan.

If notification or consultation under an Act, Order or Departmental Circular would have been necessary before granting permission and has not yet taken place, please inform the appropriate bodies of the appeal now and ask for any comments to be sent direct to us by the date your statement is due.

Appeal Reference	APP/H1515/W/24/3353271
Appeal By	CROUDACE HOMES LTD
Site Address	Officers' Meadow, Land North of Shenfield Alexander Lane Shenfield Essex CM15 8QF Grid Ref Easting: 561725 Grid Ref Northing: 190088

PART 1

1.a. Do you consider the written representation procedure to be suitable? Yes ☐ No ☑

Note: If the written procedure is agreed, the Inspector will visit the site unaccompanied by either party unless the relevant part of the site cannot be seen from a road or other public land, or it is essential for the Inspector to enter the site to check measurements or other relevant facts.

1.b. Do you wish to be heard by an Inspector at; Inquiry ☑ Hearing ☐

1.c. How long do you expect an inquiry would last? 3 day(s)

1.d. How many witnesses do you intend to call? 3

2.a. If the written procedure is agreed, can the relevant part of the appeal site be seen from a road, public footpath, bridleway or other public land? Yes ☑ No ☐

2.b. Is it essential for the Inspector to enter the site to assess the impact of the proposal? Yes ☑ No ☐

Please explain

To fully assess the site

2.c. Are there any known health and safety issues that would affect the conduct of the site inspection? Yes ☐ No ☑

3.a. Are there any other appeals or matters relating to the same site still being considered by us or the Secretary of State? Yes ☐ No ☑

3.b. Are there any other appeals or matters adjacent or close to the site still being considered by us or the Secretary of State? Yes ☐ No ☑

PART 2

4. Does the appeal relate to an application for approval of reserved matters?	Yes	☐ No	☑
5. Was a site ownership certificate submitted with the application?	Yes	☑ No	☐
6. Did you give publicity to the application in accordance with either Article 15 of the DMPO 2015, Section 67/73 of the Planning (Listed Buildings and Conservation Areas) Act 1990 or Regulation 5 of the Planning (Listed Buildings and Conservation Areas) Regulations 1990?	Yes	☑ No	☐

6.a. If a press advert notice was published, please upload a copy

☑ see 'Questionnaire Documents' section

7. Does the appeal relate to a county matter?	Yes	☐ No	☑

8. Please indicate the development type for the application to which the appeal relates.

Major Developments	☑
Minor Developments	☐
Other Developments	☐

8.a. Major Developments

Dwellings	☑
Offices/R and D/light industry	☐
General industry/storage/warehousing	☐
Retail and services	☐
Traveller caravan pitches	☐
All other major developments	☐

Is the appeal site within:

9.a. A Green Belt?	Yes	☐ No	☑
9.b. An Area of Outstanding Natural Beauty?	Yes	☐ No	☑
10. Is there a known surface or underground mineral interest at or within 400 metres of the appeal site which is likely to be a material consideration in determining the appeal?	Yes	☐ No	☑

PART 3

11. Would the development require the stopping up or diverting of a public right of way?	Yes	☑ No	☐

Please attach an extract from the Definitive Map and Statement for the area, and any other details

☑ see 'Questionnaire Documents' section

12.a. Is the site in a Conservation Area?	Yes	☐ No	☑
12.b. Is the site adjacent to a Conservation Area?	Yes	☐ No	☑
12.c. Does the appeal proposal include the demolition of a non-listed building within a conservation area?	Yes	☐ No	☑
13.a. Does the proposed development involve the demolition, alteration or extension of a Grade I / II* / II listed building?	Yes	☐ No	☑
13.b. Would the proposed development affect the setting of a listed building?	Yes	☐ No	☑

14. Has a grant been made under s3A or s4 of the Historic Buildings and Ancient Monuments Act 1953?	Yes	☐ No	☑
15.a. Would the proposals affect an Ancient Monument (whether scheduled or not)?	Yes	☐ No	☑
16. Is any part of the site subject to a Tree Preservation Order?	Yes	☑ No	☐
Please send a plan showing the extent of the Order and any relevant details. ☑ see 'Questionnaire Documents' section			
17. Have you made a Local Development Order under s61A to 61C of the Town and Country Planning Act 1990 (as inserted by s40 of the Planning & Compulsory Purchase Act 2004) relating to the application site?	Yes	☐ No	☑
18. Does the appeal involve persons claiming Gypsy/Traveller status, whether or not this is accepted by the planning authority?	Yes	☐ No	☑
19.a. Is the appeal site in or adjacent to or likely to affect an SSSI or an internationally designated site (ie. cSAC, SAC, pSPA, SPA Ramsar)?	Yes	☐ No	☑
19.b. Are any protected species likely to be affected by the proposals?	Yes	☑ No	☐
Please attach the comments of Natural England or attach details, including relevant extracts of any protected species standing advice that has been considered. ☑ see 'Questionnaire Documents' section			

PART 4

Environmental Impact Assessment - Schedule 1

20.a.i. Is the proposed development Schedule 1 development as described in Schedule 1 of the Town and Country Planning (Environmental Impact Assessment) Regulations 2011?	Yes	☐ No	☑

Environmental Impact Assessment - Schedule 2

20.b.i. Is the proposed development Schedule 2 development as described in Column 1, Schedule 2 of the Town and Country Planning (Environmental Impact Assessment) Regulations 2011?	Yes	☐ No	☑
20.c.i. Have you issued a screening opinion (SO)	Yes	☑ No	☐
Please attach a copy of the SO that was placed on the planning register, and any other related correspondence ☑ see 'Questionnaire Documents' section			
20.c.ii. Did the SO state that the proposed development is EIA development as defined by the EIA Regulations?	Yes	☐ No	☑

Environmental Impact Assessment - Environmental Statement (ES)

20.d. Has the appellant supplied an environmental statement?	Yes	☐ No	☑

Environmental Impact Assessment - Publicity

20.e. If applicable, please attach a copy of the site notice and local advertisement published as required for EIA development.	Applies	☐ N/A	☑
21. Have all notifications or consultations under any Act, Order or Departmental	Yes	☑ No	☐

Circular, necessary before granting permission, taken place?

Please attach copies of any comments that you have received in response.

☑ see 'Questionnaire Documents' section

PART 5

22. Do you wish to attach your statement of case? Yes ☐ No ☑

For appeals dealt with by written representations only

23. If this appeal is not following the written representations expedited procedure, do you intend to send a statement of case about this appeal? Yes ☑ No ☐

Copies of the following documents must, if appropriate, be attached to this questionnaire

24.a. a copy of the letter with which you notified people about the appeal; ☑

☑ see 'Questionnaire Documents' section

24.b. a list of the people you notified and the deadline you gave for their comments to be sent to us; ☑

☑ see 'Questionnaire Documents' section

Deadline: 23/12/2024

24.c. all representations received from interested parties about the original application; ☑

☑ see 'Questionnaire Documents' section

24.d. the planning officer's report to committee or delegated report on the application and any other relevant documents/minutes; ☑

☑ see 'Questionnaire Documents' section

☑ see 'Questionnaire Documents' section

24.e. any representations received as a result of a service of a site ownership notification; ☐

24.f. extracts from any relevant statutory development plan policies (even if you intend to rely more heavily on the emerging plan); ☑

You must include the front page, the title and date of the approval/adoption, please give the status of the plan. Copies of the policies should include the relevant supporting text. You must provide this even if the appeal is against non-determination.

☑ see 'Questionnaire Documents' section

☑ see 'Questionnaire Documents' section

List of policies: BE01, BE02, BE03, BE04, BE05, BE07, BE08, BE09, BE11, BE12, BE13, BE14, BE15, BE16, HP01, HP03, HP05, HP06, MG01, MG04, MG05, NE01, NE02, NE03, NE05, NE08, NE09, PC11, R03

24.g. extracts of any relevant policies which have been 'saved' by way of a Direction; ☐

24.h. extracts from any supplementary planning guidance, that you consider necessary, together with its status, whether it was the subject of public consultation and consequent modification, whether it was formally adopted and if so, when; ☐

24.i. extracts from any supplementary planning document that you consider necessary, together with the date of its adoption; ☐

In the case of emerging documents, please state what stage they have reached.

24.j. a comprehensive list of conditions which you consider should be imposed if planning permission is granted; ☐

Only tick that this applies if you intend to submit a list of conditions with the questionnaire. If you do not submit the list with the questionnaire, then this should be submitted by the date your statement is due. This list must be submitted separately from your appeal statement.

24.k. if any Development Plan Document (DPD) or Neighbourhood Plan relevant to this appeal has been examined and found sound/met the basic conditions and passed a referendum, the date the DPD or Neighbourhood Plan is likely to be adopted and, if you consider this date will be before the Inspector's decision on this appeal is issued, an explanation of the Council's policy position in respect of this appeal upon its adoption. You should also include an explanation of the status of existing policies and plans, as they relate to this appeal, upon adoption and which (if any) will be superseded; ☐

24.l. if any DPD or Neighbourhood Plan relevant to this appeal has been submitted for examination, or in the case of a Neighbourhood Plan has been examined and is awaiting a referendum, an explanation of any substantive changes in the progress of the emerging plan, and their relevance to this appeal if it is considered that the plan will not be adopted before the Inspector's decision on this appeal is issued; ☐

24.m. your Authority's CIL charging schedule is being/has been examined; ☐

24.n. your Authority's CIL charging schedule has been/is likely to be adopted; ☑

Please provide the date of adoption: 27/09/2023

24.o. any other relevant information or correspondence you consider we should know about. ☐

For the Mayor of London cases only

25.a. Was it necessary to notify the Mayor of London about the application? Yes ☐ No ☐

25.b. Did the Mayor of London issue a direction to refuse planning permission? Yes ☐ No ☐

LPA Details

I certify that a copy of this appeal questionnaire and any enclosures will be sent to the appellant or agent today. ☑

LPA's reference: 23/01164/FUL

Completed by: T Balcombe

On behalf of: Brentwood Borough Council

Please provide the details of the officer we can contact for this appeal, if different from the Planning Inspectorate's usual contact for this type of appeal.

Name

Phone no (including dialling code)

Email

Please advise the case officer of any changes in circumstances occurring after the return of the questionnaire.

QUESTIONNAIRE DOCUMENTS

Appeal Reference	APP/H1515/W/24/3353271
Appeal By	CROUDACE HOMES LTD
Site Address	Officers' Meadow, Land North of Shenfield Alexander Lane Shenfield Essex CM15 8QF Grid Ref Easting: 561725 Grid Ref Northing: 190088

The documents listed below were uploaded with this form:

Relates to Section: PART 2
Document Description: 6.a. A copy of the notice published.
File name: Newspaper Ad.pdf

Relates to Section: PART 3
Document Description: 11. An extract from the Definitive Map and Statement for the area.
File name: PROW.pdf

Relates to Section: PART 3
Document Description: 16. A plan showing the extent of the Order and any relevant details.
File name: TREE PRESERVATION ORDERS.pdf

Relates to Section: PART 3
Document Description: 19.b. The comments of Natural England or details, including relevant extracts, of any protected species standing advice that has been considered.
File name: Cons - Badger2.pdf
File name: Cons - Badger.pdf
File name: Cons - Natural England.pdf
File name: Cons - Natural England Advice note.pdf
File name: Cons - Natural EnglandAnnex A to standard letters - Oct 23 FINAL.pdf
File name: Cons - Badger1.pdf

Relates to Section: PART 4
Document Description: 20.c.i. A copy of the screening opinion (SO) that was placed on the planning register, along with any other related correspondence.
File name: Screening opinion.pdf

Relates to Section: PART 4
Document Description: 21. Copies of any comments that you have received in response.
File name: Cons - Affinity Water.pdf
File name: Cons - Arboriculturalist 1.pdf
File name: Cons - Anglian Water].pdf
File name: Cons - Archaeology.pdf
File name: Cons - Arboricultralist.pdf
File name: Cons - Arboriculturalist 2.pdf
File name: Cons - Env Agency6.pdf
File name: Cons - Env Agency3.pdf
File name: Cons - Env Agency1.pdf
File name: Cons - Env Agency Flood Estimation.pdf

File name: Cons - Cadent Attachment.pdf
File name: Cons - Cadent.pdf
File name: Cons - Cadent Attachment 1.pdf
File name: Cons - Env Agency4.pdf
File name: Cons - Env Agency.pdf
File name: Cons - Env Agency2.pdf
File name: Cons - Env Agency5.pdf
File name: Cons - Fire.pdf
File name: Cons - National Highways1.pdf
File name: Cons - Essex Wildlife.pdf
File name: Cons - Fire1.pdf
File name: Cons - Highways.pdf
File name: Cons - National Highways3.pdf
File name: Cons - National Highways2.pdf
File name: Cons - Housing.pdf
File name: Cons - Highways1.pdf
File name: Cons - Historic England.pdf
File name: Cons - National Highways.pdf
File name: Cons - NHS.pdf
File name: Cons - Urban Design.pdf
File name: Cons - Thames Water.pdf
File name: Cons UKPower Networks.pdf
File name: Cons - Sport England.pdf
File name: Cons ECC Planning.pdf
File name: Cons - Place Services.pdf
File name: Cons - Police.pdf
File name: Cons - Urban Design1.pdf
File name: Cons - Response to highways1.pdf
File name: Cons - Response to highways.pdf

Relates to Section: PART 5
Document Description: 24.a. A copy of the letter with which you notified people about the appeal.
File name: Appeal Letter.pdf

Relates to Section: PART 5
Document Description: 24.b. A document containing a list of the people you notified of the appeal.
File name: Appeal Circulation .pdf

Relates to Section: PART 5
Document Description: 24.c. Copies of all representations received from interested parties about the original application.
File name: Neighbour comment (81).pdf
File name: Neighbour comment (76).pdf
File name: Neighbour comment (77).pdf
File name: Neighbour comment (8).pdf
File name: Neighbour comment (1).pdf
File name: Neighbour comment (3).pdf
File name: Neighbour comment (75).pdf
File name: Neighbour comment (82).pdf
File name: Neighbour comment (79).pdf
File name: Neighbour comment (2).pdf
File name: Neighbour comment (7).pdf
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File name: Neighbour comment (25).pdf
File name: Neighbour comment (21).pdf
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File name:	Neighbour comment (57).pdf
File name:	Neighbour comment (60).pdf
File name:	Neighbour comment (70).pdf
File name:	Neighbour comment (71).pdf
File name:	Neighbour comment (73).pdf
File name:	Neighbour comment (72).pdf
Relates to Section:	PART 5
Document Description:	24.d. The planning officer's report to committee or delegated report on the application and any other relevant documents/minutes.
File name:	Report Supplementary.pdf
File name:	Report Main.pdf
Relates to Section:	PART 5
Document Description:	24.d. the planning officer's report to committee or delegated report on the application and any other relevant documents/minutes;
File name:	Report Minutes.pdf
Relates to Section:	PART 5
Document Description:	24.f. Copies of extracts from any relevant statutory development plan policies.
File name:	Policy Front Page.pdf
Relates to Section:	PART 5
Document Description:	24.f. Copies of extracts from any relevant statutory development plan policies.
File name:	Policy MG04.pdf
File name:	Policy MG01.pdf
File name:	Policy NE01.pdf
File name:	Policy NE02.pdf
File name:	Policy NE03.pdf
File name:	Policy PC11.pdf
File name:	Policy HP06.pdf
File name:	Policy R03.pdf
File name:	Policy MG05.pdf
File name:	Policy BE01.pdf
File name:	Policy NE08.pdf
File name:	Policy NE05.pdf
File name:	Policy BE08.pdf
File name:	Policy BE05.pdf
File name:	Policy NE09.pdf
File name:	Policy BE03.pdf
File name:	Policy BE07.pdf
File name:	Policy BE09.pdf
File name:	Policy BE04.pdf
File name:	Policy BE13.pdf
File name:	Policy BE14.pdf
File name:	Policy BE02.pdf
File name:	Policy BE12.pdf
File name:	Policy HP03.pdf
File name:	Policy HP01.pdf
File name:	Policy BE11.pdf
File name:	Policy BE16.pdf
File name:	Policy HP05.pdf
File name:	Policy BE15.pdf

Completed by	Not Set
Date	25/11/2024 10:01:08

LPA	Brentwood Borough Council

Brentwood Gazette

URN: 902237001-01 Date: 2023-10-25 Section: Main
Advertiser: BRENTWOOD BOROUGH COUNCIL Page: 29/32

Motors

Cars Wanted

Public Notices

Public Notices

Essex County Council

(Alexander Lane, Shenfield/Hutton)
(Temporary Prohibition of Traffic) Order 2023

Notice is hereby given that the Essex County Council intends, not less than seven days from the date of this notice, to make the above Order under section 14(1) of the Road Traffic Regulation Act 1984.

Effect of the order: To temporarily close that length of Alexander Lane, Shenfield/Hutton in the Borough of Brentwood, from the junction with Long Ridings Avenue to the junction with Oliver Road a distance of approximately 100m. The closure is scheduled to commence on 20th November 2023 for 1 night (22:00-05:00), or where stated on a valid permit (KL701LTN1-20-47-201123 – Network Rail Infrastructure Ltd). The scheduled dates may vary for these works with appropriate signs showing and/or displayed on one.network. The closure is required for the safety of the public and workforce while bridge structure examination works are undertaken by Network Rail Infrastructure Ltd.

An alternative route is available via Alexander Lane, Rayleigh Road, Hutton Road, Chelmsford Road and vice versa.

The Order will come into effect on 1st November 2023 and may continue in force for 18 months or until the works have been completed, whichever is the earlier.

(Hall Green Lane, Hutton)
(Temporary Prohibition of Traffic) Order 2023

Notice is hereby given that the Essex County Council intends, not less than seven days from the date of this notice, to make the above Order under section 14(1) of the Road Traffic Regulation Act 1984.

Effect of the order: To temporarily close that length of Hall Green Lane, Hutton in the Borough of Brentwood, from its junction with Park Avenue for a distance of approximately 210m in a southeasterly then easterly direction. The closure is scheduled to commence on 20th November 2023 for 4 days, or where stated on a valid permit (N713724175400 21AB – Virgin Media). The scheduled dates may vary for these works with appropriate signs showing and/or displayed on one.network. The closure is required for the safety of the public and workforce while duct installation works are undertaken by Virgin Media.

An alternative route is available via Hall Green Lane, Kingsley Road, Byron Road, Hutton Drive, Hutton Village and vice versa.

The Order will come into effect on 1st November 2023 and may continue in force for 18 months or until the works have been completed, whichever is the earlier.

(Seven Arches Road, Brentwood/ Warley & Hartswood Road, Warley)
(Temporary Prohibition of Traffic) Order 2023

Notice is hereby given that the Essex County Council intends, not less than seven days from the date of this notice, to make the above Order under section 14(1) of the Road Traffic Regulation Act 1984.

Effect of the order: To temporarily close that length of Seven Arches Road, Brentwood/Warley & Hartswood Road, Warley in the Borough of Brentwood, from the junction with Cornsland to the junction with Hartswood Close a distance of approximately 175m. The closure is scheduled to commence on 20th November 2023 for 2 days, or where stated on a valid permit (EP201EH2354182 – Essex County Council). The scheduled dates may vary for these works with appropriate signs showing and/or displayed on one.network. The closure is required for the safety of the public and workforce while jetting over railway bridge works are undertaken by Essex County Council.

An alternative route is available via Seven Arches Road, Cornsland, Ingrave Road, The Avenue, Hartswood Road and vice versa.

The Order will come into effect on 1st November 2023 and may continue in force for 18 months or until the works have been completed, whichever is the earlier.

(Doddinghurst Road, Doddinghurst)
(Temporary Prohibition of Traffic) Order 2023

Notice is hereby given that the Essex County Council has made the above Order under section 14(1) of the Road Traffic Regulation Act 1984.

Effect of the order: To temporarily close that length of Doddinghurst Road, Doddinghurst in the Borough of Brentwood, from a point approximately 135m southeast of its junction with Mountnessing Lane for a distance of approximately 635m in a southeasterly then southwesterly direction. The closure is scheduled to commence on 6th November 2023 for 5 days, or where stated on a valid permit (EP201EH2349920 – Essex County Council). The scheduled dates may vary for these works with appropriate signs showing and/or displayed on one.network. The closure is required for the safety of the public and workforce while highway maintenance works are undertaken by Essex County Council.

An alternative route is available via Church Lane, Mill Lane, Hook End Road, Blackmore Road, Ongar Road and vice versa (with access only into Doddinghurst Road).

The Order came into effect on 18th October 2023 and may continue in force for 18 months or until the works have been completed, whichever is the earlier.

Planning

BRENTWOOD BOROUGH COUNCIL STATUTORY PLANNING NOTICE

Notice is hereby given that the Council has received the following applications which need to be advertised for the following reasons set out below:

Application No: 23/01124/FUL
Location: Furze Hall Blackmore Road Fryerning Ingatestone Essex CM4 0PB
Proposal: Installation of 120 ground mounted solar panels
Reason: Affects the setting of a Listed Building

Application No: 23/01228/LBC
Location: 98 High Street Ingatestone Essex CM4 0BA
Proposal: Installation of a blue plaque, diameter, 400mm
Reason: Listed Building

Application No: 23/01171/FUL
Location: Shepherds Croft Wigley Bush Lane South Weald Brentwood Essex CM14 5QN
Proposal: Demolition of existing dwelling and construction of replacement house.
Reason: Adj to Conservation Area
Affects the setting of a Listed Building

Application No: 23/01071/LBC
Location: Thorndon Hall Thorndon Park Ingrave Essex
Proposal: Installation of fibre optic to 1-38 Thorndon Hall, 43-58 & 61-73 Thorndon Hall. This will entail fibre cables and connection boxes externally to each apartment.
Reason: Listed Building

Application No: 23/01230/FUL
Location: Kiln Farm Mountnessing Road Blackmore Ingatestone Essex CM4 0NX
Proposal: Demolition of all buildings and construction of a detached two storey dwelling
Reason: Affects the setting of a Listed Building

Application No: 23/01238/PNTEL
Location: Calcott Hall Farm Ongar Road Pilgrims Hatch Brentwood Essex CM15 9HS
Proposal: Installation of new sharable 25m lattice mast. To include a base station, 2.4m high palisade fencing, 6no. operator cabinets, 1 no. meter cabinet, no.2 dishes, 6no. antennas, and ancillary development.
Reason: Tel Det

Application No: 23/01164/FUL
Location: Land North Of Shenfield Alexander Lane Shenfield Essex
Proposal: Hybrid planning application for 344 units including 35% affordable housing, safeguarded land for a 2FE primary school and early years facility, public open space and associated landscaping, drainage and highways infrastructure.
Reason: Major Development
Adjacent to a Public Footpath
Public Right of Way

DATED: 25.10.2023
Jonathan Stephenson, Chief Executive,
Town Hall, Ingrave Road,
Brentwood CM15 8AY

Probate & Trustee

ALAN JOHN SHUTTLEWORTH
(Deceased)

Pursuant to the Trustee Act 1925 any persons having a claim against or an interest in the Estate of the above named, late of Ardtully Retirement Residence, Station Lane, Ingatestone, Essex, CM4 0BL, who died on 22/08/2022, are required to send written particulars thereof to the undersigned on or before 26/12/2023, after which date the Estate will be distributed having regard only to the claims and interests of which they have had notice.

BROWNS SOLICITORS (ESSEX) LIMITED,
87 London Road, Benfleet, Essex, GB, SS7 5TG

BRIAN DAVID JACKSON
(Deceased)

Pursuant to the Trustee Act 1925 any persons having a claim against or an interest in the Estate of the above named, late of Roseville 37 Mill Road, Stock Ingatestone, Essex , CM4 9LN, who died on 10/05/2023, are required to send written particulars thereof to the undersigned on or before 26/12/2023, after which date the Estate will be distributed having regard only to the claims and interests of which they have had notice.

LEONARD GRAY,
72-74 Duke Street, Chelmsford, GB, CM1 1JY

Good afternoon,

Affinity Water has no comments to make regarding planning application 23/01164/FUL.

Kind regards,

Tom Russell
Environmental Projects Officer
Water Resources and Environment
09/11/23

Planning Applications – Suggested Informative Statements and Conditions Report

If you would like to discuss any of the points in this document please contact us on 07929 786955 or email planningliaison@anglianwater.co.uk.

AW Site Reference:	208220/1/0198554
Local Planning Authority:	Brentwood District (B)
Site:	Land North Of Shenfield Alexander Lane Shenfield Essex
Proposal:	Hybrid planning application for 344 units including 35% affordable housing, safeguarded land for a 2FE primary school and early years facility, public open space and associated landscaping, drainage and highways infrastructur
Planning application:	23/01164/FUL

Prepared by: Pre-Development Team

Date: 3 November 2023

ASSETS

Section 1 - Assets Affected

There are assets owned by Anglian Water or those subject to an adoption agreement within or close to the development boundary that may affect the layout of the site. Anglian Water would ask that the following text be included within your Notice should permission be granted.

Anglian Water has assets close to or crossing this site or there are assets subject to an adoption agreement. Therefore the site layout should take this into account and accommodate those assets within either prospectively adoptable highways or public open space. If this is not practicable then the sewers will need to be diverted at the developers cost under Section 185 of the Water Industry Act 1991. or, in the case of apparatus under an adoption agreement, liaise with the owners of the apparatus. It should be noted that the diversion works should normally be completed before development can commence.

The development site is within 15 metres of a sewage pumping station. This asset requires access for maintenance and will have sewerage infrastructure leading to it. For practical reasons therefore it cannot be easily relocated.

Anglian Water consider that dwellings located within 15 metres of the pumping station would place them at risk of nuisance in the form of noise, odour or the general disruption from maintenance work caused by the normal operation of the pumping station.

The site layout should take this into account and accommodate this infrastructure type through a necessary cordon sanitaire, through public space or highway infrastructure to ensure that no development within 15 metres from the boundary of a sewage pumping station if the development is potentially sensitive to noise or other disturbance or to ensure future amenity issues are not created.

WASTEWATER SERVICES

Section 2 - Wastewater Treatment

The foul drainage from this development is in the catchment of Shenfield And Hutton Water Recycling Centre that will have available capacity for these flows

Section 3 - Used Water Network

"This response has been based on the following submitted documents: FRA and Drainage Strategy Rev P02 September 2023 The sewerage system at present has available capacity for these flows. If the developer wishes to connect to our sewerage network they should serve notice under Section 106 of the Water Industry Act 1991. We will then advise them of the most suitable point of connection. 1. INFORMATIVE - Notification of intention to connect to the public sewer under S106 of the Water Industry Act Approval and consent will be required by Anglian Water, under the Water Industry Act 1991. Contact Development Services Team 0345 606 6087. 2. INFORMATIVE - Protection of existing assets - A public sewer is shown on record plans within the land identified for the proposed development. It appears that development proposals will affect existing public sewers. It is recommended that the applicant contacts Anglian Water Development Services Team for further advice on this matter. Building over existing public sewers will not be permitted (without agreement) from Anglian Water. 3. INFORMATIVE - Building near to a public sewer - No building will be permitted within the statutory easement width of 3 metres from the pipeline without agreement from Anglian Water. Please contact Development Services Team on 0345 606 6087. 4. INFORMATIVE: The developer should note that the site drainage details submitted have not been approved for the purposes of adoption. If the developer wishes to have the sewers included in a sewer adoption agreement with Anglian Water (under Sections 104 of the Water Industry Act 1991), they should contact our Development Services Team on 0345 606 6087 at the earliest opportunity. Sewers intended for adoption should be designed and constructed in accordance with Sewers for Adoption guide for developers, as supplemented by Anglian Water's requirements.

Section 4 - Surface Water Disposal

The preferred method of surface water disposal would be to a sustainable drainage system (SuDS) with connection to sewer seen as the last option. Building Regulations (part H) on Drainage and Waste Disposal for England includes a surface water drainage hierarchy, with infiltration on site as the preferred disposal option, followed by discharge to watercourse and then connection to a sewer.

"From the details submitted to support the planning application the proposed method of surface water management does not relate to Anglian Water operated assets. As such, we are unable to provide comments in the suitability of the surface water management. The Local Planning Authority should seek the advice of the Lead Local Flood Authority or the Internal Drainage Board. The Environment Agency should be consulted if the drainage system directly or indirectly involves the discharge of water into a watercourse. Should the proposed method of surface water management change to include interaction with Anglian Water operated assets, we would wish to be re-consulted to ensure that an effective surface water drainage strategy is prepared and implemented. We note the applicant states the SuDS scheme may / will be adopted by Anglian Water. As yet the applicant has not engaged with us, therefore we cannot comment, at this stage, on the proposal's suitability. Anglian Water encourage the use of SuDS and if the developer wishes us to be the adopting body for all or part of the proposed SuDS scheme the Design and Construction Guidance must be followed. We would recommend the applicant contact us at the earliest opportunity to discuss their SuDS design via a Pre-Design Strategic Assessment (PDSA) form available on our website Sustainable drainage systems (anglianwater.co.uk), or please contact planningliaison@anglianwater.co.uk The lead local flood authority is the statutory consultee for all surface water drainage systems on major developments and should be contacted as soon as possible regarding the proposal.

Land North Of Shenfield Alexander Lane Shenfield Essex – 23/01164/FUL

Hybrid planning application for 344 units including 35% affordable housing, safeguarded land for a 2FE primary school and early years facility, public open space and associated landscaping, drainage and highways infrastructure.

Ecology

The site is predominately former arable farmland and therefore has a generally restricted ecology. The most significant features are Arnolds Wood the tree belt to the west of it, some of the hedgerows and the veteran tree.

Arnold's Wood, an ancient woodland Local Wildlife Site, forms the eastern site boundary. The layout has been designed to secure a minimum 15m buffer to the site in accordance with national guidance. The proposal to realign the public footpath would be beneficial as it would move part of the footpath outside the buffer. If it were retained on the definitive route to could require trees and shrubs that now form an important woodland edge habitat to be cut back.

The External Lighting Strategy illustrates that street lighting has been designed to avoid sensitive ecological features such as the ancient woodland and Oak Walk (Zone 2) tree line.

An initial Biodiversity Net Gain calculation has been undertaken. This shows a predicted gain of habitat units of 16.33%, watercourse units gain of 22.35% which exceed the 10% target set out in the Environment Act 2021 (although BNG is not yet a mandatory requirement). Hedgerows however are currently predicting only a 0.49% gain. Following discussions with the applicant there could be scope to increase this figure by creating more hedges.

To enable a more accurate review of the BNG calculation I request that the applicant provides the full current metric spreadsheet as it is not possible to read all the columns that have been provided in the report.

The Outline Woodland Management Strategy describes the current condition of the woodland. It is typical of most local ancient woods, being primarily hornbeam coppice with oak standards. Lack of management over several decades means that there is little understorey or ground flora. The strategy recommends that recreational use is managed rather than trying to prevent access to the wood. This is considered the best approach for this wood given its long history of de facto access.

It is noted that this is an outline strategy and a detailed plan would be required. There is a mention of coppicing in Objectives; however I would wish to see a commitment in the full plan to reintroducing coppicing as this is effective in promoting natural regeneration and ground flora as it removes excessive shading and also reduces the risk of old coppice stools collapsing.

Given the scale of the development I would require a Construction Environmental Management Plan to be produced to ensure all the ecological and arboricultural protection measures are followed. This can be secured by condition.

Landscape and visual impact

An LVIA prepared in accordance with the Guidelines for Landscape and Visual Impact Assessment 3rd Edition, which is up to date good practice.

The LVIA concludes that while there would be significant effect on landscape character within the site due to the proposed development, this would be localised and contained. This conclusion is considered appropriate.

The visual assessment concluded that the site had a localised visual envelope due to topography and existing vegetation and development screening views. The most significant effects would be experienced by residents on Chelmsford Road backing directly onto the site. Visual effects from other viewpoints were not assessed as being significant. These conclusions are considered appropriate.

Landscape Strategy

The strategy has sought to create a significant area open space with associated NEAP, flood attenuation and cycle and pedestrian access. This should result in a meaningful, attractive space that is proportionate to the scale of the development. This should help manage visitor pressure on Arnolds Wood.

The School Plaza should create a large-scale focal point close to the entrance of the development. The large buffer around the veteran Oak with a new tree planted as a future replacement is welcome. The hard landscaped areas should help guide pedestrians towards the school. As there are no details yet for the school it is accepted that some of the details, particularly relating to the eastern boundary with the school may need refinement; however I would not wish to see significant changes to the overall approach.

The proposed boardwalk feature in the northeast corner adjacent to the wood should help create a more attractive pedestrian entrance to the development.

The detailed planting strategy proposes a diverse mix of trees and shrubs. As well as providing visual interest they will increase resilience to the effects of climate change and plant diseases. The details of the hard landscape elements are considered appropriate for the development.

Conclusion

Overall it is considered that the scheme is broadly acceptable on ecological and landscape grounds; however I do wish to see the full BNG metric spreadsheet to allow a detailed assessment of this. If the scheme is permitted I would require a full Woodland Management Plan be conditioned. The landscape scheme contains

enough details not to require a landscape condition, unless there are any significant changes to the scheme to take account of other consultee responses. A CEMP Is also required.

Regards

Steve Plumb
13/11/2023

Coombe Warley Road Great Warley Brentwood Essex CM13 3HZ – 23/01169/FUL

Proposed 3No. Detached Dwellings

The plans that have been submitted with the application show that several trees would be removed to facilitate the development. No detail has been provided as to their quality. It is necessary for the applicant to submit an arboricultural impact assessment carried out in accordance with BS5837:2012 to enable to assessment of the likely effects to be made.

New planting is shown but no detail is provided regarding species, size of stock etc. more detail is required to determine how this planting could mitigate for the loss of existing trees.

The site is close to two Local Wildlife Sites and the surrounding wooded area was identified in the 2012 Local Wildlife Site review as a potential Local Wildlife Site. There is potential for the scheme to have direct or indirect ecological impacts; therefore I would request a preliminary ecological appraisal be undertaken to establish the potential of the site to support protected species and what mitigation might be required and what biodiversity enhancements can be provided.

Until this information is provided it is not possible for the LPA to determine the landscape and ecological effects of the proposal.

Regards

Steve Plumb
13/11/2023

Land North Of Shenfield Alexander Lane Shenfield Essex – 23/01164/FUL

Hybrid planning application for 344 units including 35% affordable housing, safeguarded land for a 2FE primary school and early years facility, public open space and associated landscaping, drainage and highways infrastructure.

Further to my consultation response of 13th November 2023, I wish to make the additional comments.

Lighting Strategy

The lighting strategy has been developed in consultation with the project ecologists. Specific avoidance and mitigation measures include the use of 3000K warm white colour temperature lighting, avoidance of lighting in private areas, selecting lighting optics to avoid light spill and the use of back light shields. The lighting plans provided in Appendix B provide the lux contour lines. These show minimal lighting being provided close to Arnolds Wood and other treed boundaries. There is some light spill into the open space as a result of the highway lighting at the site entrance; however most of the area would not be impacted.

Based on the information provided I am satisfied that the external lighting would not have any significant adverse effects on bats or other wildlife.

Landscape and Biodiversity Management Strategy

The document sets out the long-term management objectives for the various areas within the site and provides maintenance recommendations for ensuring the successful establishment and development of each element. The Strategy is considered to be appropriate for the scheme.

Arnolds Wood Outline Management Plan.

Arnold's Wood, an ancient woodland Local Wildlife Site, forms the eastern site boundary. The Outline Woodland Management Strategy describes the current condition of the woodland. It is typical of most local ancient woods, being primarily hornbeam coppice with oak standards. Lack of management over several decades means that there is little understorey or ground flora. The strategy recommends that recreational use is managed rather than trying to prevent access to the wood. This is considered the best approach for this wood given its long history of de facto access.

It is noted that this is an outline strategy and a detailed plan would be required. There is a mention of coppicing in Objectives; however I would wish to see a commitment in the full plan to reintroducing coppicing as this is effective in promoting natural regeneration and ground flora as it removes excessive shading and also reduces the risk of old coppice stools collapsing.

The general approach of the Outline Management Plan is considered acceptable subject to the commitment for more active coppice management; however a condition is sought requiring the production of the final management plan. It would be useful for this plan to be developed in discussion with the LPA.

Landscape and visual impact

An LVIA prepared in accordance with the Guidelines for Landscape and Visual Impact Assessment 3rd Edition, which is up to date good practice.

The LVIA concludes that while there would be significant effect on landscape character within the site due to the proposed development, this would be localised and contained. This conclusion is considered appropriate.

The visual assessment concluded that the site had a localised visual envelope due to topography and existing vegetation and development screening views. The most significant effects would be experienced by residents on Chelmsford Road backing directly onto the site. Visual effects from other viewpoints were not assessed as being significant. These conclusions are considered appropriate.

Regards

Steve Plumb
13/02/2024

Place Services
Essex County Council
County Hall, Chelmsford
Essex, CM1 1QH

T: 0333 013 6840
www.placeservices.co.uk

24th October 2023

Planning Services
Brentwood Borough Council
Town Hall
Ingrave Rd
Brentwood
Essex
CM15 8AY

Your ref: 23/01164/FUL

Dear Kathryn,

RE: 23/01164/FUL – Hybrid planning application for 344 units including 35% affordable housing, safeguarded land for a 2FE primary school and early years facility, public open space and associated landscaping, drainage and highways infrastructure.
Land North Of Shenfield, Alexander Lane, Shenfield

Thank you for consulting the Historic Environment Advisor to Brentwood Borough Council on the above application, which has archaeological implications.

As attested by the submitted archaeological desk-based assessment and the Essex Historic Environment Record (EHER), the proposed development site has the potential to contain archaeological remains. The site is located to the south of the main Roman road (EHER 5428) between Chelmsford and London (the modern-day Chelmsford Road). It is also located to the north-east of the historic core of Brentwood (EHER 525), and to the south-west of the settlement of Mountnessing (EHER 1353) both of which have medieval origins.

Roman roads often have contemporary field systems, settlement activity and cemeteries located within their proximity, and similar remains may be present on this site. Additionally, extramural settlement evidence related to the nearby medieval towns of Brentwood and Mountnessing could survive within the development area. Any archaeological features or deposits present on the site are likely to be negatively impacted by the groundworks associated with the development.

Accordingly, this office recommends that the following conditions are applied to any consent, in line with National Planning Policy Framework, paragraph 205 and the Brentwood Local Plan policy BE16:

RECOMMENDATION: A Programme of Trial Trenching, and Open Area Excavation

1. **No development or preliminary groundworks can commence until a programme of archaeological trial trenching evaluation has been secured in accordance with a Written Scheme of Investigation which has been submitted by the applicant, and approved by the planning authority.**

2. **No development or preliminary groundworks of any kind shall take place until the completion of the programme of archaeological evaluation identified in the Written Scheme of Investigation defined in Part 1 and confirmed by the Local Authorities archaeological advisors.**

3. **A mitigation strategy detailing the excavation/preservation strategy of the archaeological remains identified shall be submitted to the local planning authority following the completion of the archaeological evaluation.**

4. **No development or preliminary groundworks can commence on those areas containing archaeological deposits until the satisfactory completion of fieldwork, as detailed in the mitigation strategy, and which has been signed off by the local planning authority through its historic environment advisors.**

5. **The applicant will submit to the local planning authority a post-excavation assessment (to be submitted within six months of the completion of fieldwork, unless otherwise agreed in advance with the Planning Authority). This will result in the completion of post-excavation analysis, preparation of a full site archive and report ready for deposition at the local museum, and submission of a publication report.**

A professional and accredited team of archaeologists should undertake the work, which will initially comprise an archaeological trial trenching evaluation of the areas within the proposed development site that have not already been archaeologically evaluated. This will allow the archaeological potential of the site to be accurately established. Depending on the results of this evaluation it may be followed by a programme of archaeological excavation and/or monitoring, as detailed in a submitted and approved mitigation strategy.

The Borough Council should inform the applicant of the archaeological recommendation and its financial implications. An archaeological brief detailing the work will be issued from this office on request and should be acquired prior to the production of a Written Scheme of Investigation.

If you have any questions please do not hesitate to contact me.

Yours sincerely

Mark Baister
Historic Environment Advisor

Telephone: 03330 133121
Email: mark.baister@essex.gov.uk

NOTE: *This letter is advisory and should only be considered as the opinion formed by specialist staff in relation to this particular matter.*

Tracey Balcombe

From: Darren Parker <darren@ebpg.co.uk>
Sent: 31 October 2023 09:48
To: Planning Team, Brentwood Borough Council
Subject: Re: Planning Consultation 23/01164/FUL

Categories: Tanya

FAO Kathryn Williams - Planning Officer

Dear Kathryn,

Re. 23/01164/FUL | Hybrid planning application for 344 units including 35% affordable housing, safeguarded land for a 2FE primary school and early years facility, public open space and associated landscaping, drainage and highways infrastructure. | Land North Of Shenfield Alexander Lane Shenfield Essex

Thank you for contacting us regarding this application.

As confirmed in the latest Wildlife and Countryside Link Report, the badger remains the most persecuted protected mammal in the UK and it is therefore imperative that the location of any badger setts remains strictly confidential and is not published on public forums. As the commentary which follows relates to the location of known badger setts, we ask that it is not uploaded to the planning portal and instead treated with the utmost sensitivity.

Badgers and their setts are fully protected in the UK by the Protection of Badgers Act 1992 and by Schedule 6 of the Wildlife and Countryside Act (as amended), and Section 40 of the Natural Environment and Rural Communities Act 2006 places a public duty on all public authorities in England and Wales to have regard, in the exercise of their functions, to the purpose of conserving biodiversity. The presence of badgers is therefore of material consideration when it comes to planning applications.

The Crime and Disorder Act 1998 also requires local authorities to demonstrate a duty to implement crime and disorder reduction strategies in areas including wildlife and the environment. Over 50% of badger crimes reported relate to sett interference and many of these are related to housing and development projects. It is therefore imperative that all issues relating to badgers are properly considered.

The application in question appears to encompass two existing schemes which remain under consideration, namely 22/01324/FUL and 23/01159/OUT. As such, our views and comments are identical. In the interests of clarity these are restated as follows.

The Essex Badger Protection Group is currently unaware of any setts close enough to this scheme to be considered at risk of harm although we are aware of badger activity in the wider area. The accompanying ecological impact assessment also identifies three setts on the boundary between the application site and Arnolds Wood. Although none of these setts are considered at risk from these proposals, the badger activity in the area necessitates the need for caution in respect of any construction schemes and we welcome the mitigation measures already proposed within the EIA.

Whilst the EIA is dated September 2022, it is not entirely clear when the actual field surveys which informed it were carried out. Indeed, point 2.11 states *"A targeted badger scoping survey was undertaken on 19th May 2021 to initially identify areas that might be used by badger Meles meles for foraging, commuting and sett creation, and to look for signs of badgers such as paths, hairs, latrines and setts on site."* Since no later dates are offered by the assessment indicating a more up to date appraisal, we assume that the EIA, in so far as it relates to badgers, is out of date and therefore needs to be refreshed.

Badgers are dynamic animals, such that nature and levels of activity throughout their range would be anticipated to vary over time and accordingly, any survey can only provide a snapshot of the current/recent activity to guide consideration of the overall activity levels at a site, with surveys considered to remain valid/up to date for a limited period (no more than 12 months). This is supported by the current Natural England/CIEEM guidance for developments which can be found here: Badgers: advice for making planning decisions - GOV.UK (www.gov.uk) and here: Advice-Note.pdf (cieem.net).

Whilst we note that the EIA itself recommends a "walkover survey" prior to the commencement of works, updated Natural England guidance for local planning authorities, which can be found here : Protected species and development: advice for local planning authorities - GOV.UK (www.gov.uk), states that *"you should not usually attach planning conditions that ask for surveys. This is because you need to consider the full impact of the proposal on protected species before you can grant planning permission."* With this in mind, an updated badger survey should be provided **before** consideration is given to granting planning permission for this scheme in order that mitigation measures may be revised as necessary should it be found that badgers have occupied the application site since May 2021.

Until such time as a revised badger survey is carried out and made available for consultation, we do not believe that there is sufficient information available on which to determine this application. On this basis, we wish to lodge a **holding objection** which we will be happy to review upon receipt of an up to date survey.

We thank you again for contacting us regarding this proposal.

Regards,

Darren Parker
Vice Chair

Essex Badger Protection Group
Patron: *Mike Dilger (Natural History Presenter)*
WWW: http://www.ebpg.co.uk
The Essex Badger Protection Group is run by unpaid volunteers and funded entirely through donations from the public

-------- Original Message --------

Subject: Planning Consultation 23/01164/FUL
Date:18/10/2023 10:54
From:<planning@brentwood.gov.uk>
To:<Info@ebpg.co.uk>

Please see attached consultation letter
.

[Email Banner] <https://www.brentwood.gov.uk/budgetsurvey>

Find out more about cost of living support | Brentwood Council<https://www.brentwood.gov.uk/cost-of-living>
Find out more about cost of living support | Rochford Council<https://www.rochford.gov.uk/community-and-people/cost-living>

[Email Footer]

Brentwood Borough Council and Rochford District Council. This email (including any attachments) is intended only for the recipient(s) named above. It may contain

We will use your information to provide the service requested. We may share your personal data between our services and with partner organisations, such as other local authorities, strategic partnerships, government bodies and the police. We will do so when it is of benefit to you, is required by law, or to prevent or detect fraud. To find out more, go to www.brentwood.gov.uk/privacy<https://www.brentwood.gov.uk/privacy> - new.rochford.gov.uk/data-protection<https://new.rochford.gov.uk/data-protection>.

Thank you for providing a copy of the updated badger survey for these proposals. I have now had a chance to review the findings and provide my updated comments as follows:

As confirmed in the latest Wildlife and Countryside Link Report, the badger remains the most persecuted protected mammal in the UK and it is therefore imperative that the location of any badger setts remains strictly confidential and is not published on public forums. As the commentary which follows relates to the location of known badger setts, we ask that it is not uploaded to the planning portal and instead treated with the utmost sensitivity.

Badgers and their setts are fully protected in the UK by the Protection of Badgers Act 1992 and by Schedule 6 of the Wildlife and Countryside Act (as amended), and Section 40 of the Natural Environment and Rural Communities Act 2006 places a public duty on all public authorities in England and Wales to have regard, in the exercise of their functions, to the purpose of conserving biodiversity. The presence of badgers is therefore of material consideration when it comes to planning applications.

The Crime and Disorder Act 1998 also requires local authorities to demonstrate a duty to implement crime and disorder reduction strategies in areas including wildlife and the environment. Over 50% of badger crimes reported relate to sett interference and many of these are related to housing and development projects. It is therefore imperative that all issues relating to badgers are properly considered.

The updated badger survey identifies seven badger setts on the application site, albeit only two are acknowledged as active. Although any assessment of a badger sett, in terms of activity levels, ought to be supported by a consecutive 21 day camera trap survey, we welcome the detailed written assessment of each sett in the report and would not wish to challenge this. As such, our concerns currently revolve setts BS5 and BS6 as shown on the map within the report.

We are told that the current plans are for sett BS5 to be closed under licence but that sett BS6 is to be retained with a 20m exclusion zone, alongside dormant setts BS2, BS3 and BS7.

Sett closures should be carefully considered. Long-term consideration must be given to the impact on setts and badgers during a construction project
and the period afterwards. Badger movements across a site during and after development must also be a consideration of mitigation and enhancement proposals. Badger Trust guidance, issued in August 2023, states that *"Development proposals including sett closure should demonstrate that other available options have been considered and explain why they are not being pursued."* This is not the case here and we believe that the developer/ecologist should be challenged on this point and asked to explain the reasoning behind their chosen strategy. Sett closures are something which ought to be avoided where possible. Excluded badgers can cause damage to land and property through broken fences, trying to gain access to foraging areas, new or old, or looking to create setts within new gardens, under sheds or in public open spaces. It may also lead to conflict with other nearby badger populations in larger development projects.

With these points in mind, we would strongly recommend the following:

- An updated commentary from the applicant or ecologist to better explain the badger mitigation plan and why other options are not being pursued in line with Badger Trust Guidance (copy attached).
- Proposed Badger Construction Safeguards (Point 5.4 in the latest report) to be enforced by way of condition to any ultimate planning approval, with the following additions -

    - All site personnel to be fully briefed concerning the presence of badgers on site and the mitigation measures to be followed.
    - Retained Badger Setts to be surrounded by a clearly marked exclusion zone extending 20m from the sett. No site personnel are to enter the exclusion zone and no site materials are to be stored within it.
    - Adherence to these measures to be confirmed to planners at regular intervals by the project ecologist.
- No additional badger setts are to be closed under licence without the prior permission of the Local Planning Authority and without the submission of a further badger survey by way of explanation.

Thank you again for providing us with a copy of the latest report for review.

Regards,

Tracey Balcombe

From: Federica Ambrosini <federica@kewplanning.co.uk>
Sent: 12 June 2024 07:54
To: Planning Team, Brentwood Borough Council
Cc: Shanshan Li
Subject: EBPG for 23/01164/FUL, Croudace, Shenfield
Attachments: Badger Trust Badger Protection Best Practice Guidance for Developers Ecolo...IGITAL.pdf

Categories: Bob

Hello Planning Team,

Can you please save the response below in the system, and keep it confidential as it refers to badger's setts?

Kind regards
Federica

From: Darren Parker <darren@ebpg.co.uk>
Sent: Wednesday, February 7, 2024 1:57 PM
To: Federica Ambrosini <federica@kewplanning.co.uk>
Cc: Planning <planning@brentwood.gov.uk>; Kathryn Williams <Kathryn@kewplanning.co.uk>; Shanshan Li <Shanshan@kewplanning.co.uk>
Subject: Re: Brentwood BC, Planning Consultation 23/01159/OUT and 23/01164/FUL, Croudace, Shenfield

Dear Frederica,

Thank you for providing a copy of the updated badger survey for these proposals. I have now had a chance to review the findings and provide my updated comments as follows:

As confirmed in the latest Wildlife and Countryside Link Report, the badger remains the most persecuted protected mammal in the UK and it is therefore imperative that the location of any badger setts remains strictly confidential and is not published on public forums. As the commentary which follows relates to the location of known badger setts, we ask that it is not uploaded to the planning portal and instead treated with the utmost sensitivity.

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The Crime and Disorder Act 1998 also requires local authorities to demonstrate a duty to implement crime and disorder reduction strategies in areas including wildlife and the environment. Over 50% of badger crimes reported relate to sett interference and many of these are related to housing and development projects. It is therefore imperative that all issues relating to badgers are properly considered.

The updated badger survey identifies seven badger setts on the application site, albeit only two are acknowledged as active. Although any assessment of a badger sett, in terms of activity levels, ought to be supported by a consecutive 21 day camera trap survey, we welcome the detailed written assessment of each sett in the report and would not wish to challenge this. As such, our concerns currently revolve setts BS5 and BS6 as shown on the map within the report.

We are told that the current plans are for sett BS5 to be closed under licence but that sett BS6 is to be retained with a 20m exclusion zone, alongside dormant setts BS2, BS3 and BS7.

Sett closures should be carefully considered. Long-term consideration must be given to the impact on setts and badgers during a construction project
and the period afterwards. Badger movements across a site during and after development must also be a consideration of mitigation and enhancement proposals. Badger Trust guidance, issued in August 2023, states that *"Development proposals including sett closure should demonstrate that other available options have been considered and explain why they are not being pursued."* This is not the case here and we believe that the developer/ecologist should be challenged on this point and asked to explain the reasoning behind their chosen strategy. Sett closures are something which ought to be avoided where possible. Excluded badgers can cause damage to land and property through broken fences, trying to gain access to foraging areas, new or old, or looking to create setts within new gardens, under sheds or in public open spaces. It may also lead to conflict with other nearby badger populations in larger development projects.

With these points in mind, we would strongly recommend the following:

- An updated commentary from the applicant or ecologist to better explain the badger mitigation plan and why other options are not being pursued in line with Badger Trust Guidance (copy attached).
- Proposed Badger Construction Safeguards (Point 5.4 in the latest report) to be enforced by way of condition to any ultimate planning approval, with the following additions -
    - All site personnel to be fully briefed concerning the presence of badgers on site and the mitigation measures to be followed.
    - Retained Badger Setts to be surrounded by a clearly marked exclusion zone extending 20m from the sett. No site personnel are to enter the exclusion zone and no site materials are to be stored within it.
    - Adherence to these measures to be confirmed to planners at regular intervals by the project ecologist.
- No additional badger setts are to be closed under licence without the prior permission of the Local Planning Authority and without the submission of a further badger survey by way of explanation.

Thank you again for providing us with a copy of the latest report for review.

Regards,

Darren Parker
Vice Chair

Essex Badger Protection Group
Patron: *Mike Dilger (Natural History Presenter)*

WWW: http://www.ebpg.co.uk
The Essex Badger Protection Group is run by unpaid volunteers and funded entirely through donations from the public

On 05/02/2024 14:58, Federica Ambrosini wrote:

Hi Darren,

Further to our email exchange below, please see attached the updated Badger Survey for your comments.

@Planning Team, Brentwood Borough Council can this email please be uploaded to the file, but marked as sensitive?

Kind regards
Federica

From: Darren Parker <darren@ebpg.co.uk>
Sent: Monday, November 13, 2023 11:47 AM
To: Federica Ambrosini <federica@kewplanning.co.uk>
Cc: Planning <planning@brentwood.gov.uk>
Subject: Re: Planning Consultation 23/01159/OUT

Hi Frederica,

Re. 23/01159/OUT | Outline application with all matters reserved for a 2FE safeguarded primary school | Land North Of Shenfield Alexander Lane Shenfield Essex

Thank you for your email (below), to which I am happy to issue the following revision to the existing consultation response to 23/01159/OUT which I issued on 30th Oct 2023.

As confirmed in the latest Wildlife and Countryside Link Report, the badger remains the most persecuted protected mammal in the UK and it is therefore imperative that the location of any badger setts remains strictly confidential and is not published on public forums. As the commentary which follows relates to the location of known badger setts, we ask that it is not uploaded to the planning portal and instead treated with the utmost sensitivity.

Badgers and their setts are fully protected in the UK by the Protection of Badgers Act 1992 and by Schedule 6 of the Wildlife and Countryside Act (as amended), and Section 40 of the Natural Environment and Rural Communities Act 2006 places a public duty on all public authorities in England and Wales to have regard, in the exercise of their functions, to the purpose of conserving biodiversity. The presence of badgers is therefore of material consideration when it comes to planning applications.

The Crime and Disorder Act 1998 also requires local authorities to demonstrate a duty to implement crime and disorder reduction strategies in areas including wildlife and the environment. Over 50% of badger crimes reported relate to sett interference and many of these are related to housing and development projects. It is therefore imperative that all issues relating to badgers are properly considered.

We now understand that this application forms part of a wider 'hybrid' application for officers meadow - also covered by application 23/01164/FUL - and that the single ecology survey provided in support of the FUL part of the application is intended to cover the OUTLINE segment as well. On that basis, our comments in respect of this outline scheme mirror those issued for the full application.

The Essex Badger Protection Group is currently unaware of any setts close enough to this scheme to be considered at risk of harm although we are aware of badger activity in the wider area, notably within nearby Arnolds Wood. The badger activity in the area necessitates the need for caution in respect of any construction schemes and we welcome the mitigation measures already proposed within the EIA.

Whilst the EIA is dated September 2022, it is not entirely clear when the actual field surveys which informed it were carried out. Indeed, point 2.11 states *"A targeted badger scoping survey was undertaken on 19th May 2021 to initially identify areas that might be used by badger Meles meles for foraging, commuting and sett creation, and to look for signs of badgers such as paths, hairs, latrines and setts on site."* Since no later dates are offered by the assessment indicating a more up to date appraisal, we assume that the EIA, in so far as it relates to badgers, is out of date and therefore needs to be refreshed.

Badgers are dynamic animals, such that nature and levels of activity throughout their range would be anticipated to vary over time and accordingly, any survey can only provide a snapshot of the current/recent activity to guide consideration of the overall activity levels at a site, with surveys considered to remain valid/up to date for a limited period (no more than 12 months). This is supported

by the current Natural England/CIEEM guidance for developments which can be found here: Badgers: advice for making planning decisions - GOV.UK (www.gov.uk) and here: Advice-Note.pdf (cieem.net).

Whilst we note that the EIA itself recommends a "walkover survey" prior to the commencement of works, updated Natural England guidance for local planning authorities, which can be found here : Protected species and development: advice for local planning authorities - GOV.UK (www.gov.uk), states that *"you should not usually attach planning conditions that ask for surveys. This is because you need to consider the full impact of the proposal on protected species before you can grant planning permission."* With this in mind, an updated badger survey should be provided **before** consideration is given to granting planning permission for this scheme in order that mitigation measures may be revised as necessary should it be found that badgers have occupied the application site since May 2021.

Until such time as a revised badger survey is carried out and made available for consultation, we do not believe that there is sufficient information available on which to determine this application. On this basis, we wish to lodge a **holding objection** which we will be happy to review upon receipt of an up to date survey.

We thank you again for contacting us regarding this proposal.

Regards,

Darren Parker
Vice Chair

Essex Badger Protection Group
Patron: *Mike Dilger (Natural History Presenter)*

WWW: http://www.ebpg.co.uk
The Essex Badger Protection Group is run by unpaid volunteers and funded entirely through donations from the public

On 13/11/2023 08:36, Federica Ambrosini wrote:

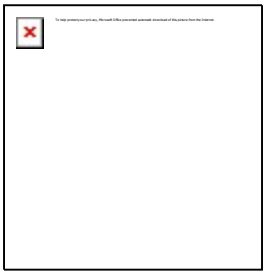
Dear Mr Parker,

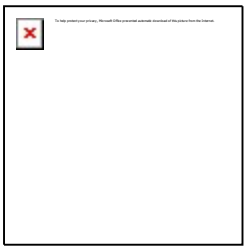
I am a colleague of Kathryn Williams and we have been instructed by Brentwood BC to determine the above planning application. This was submitted in tandem with 23/01164/FUL, that you have already commented on.

I am writing to clarify that the Ecology Survey submitted for 23/01164/FUL covers the site of 23/01159/OUT too: both applications form part of a hybrid scheme with a full planning application (23/01164/FUL, the residential element) and an outline application (23/01159/OUT, the school).

We received your holding objection to 23/01164/FUL, and we will work with the applicant and the Council's Ecologist to address your concerns. In the meantime, I would be grateful if you could please submit a new response to application 23/01159/OUT, to confirm that your comments to 23/01164/FUL also apply to the outline application.

Kind regards
Federica





Federica Ambrosini

Associate

KEW Planning Ltd

+44 2921 690034 | +44 7738 472003

Federica@KEWPlanning.co.uk

www.KEWPlanning.co.uk

Suite 3, 11 Cathedral Road, Cardiff, CF11 9HA

Knowledgeable | Experienced | Wins

From: Darren Parker <darren@ebpg.co.uk>
Sent: Monday, October 30, 2023 11:01 AM
To: Planning Team, Brentwood Borough Council <planning@brentwood.gov.uk>
Subject: Re: Planning Consultation 23/01159/OUT

FAO Kathryn Williams - Planning Officer

Dear Kathryn,

Re. 23/01159/OUT | Outline application with all matters reserved for a 2FE safeguarded primary school | Land North Of Shenfield Alexander Lane Shenfield Essex

Thank you for contacting us regarding this application.

As confirmed in the latest Wildlife and Countryside Link Report, the badger remains the most persecuted protected mammal in the UK and it is therefore imperative that the location of any badger setts remains strictly confidential and is not published on public forums. As the commentary which follows relates to the location of known badger setts, we ask that it is not uploaded to the planning portal and instead treated with the utmost sensitivity.

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and Wales to have regard, in the exercise of their functions, to the purpose of conserving biodiversity. The presence of badgers is therefore of material consideration when it comes to planning applications.

The Crime and Disorder Act 1998 also requires local authorities to demonstrate a duty to implement crime and disorder reduction strategies in areas including wildlife and the environment. Over 50% of badger crimes reported relate to sett interference and many of these are related to housing and development projects. It is therefore imperative that all issues relating to badgers are properly considered.

Whilst the Essex Badger Protection Group is currently unaware of any setts close enough to this scheme to be considered at risk of harm, we are aware of badger activity in the wider area, notably within nearby Arnolds Wood and the application boundary to the East. In order to better understand the potential ecological impacts of this scheme, it should be considered alongside the outstanding application for "Officers Meadow" (22/01324/FUL) to which it is closely related - falling within the application boundary of that scheme. The officers meadow application remains undetermined at the time of writing and we have already recommended updated badger surveys prior to a decision being made.

Turning back to this particular scheme, we are presented with scant information from which to properly consider the proposal. All we have on the planning portal are a site location plan and a copy of the block plan which was provided to support the earlier scheme. We have yet to be provided with an up to date badger survey in line with Natural England guidance and therefore, as with the officers meadow scheme, we wish to lodge a holding objection until such time as we are presented with the necessary survey report.

I thank you again for contacting us regarding this scheme.

Regards,

Darren Parker
Vice Chair

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WWW: http://www.ebpg.co.uk
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On 05/10/2023 15:27, Essex Badger Protection Group wrote:

Begin forwarded message:

From: planning@brentwood.gov.uk
Date: 5 October 2023 at 14:30:45 BST
To: info@ebpg.co.uk
Subject: Planning Consultation 23/01159/OUT

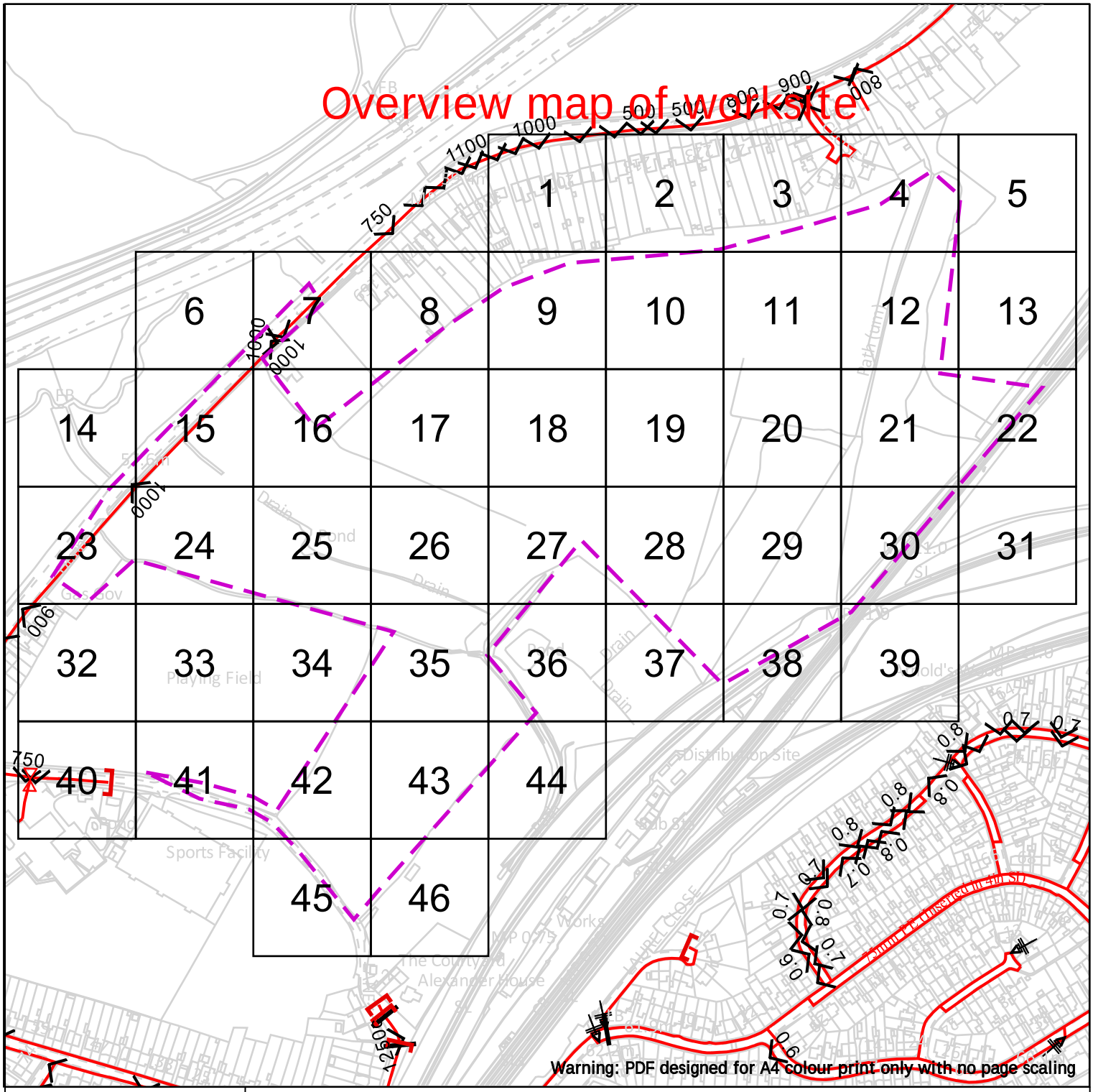
Please see attached consultation letter
.

[Email Banner] <https://www.brentwood.gov.uk/budgetsurvey>

Find out more about cost of living support | Brentwood Council<https://www.brentwood.gov.uk/cost-of-living>
Find out more about cost of living support | Rochford Council<https://www.rochford.gov.uk/community-and-people/cost-living>

[Email Footer]

Overview map of worksite



Dig Sites Area: Line:

- LP Mains
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- Valve
- Depth of cover
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- Diameter Change
- Material Change
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Cadent
Your Gas Network

Date Requested: 09/11/2023
Job Reference: 31483441
Site Location: 561690 196075
Requested by: Mr James Parker

Your Scheme/Reference:
23/01164/FUL (JP)

View extent: 100m, 100m

Scale: 1:4613 (When plotted at A4)

IMPORTANT NOTICES

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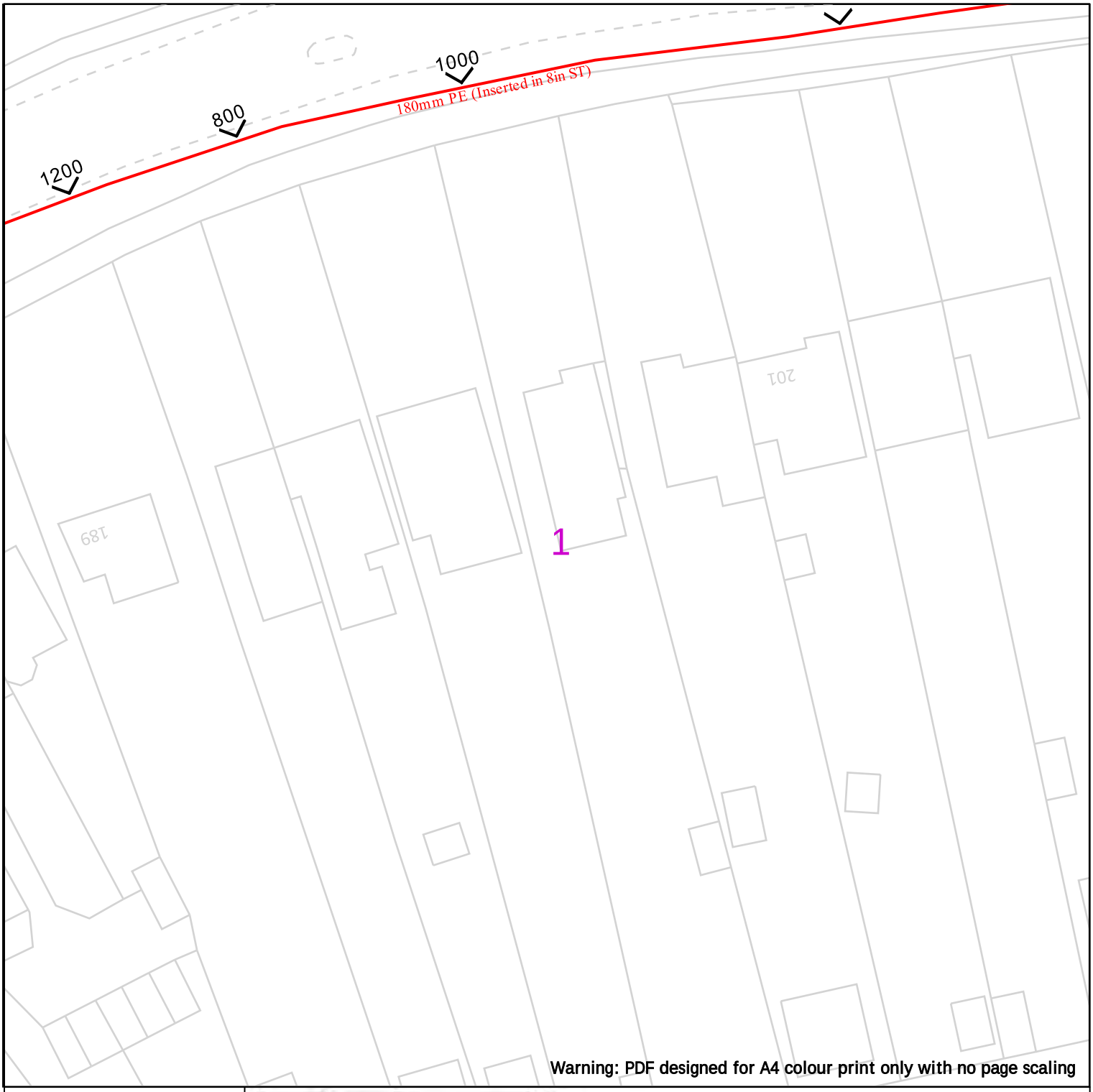
In case of emergency call - 0800 111 999



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25m

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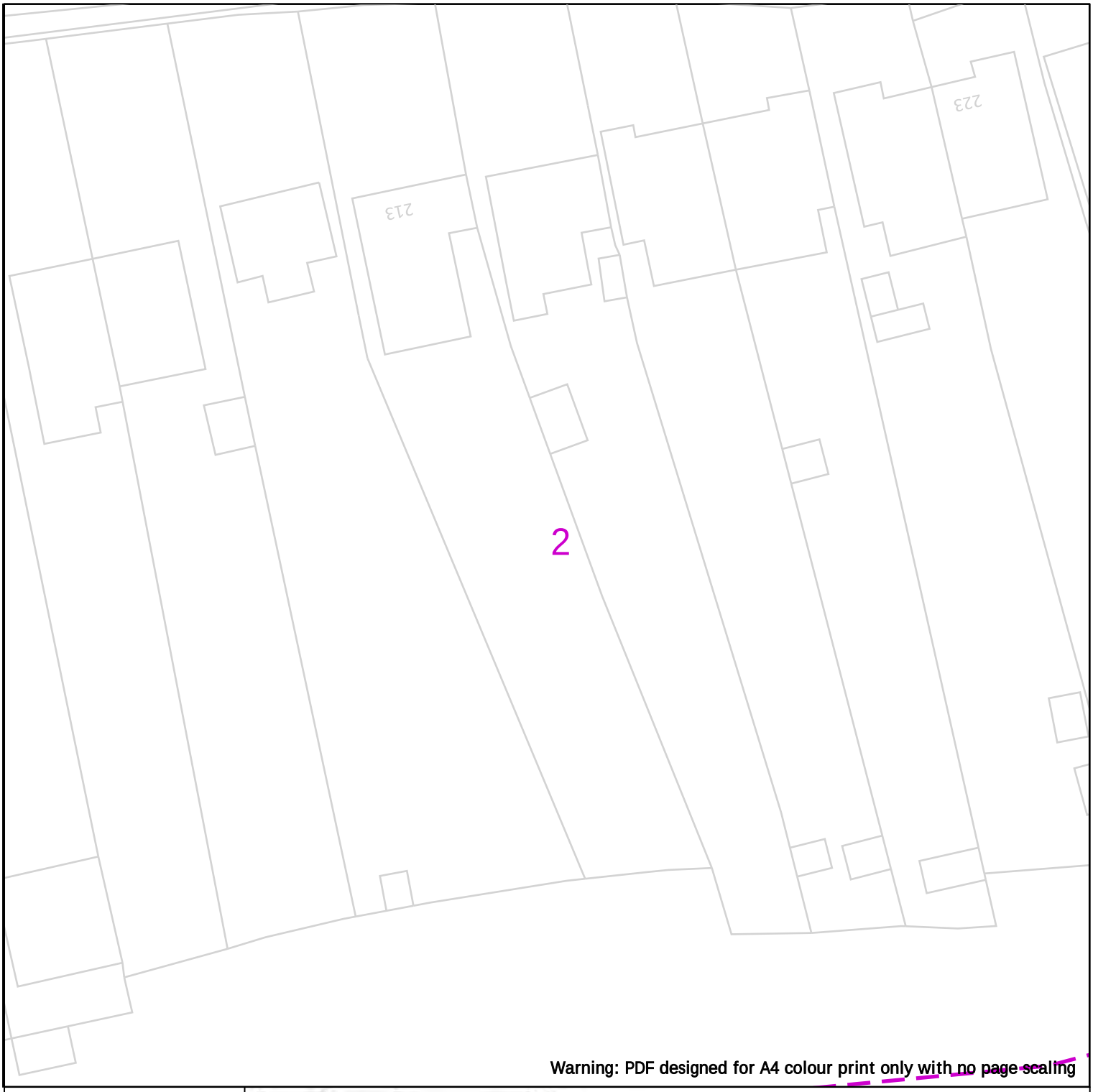

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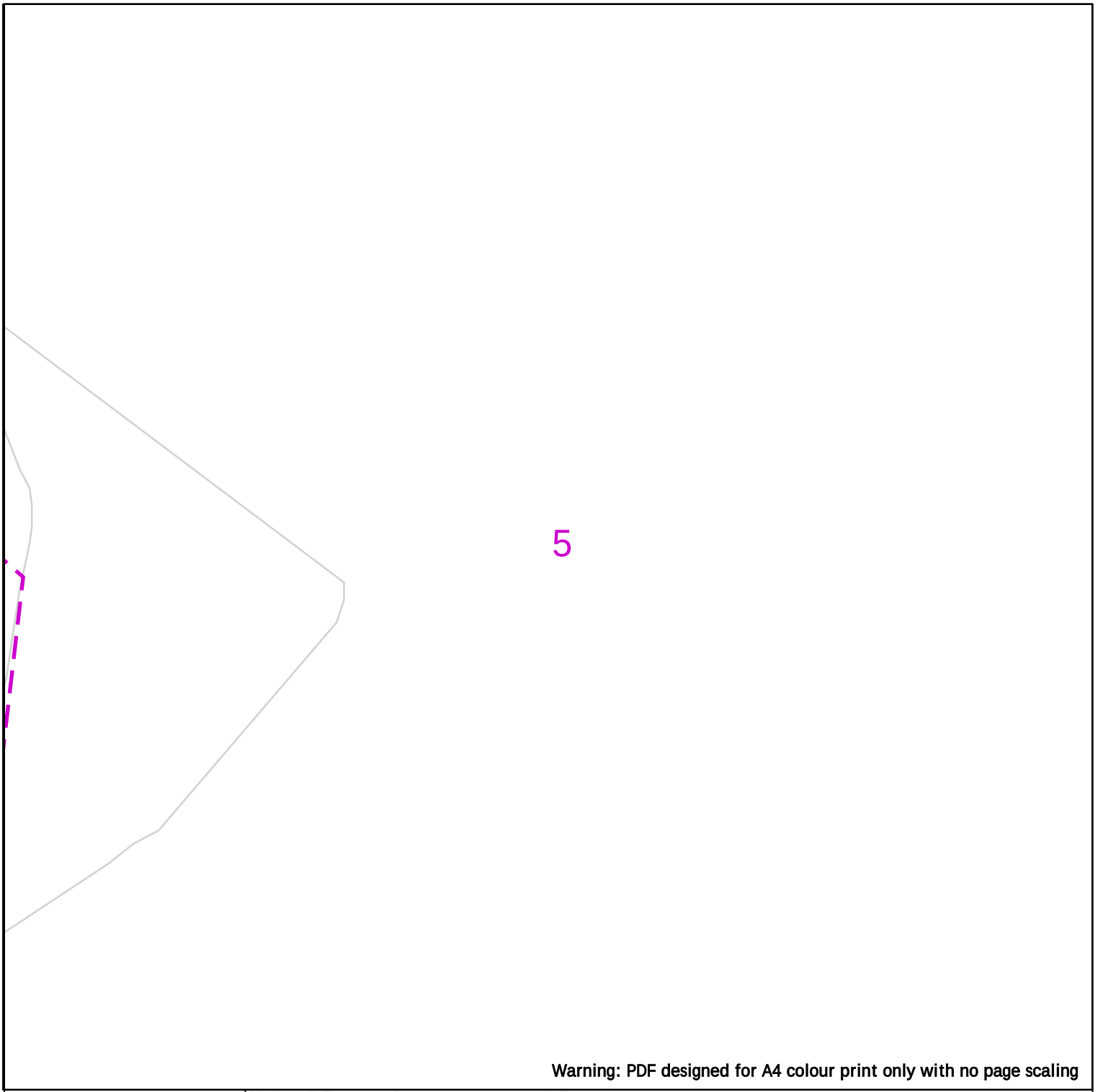

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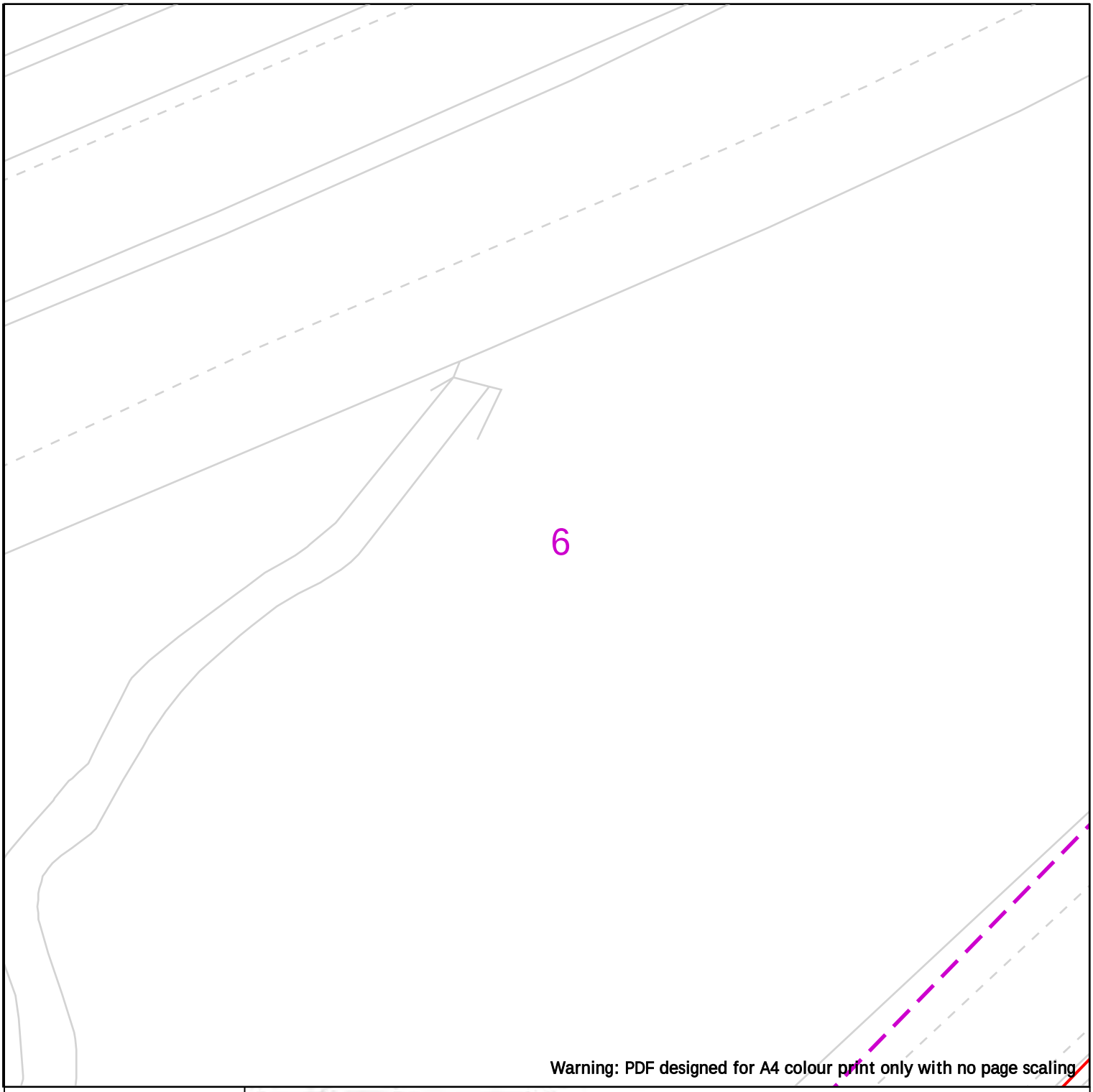

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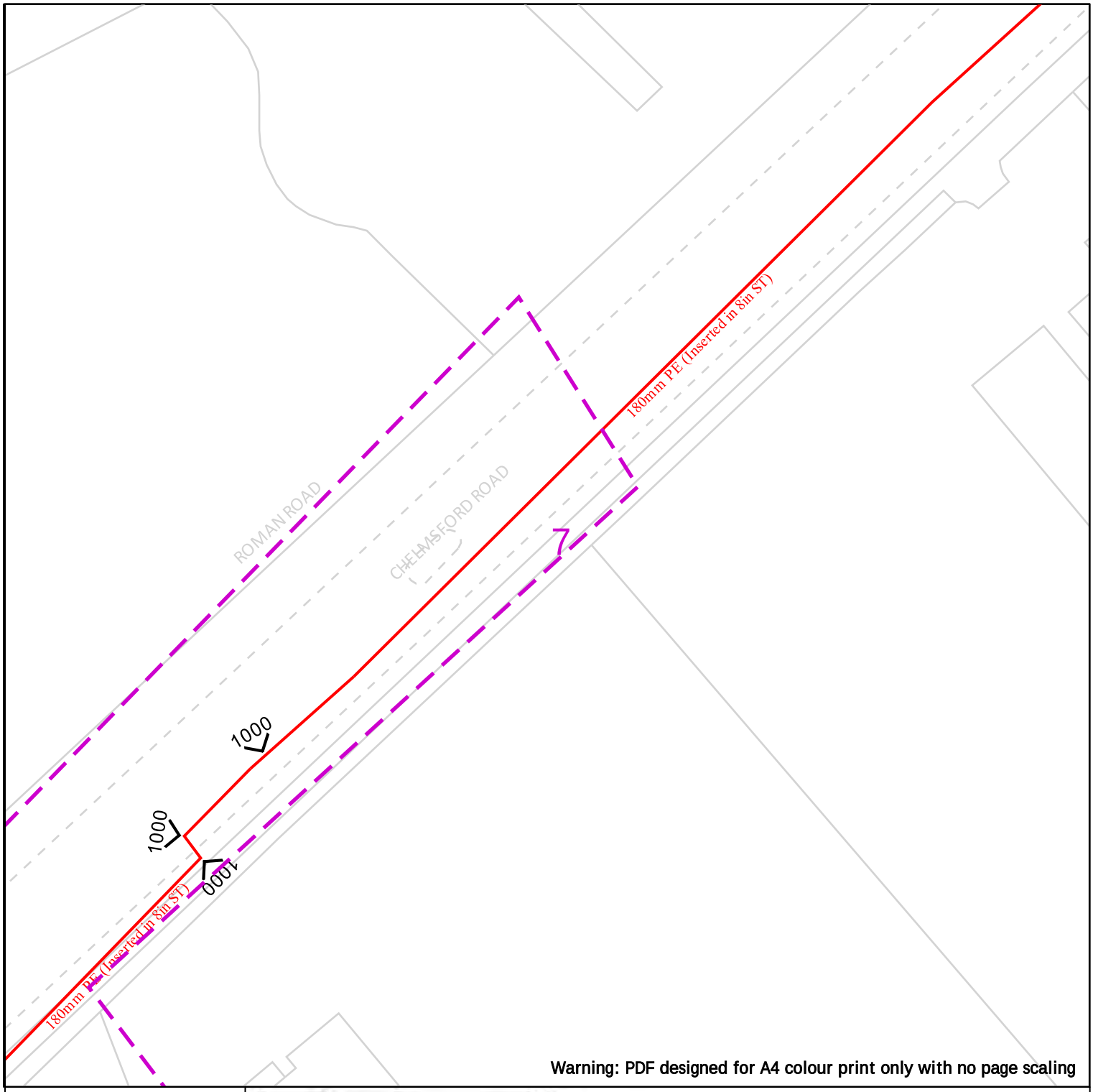

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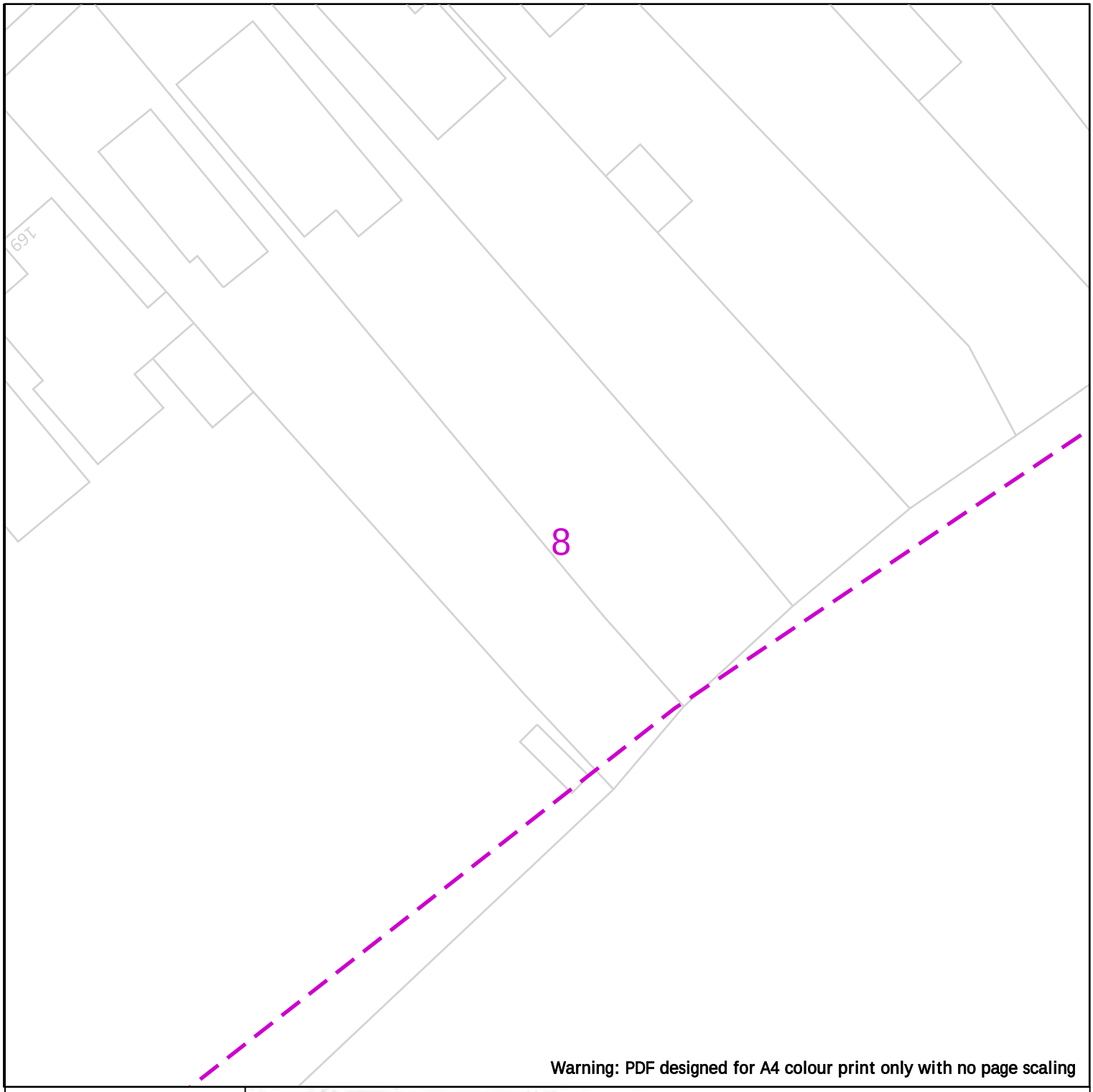

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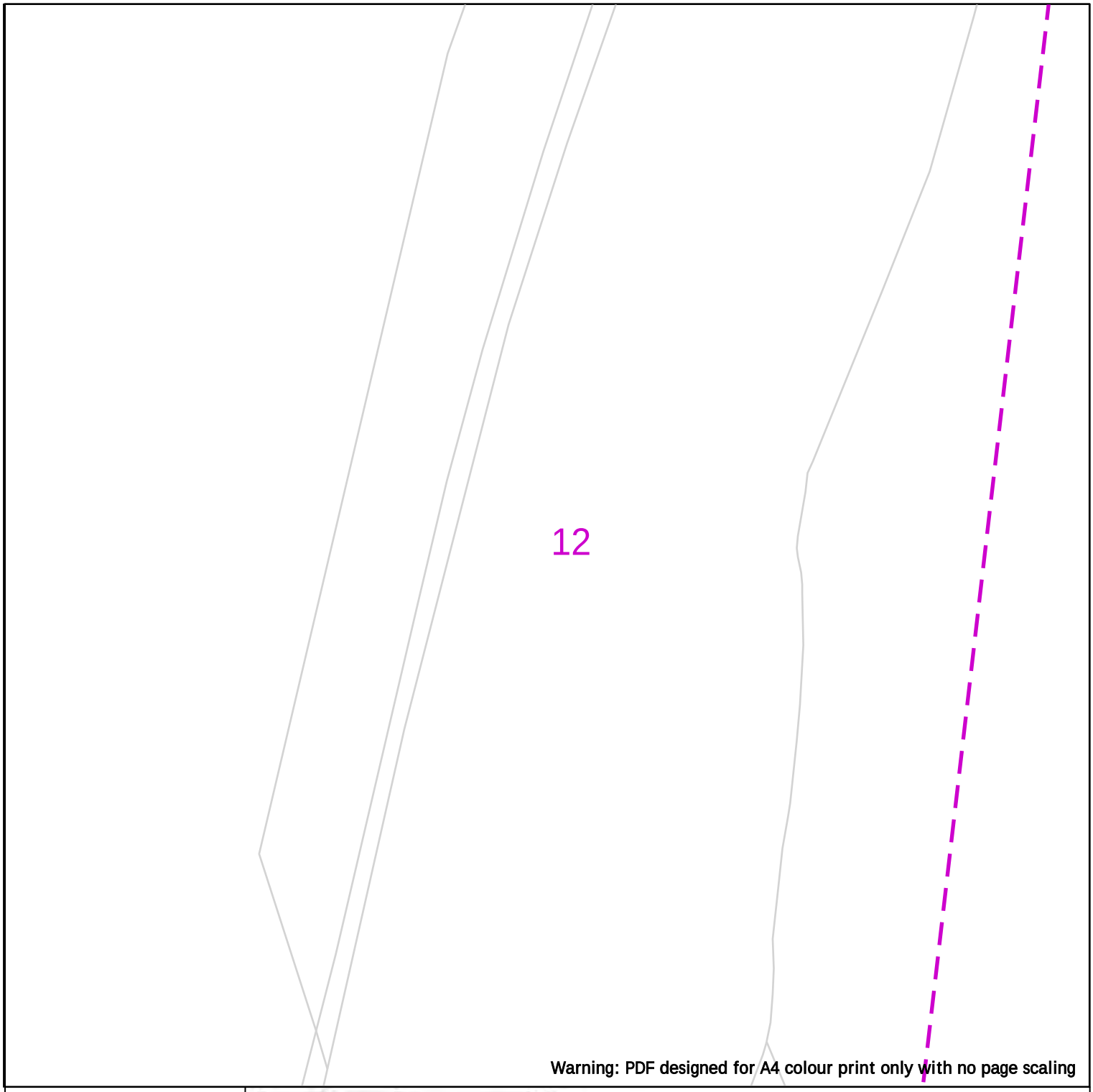

Warning: PDF designed for A4 colour print only with no page scaling

25m

Dig Sites Area: Line:

LP Mains
MP Mains
IP Mains
LHP Mains

Valve
Depth of cover
Syphon
Diameter Change
Material Change
Out of Standard Service

Cadent
Your Gas Network

Date Requested: 09/11/2023
Job Reference: 31483441
Site Location: 561690 196075
Requested by: Mr James Parker

Your Scheme/Reference:
23/01164/FUL (JP)

View extent: 100m, 100m

Scale: 1:500 (When plotted at A4)

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13

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Dig Sites Area: Line:

LP Mains
MP Mains
IP Mains
LHP Mains

Valve
Depth of cover
Syphon

Diameter Change
Material Change
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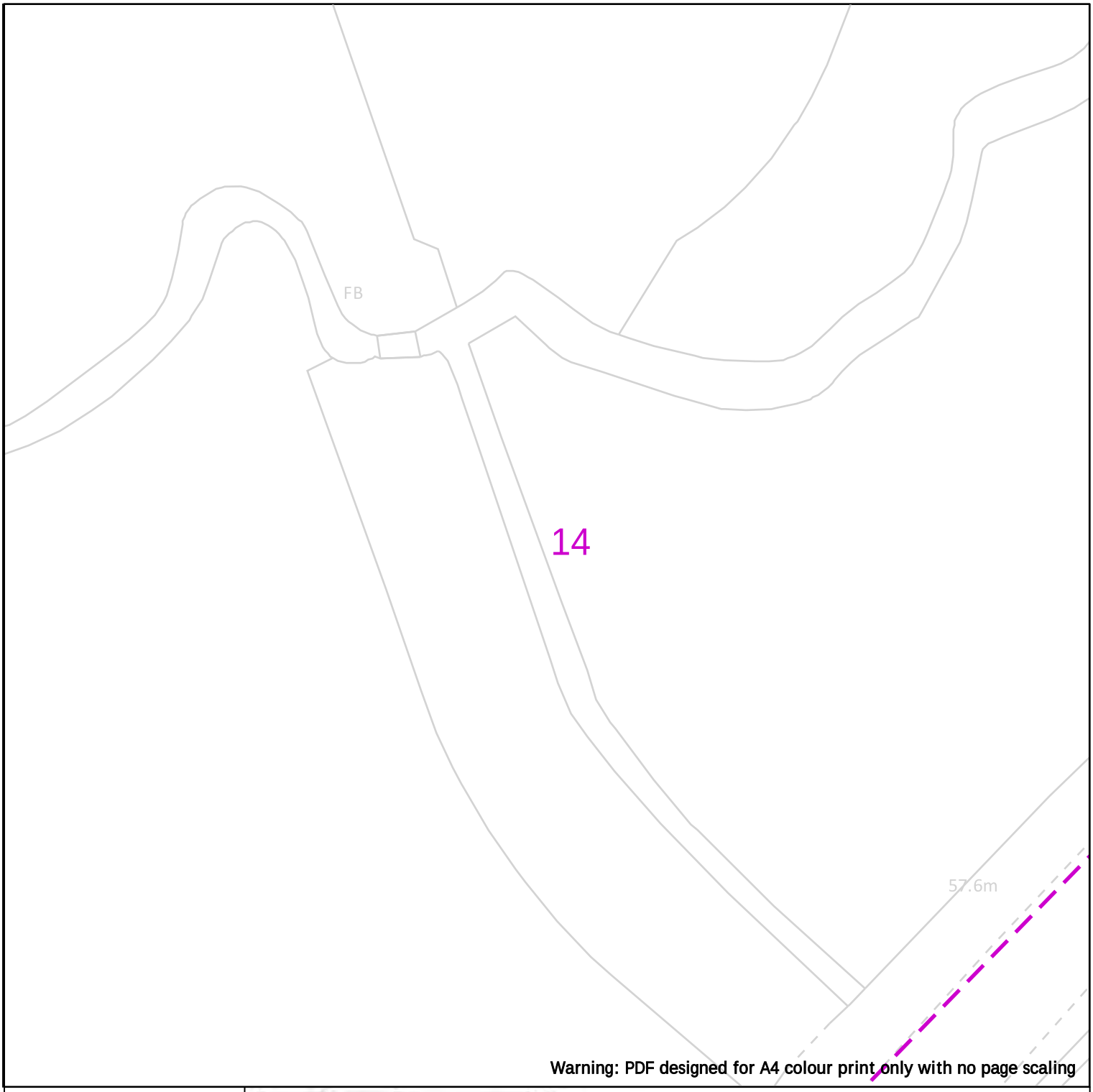

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25m

Dig Sites Area: Line:

LP Mains
MP Mains
IP Mains
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Valve
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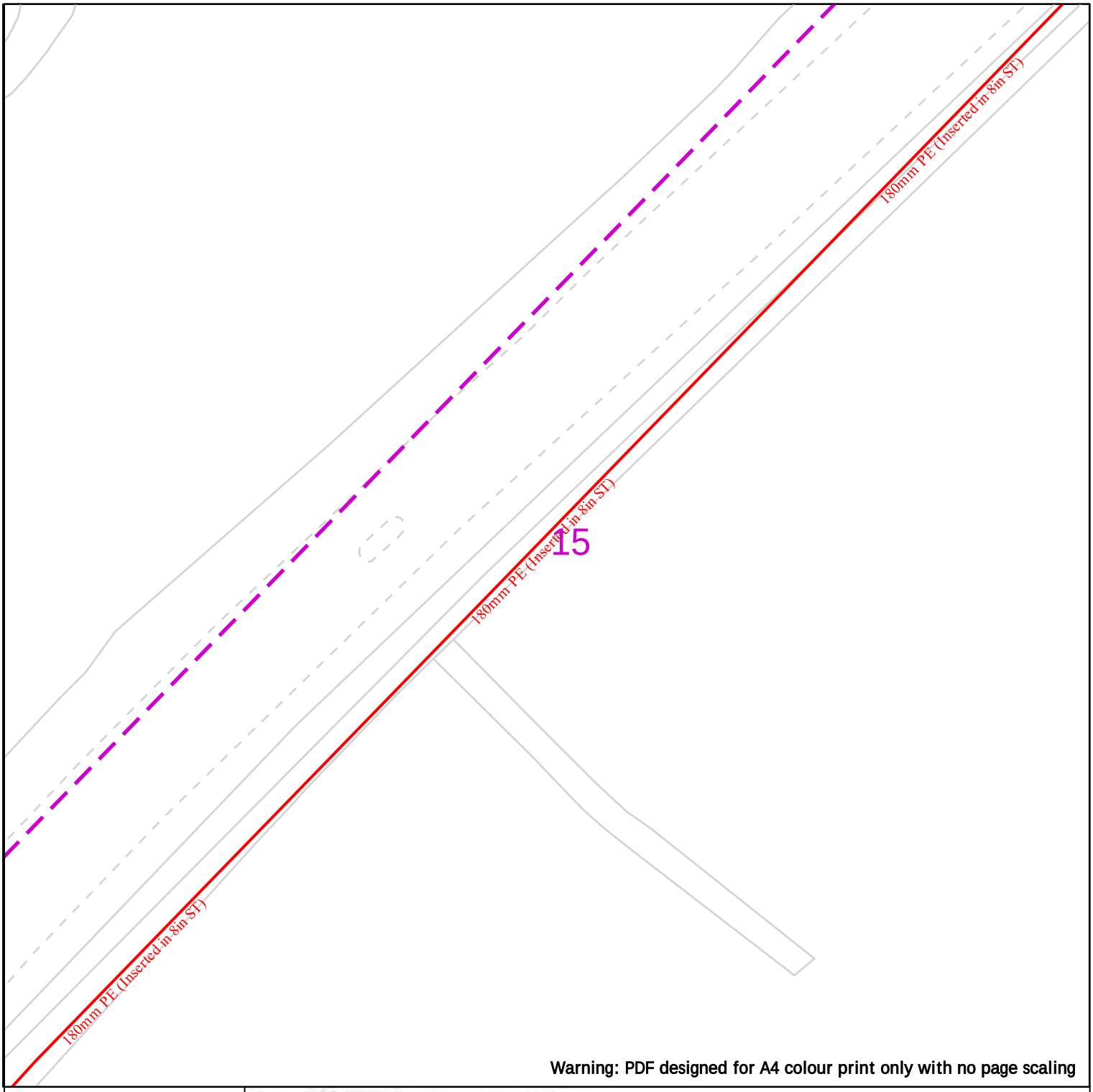

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Valve
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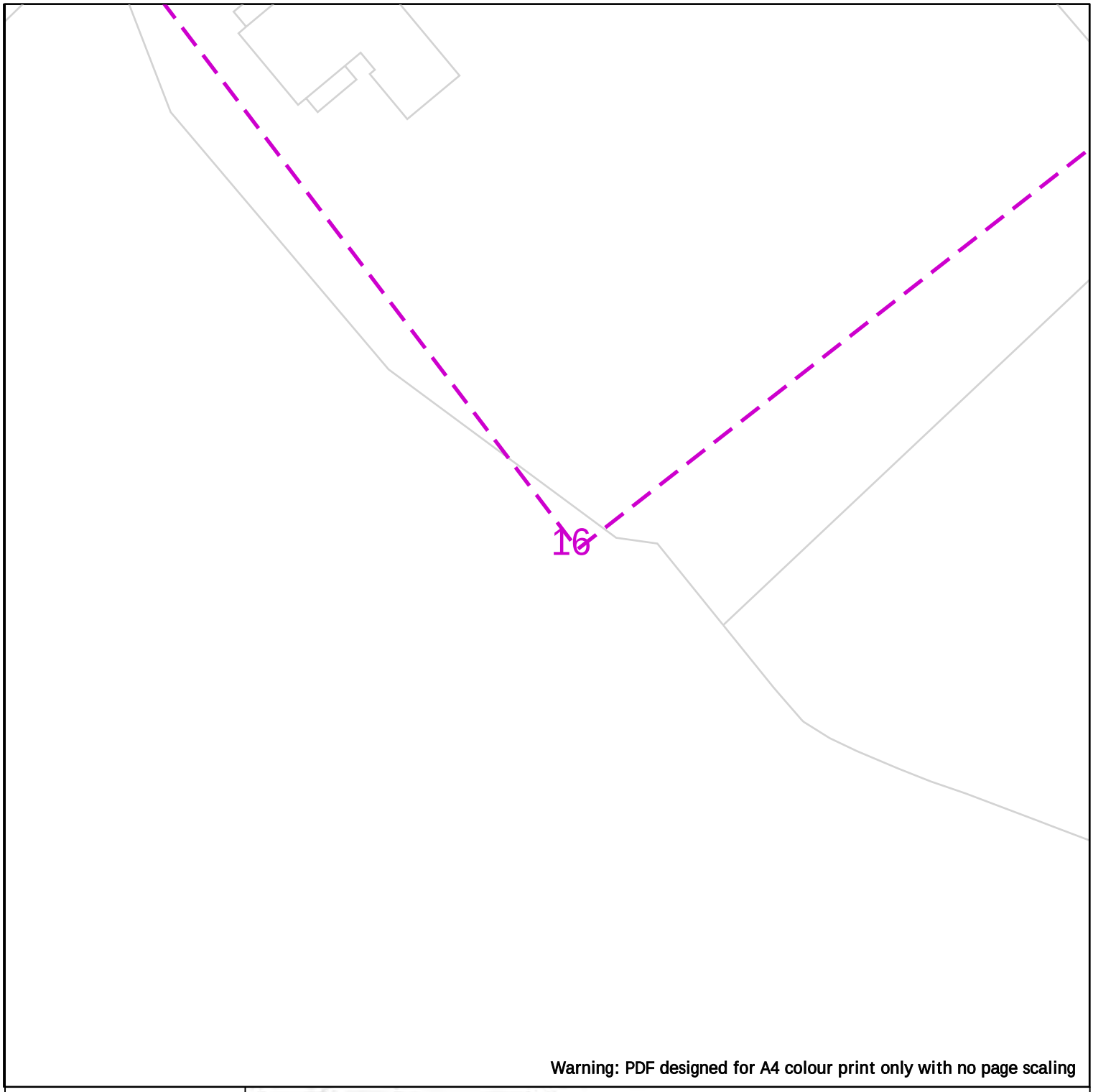

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25m

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Valve
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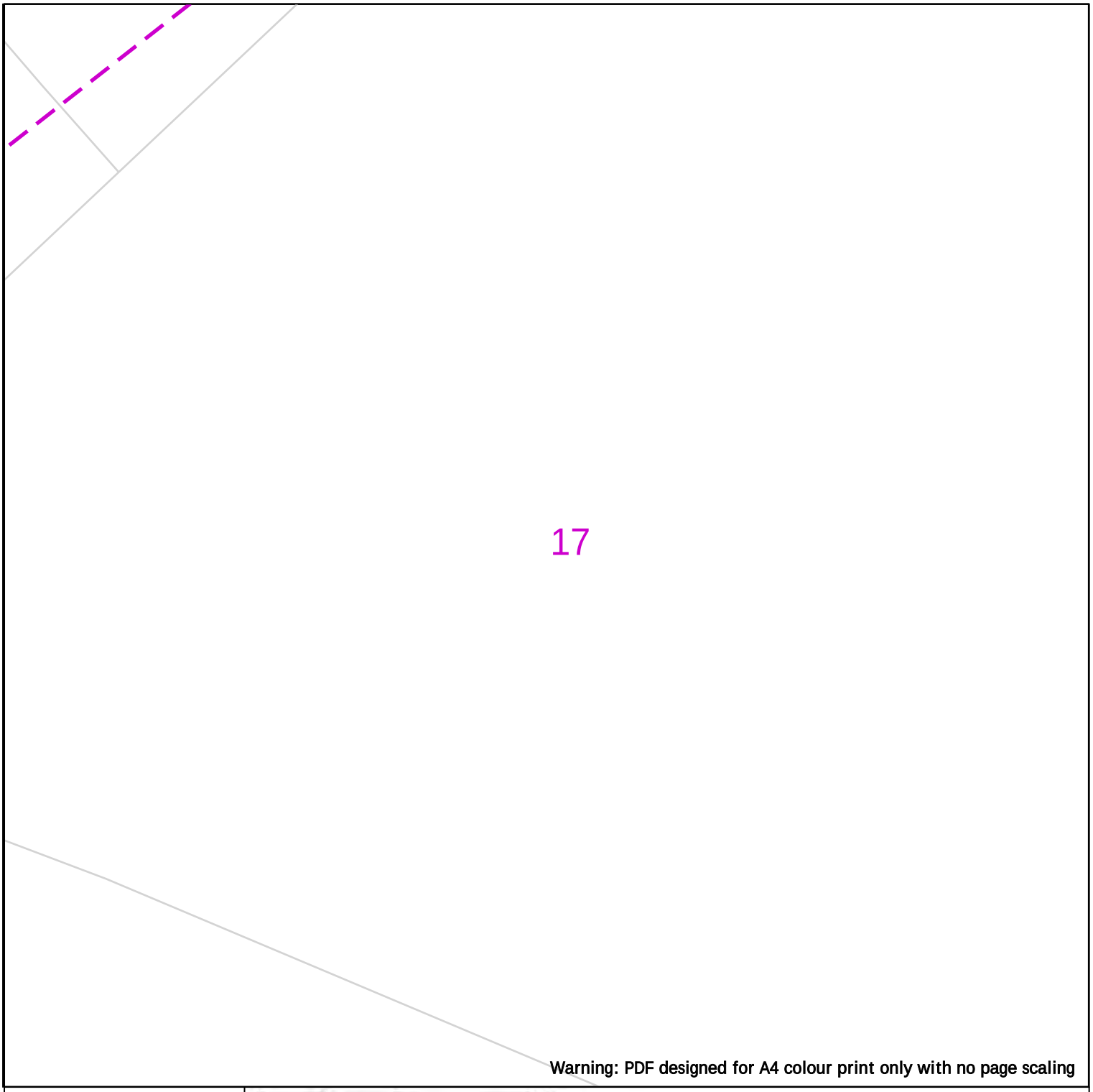

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25m

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18

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Dig Sites Area: Line:

LP Mains
MP Mains
IP Mains
LHP Mains

Valve
Depth of cover
Syphon
Diameter Change
Material Change
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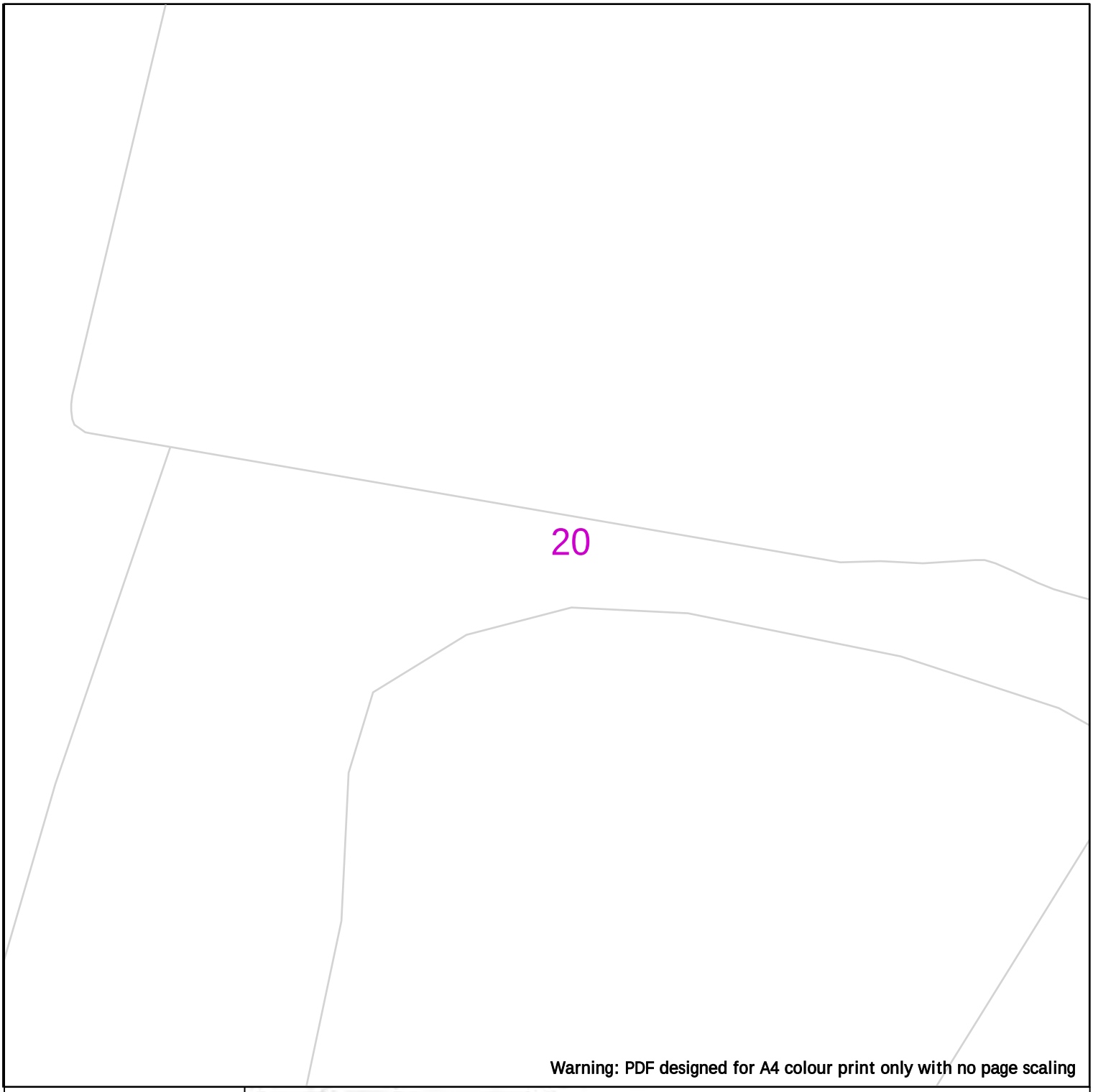

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25m

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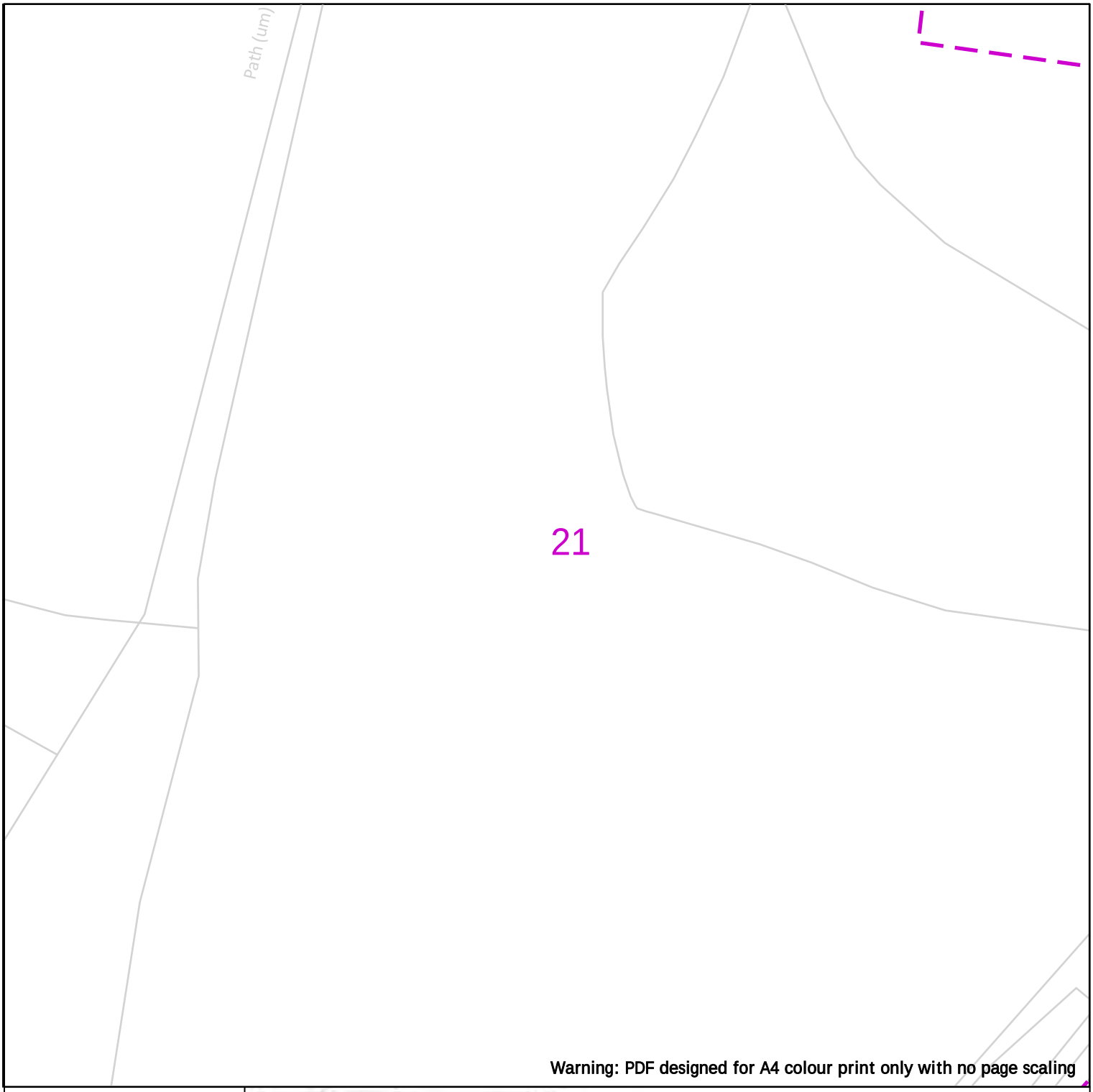

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25m

Dig Sites Area: Line:

- LP Mains
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- Valve
- Depth of cover
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- Diameter Change
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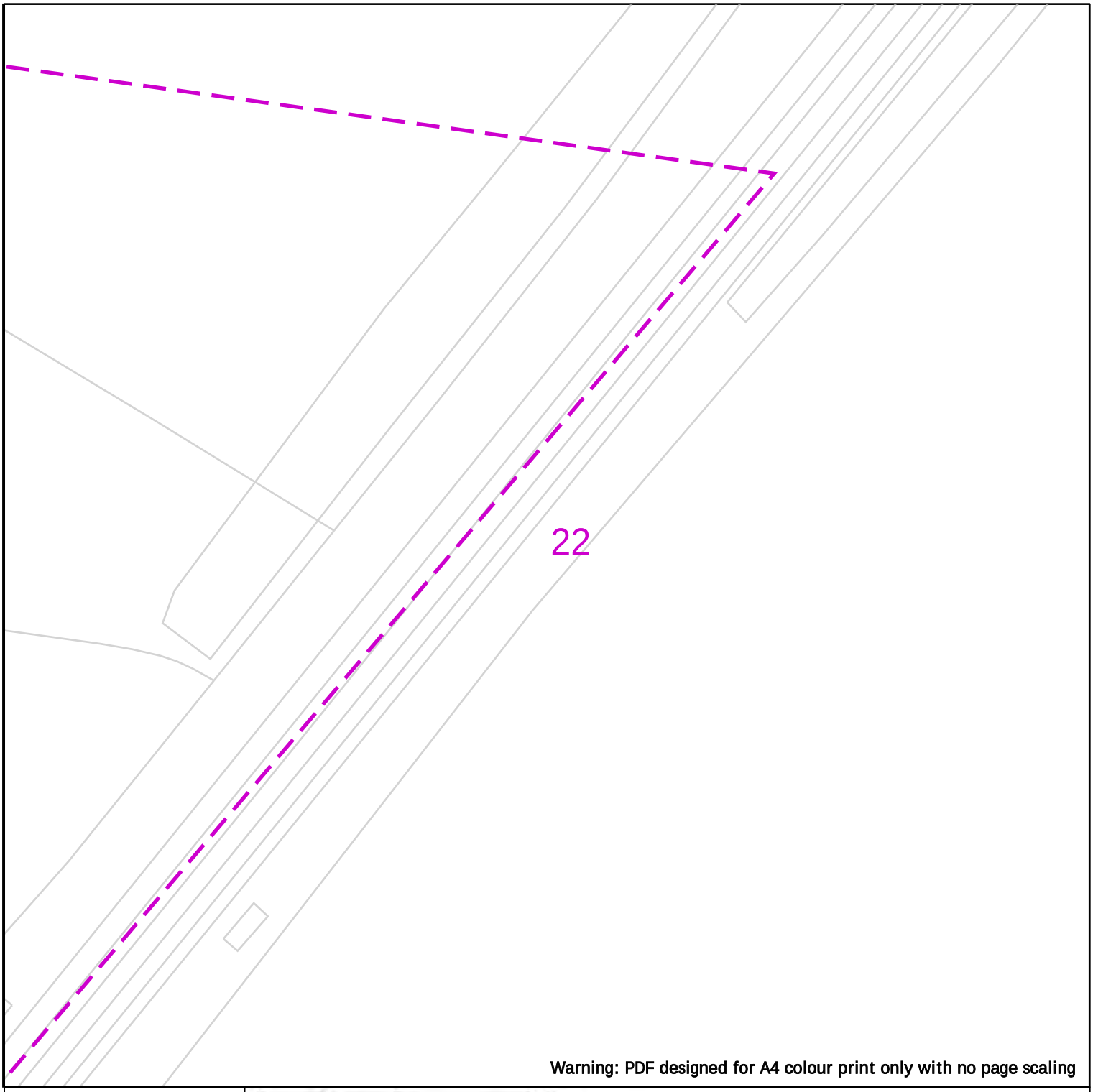

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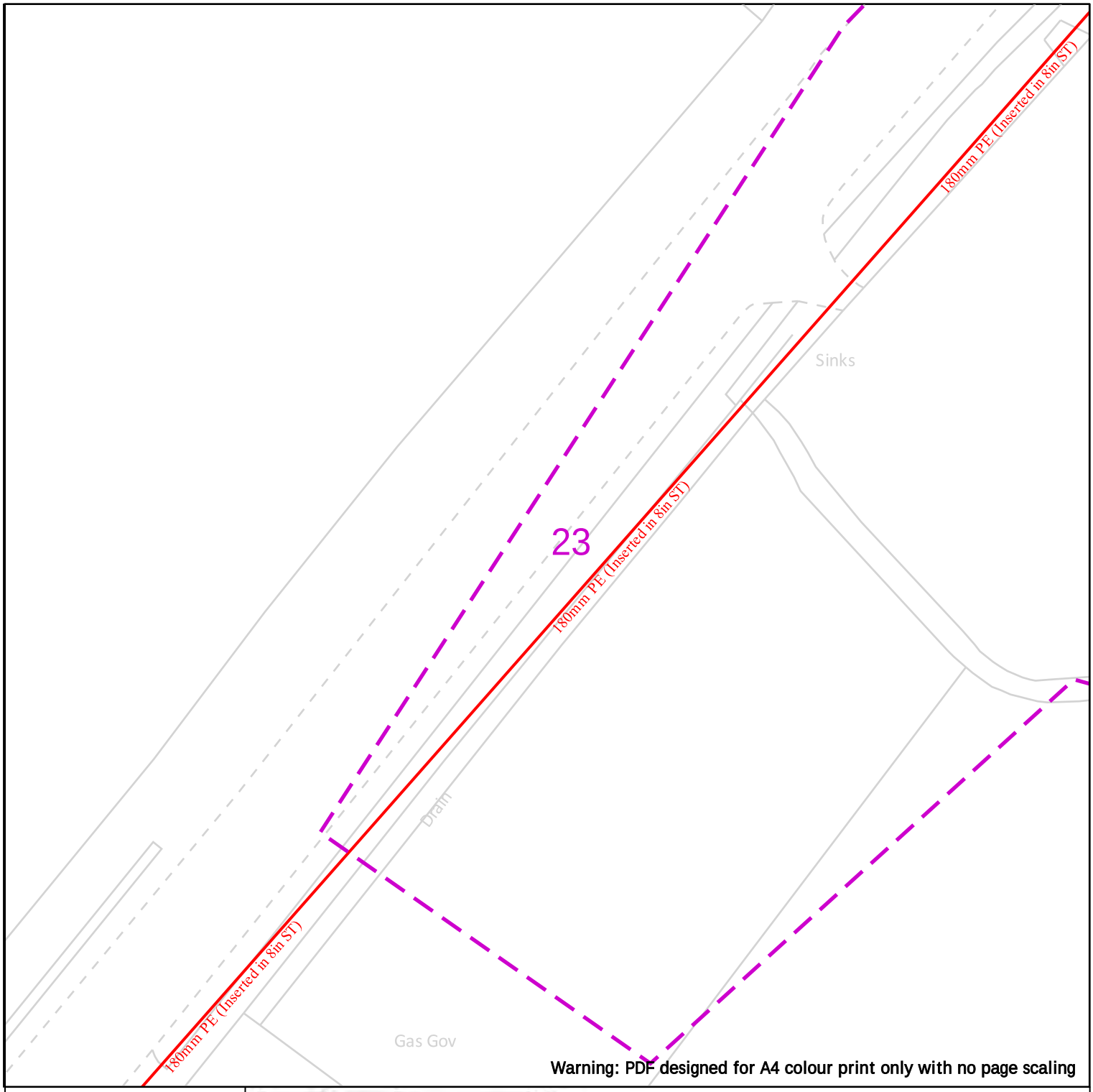

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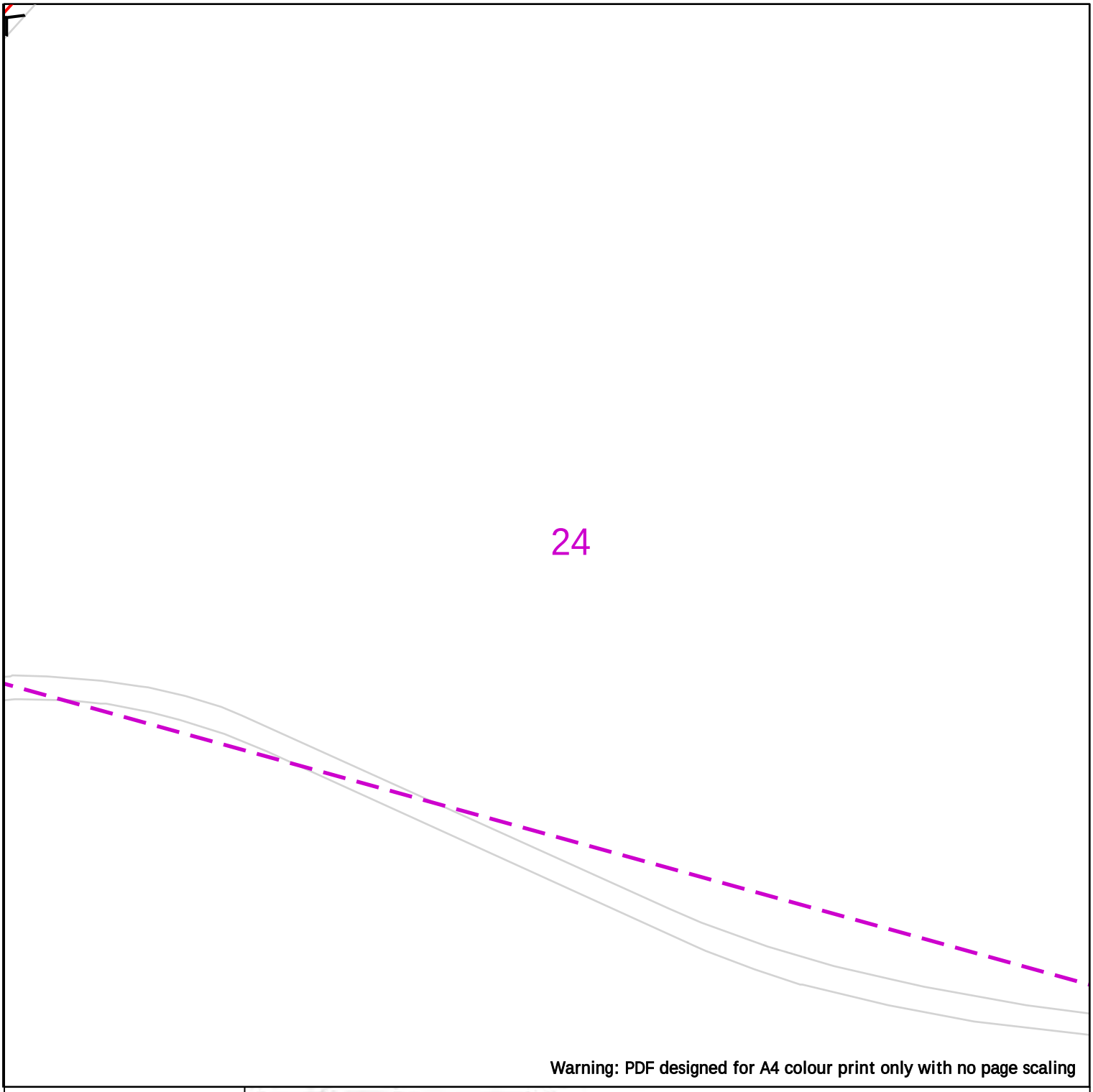

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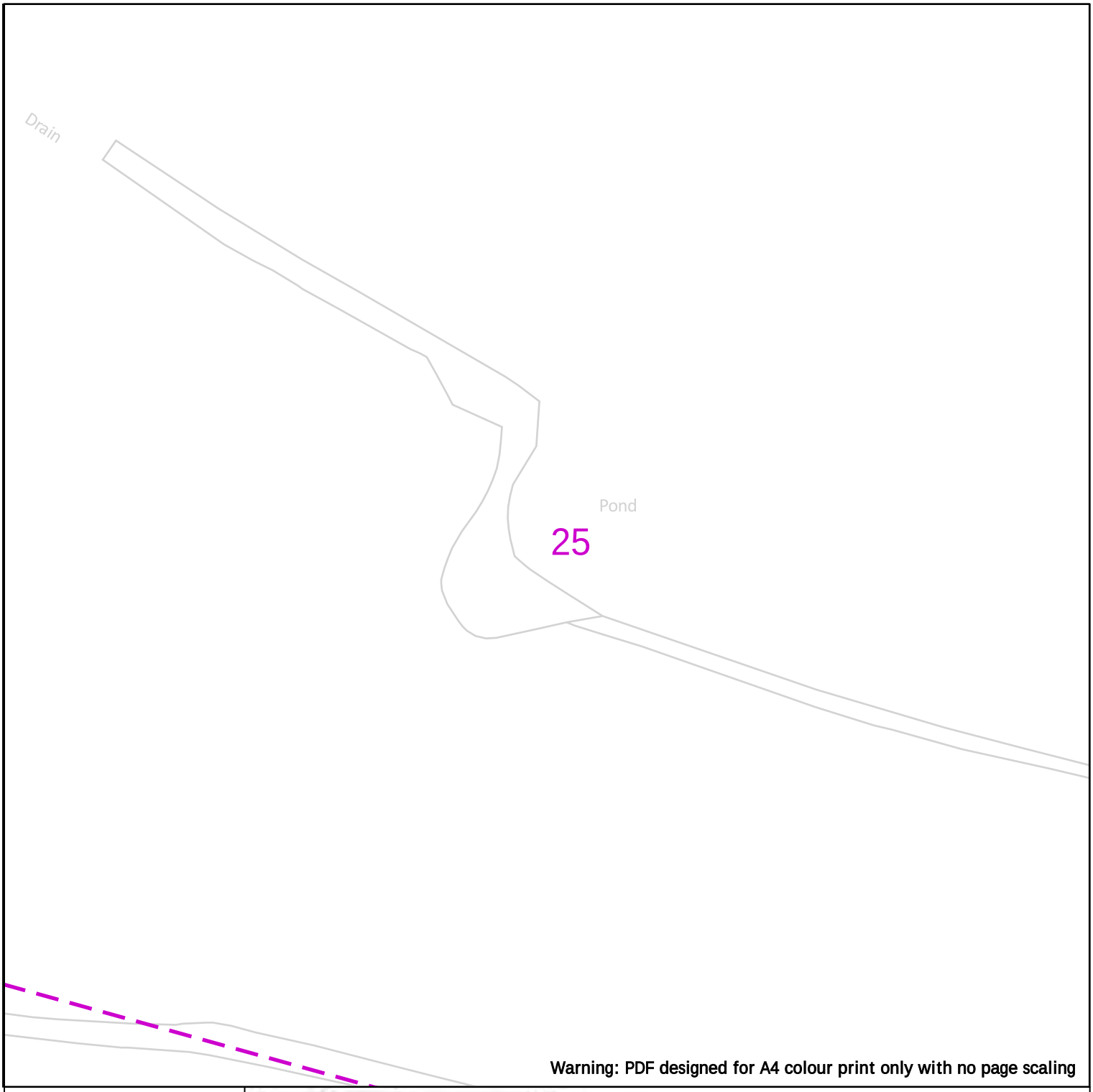

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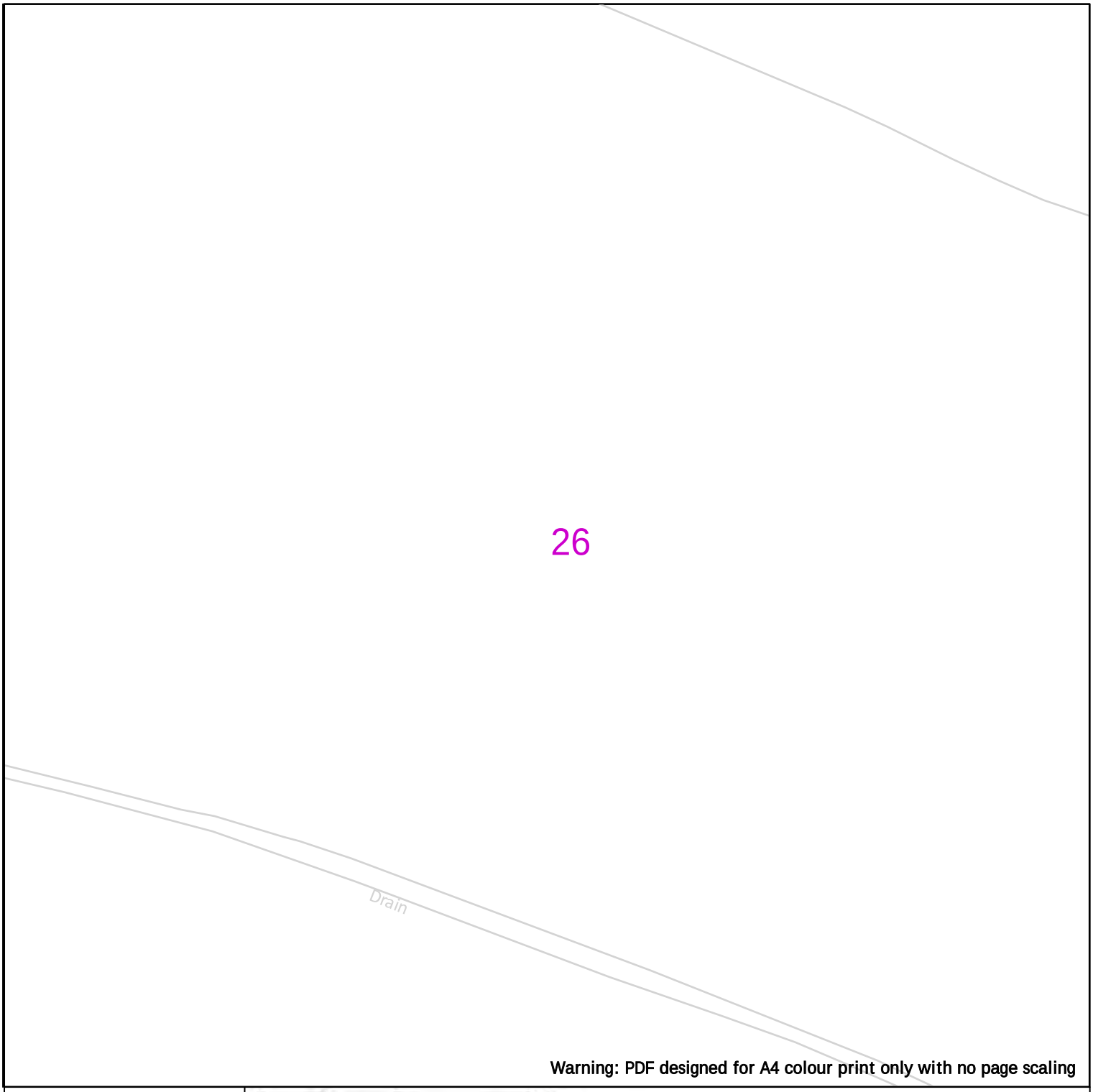

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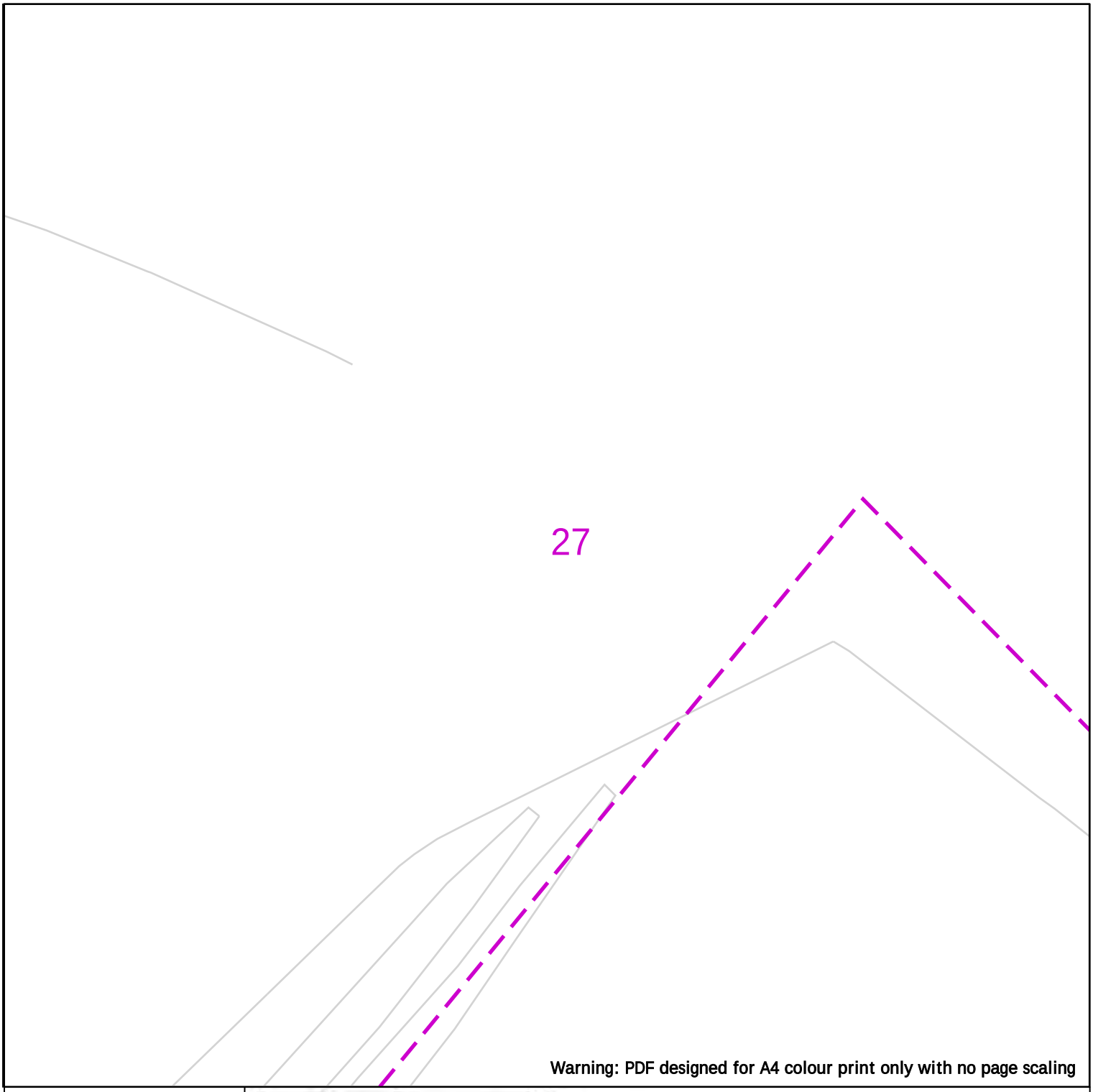

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Job Reference: 31483441
Site Location: 561690 196075
Requested by: Mr James Parker

Your Scheme/Reference:
23/01164/FUL (JP)

View extent: 100m, 100m

Scale: 1:500 (When plotted at A4)

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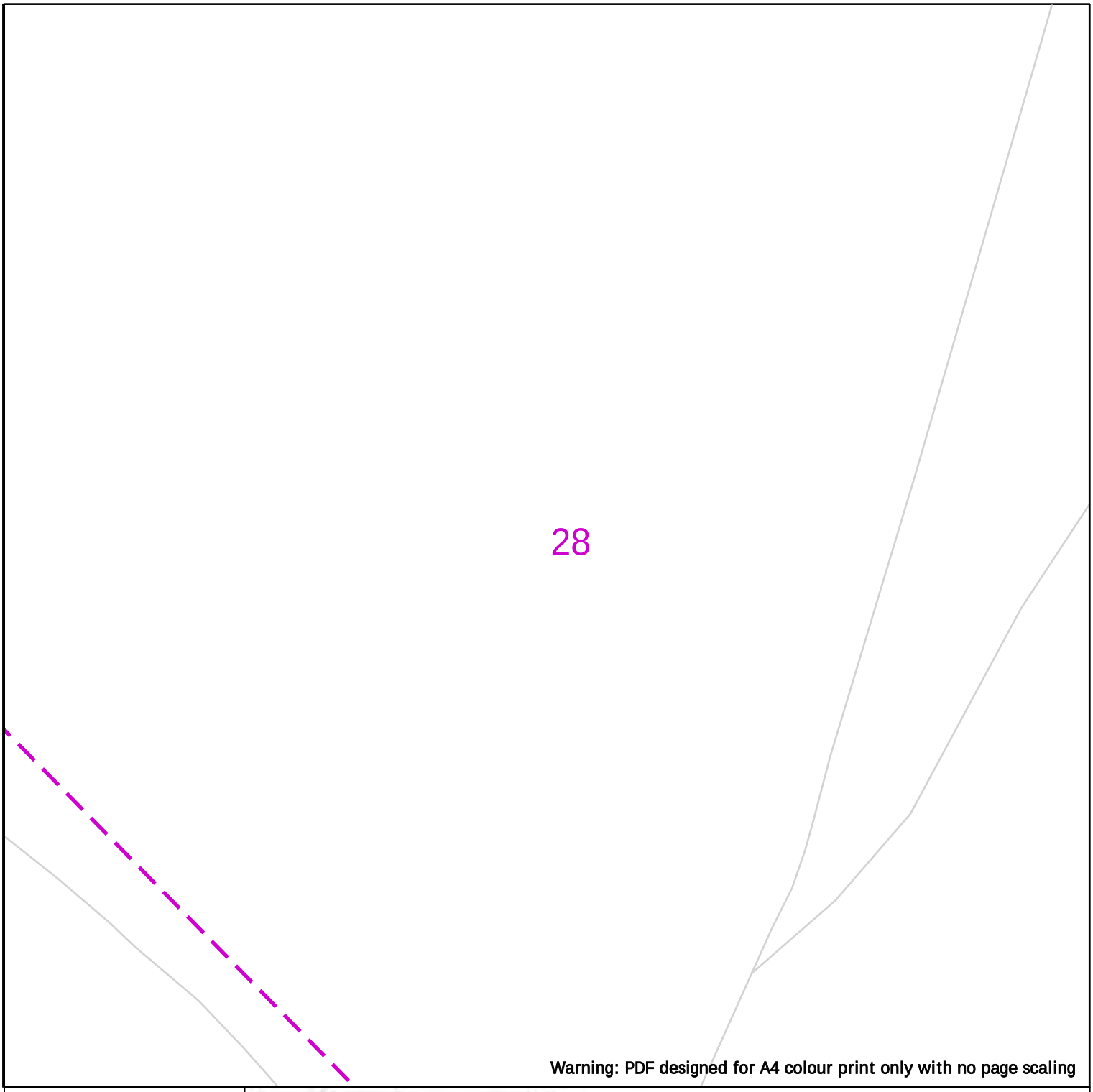

Warning: PDF designed for A4 colour print only with no page scaling

25m

Dig Sites Area: Line:

LP Mains
MP Mains
IP Mains
LHP Mains

Valve
Depth of cover
Syphon
Diameter Change
Material Change
Out of Standard Service

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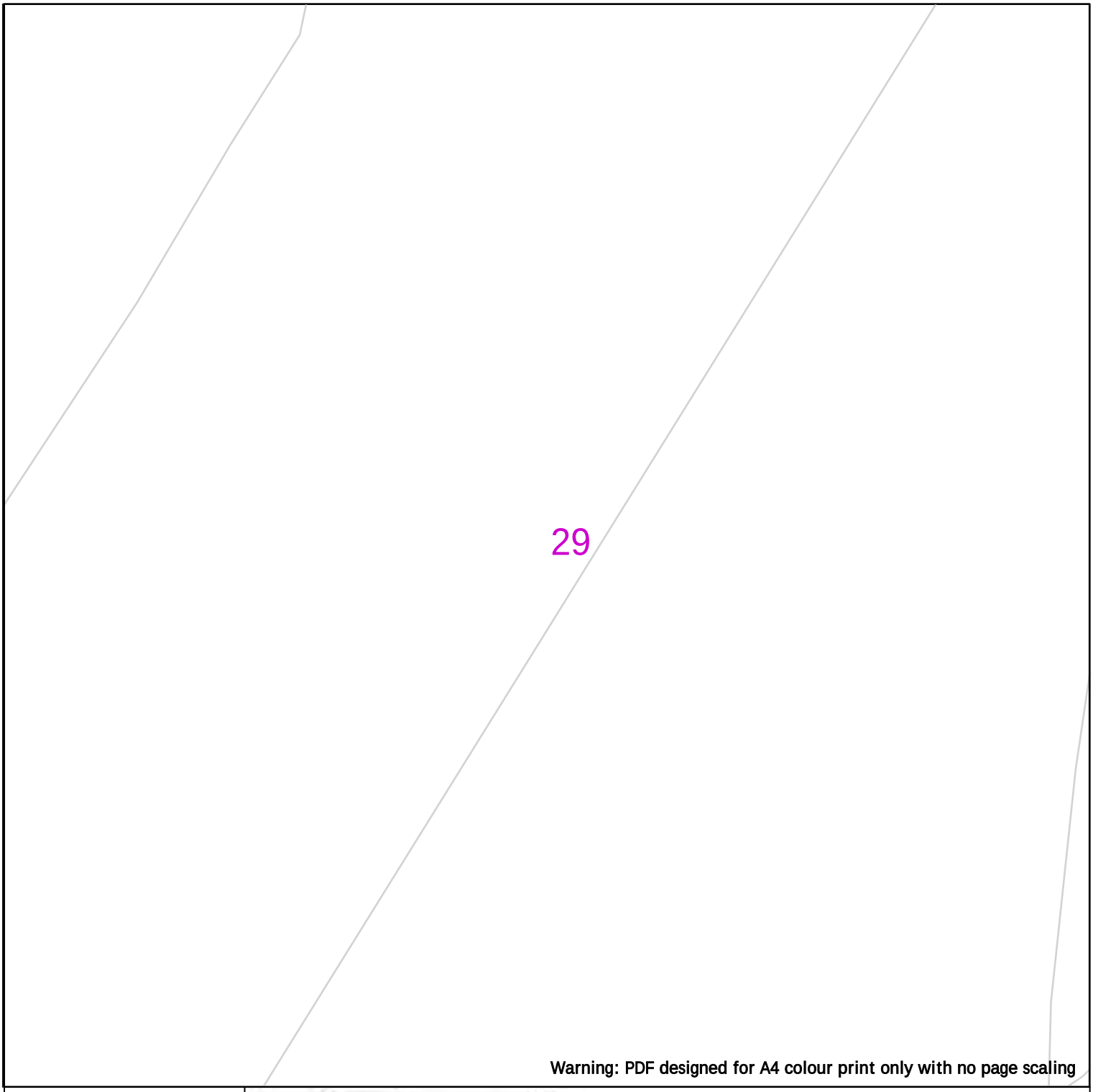

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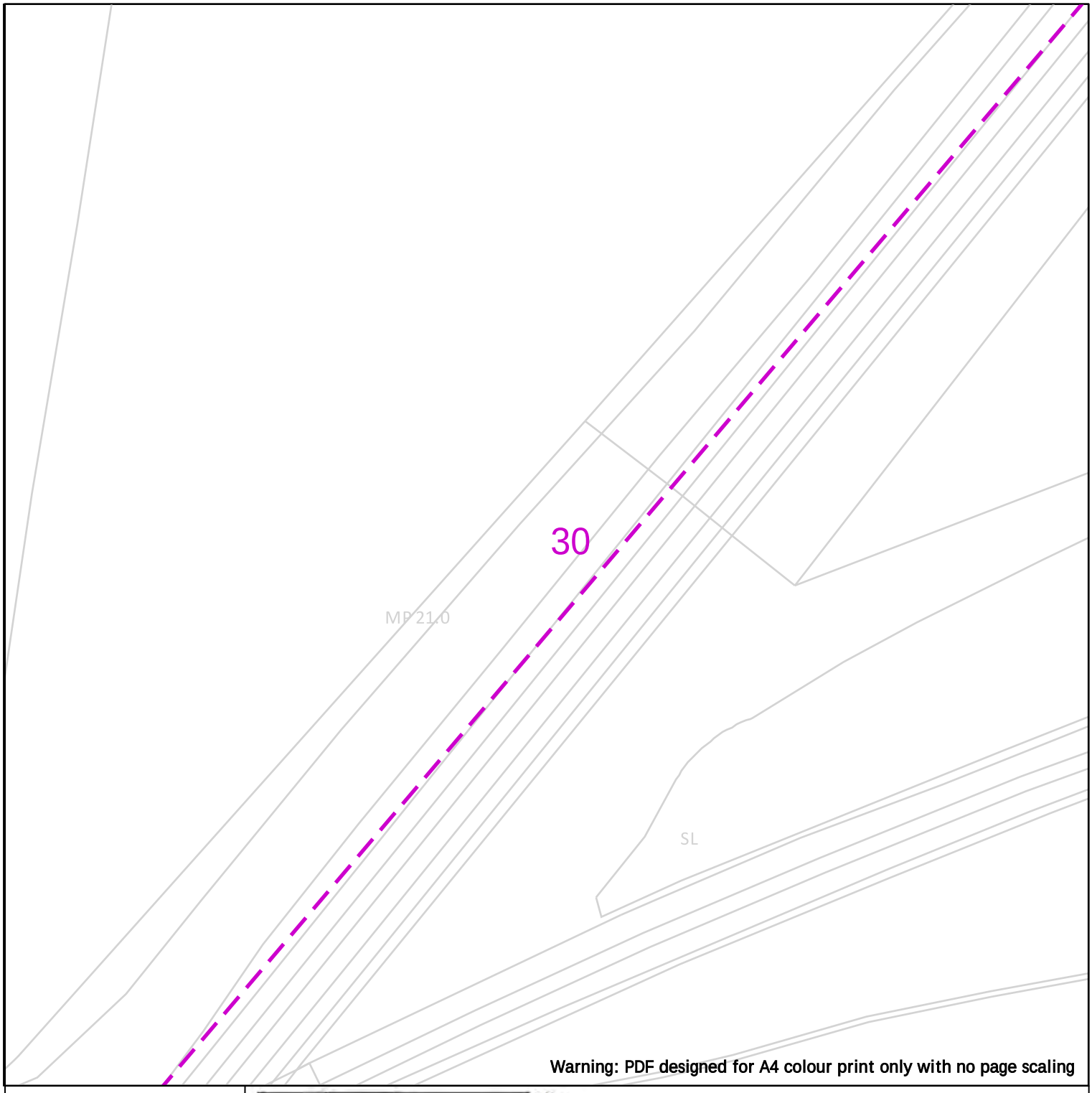

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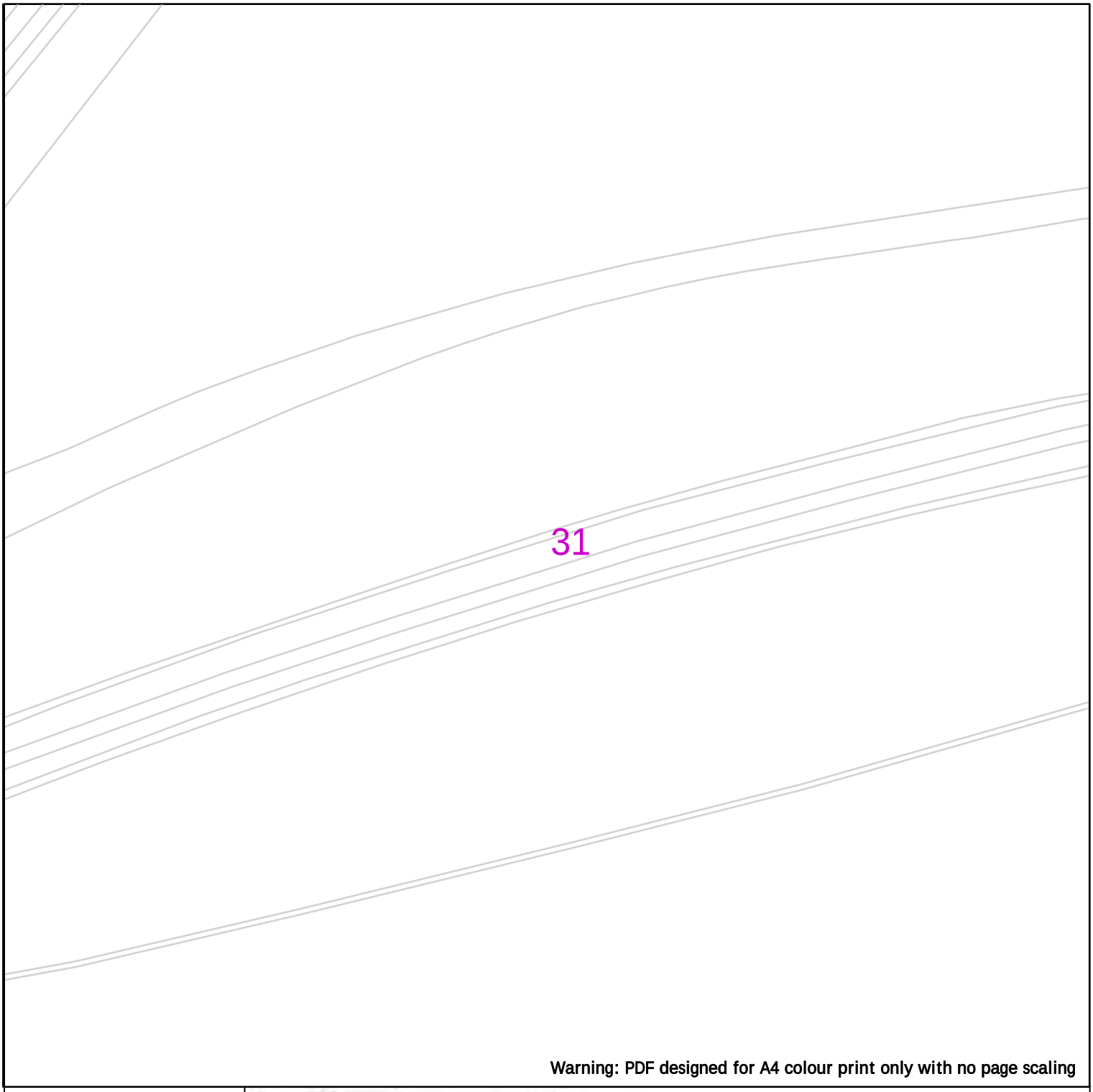

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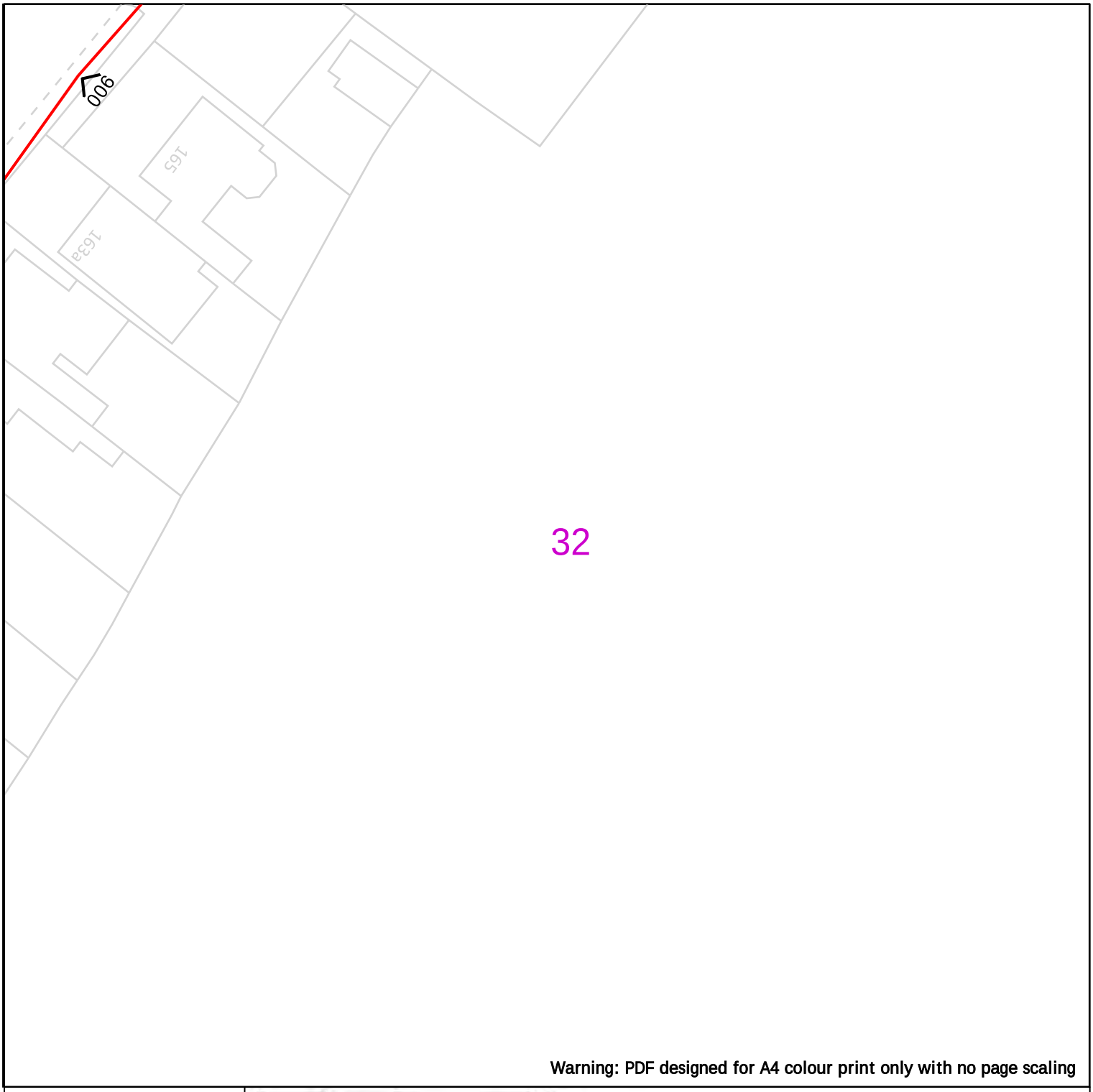

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25m

Dig Sites Area: Line:

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33

Playing Field

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25m

Dig Sites Area: Line:

LP Mains
MP Mains
IP Mains
LHP Mains

Valve
Depth of cover
Syphon

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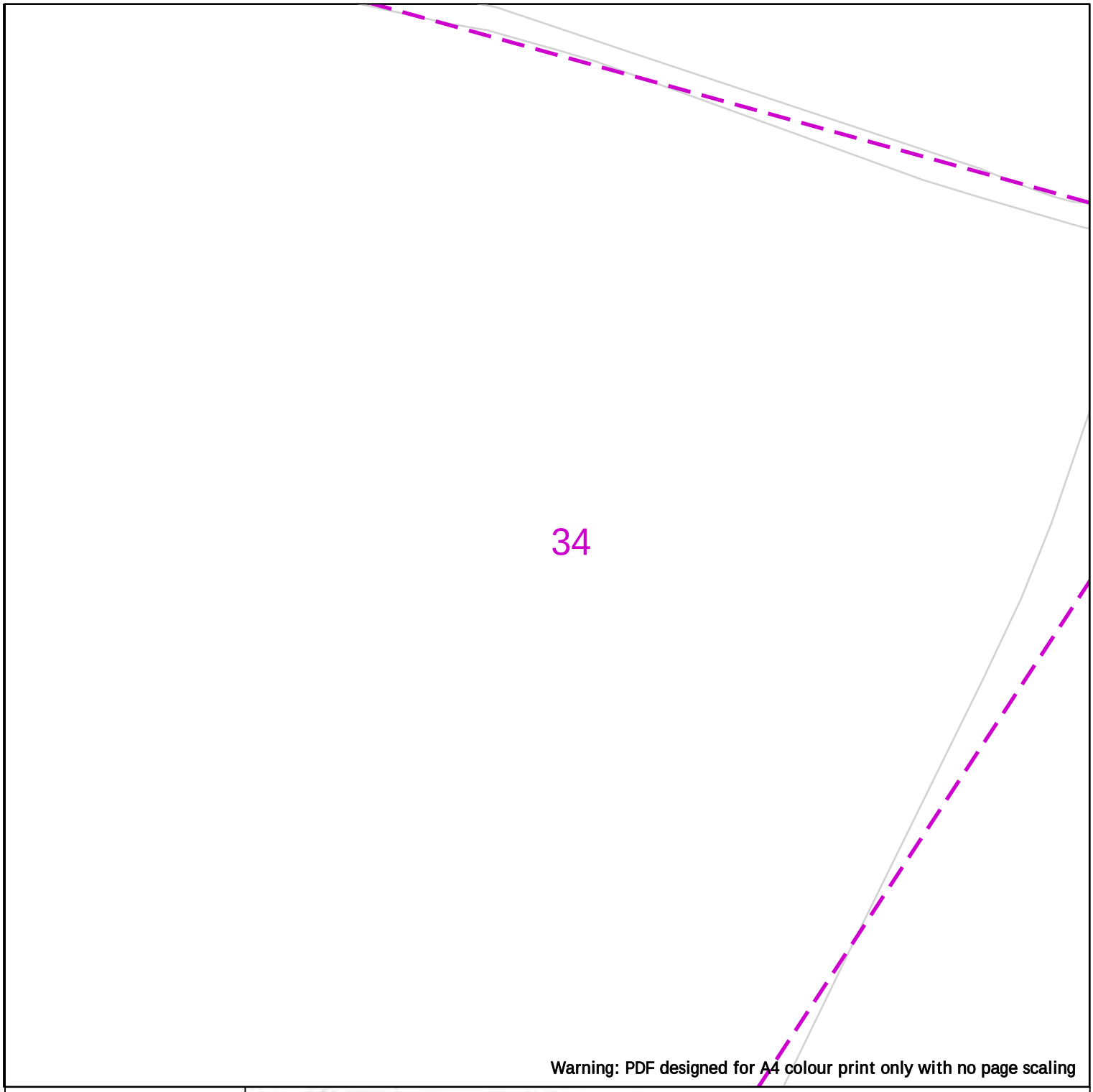

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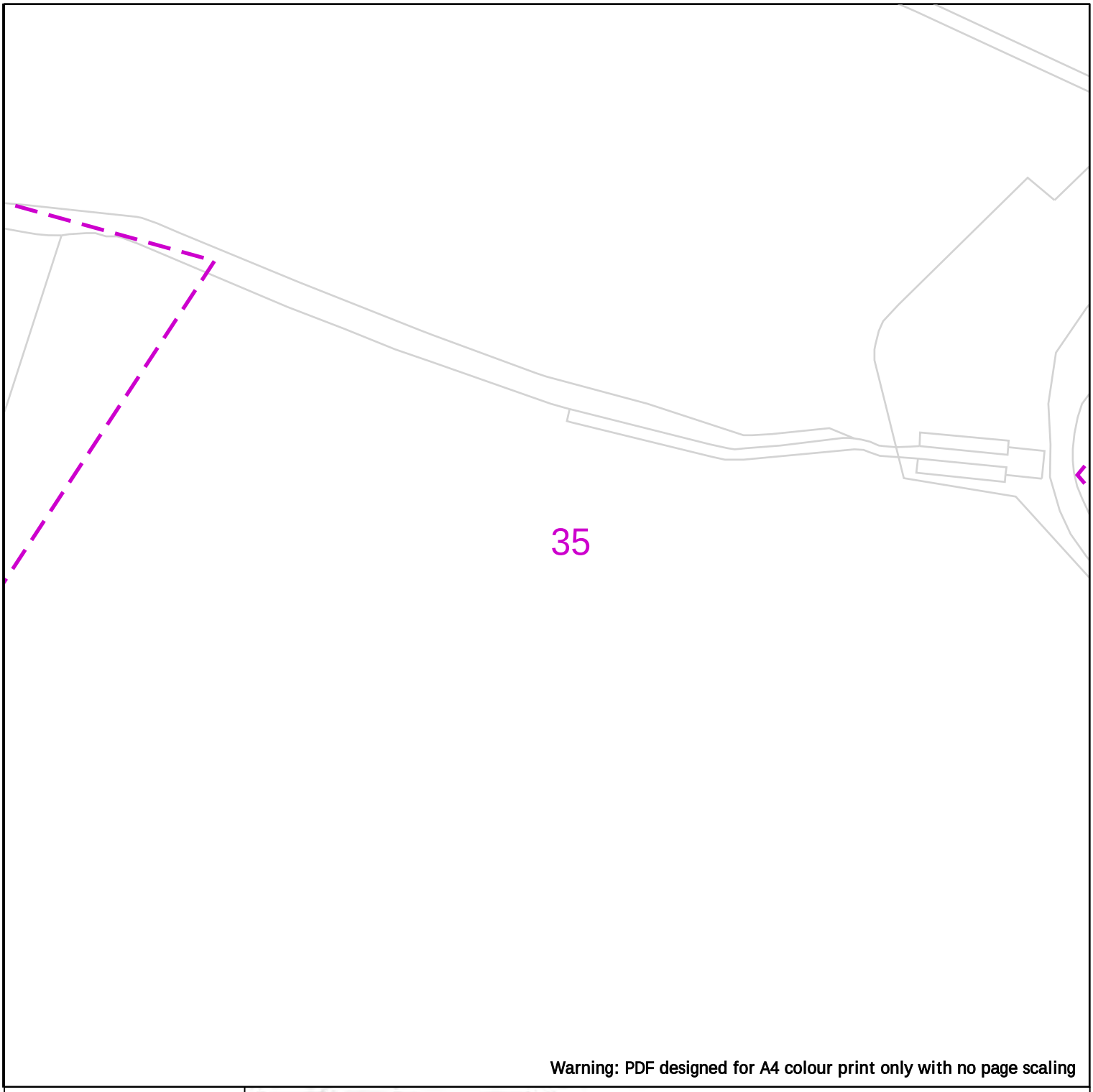

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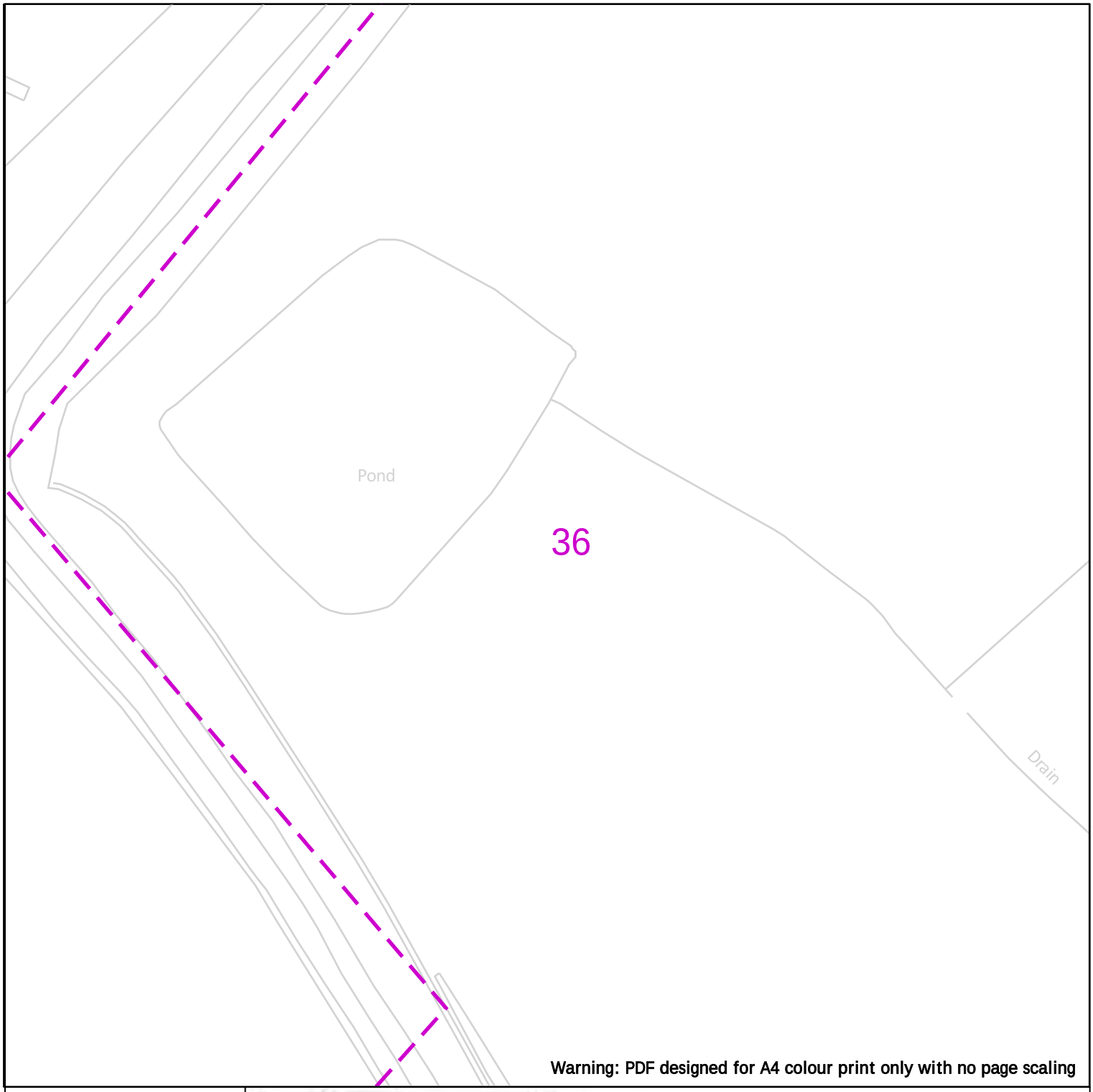

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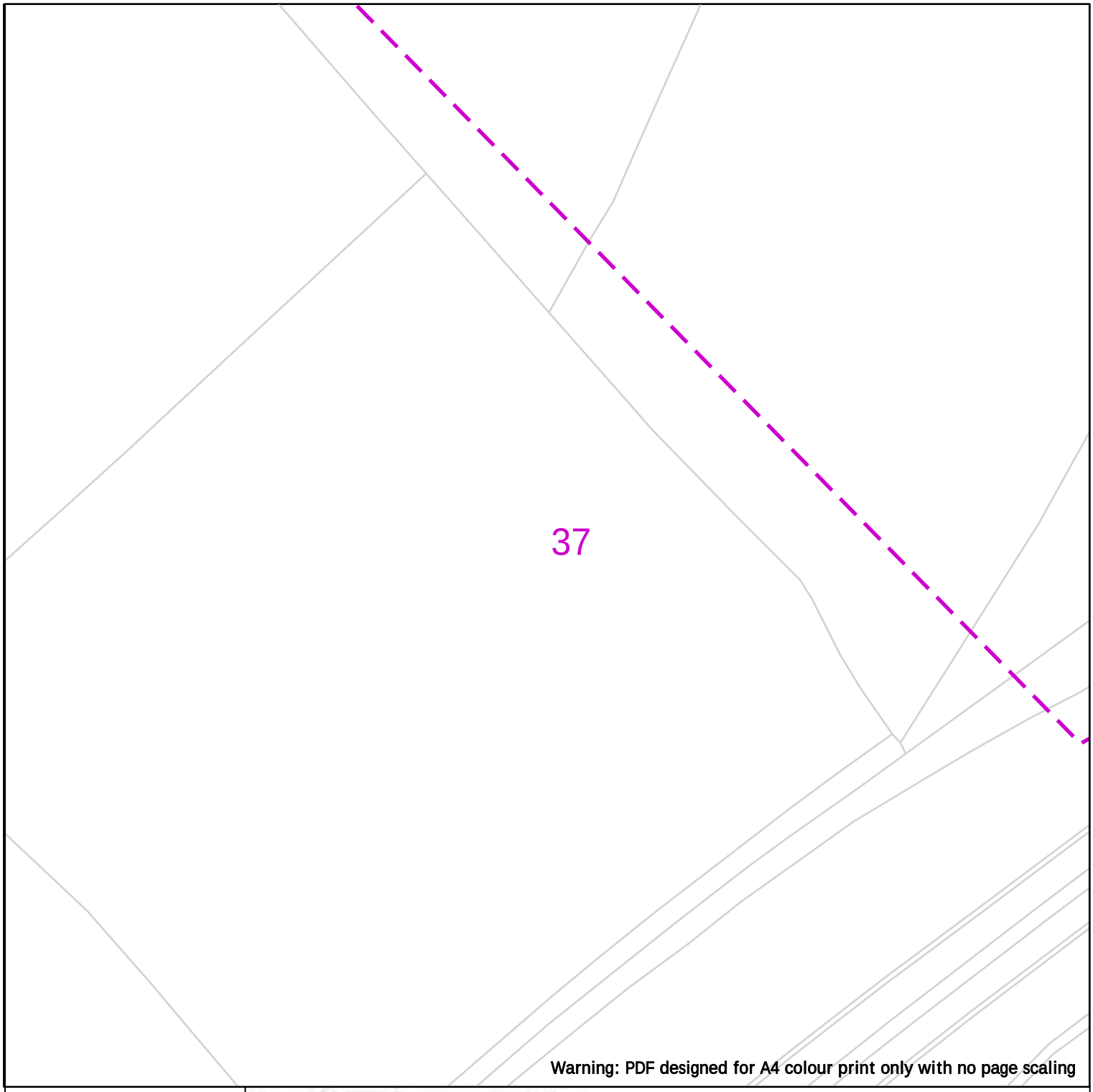

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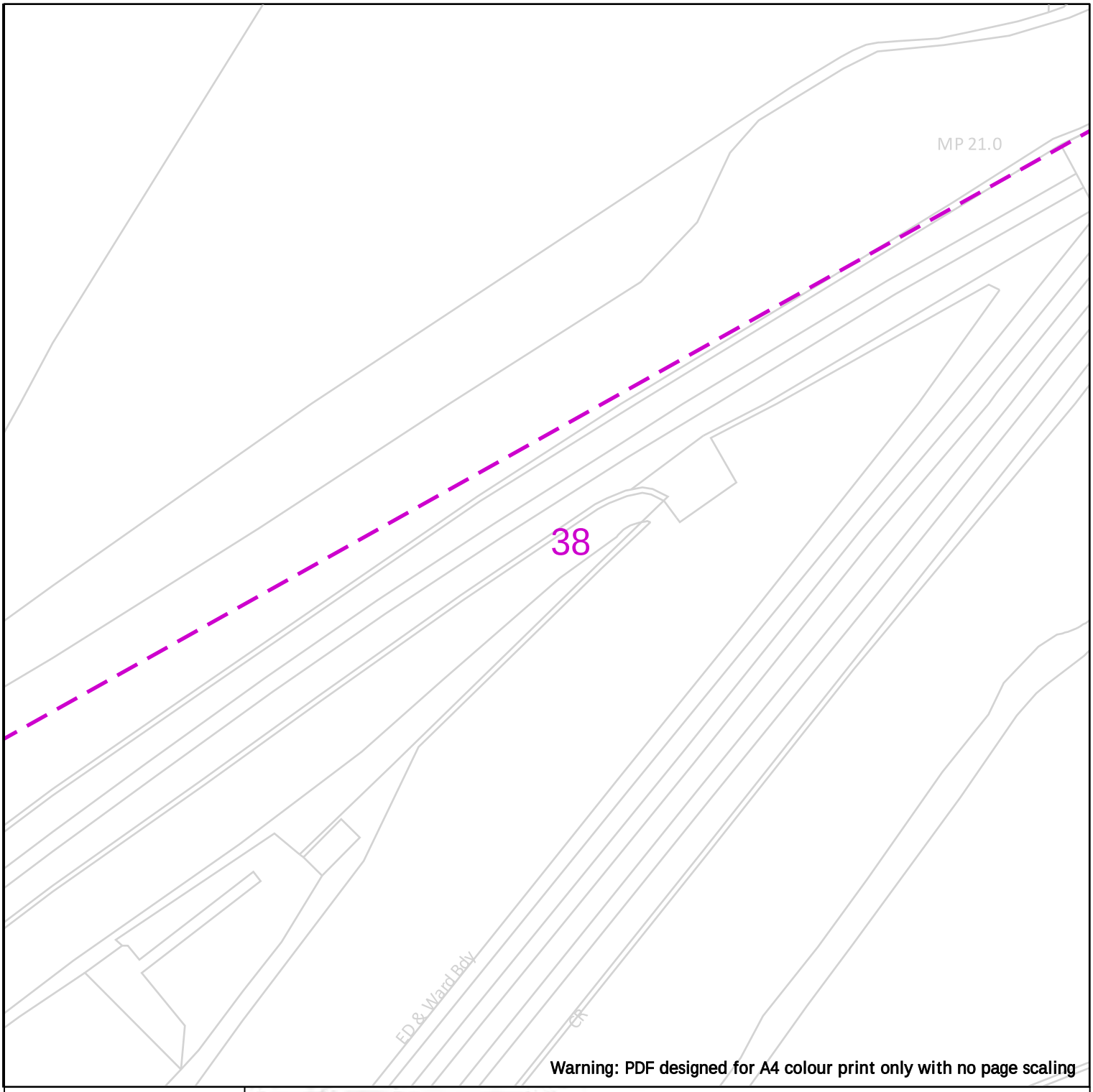

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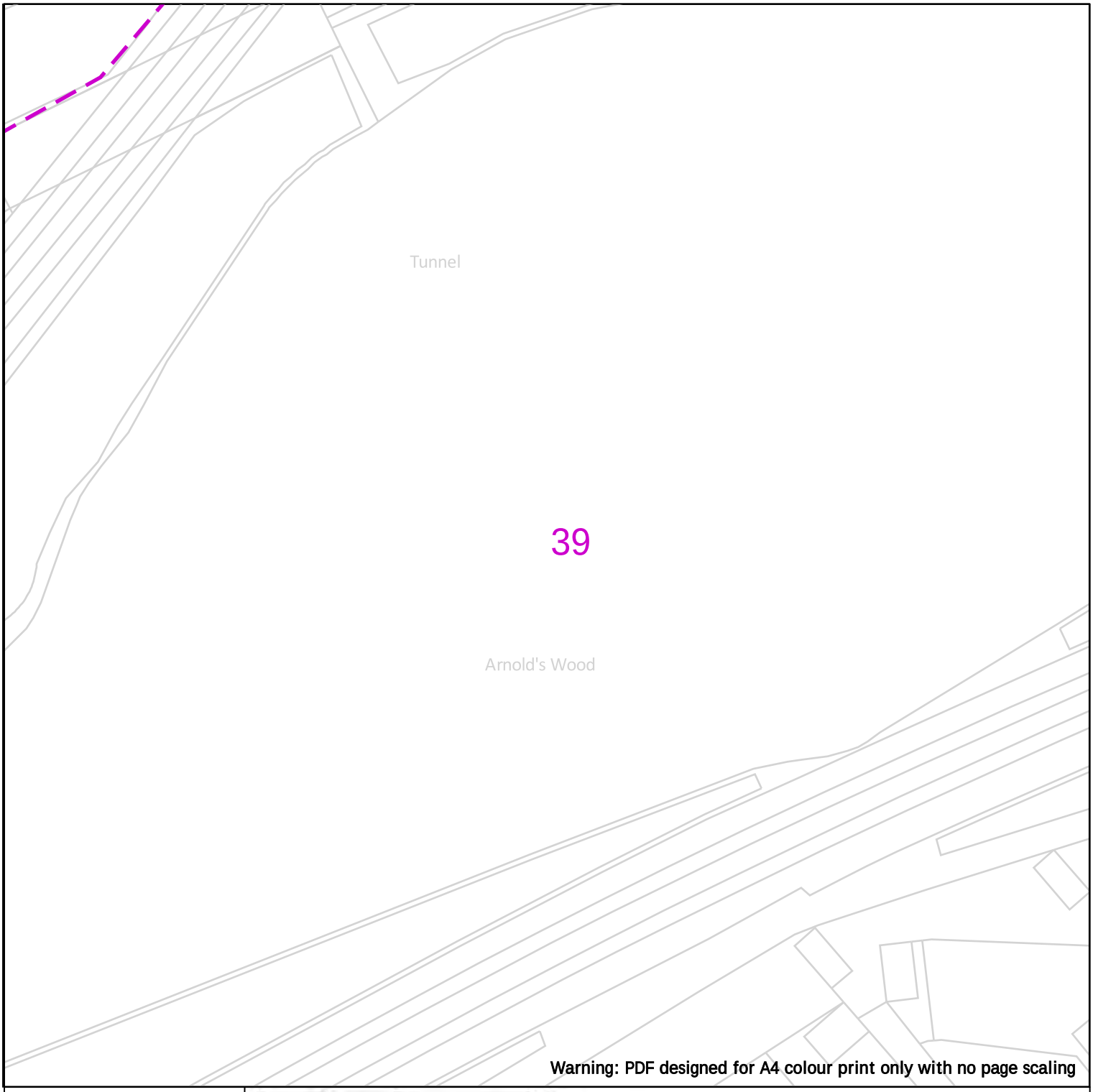

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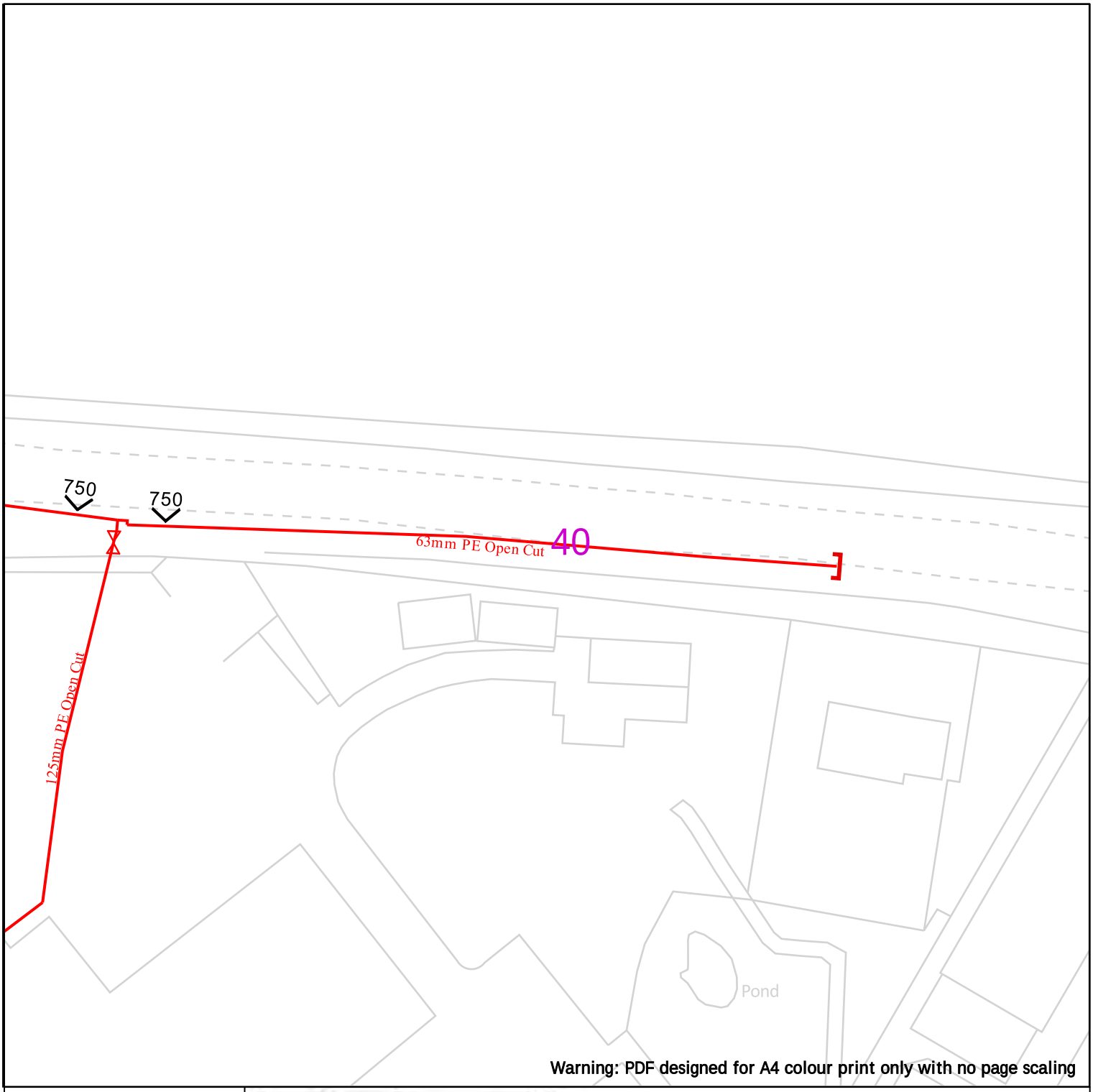

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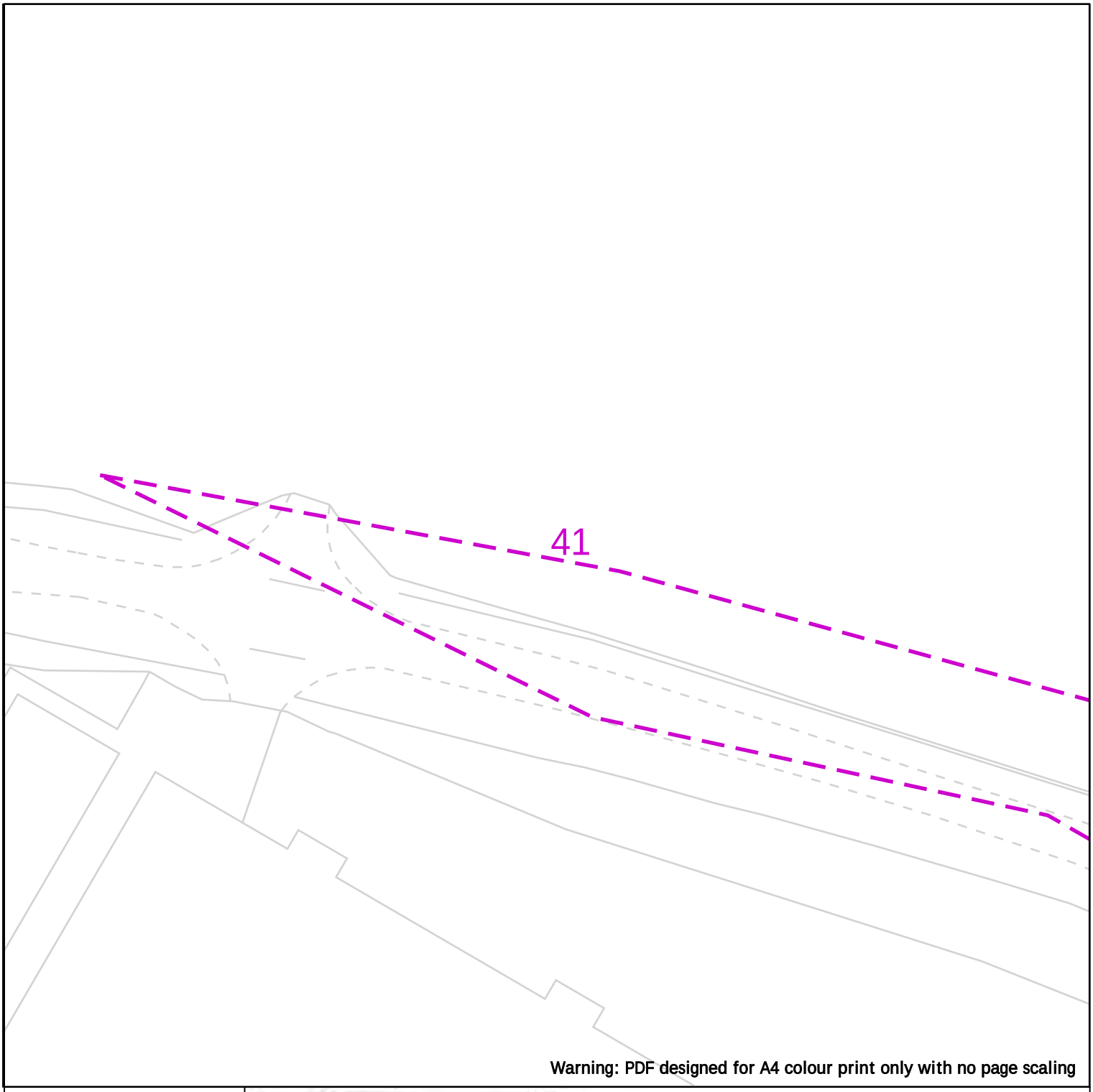

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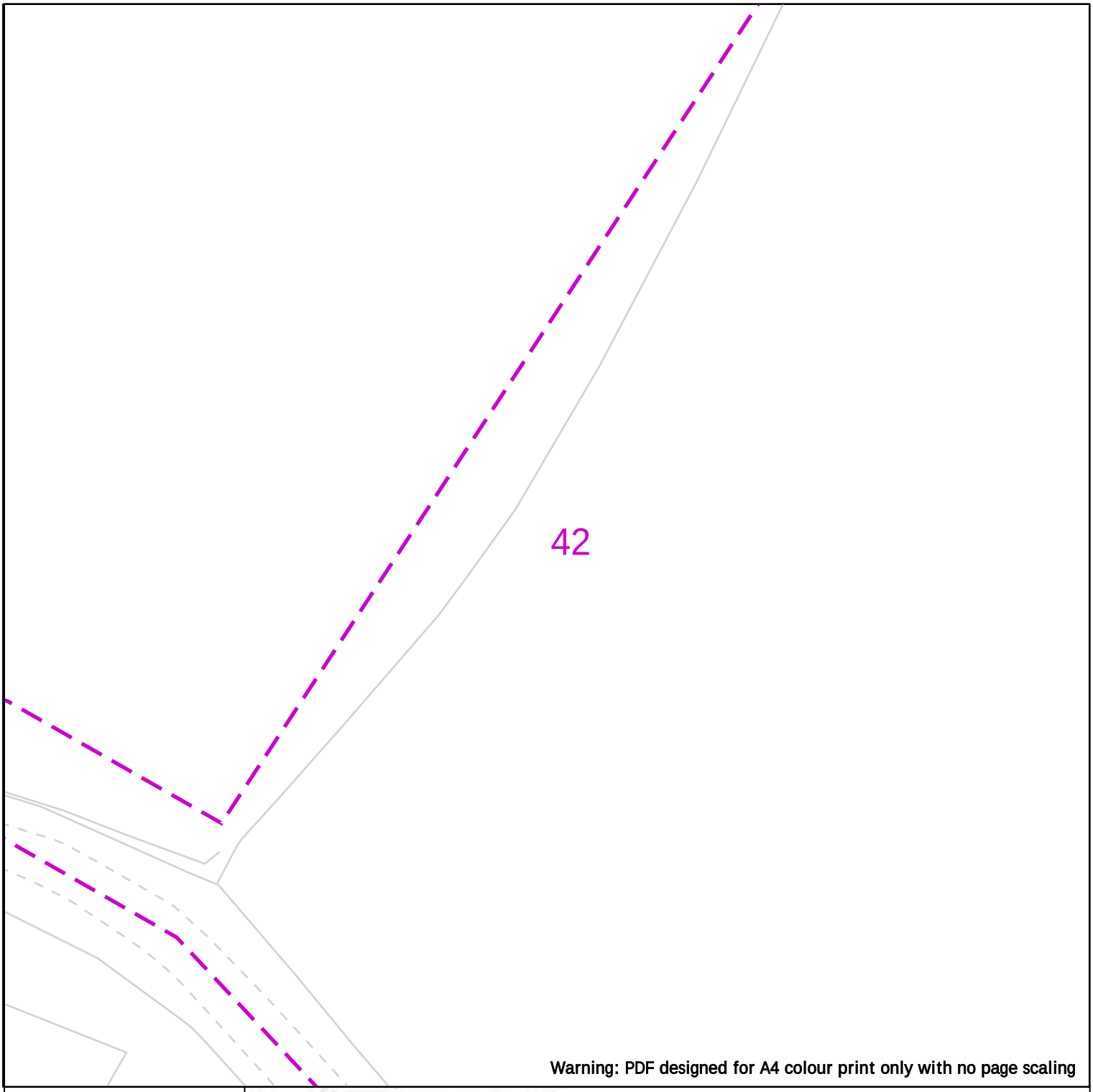

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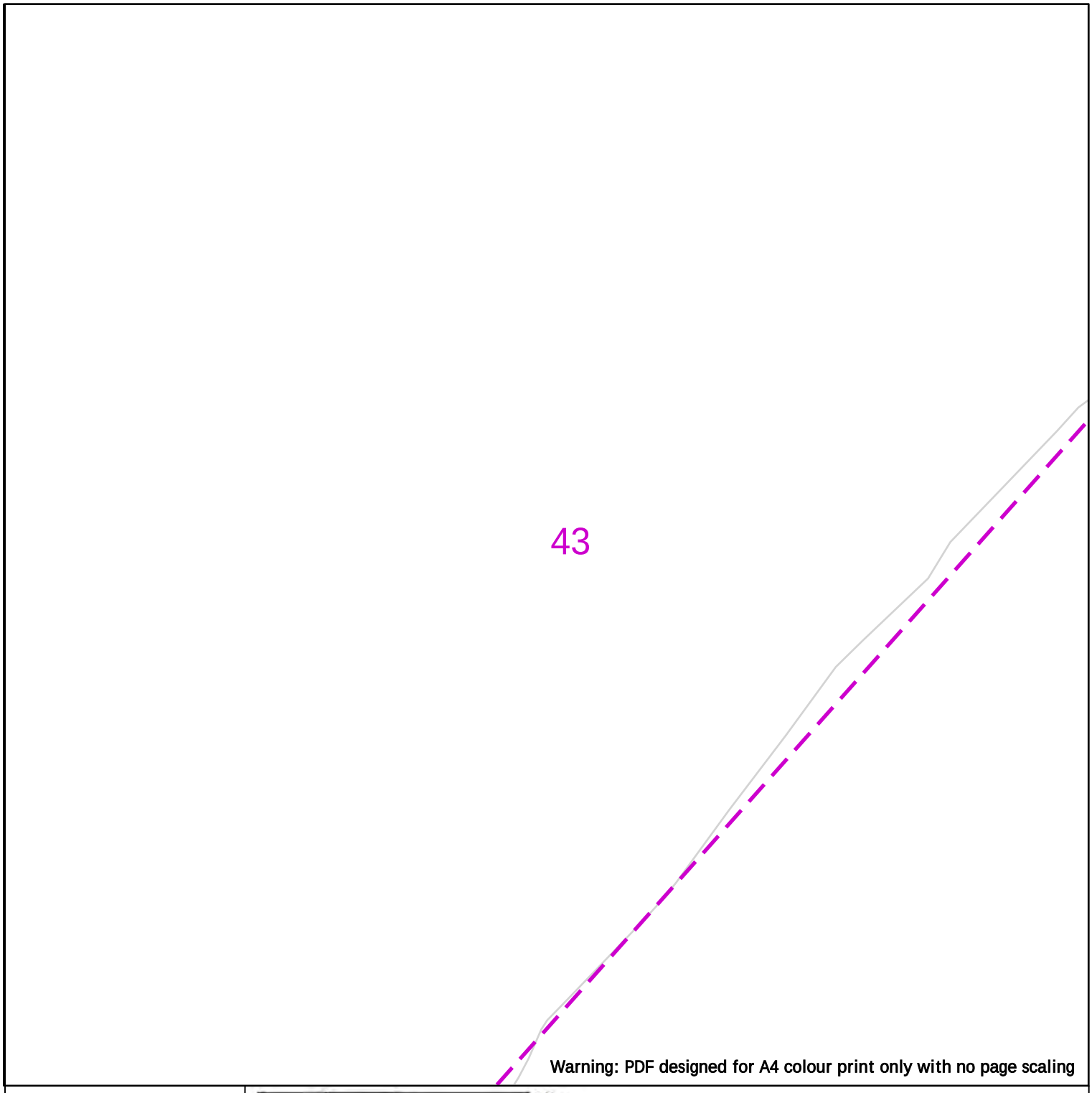
In case of emergency call - 0800 111 999



Warning: PDF designed for A4 colour print only with no page scaling

25m

Dig Sites Area: Line:

LP Mains
MP Mains
IP Mains
LHP Mains

Valve
Depth of cover
Syphon
Diameter Change
Material Change
Out of Standard Service

Cadent
Your Gas Network

Date Requested: 09/11/2023
Job Reference: 31483441
Site Location: 561690 196075
Requested by: Mr James Parker

Your Scheme/Reference:
23/01164/FUL (JP)

View extent: 100m, 100m

Scale: 1:500 (When plotted at A4)

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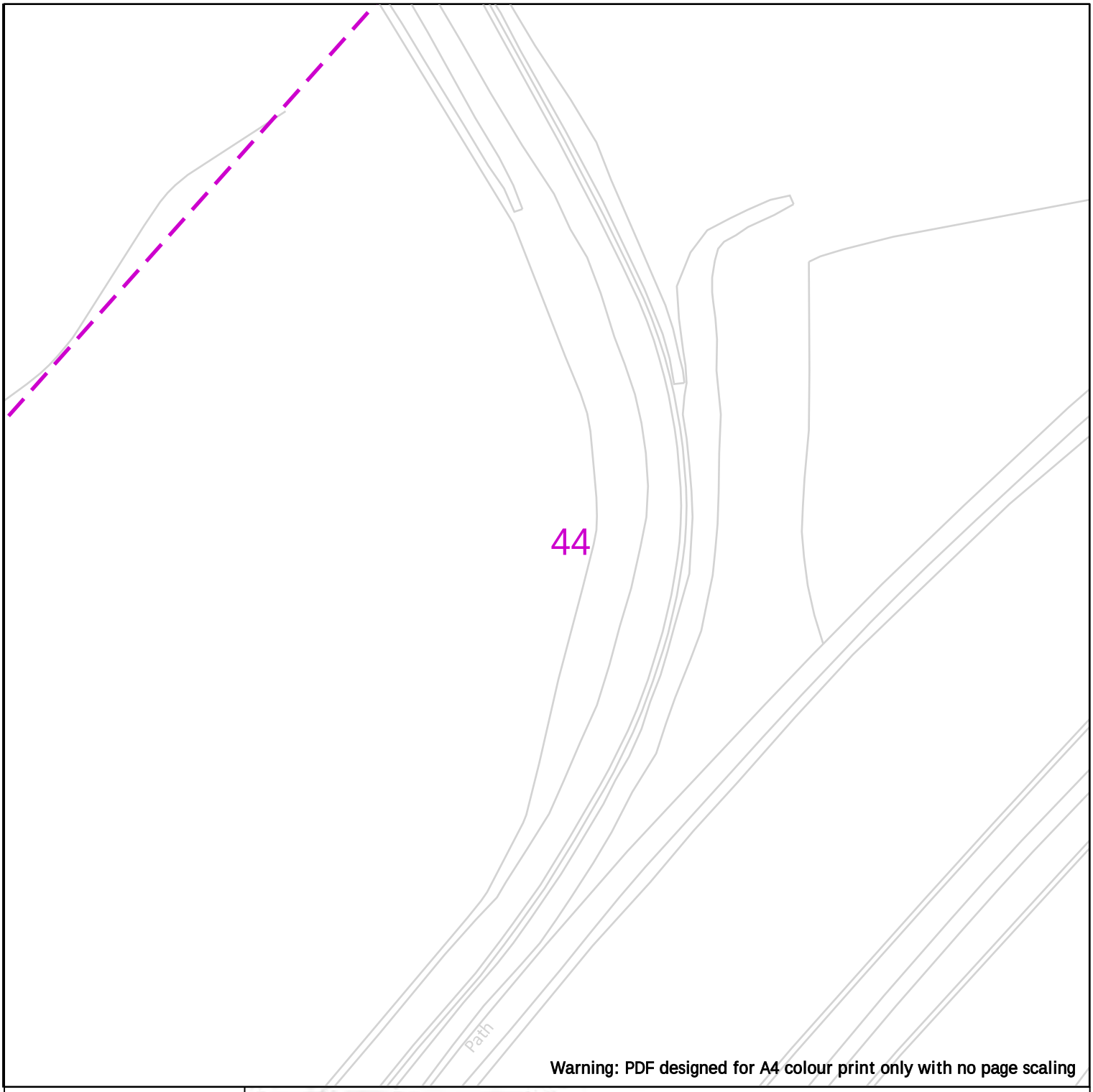

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25m

Dig Sites Area: Line:

LP Mains
MP Mains
IP Mains
LHP Mains

Valve
Depth of cover
Syphon
Diameter Change
Material Change
Out of Standard Service

Cadent
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Your Scheme/Reference:
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Scale: 1:500 (When plotted at A4)

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25m

Dig Sites Area: Line:

LP Mains
MP Mains
IP Mains
LHP Mains

Valve
Depth of cover
Syphon

Diameter Change
Material Change
Out of Standard Service

Cadent
Your Gas Network

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Your Scheme/Reference:
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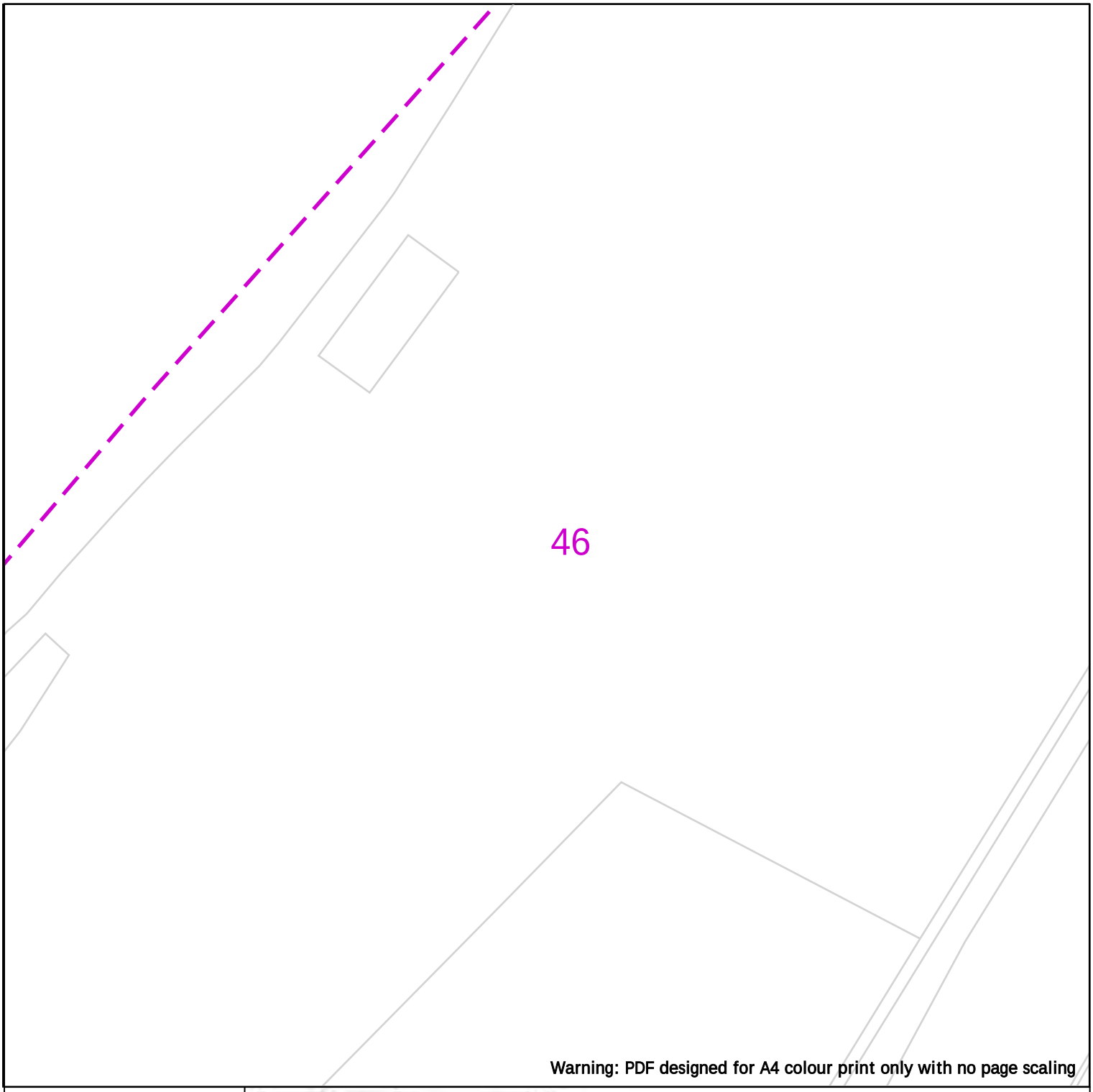

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25m

Dig Sites Area: Line:

LP Mains
MP Mains
IP Mains
LHP Mains

Valve
Depth of cover
Syphon
Diameter Change
Material Change
Out of Standard Service

Cadent
Your Gas Network

Date Requested: 09/11/2023
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Your Scheme/Reference:
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View extent: 100m, 100m

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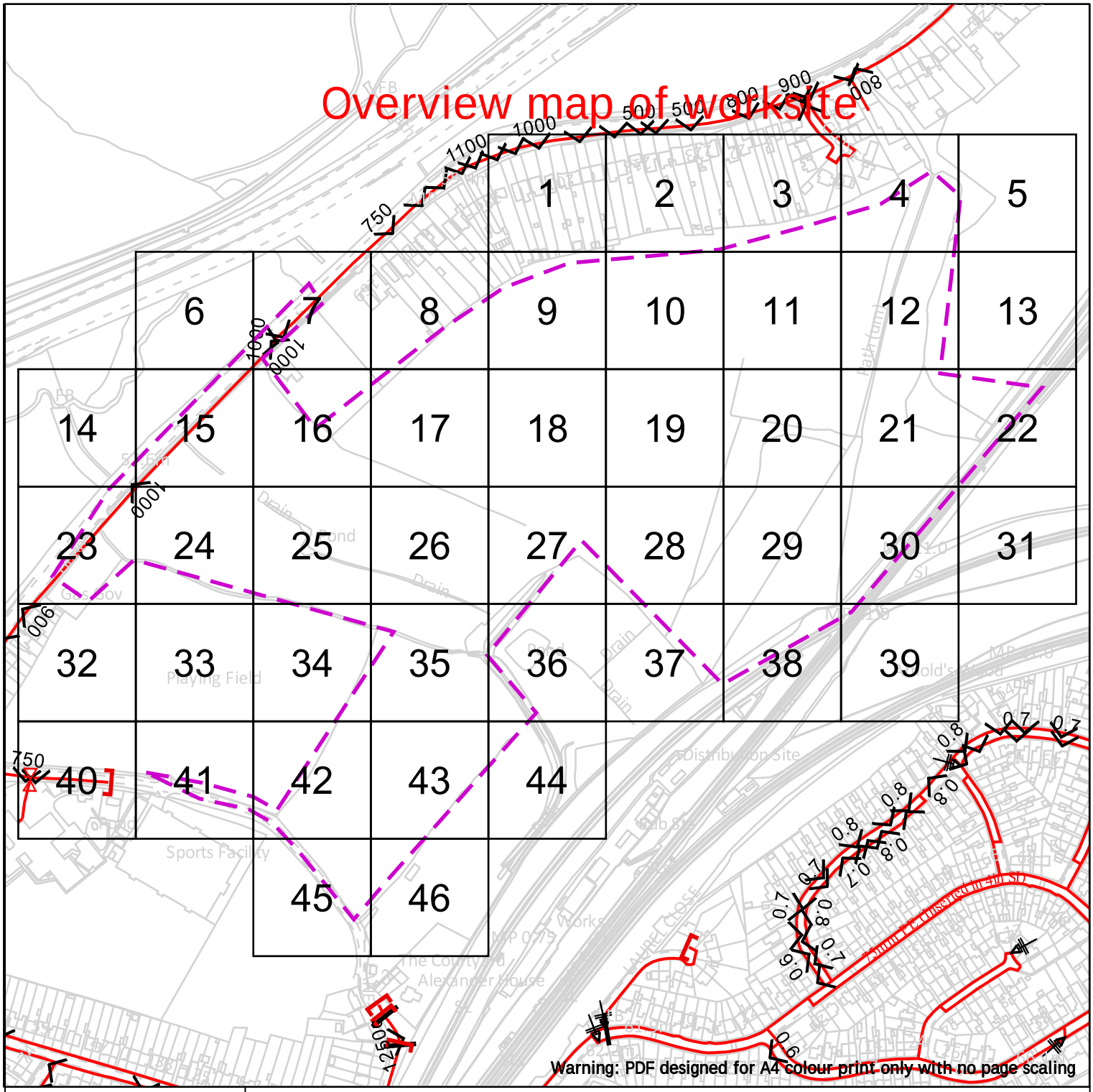
Overview map of worksite



Dig Sites Area: Line:

- LP Mains
- MP Mains
- IP Mains
- LHP Mains

- Valve
- Depth of cover
- Syphon
- Diameter Change
- Material Change
- Out of Standard Service

Cadent
Your Gas Network

Date Requested: 09/11/2023
Job Reference: 31483441
Site Location: 561690 196075
Requested by: Mr James Parker

Your Scheme/Reference:
23/01164/FUL (JP)

View extent: 100m, 100m

Scale: 1:4613 (When plotted at A4)

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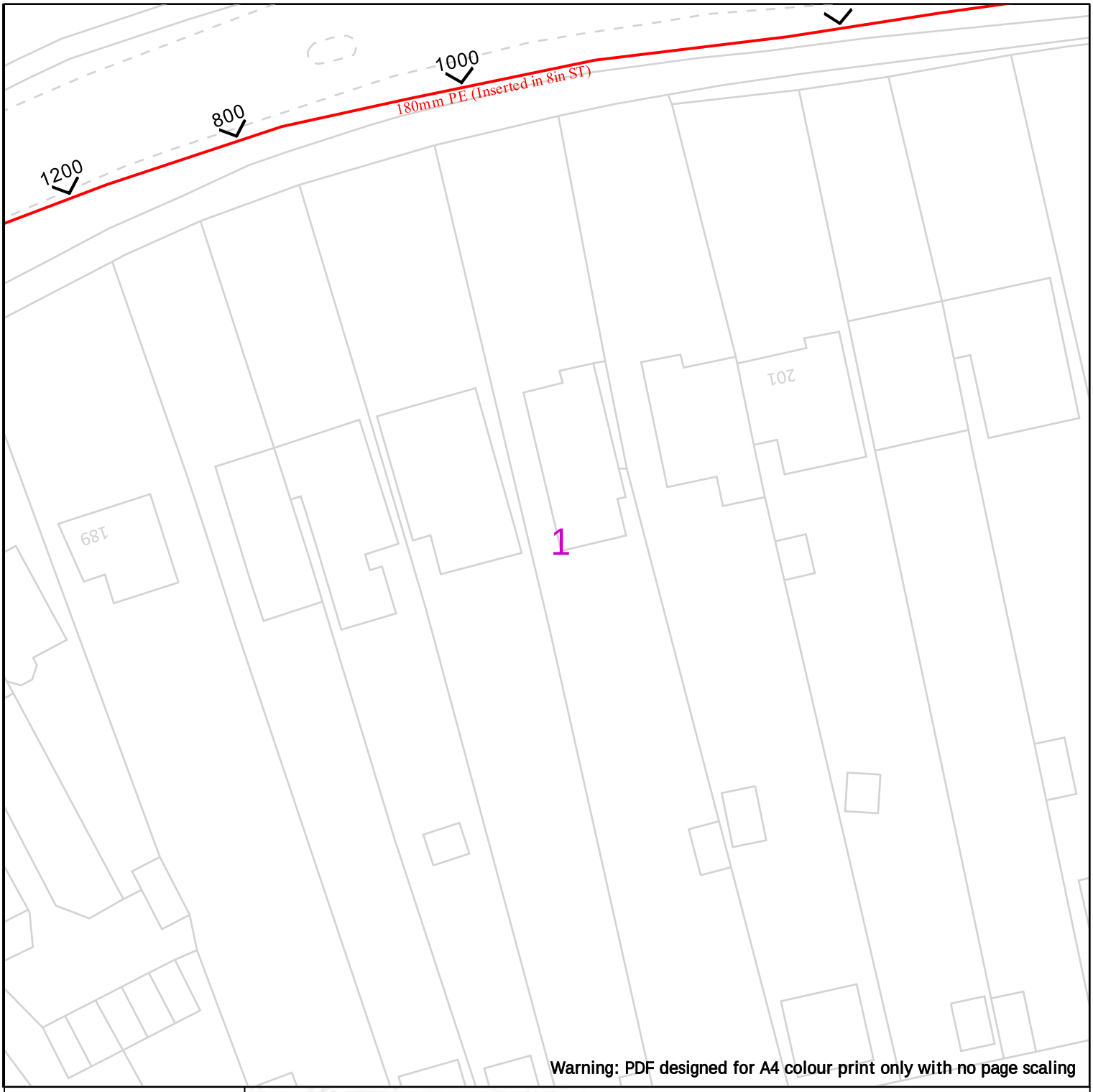

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25m

Dig Sites Area: Line:

LP Mains
MP Mains
IP Mains
LHP Mains

Valve
Depth of cover
Syphon
Diameter Change
Material Change
Out of Standard Service

Cadent
Your Gas Network

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Site Location: 561690 196075
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Your Scheme/Reference:
23/01164/FUL (JP)

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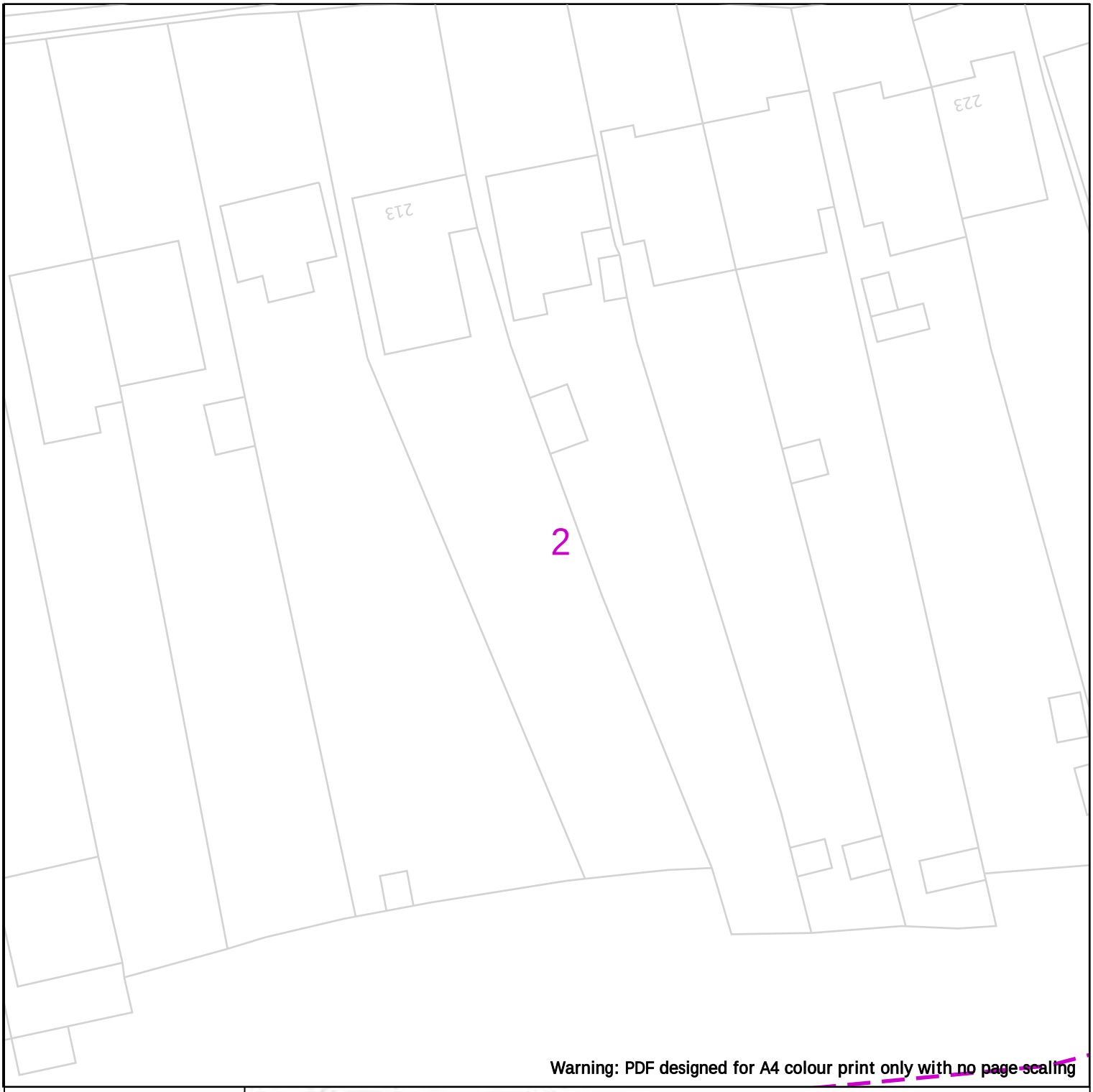

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25m

Dig Sites Area: Line:

LP Mains
MP Mains
IP Mains
LHP Mains

Valve
Depth of cover
Syphon
Diameter Change
Material Change
Out of Standard Service

Cadent
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25m

Dig Sites Area: Line:

- LP Mains
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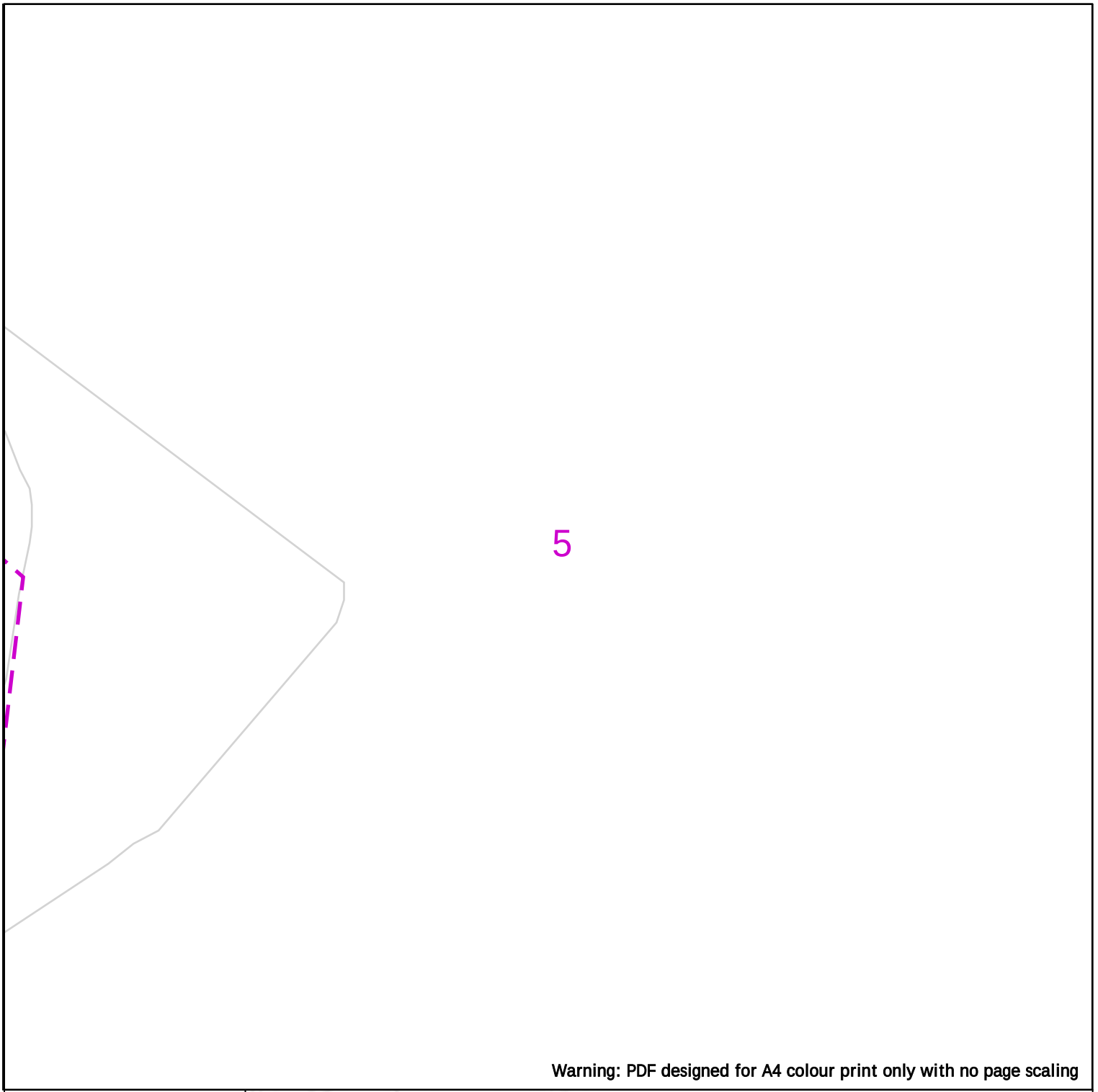

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Valve
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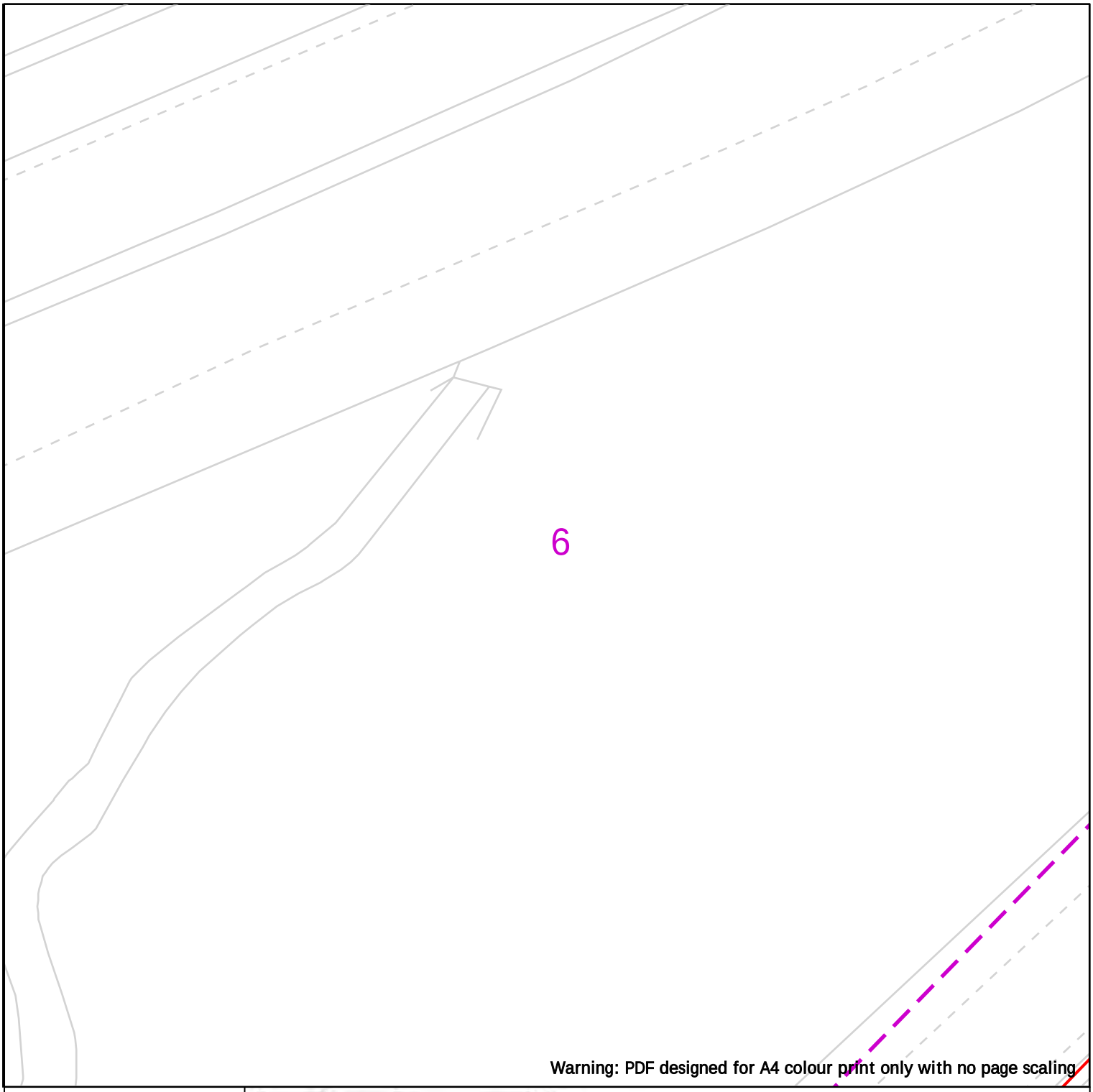

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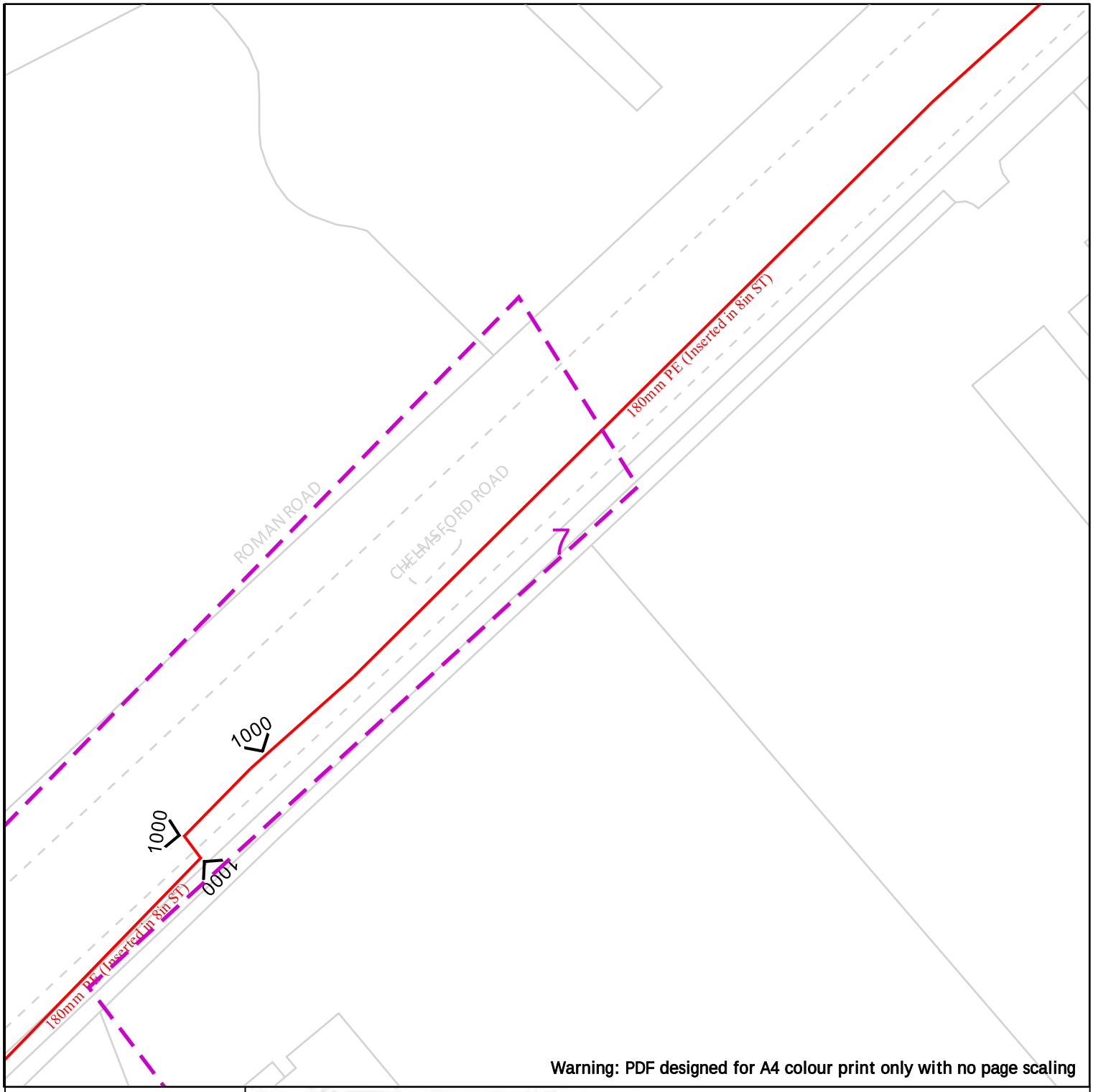

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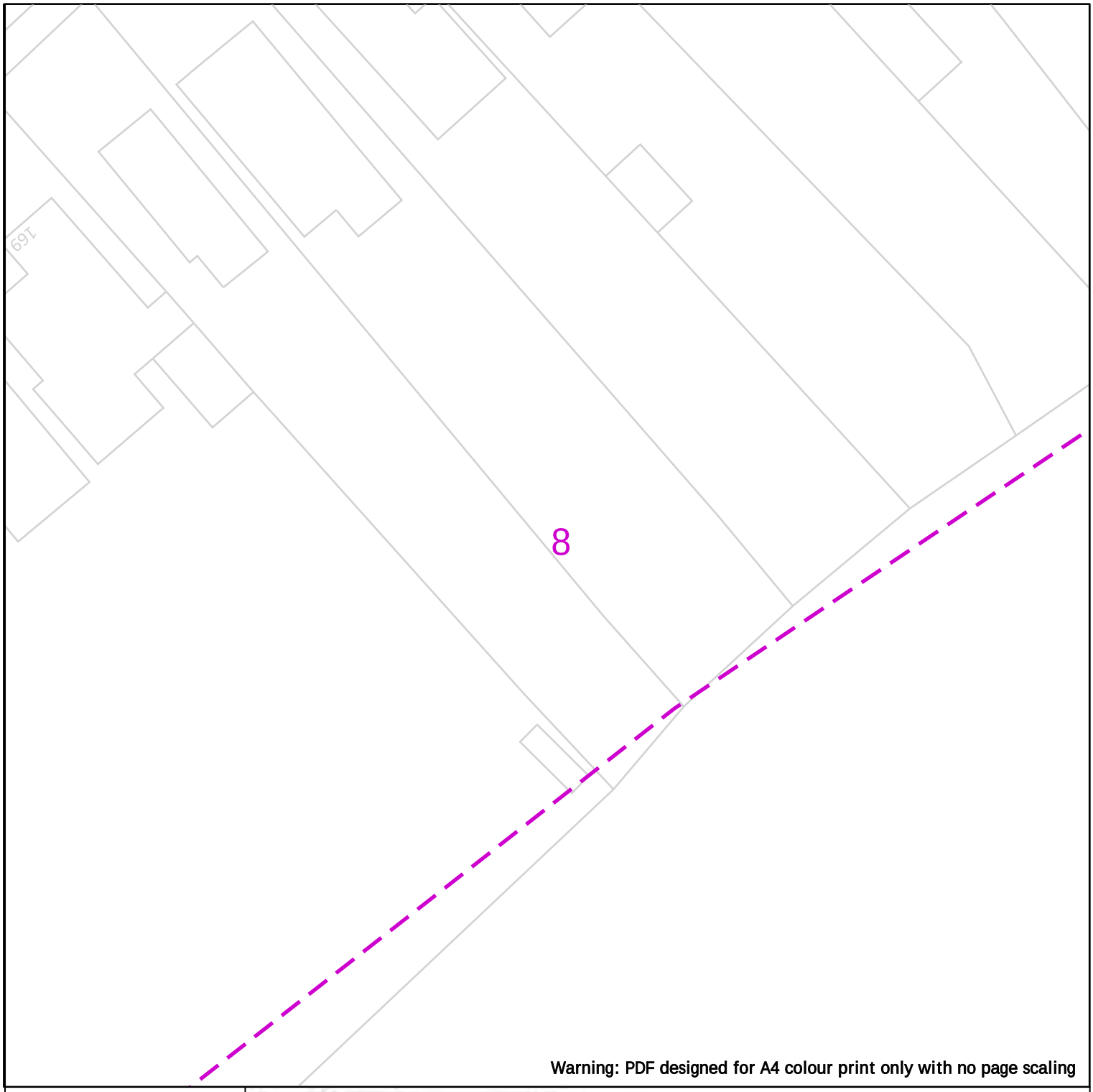

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25m

Dig Sites Area: Line:

- LP Mains
- MP Mains
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- LHP Mains
- Valve
- Depth of cover
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Cadent
Your Gas Network

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Dig Sites Area: Line:

LP Mains
MP Mains
IP Mains
LHP Mains

Valve
Depth of cover
Syphon
Diameter Change
Material Change
Out of Standard Service

Cadent
Your Gas Network

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10

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Dig Sites Area: Line:

LP Mains
MP Mains
IP Mains
LHP Mains

Valve
Depth of cover
Syphon
Diameter Change
Material Change
Out of Standard Service

Cadent
Your Gas Network

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11

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Dig Sites Area: Line:

LP Mains
MP Mains
IP Mains
LHP Mains

Valve
Depth of cover
Syphon

Diameter Change
Material Change
Out of Standard Service

Cadent
Your Gas Network

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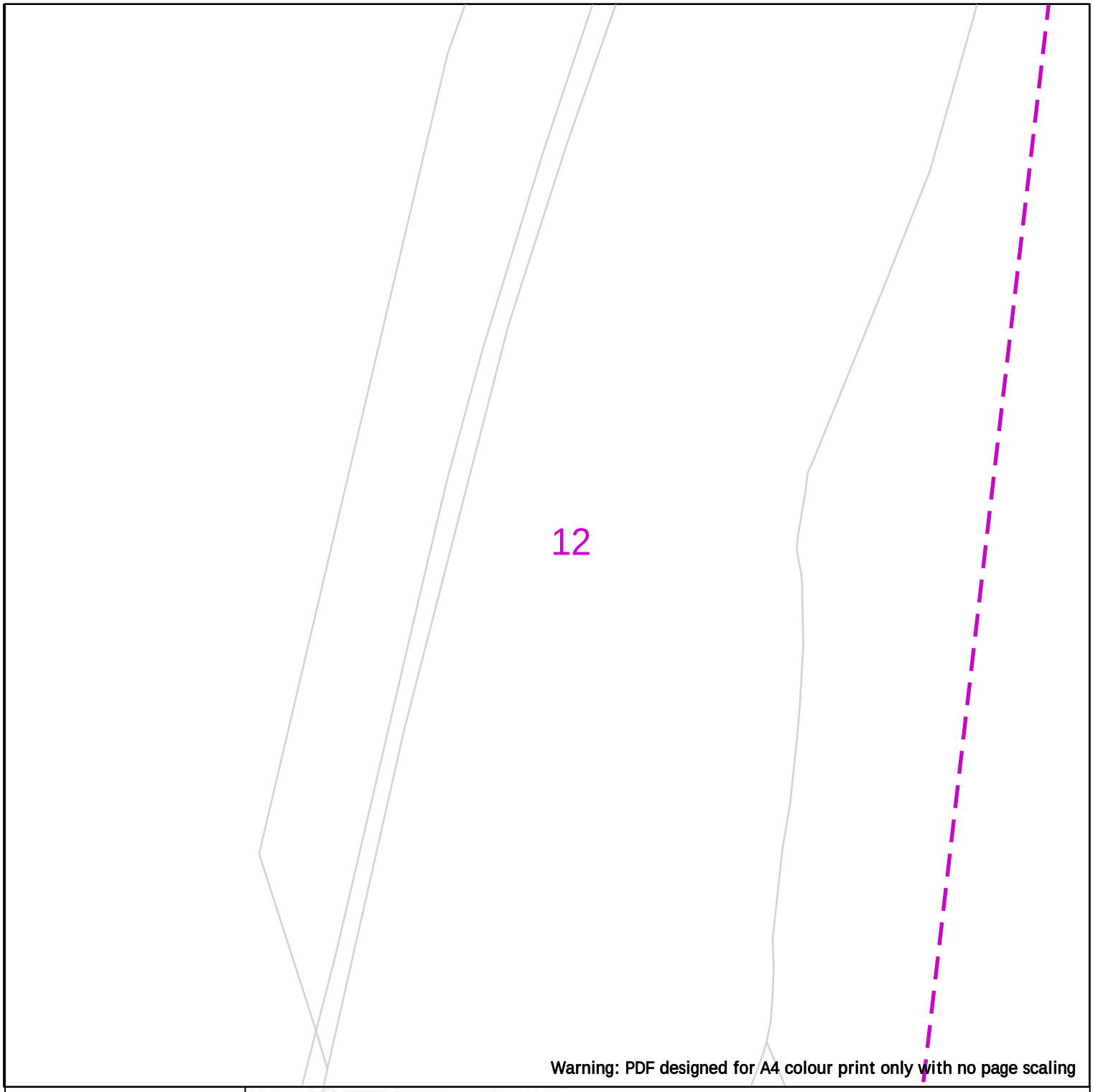

Warning: PDF designed for A4 colour print only with no page scaling

25m

Dig Sites Area: Line:

LP Mains
MP Mains
IP Mains
LHP Mains

Valve
Depth of cover
Syphon
Diameter Change
Material Change
Out of Standard Service

Cadent
Your Gas Network

Date Requested: 09/11/2023
Job Reference: 31483441
Site Location: 561690 196075
Requested by: Mr James Parker

Your Scheme/Reference:
23/01164/FUL (JP)

View extent: 100m, 100m

Scale: 1:500 (When plotted at A4)

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13

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Dig Sites Area: Line:

LP Mains
MP Mains
IP Mains
LHP Mains

Valve
Depth of cover
Syphon

Diameter Change
Material Change
Out of Standard Service

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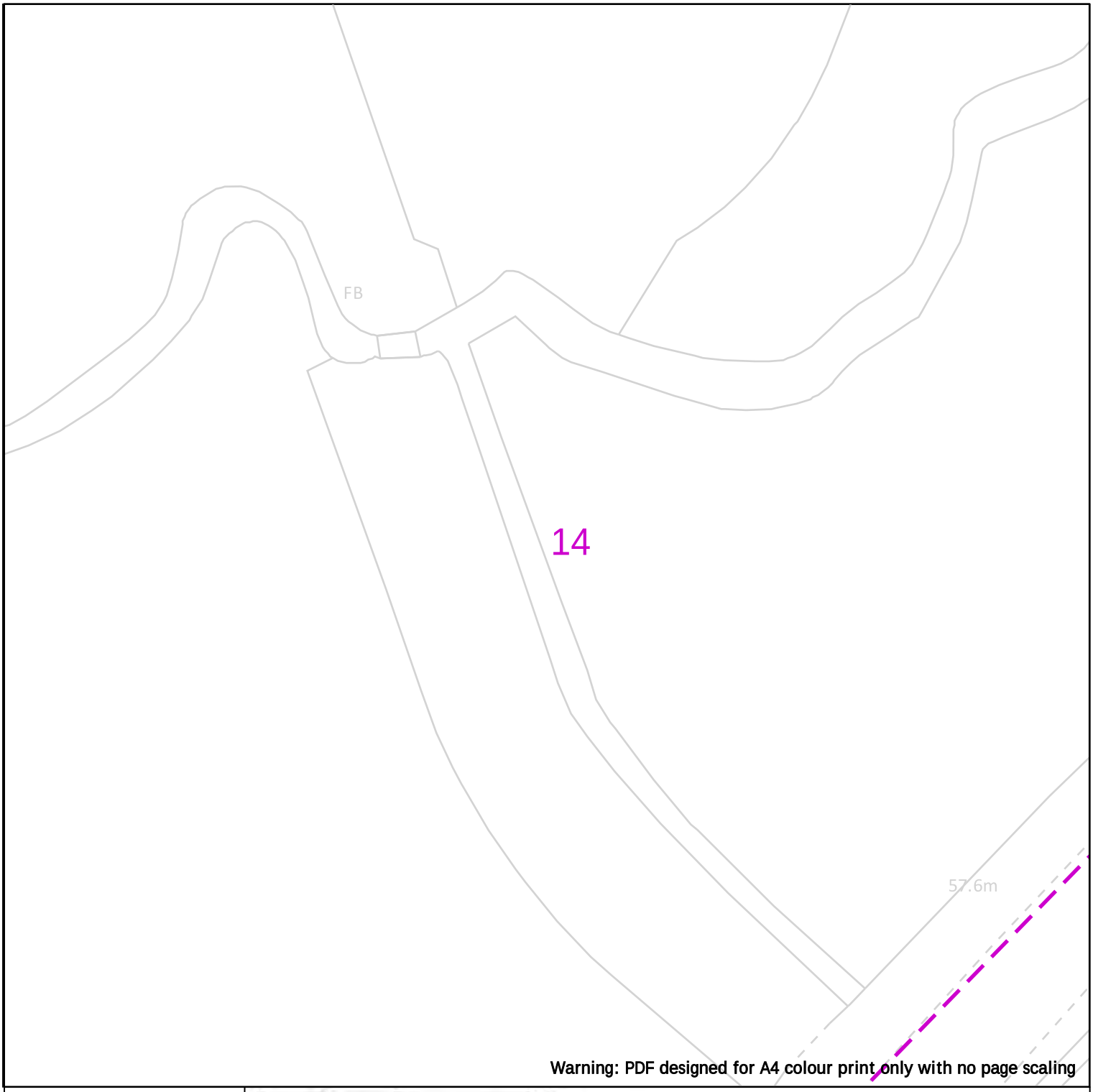

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25m

Dig Sites Area: Line:

LP Mains
MP Mains
IP Mains
LHP Mains

Valve
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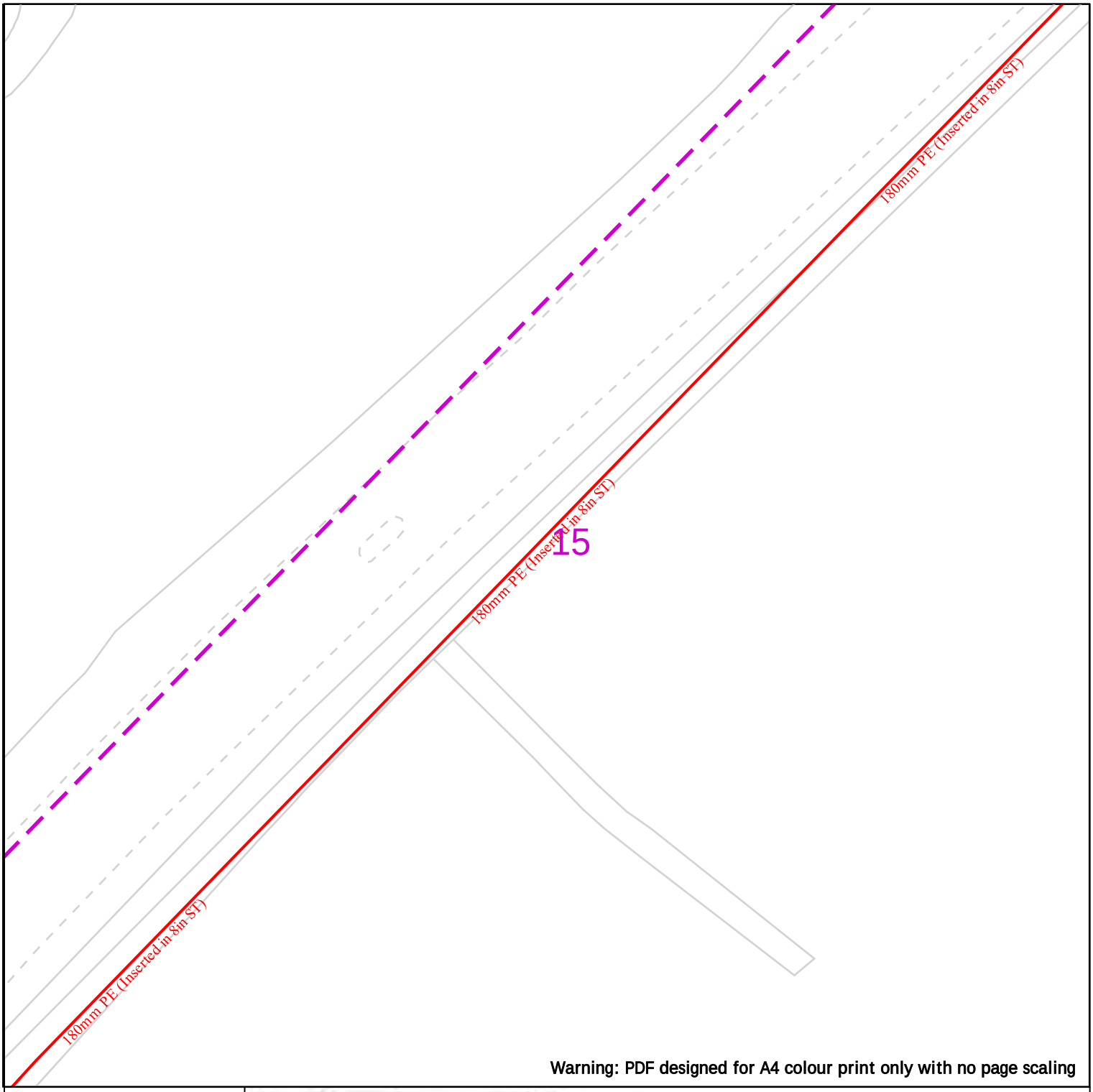

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Valve
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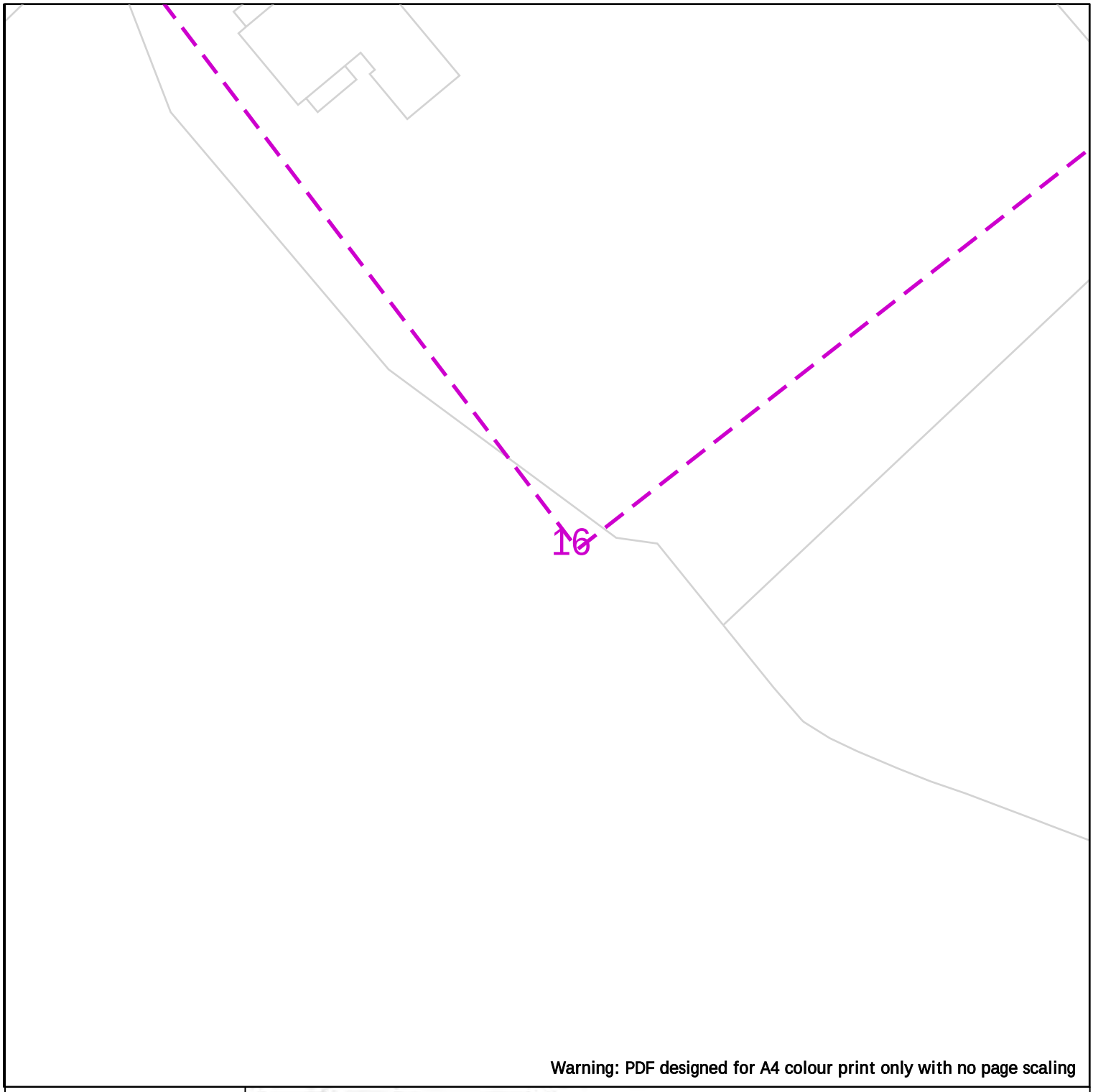

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25m

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Valve
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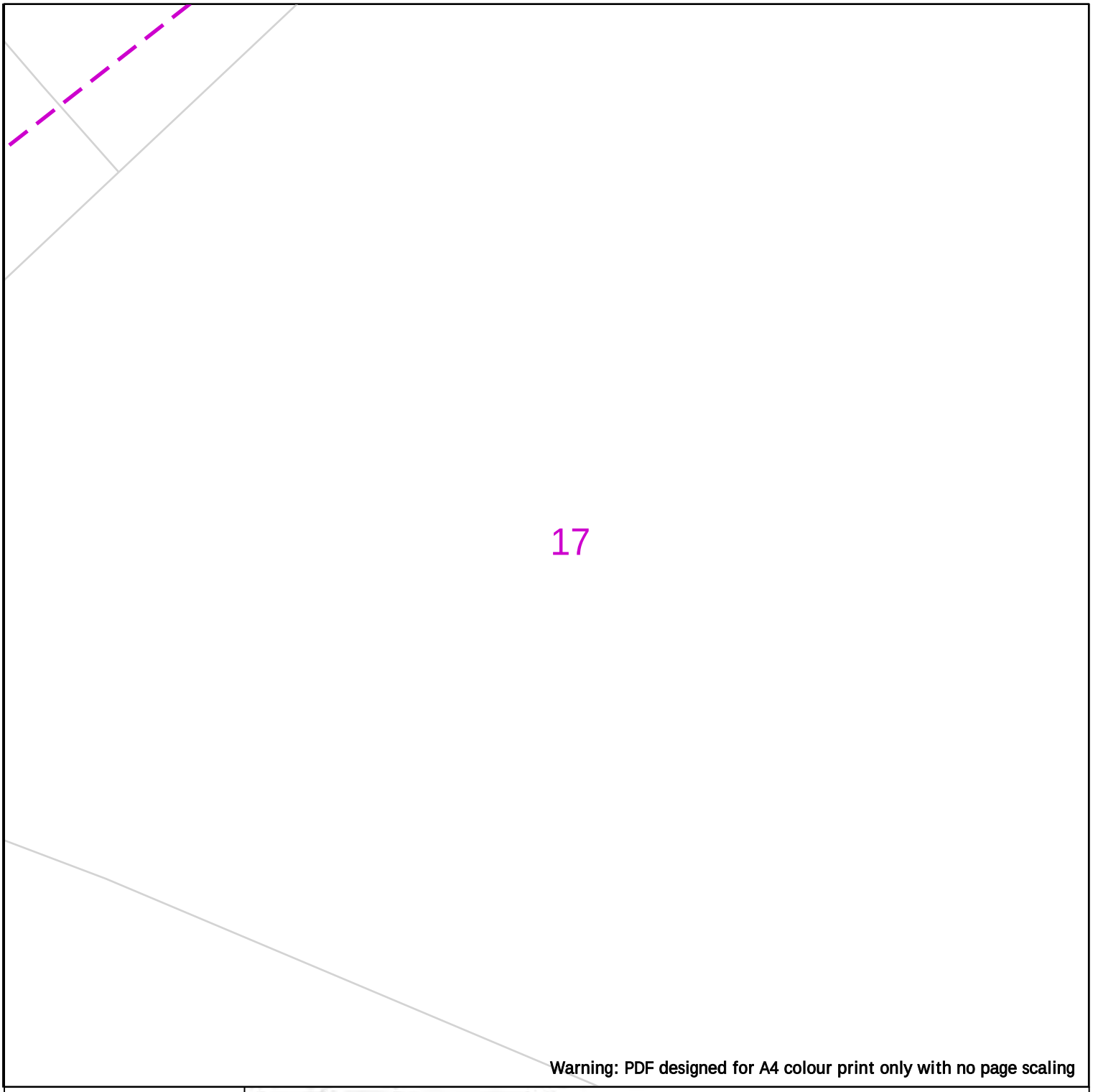

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25m

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18

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Dig Sites Area: Line:

LP Mains
MP Mains
IP Mains
LHP Mains

Valve
Depth of cover
Syphon
Diameter Change
Material Change
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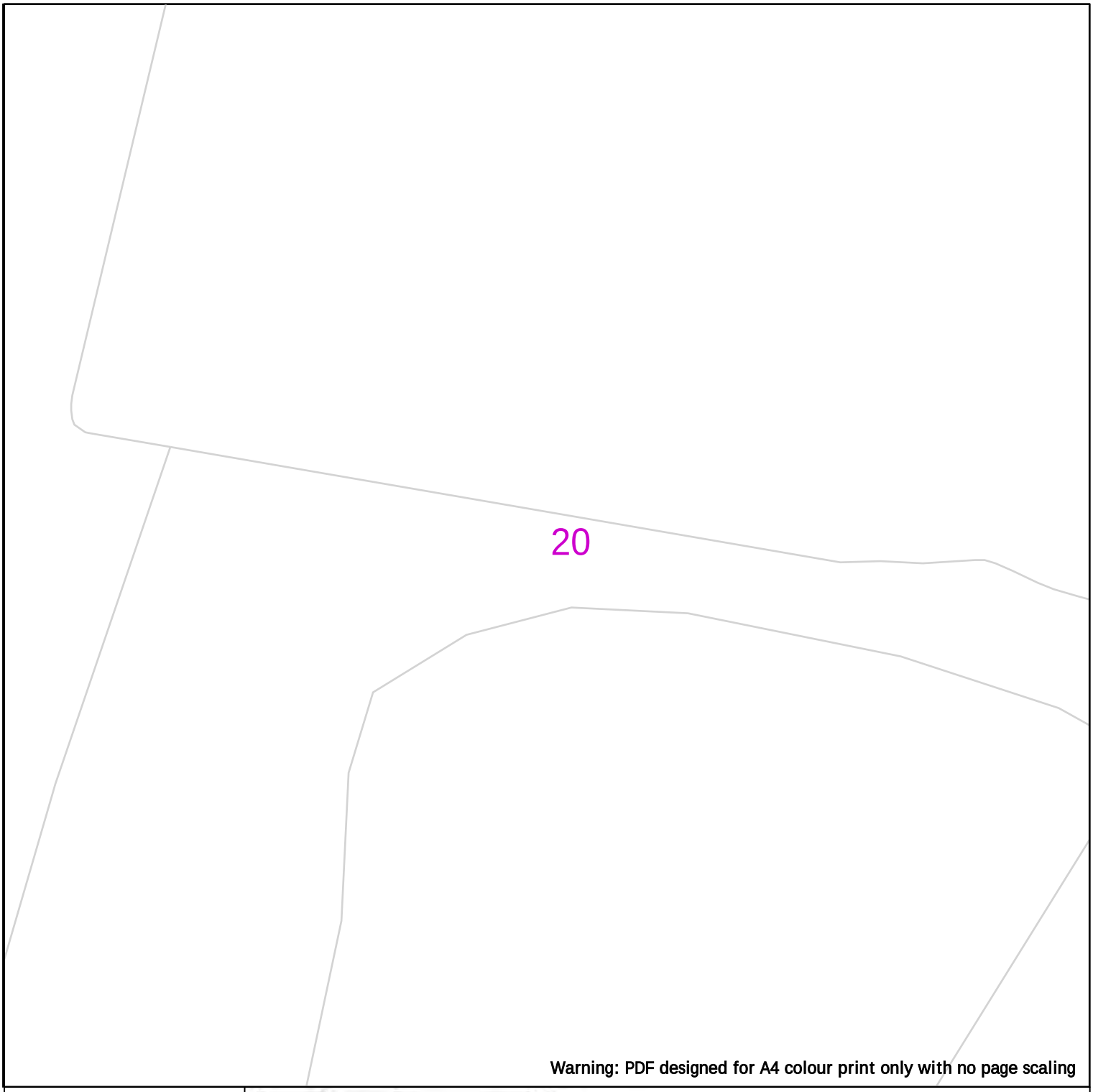

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25m

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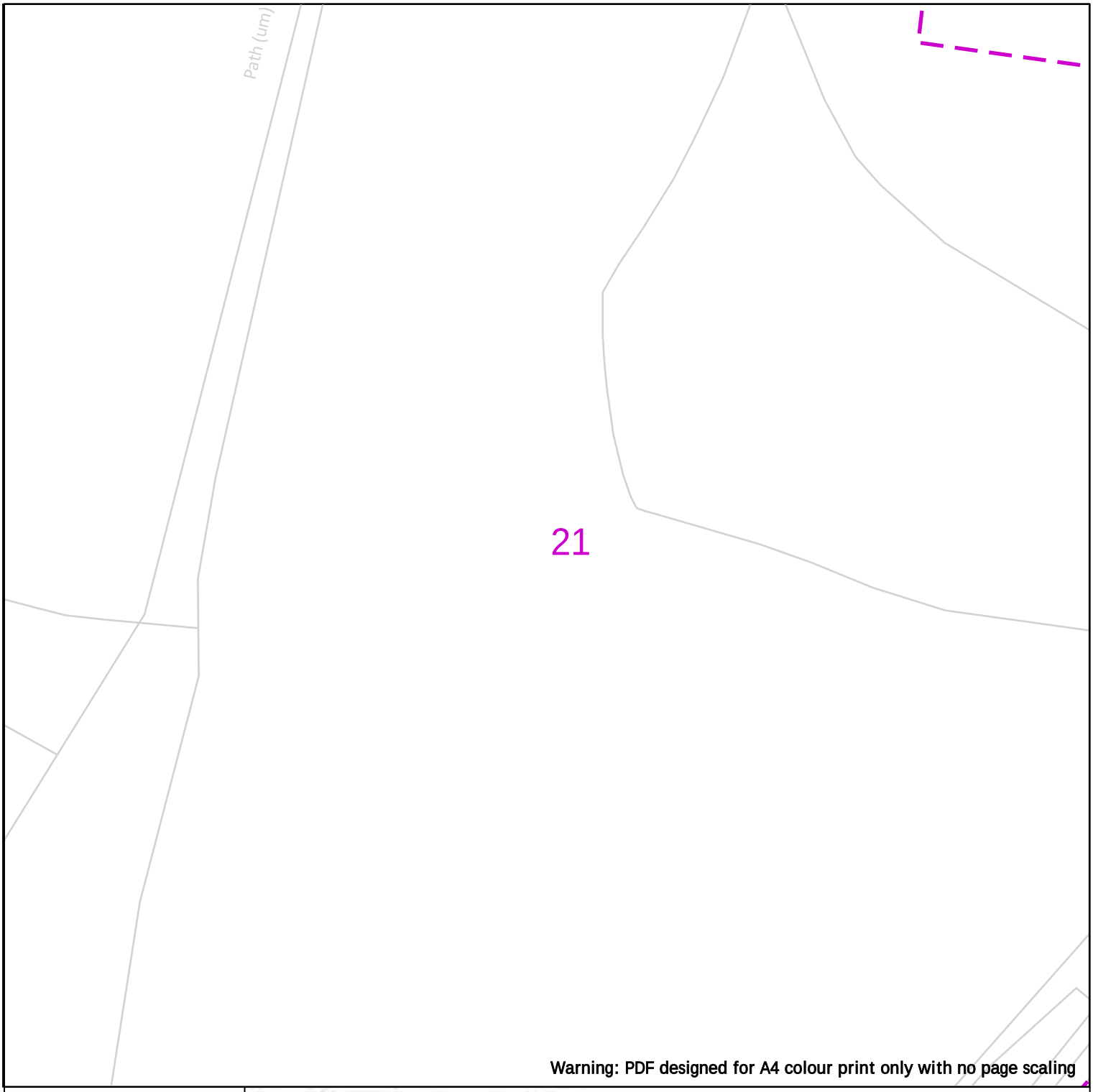

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25m

Dig Sites Area: Line:

- LP Mains
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- LHP Mains
- Valve
- Depth of cover
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- Diameter Change
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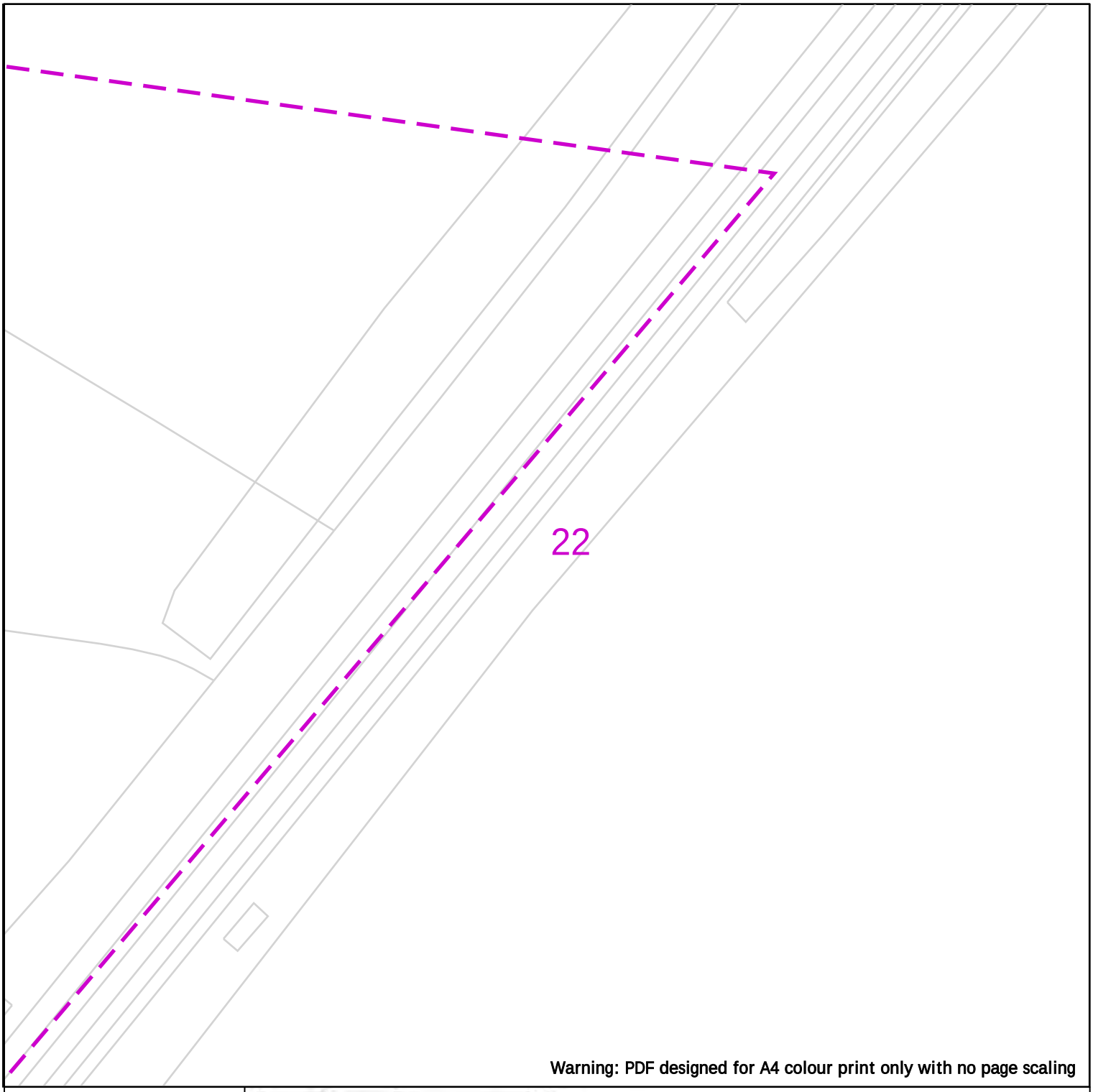

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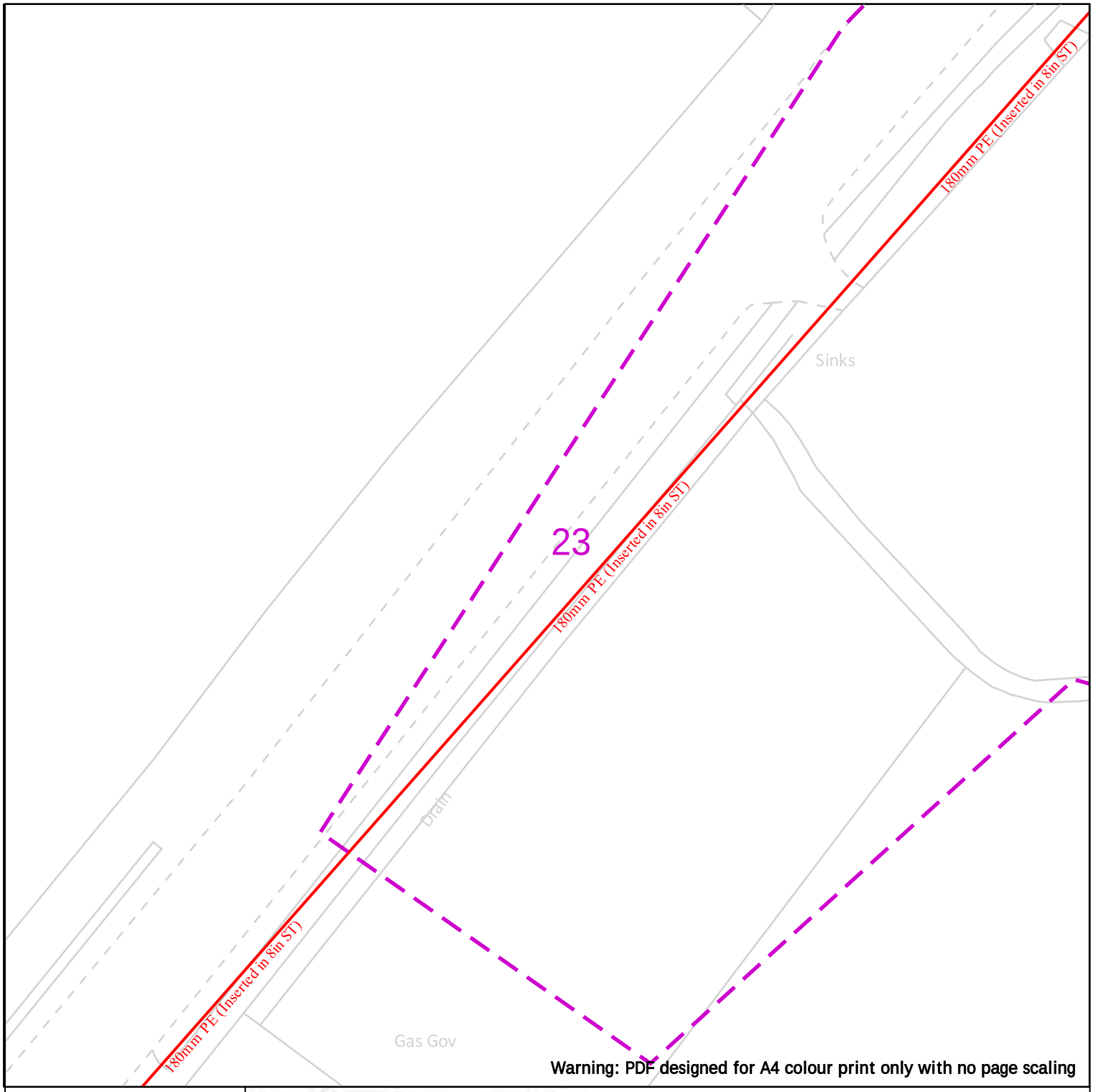

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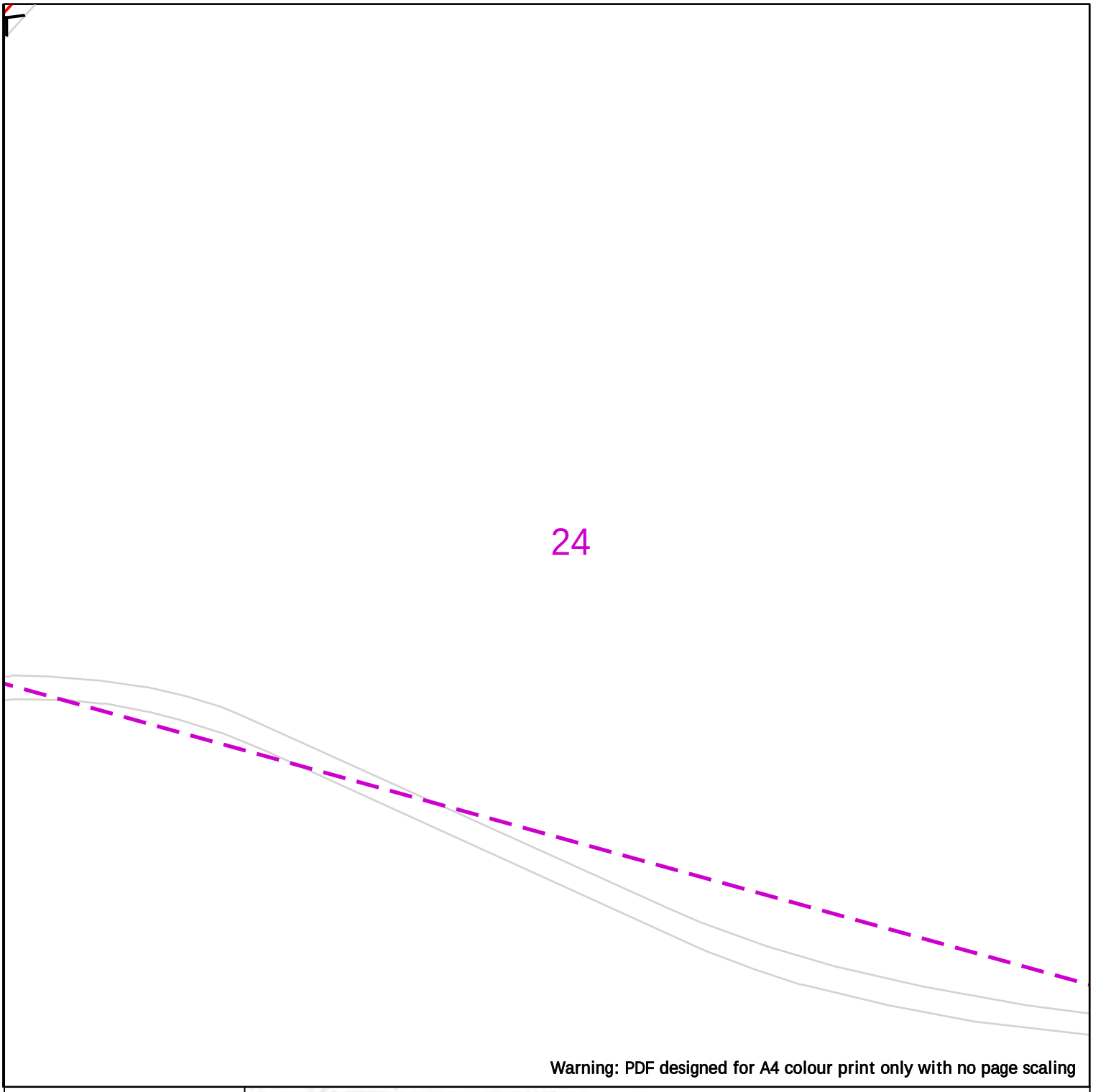

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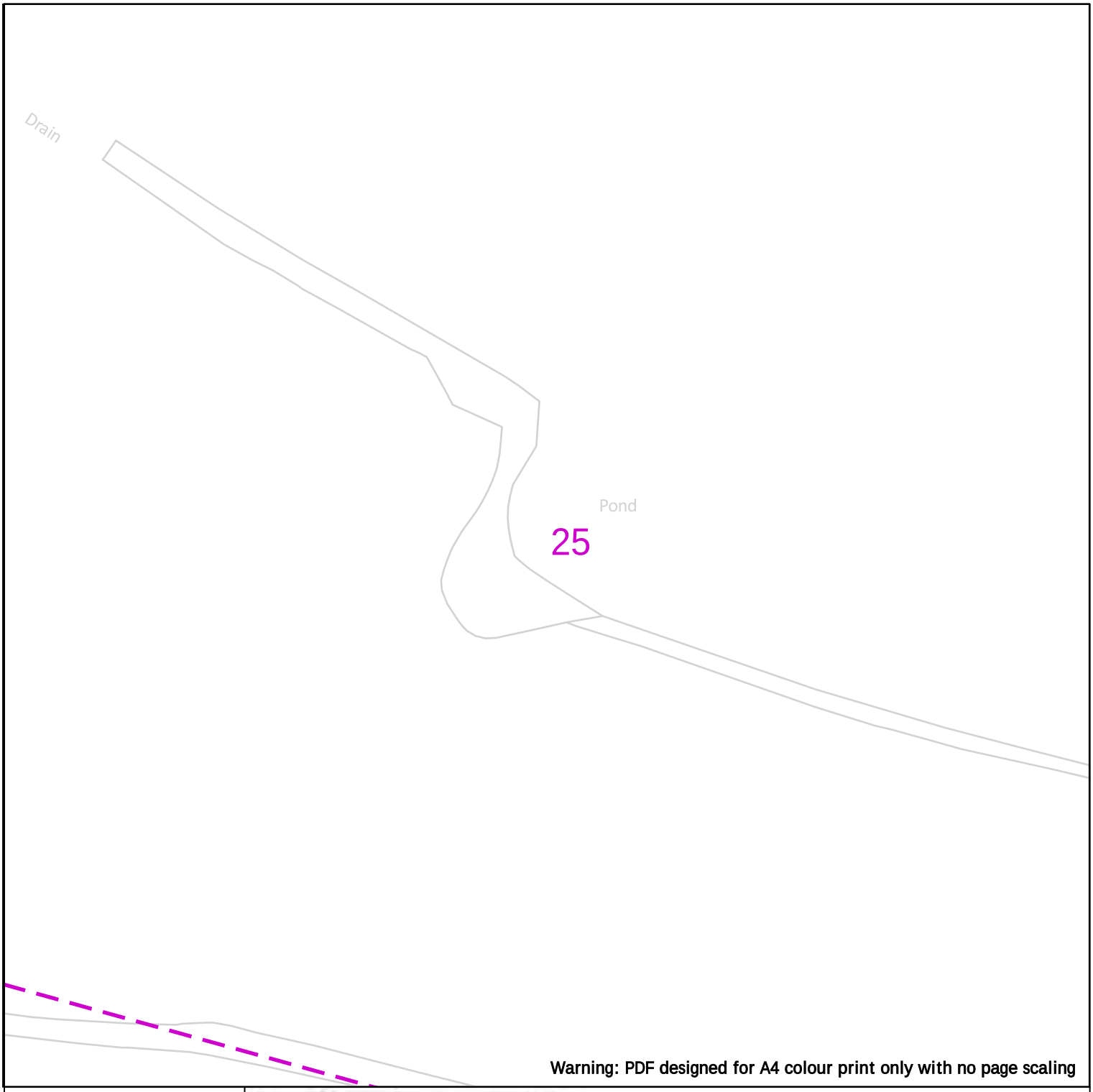

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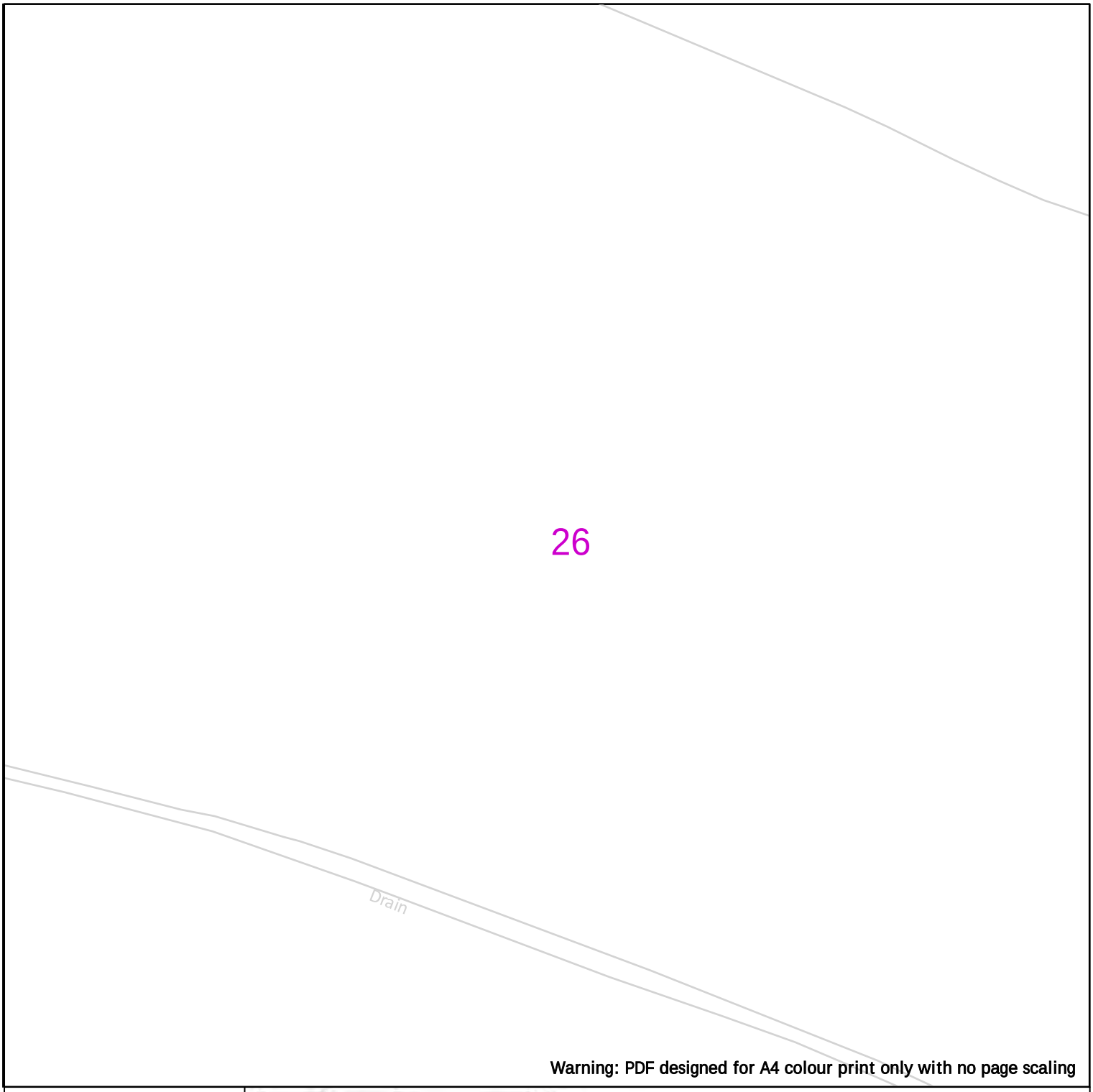

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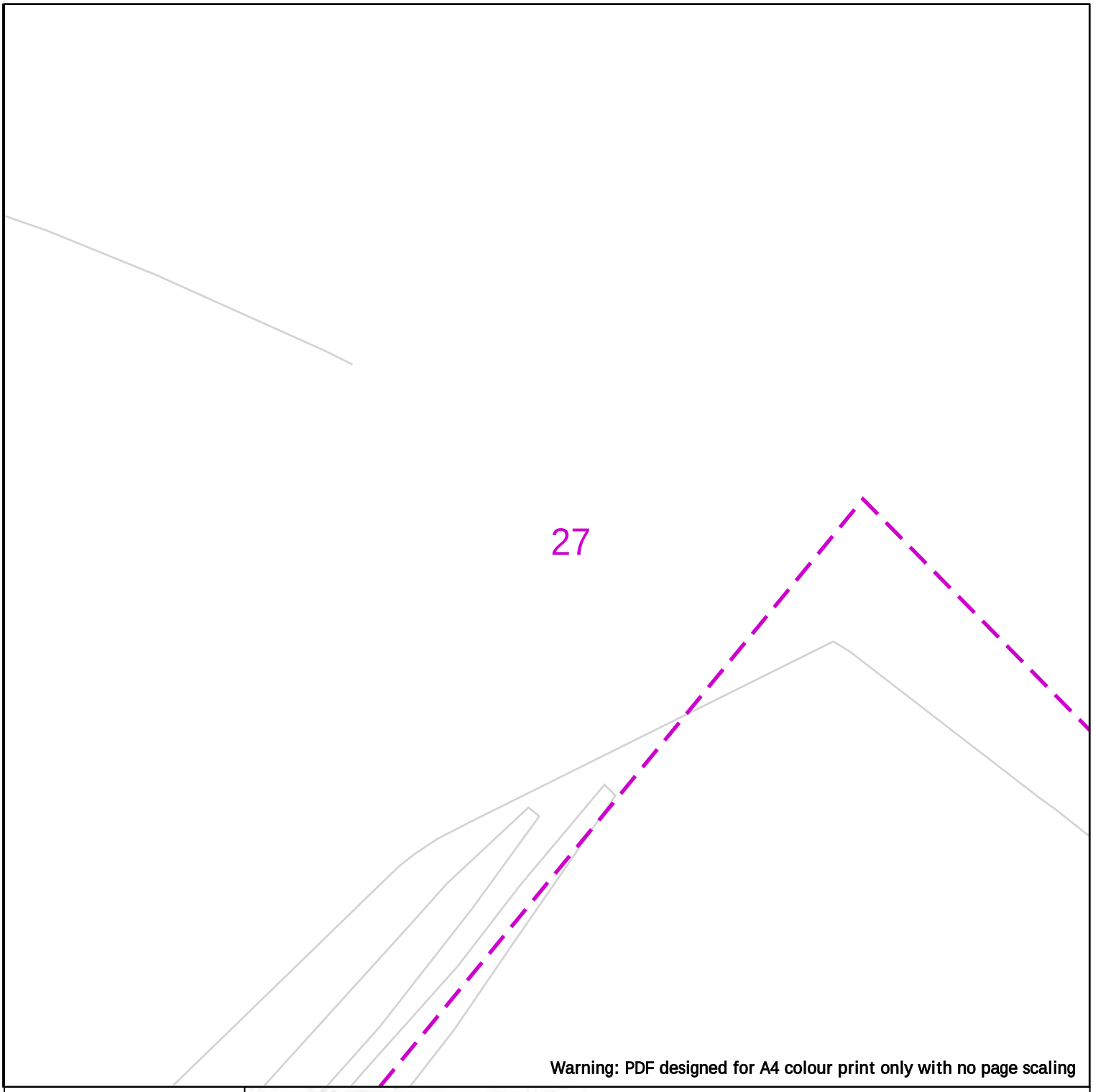

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Requested by: Mr James Parker

Your Scheme/Reference:
23/01164/FUL (JP)

View extent: 100m, 100m

Scale: 1:500 (When plotted at A4)

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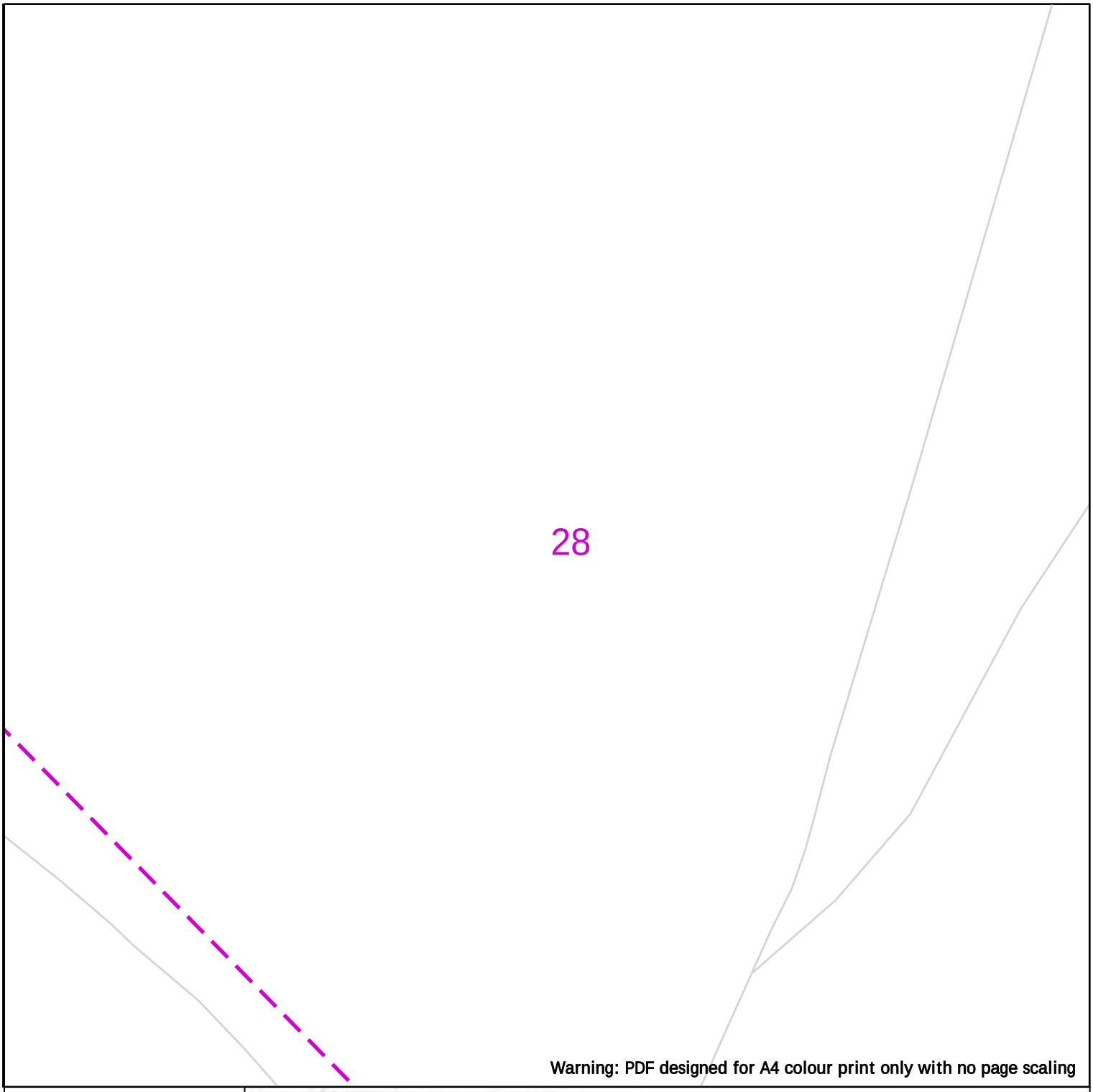

Warning: PDF designed for A4 colour print only with no page scaling

25m

Dig Sites Area: Line:

LP Mains
MP Mains
IP Mains
LHP Mains

Valve
Depth of cover
Syphon
Diameter Change
Material Change
Out of Standard Service

Cadent
Your Gas Network

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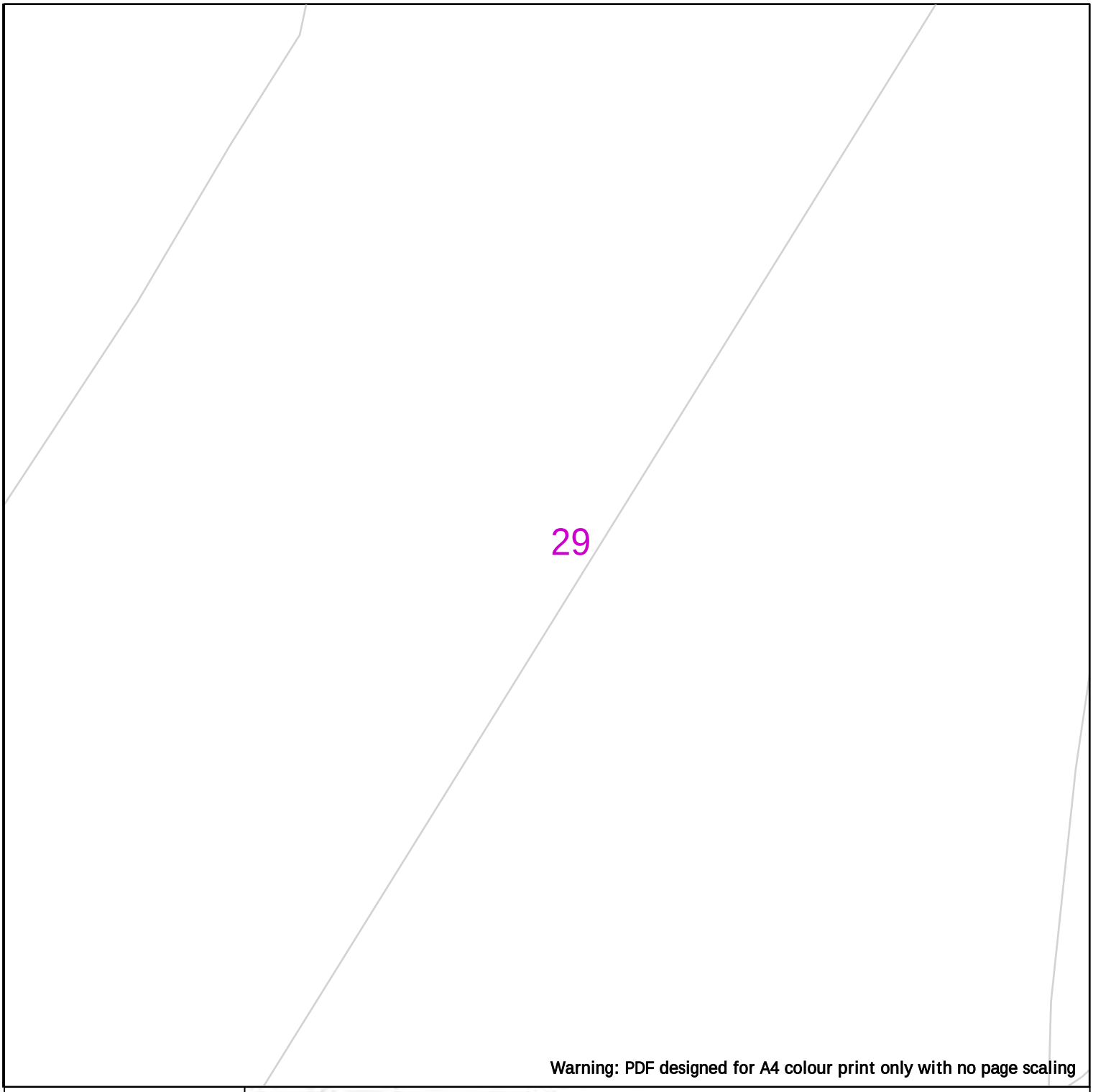

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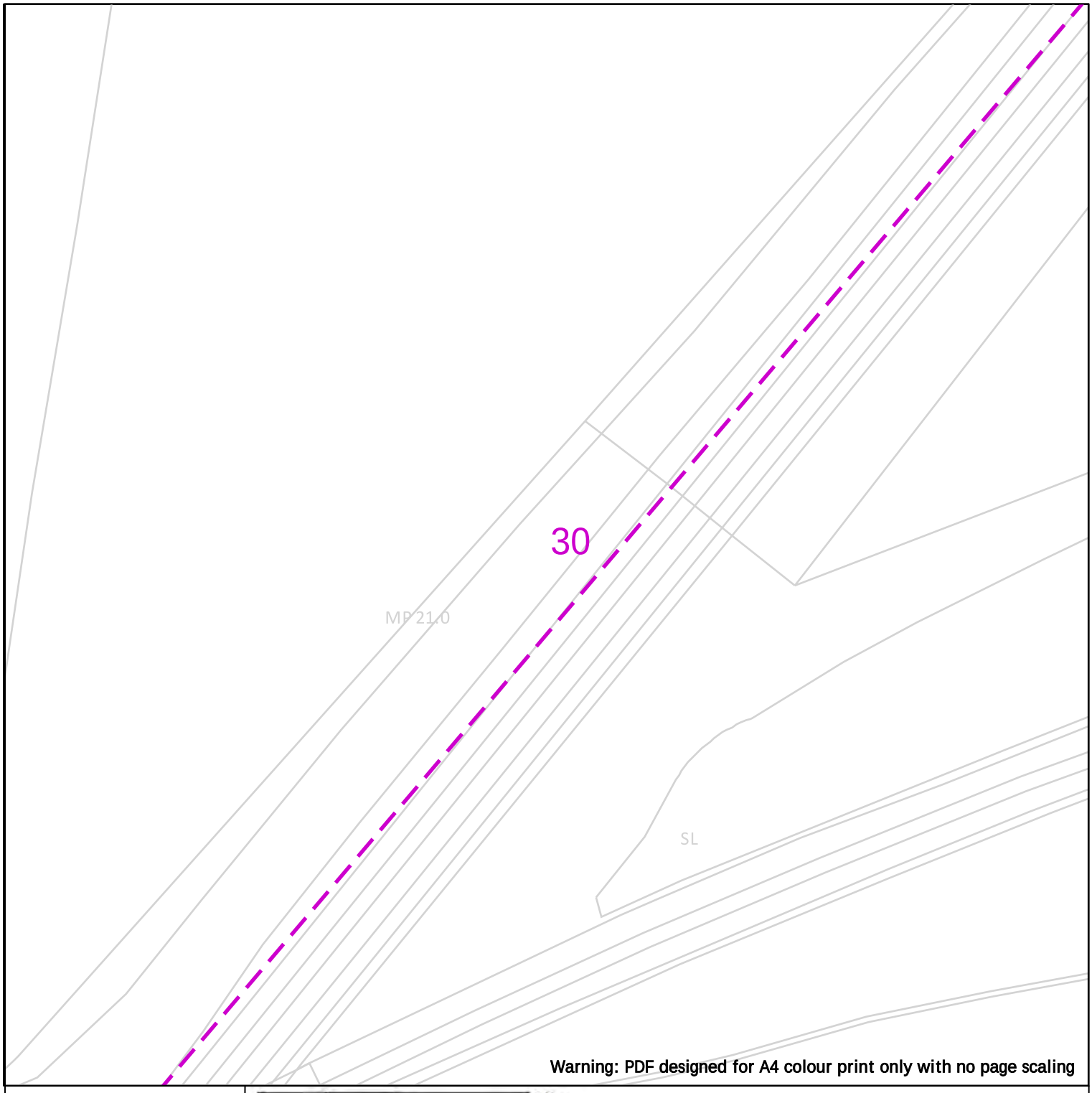

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Valve
Depth of cover
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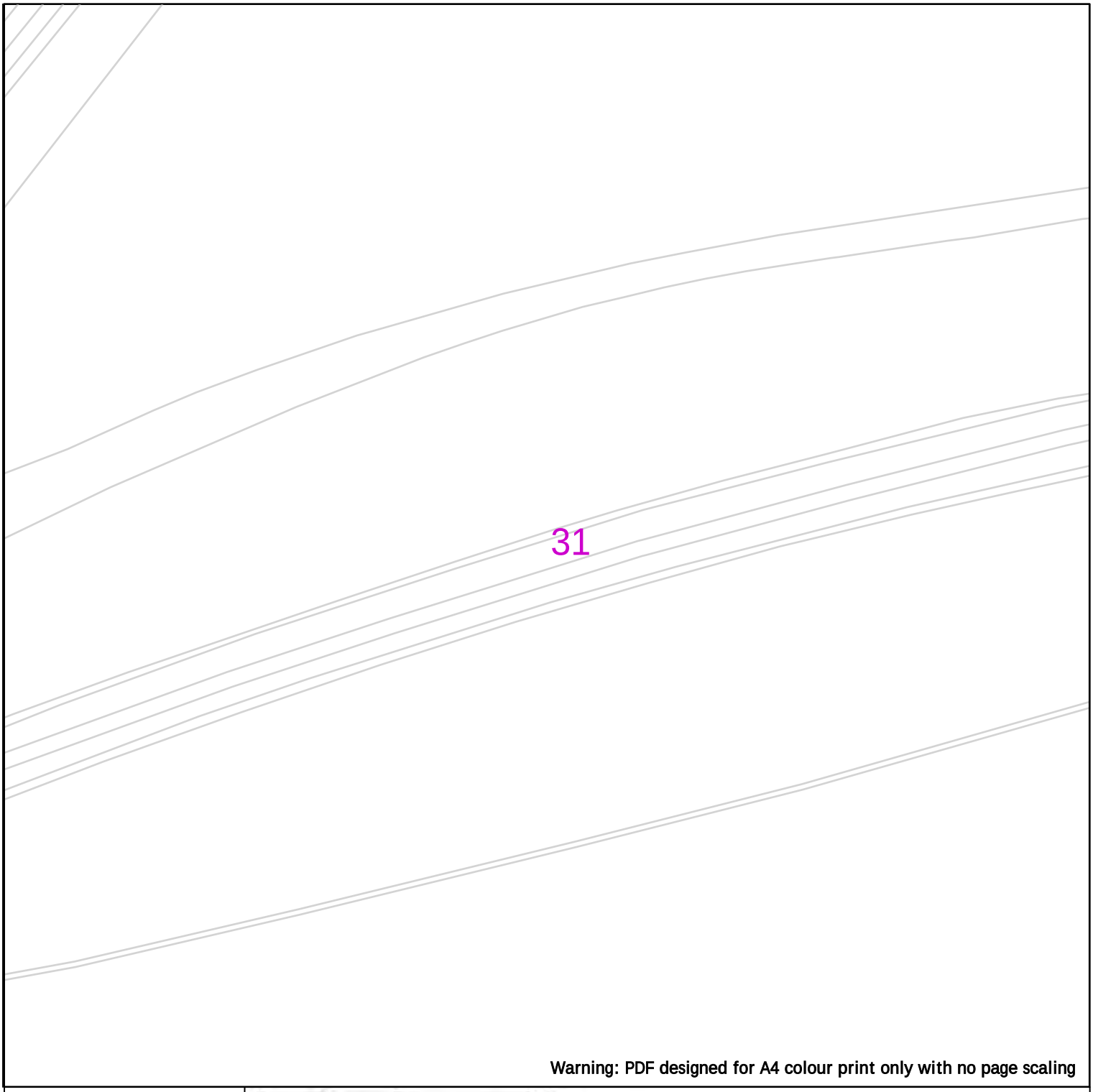

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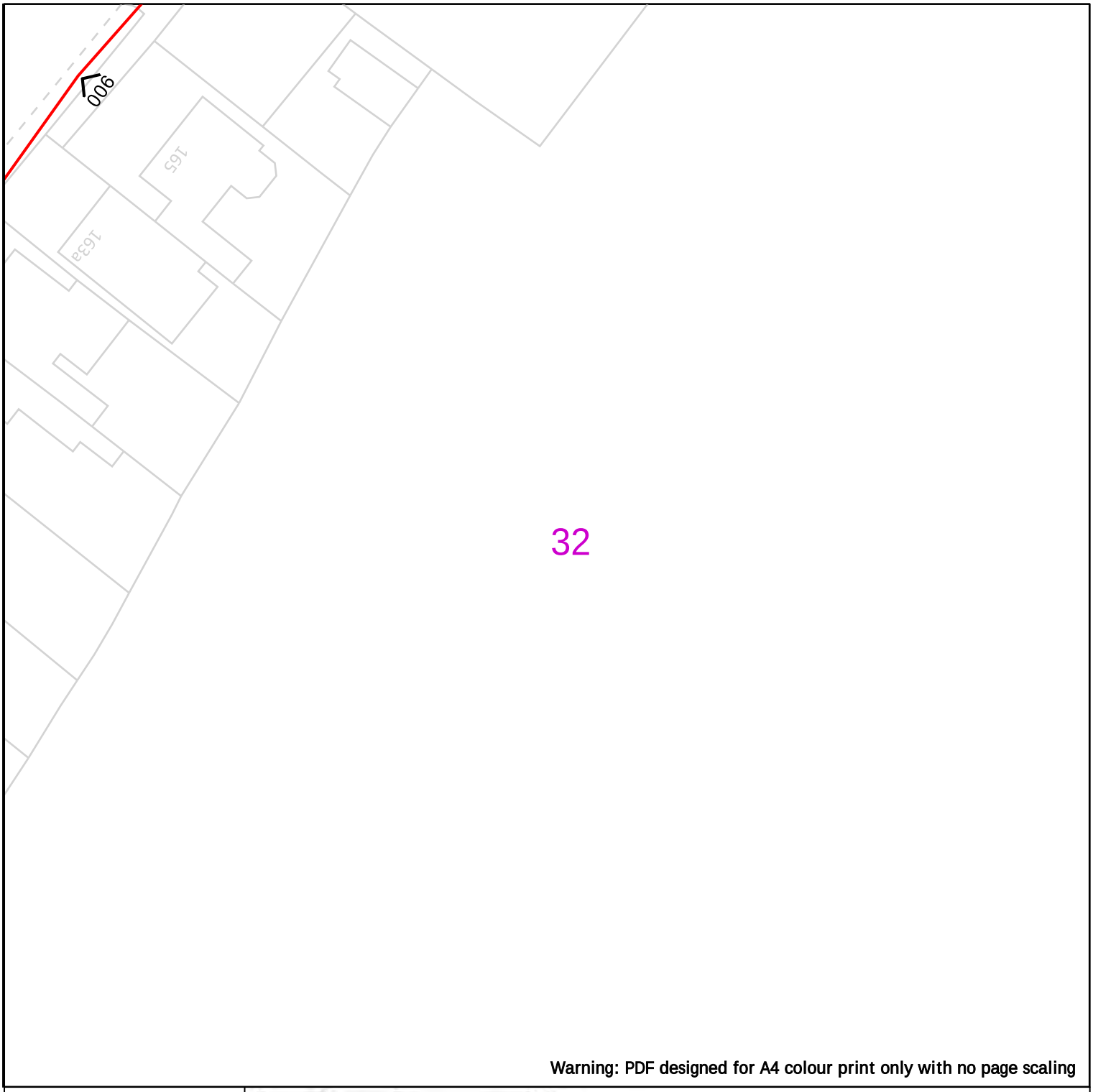

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25m

Dig Sites Area: Line:

- LP Mains
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33

Playing Field

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25m

Dig Sites Area: Line:

LP Mains
MP Mains
IP Mains
LHP Mains

Valve
Depth of cover
Syphon

Diameter Change
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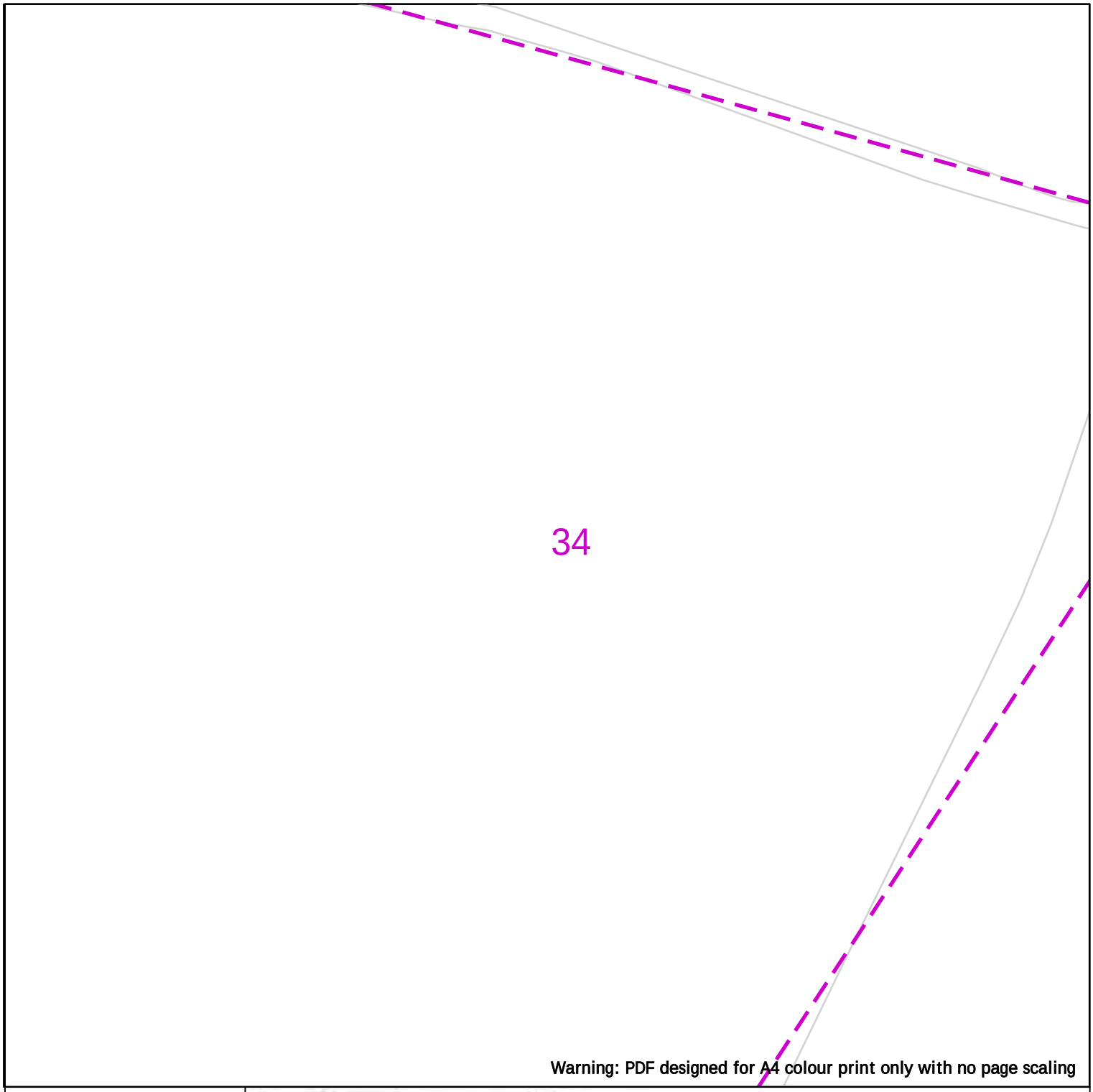

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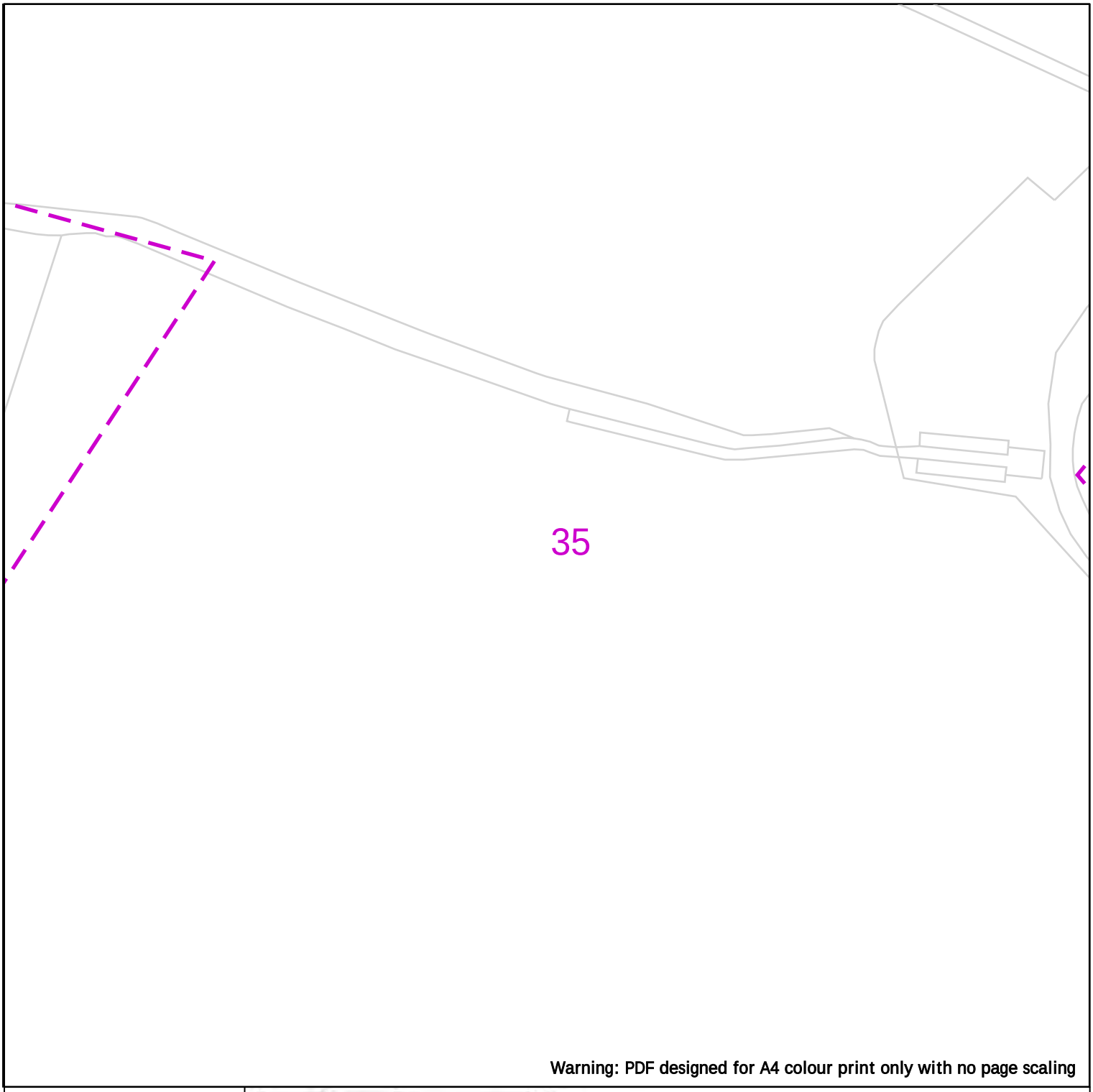

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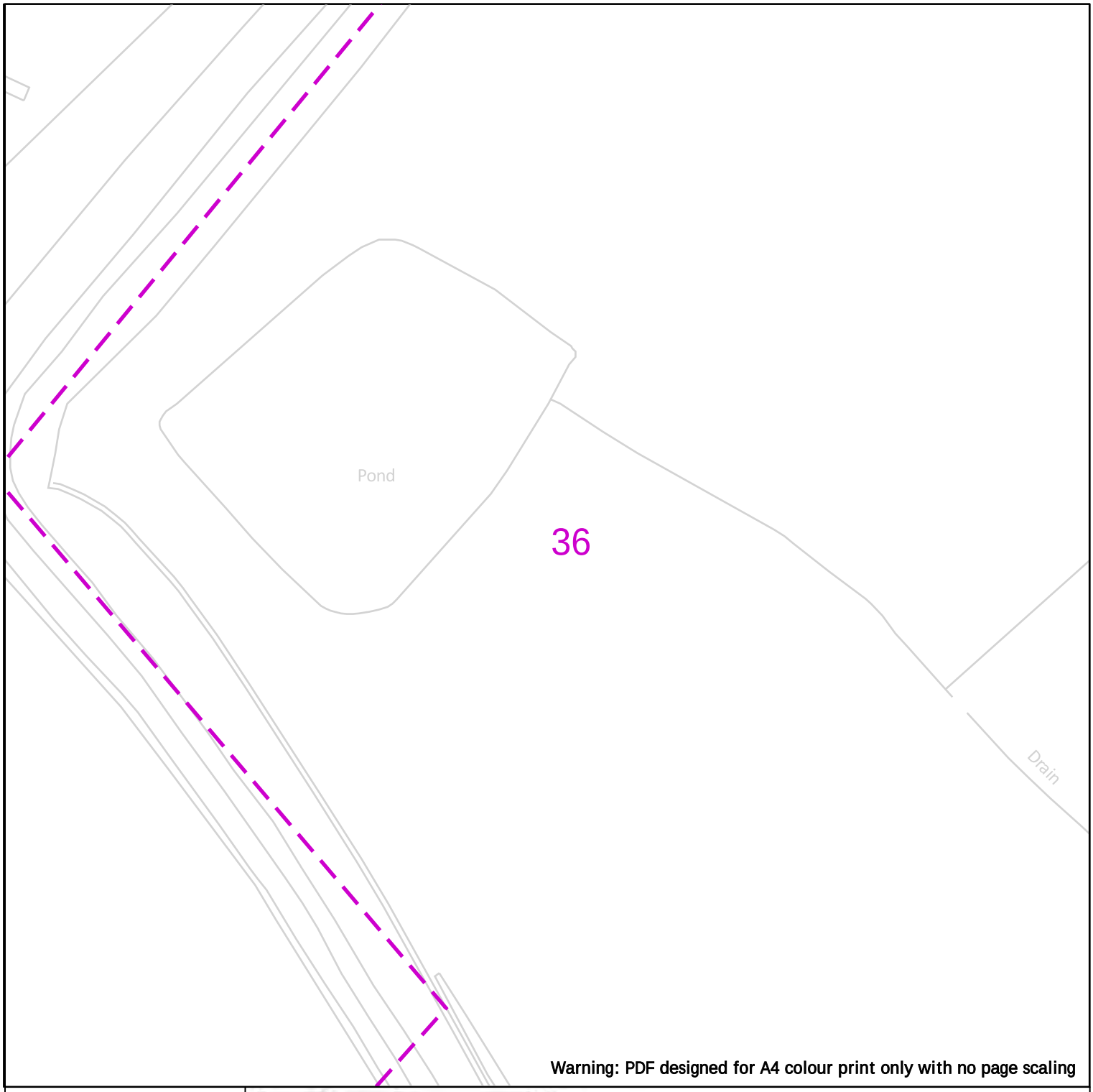

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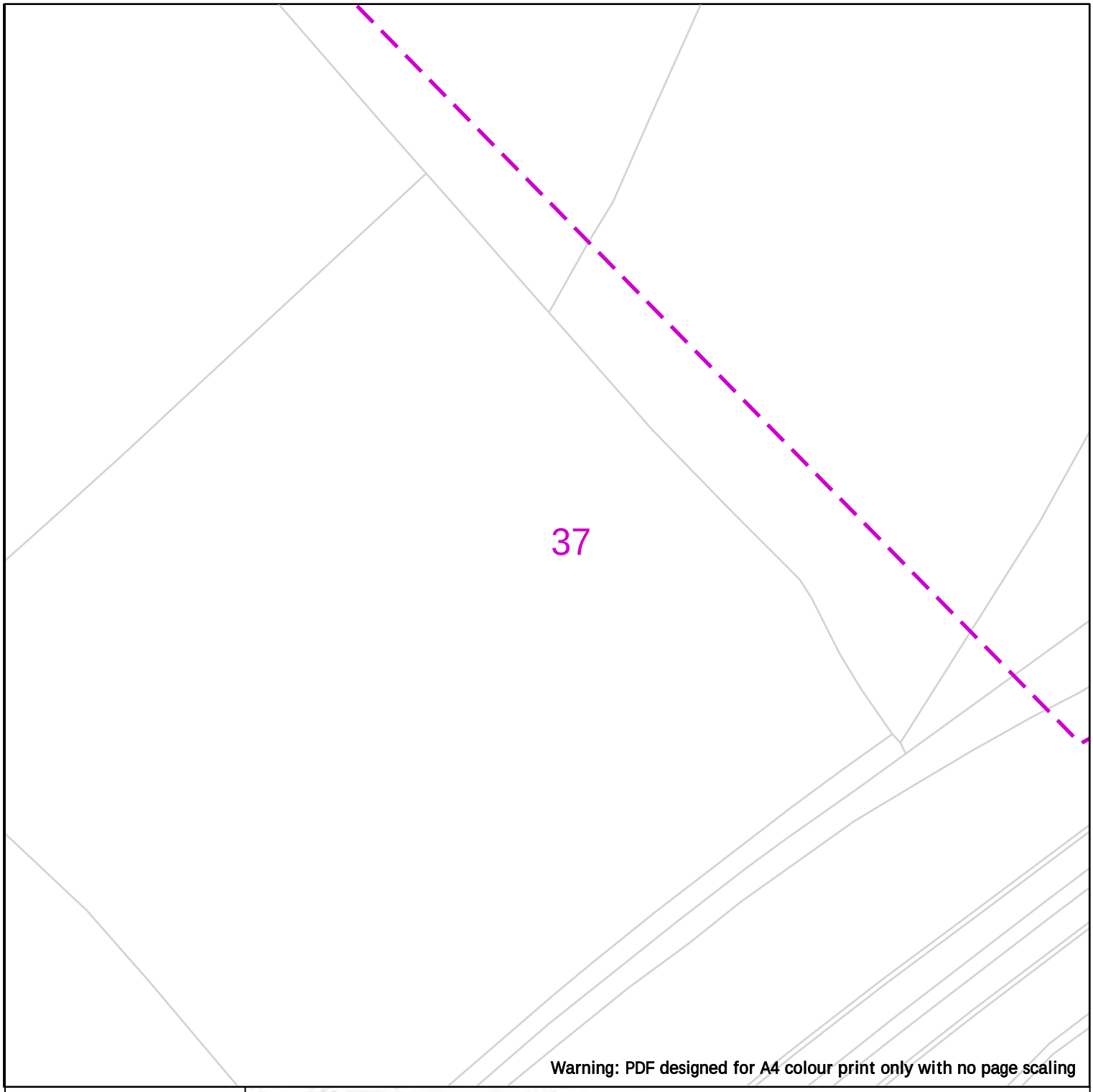

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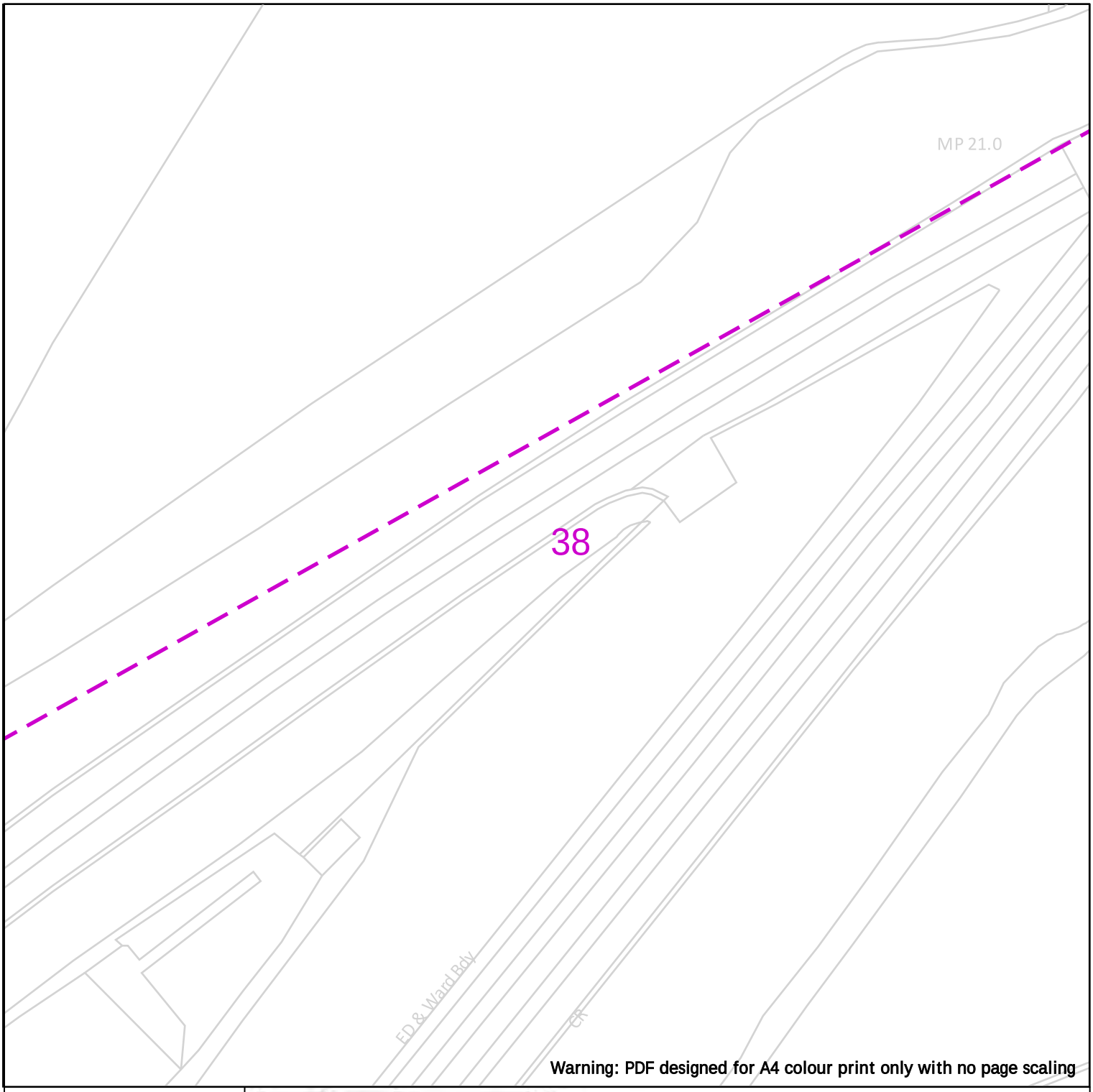

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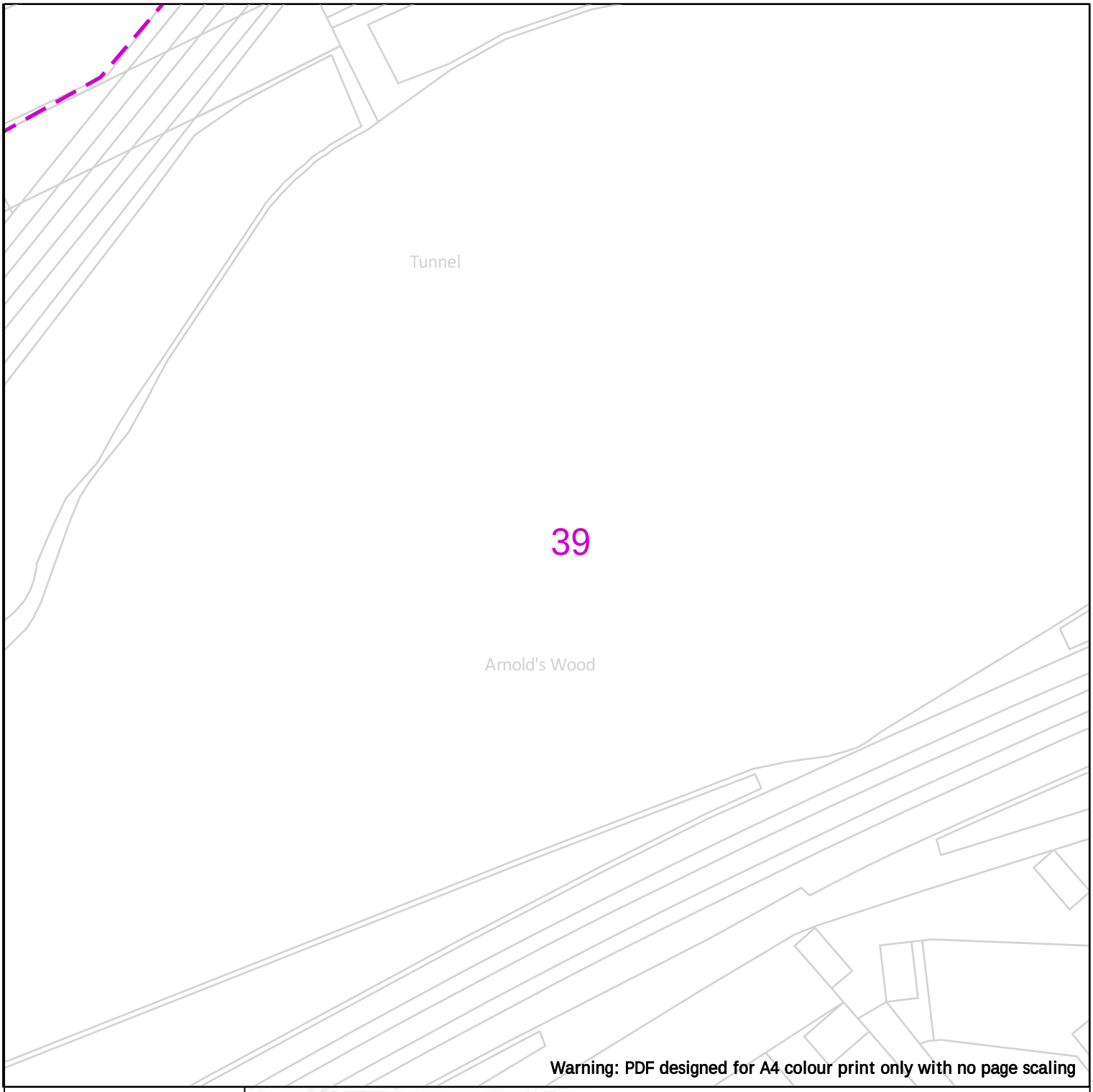

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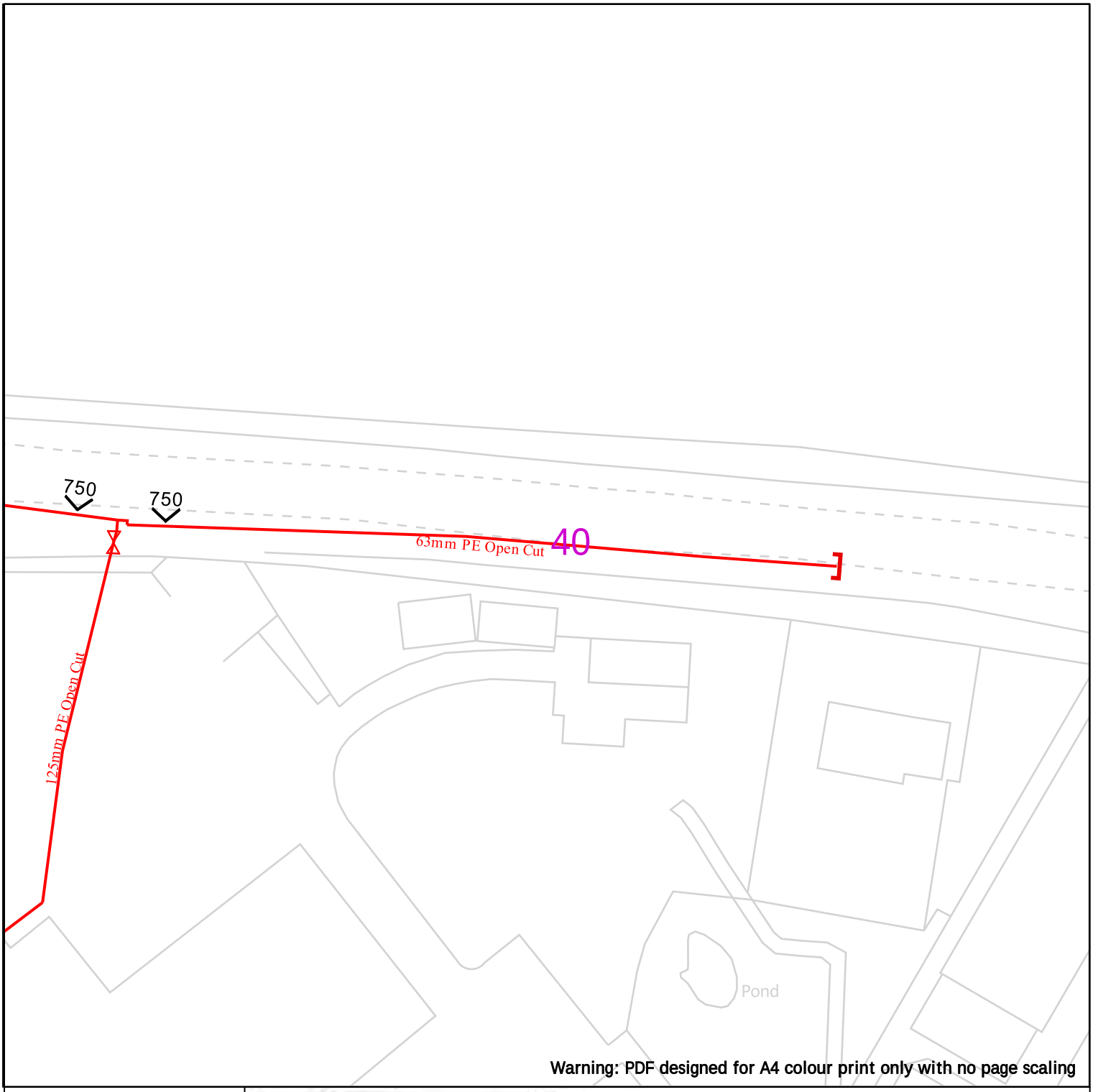

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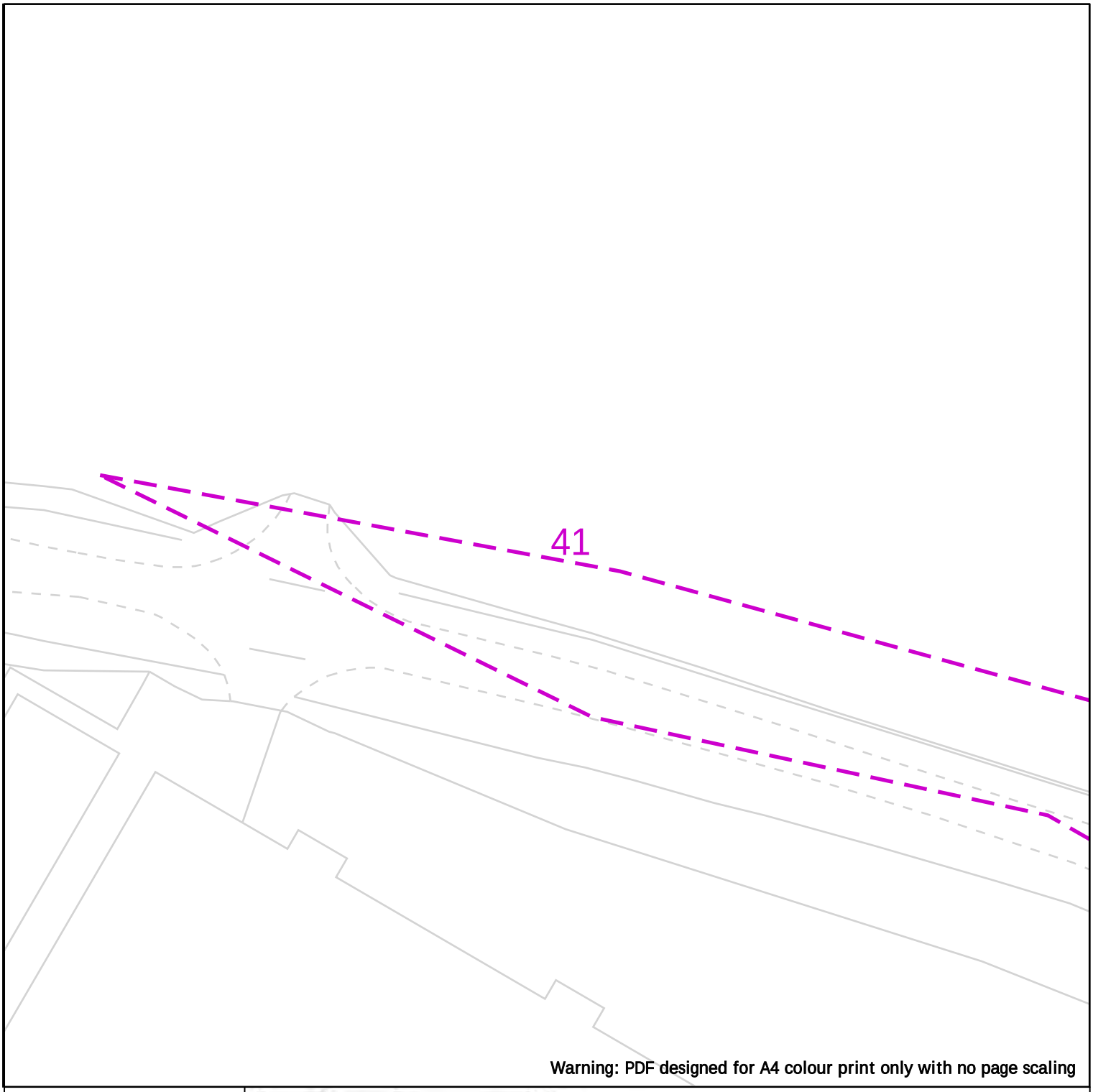

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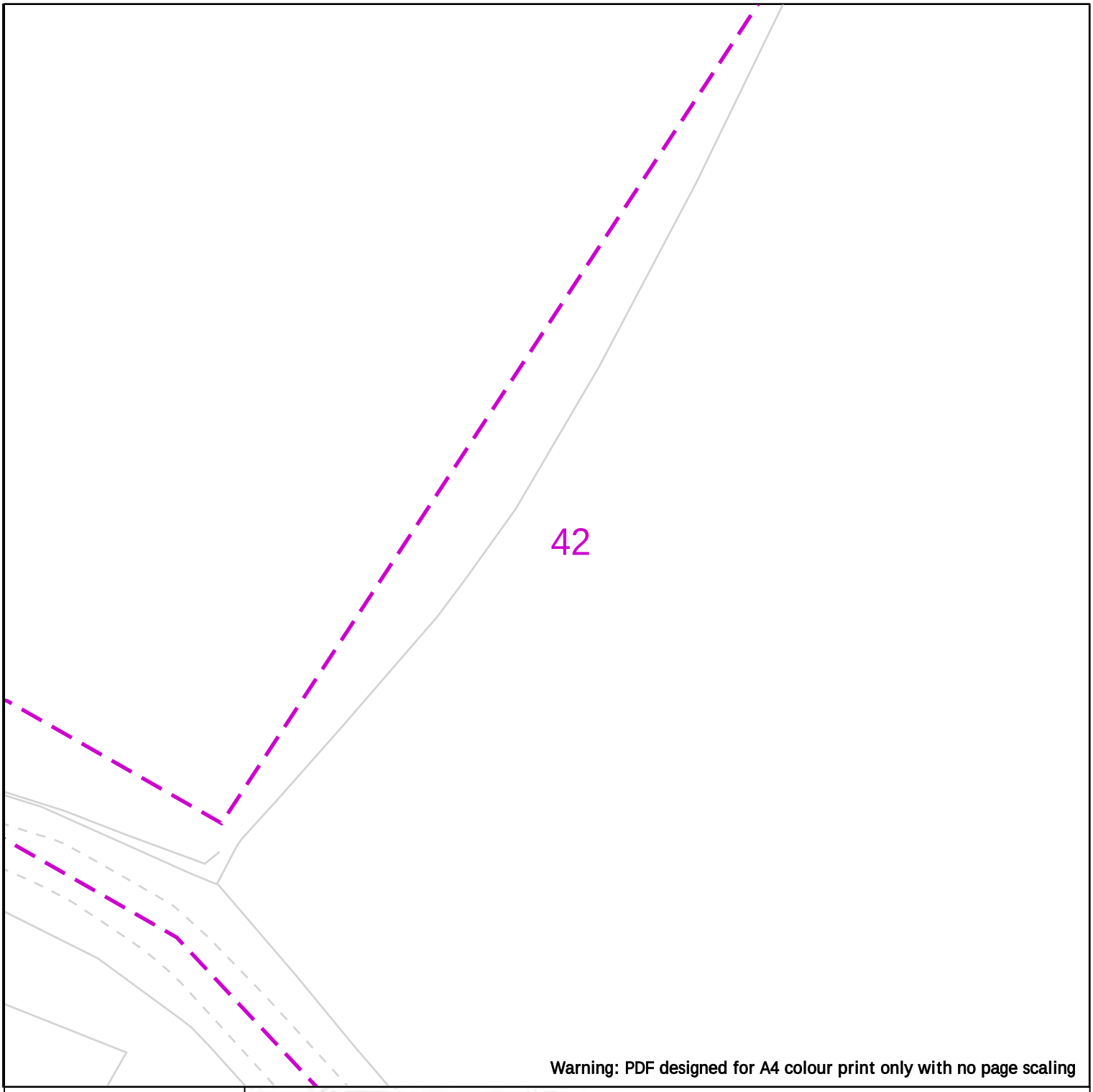

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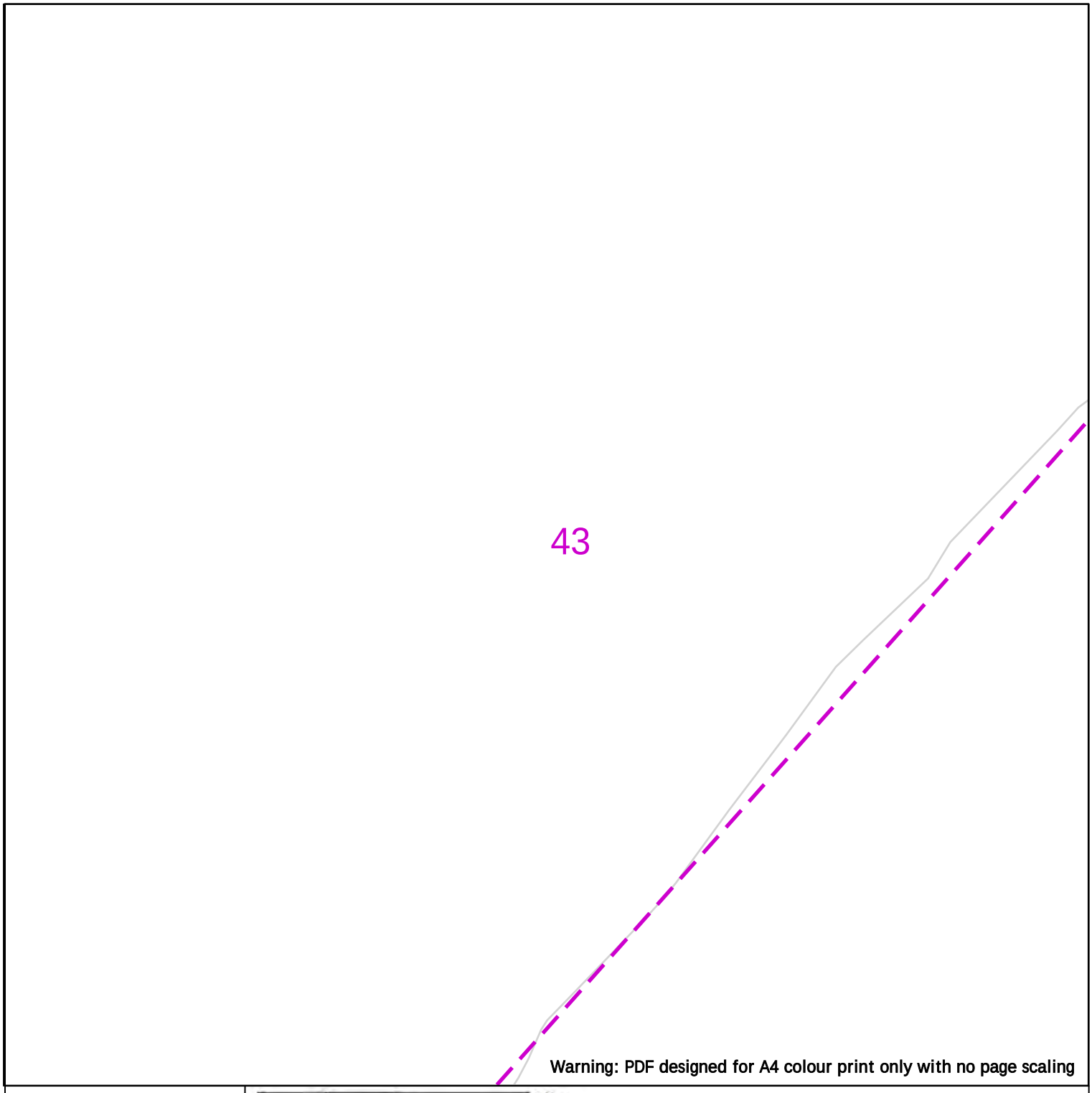
In case of emergency call - 0800 111 999



Warning: PDF designed for A4 colour print only with no page scaling

25m

Dig Sites Area: Line:

LP Mains
MP Mains
IP Mains
LHP Mains

Valve
Depth of cover
Syphon
Diameter Change
Material Change
Out of Standard Service

Cadent
Your Gas Network

Date Requested: 09/11/2023
Job Reference: 31483441
Site Location: 561690 196075
Requested by: Mr James Parker

Your Scheme/Reference:
23/01164/FUL (JP)

View extent: 100m, 100m

Scale: 1:500 (When plotted at A4)

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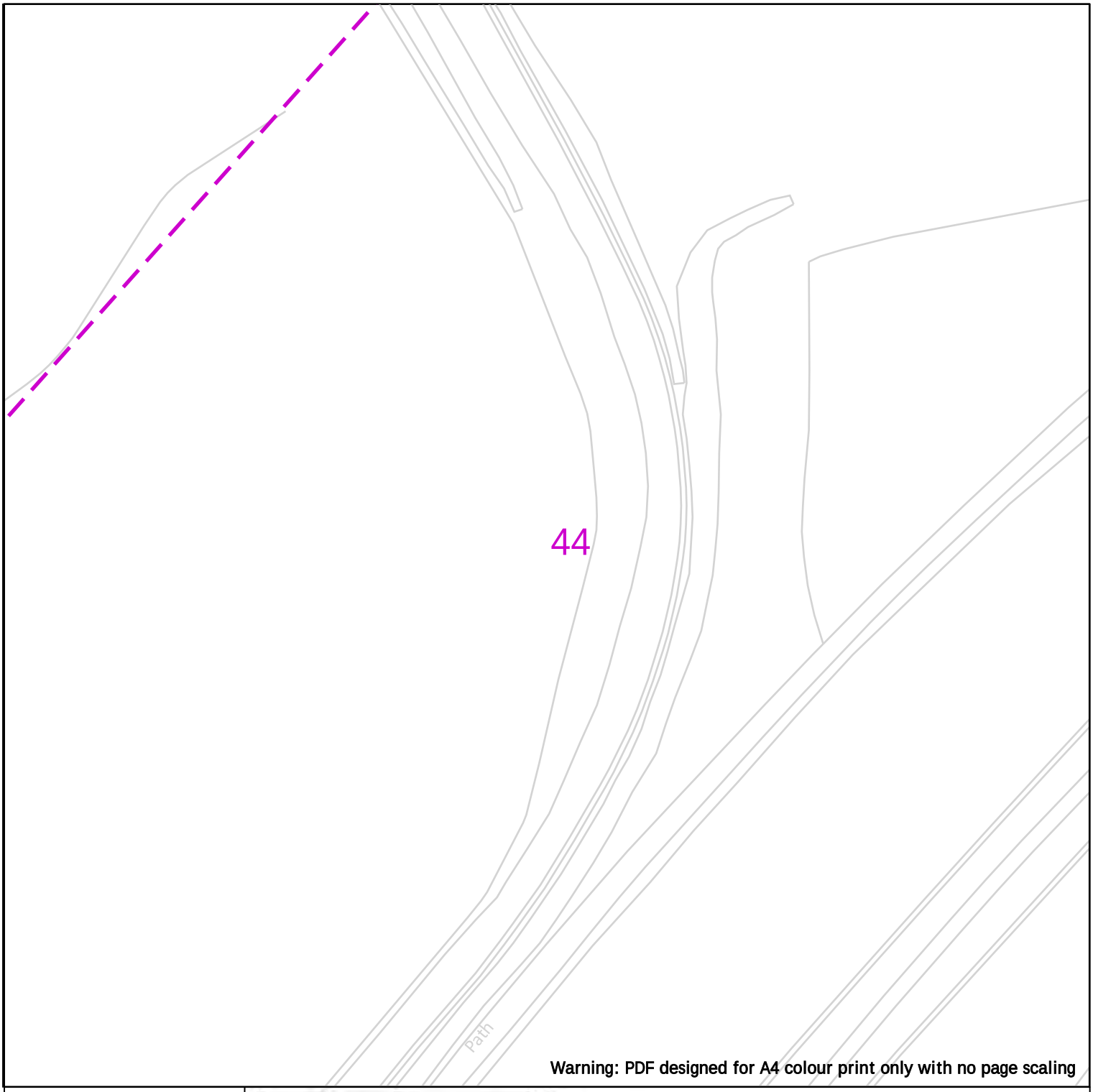

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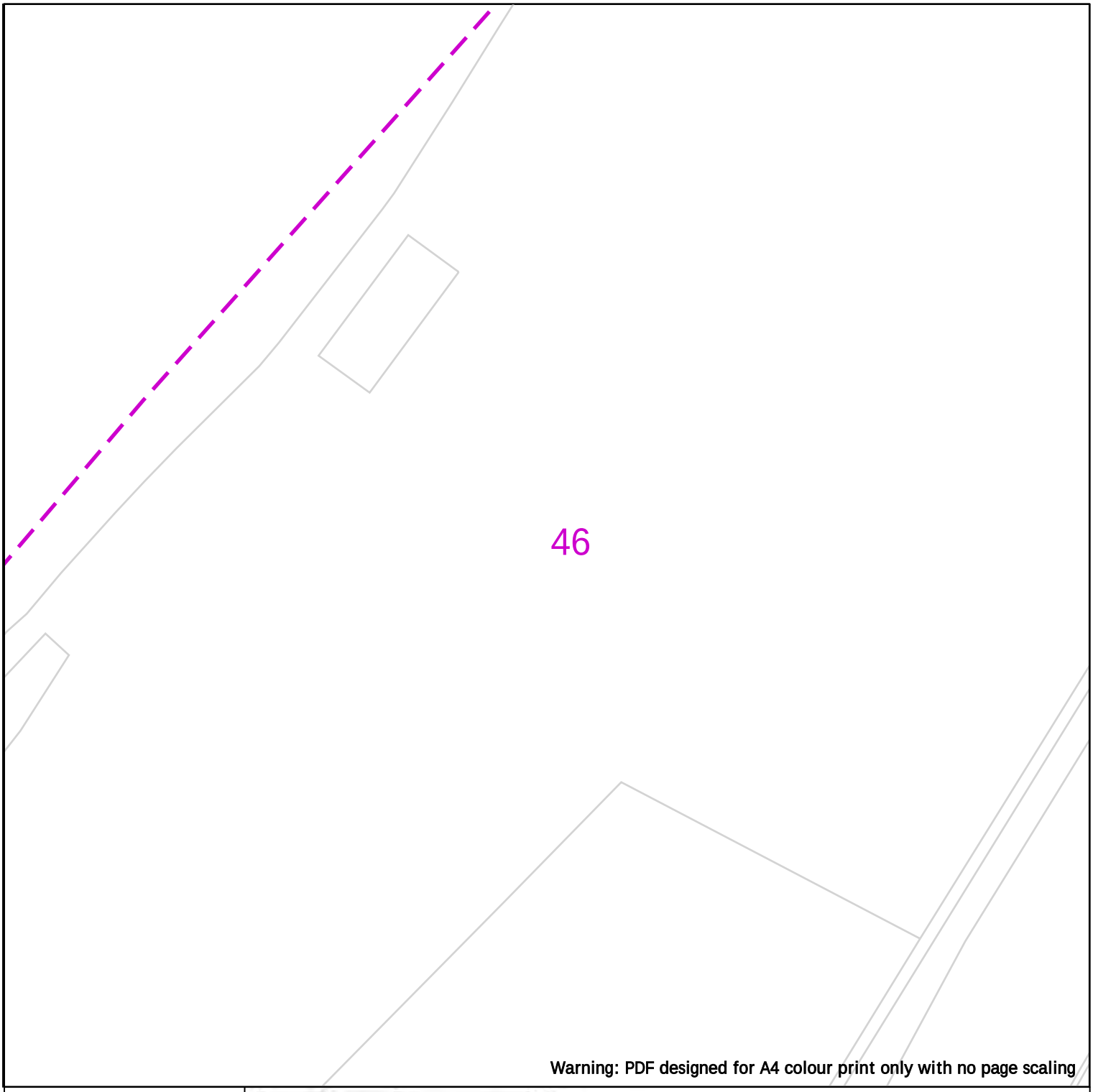

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In case of emergency call - 0800 111 999

Tracey Balcombe

From: .box.Cadent.PlanningApplications <Cadent.PlanningApplications@cadentgas.com>
Sent: 09 November 2023 13:12
To: Planning Team, Brentwood Borough Council
Subject: FW: [EXT] LSBUD Ref: 31483441 Your Ref: 23/01164/FUL (JP) DBYD MP-LP High Risk
Attachments: 31483441_CadentGas.pdf

Categories: Tanya

Date: 09/11/2023
LinesearchbeforeUdig ref: 31483441
Your ref: 23/01164/FUL (JP)

Dear Sir/Madam,

Your planning application – No objection, informative note required

We have received a notification from the LinesearchbeforeUdig (LSBUD) platform regarding a planning application that has been submitted which is in close proximity to our medium and low pressure assets. We have no objection to this proposal from a planning perspective, however we need you to take the following action.

What you need to do

To prevent damage to our assets or interference with our rights, please add the following **Informative Note** into the **Decision Notice:**

Cadent Gas Ltd own and operate the gas infrastructure within the area of your development. There may be a legal interest (easements and other rights) in the land that restrict activity in proximity to Cadent assets in private land. The applicant must ensure that the proposed works do not infringe on legal rights of access and or restrictive covenants that exist.

If buildings or structures are proposed directly above the apparatus the development may only take place following diversion of the apparatus. The applicant should apply online to have apparatus diverted in advance of any works, by visiting cadentgas.com/diversions

Prior to carrying out works, including the construction of access points, please register on www.linesearchbeforeudig.co.uk to submit details of the planned works for review, ensuring requirements are adhered to.

Your responsibilities and obligations

Cadent may have a Deed of Easement on the pipeline, which provides us with a right of access for a number of functions and prevents change to existing ground levels, storage of materials. It also prevents the erection of permanent/temporary buildings, or structures. If necessary Cadent will take action to legally enforce the terms of the easement.

This letter does not constitute any formal agreement or consent for any proposed development work either generally or related to Cadent's easements or other rights, or any planning or building regulations applications.

Cadent Gas Ltd or their agents, servants or contractors do not accept any liability for any losses arising under or in connection with this information. This limit on liability applies to all and any claims in contract, tort (including negligence), misrepresentation (excluding fraudulent misrepresentation), breach of statutory duty or otherwise. This limit on liability does not exclude or restrict liability where prohibited by the law nor does it supersede the express terms of any related agreements.

If you need any further information or have any questions about the outcome, please contact us at plantprotection@cadentgas.com or on 0800 688 588 quoting your reference at the top of this letter.

Kind Regards,
Plant Protection Team
T: 0800 688 588
plantprotection@cadentgas.com
cadentgas.com

Flood Estimation Report Template Notes

Guidance: LIT 65088 Published: 29/12/2022

Audience: Environment Agency

Description: This document provides guidance notes to help you complete the Flood Estimation Report Template. Example responses are included in *italics.*

Contents

Approval

- This table can be amended / removed to suit the need of the organisation undertaking the assessment.
- A document revision history can be added after the approval table if required.
- If a separate method statement stage is not undertaken add N/A to all cells for method statement.
- Revision rows are intended for studies where amendments may be required following application of flows to a hydraulic model which leads to estimates / approaches needing to be revisited, for example.

Revision stage	Analyst:	Approved by:	Amendments	Date
Method statement				
Calculations - Revision 1				
Calculations - Revision 2				

Abbreviations

Abbreviation	Short for
AEP	annual exceedance probability
AMAX	Annual Maximum
AREA	Catchment area (km2)
BFI	Base Flow Index
BFIHOST19	Base Flow Index derived using the HOST soil classification, revised in 2019
FARL	FEH index of flood attenuation due to reservoirs and lakes
FEH	Flood Estimation Handbook
GEV	Generalised Extreme Value
GLO	Generalised Logistic
HOST	Hydrology of Soil Types
IF	Impervious Fraction
IRF	Impervious Runoff Factor
LF	Low flow statistics (flow duration curve)
NRFA	National River Flow Archive
POT	Peaks Over a Threshold
QMED	Median Annual Flood (with return period 2 years)
ReFH	Revitalised Flood Hydrograph method
ReFH2	Revitalised Flood Hydrograph 2 method
SAAR	Standard Average Annual Rainfall (mm)
Tp	Time to peak of the instantaneous unit hydrograph
URBAN	Flood Studies Report index of fractional urban extent
URBEXT1990	FEH index of fractional urban extent
URBEXT2000	Revised index of urban extent, measured differently from URBEXT1990
WINFAP	Windows Frequency Analysis Package (software that can be used for FEH statistical method)

1. Summary of assessment

1.1 Summary

- This section provides a summary of the key information contained within the detailed assessment in the following sections.
- The aim is to enable quick and easy identification of the type of assessment undertaken. This should assist in identifying an appropriate reviewer and the ability to compare different studies more easily.
- Keep the text to one or two sentences for each point.

Catchment location:

e.g., watercourse name, main area of interest, upstream and downstream extents

Purpose of study and complexity:

For complexity e.g., simple, routine, moderate, difficult, very difficult

Key catchment features:

e.g., permeable, urban, pumped, mined, reservoir

Flooding mechanisms:

e.g., fluvial, surface water, groundwater

Gauged / ungauged:

e.g., gauged at X station, with X years of data and good data quality

Final choice of method:

e.g., statistical / ReFh2 / hybrid / non-stationary, etc.

Key limitations / uncertainties in results:

e.g., assumptions about gauging station rating equations, etc.

1.2 Flood frequencies

- The frequency of a flood can be quoted in terms of a return period, which is defined as the average time between years with at least one larger flood, or as an annual exceedance probability (AEP), which is the inverse of the return period.
- Return periods are output by the Flood Estimation Handbook (FEH) software and can be expressed more succinctly than AEP. However, AEP can be helpful when presenting results to members of the public who may associate the concept of return period with a regular occurrence rather than an average recurrence interval.
- Results tables in this document contain both return period and AEP titles; both rows can be retained, or the relevant row can be retained and the other removed, depending on the requirement of the study.
- The table below is provided to enable quick conversion between return periods and annual exceedance probabilities.

AEP (%)	50	20	10	5	3.33	2	1.33	1	0.5	0.1
AEP	0.5	0.2	0.1	0.05	0.033	0.02	0.013	0.01	0.005	0.001
Return period (yrs)	2	5	10	20	30	50	75	100	200	1,000

2. Method Statement

- For all but simple or routine projects, establish a breakpoint in which the method statement is reviewed before work continues. This creates a valuable opportunity to agree on the intended approach and address any difficulties with availability of data or information from previous work.

2.1 Requirements for flood estimates

Overview and Project Scope:

- The content and level of detail provided in this section will depend on the scope of the study. The following should be included as a minimum:
    - Purpose of study
    - Peak flows or hydrographs?
    - Design events for which flow estimates are to be made (AEP %)
    - Climate change allowances with reference to relevant guidance
    - Potential number of locations for flow estimation
    - The purpose of the document
    - What is the complexity of the study – simple, routine, moderate, difficult, very difficult?
    - What does the client's scope specify for inclusion in the study, e.g., review of existing studies, rating reviews / updates, simple / detailed flood history review, ReFH model parameter estimation, joint probability?
- Include a reference to any modelling reports which this flood estimation calculation record supports.

2.2 The Catchment

Maps:

- Include a map of the catchment in here, at a minimum showing the river network, catchment boundary and gauging stations, and appropriately labelled / referenced in a legend. Additional information which could be included is the model extent or locations of unusual / interesting features, for example. Think about the background mapping being used – scale and colour / greyscale – think about if the reader could easily identify locations from the background mapping.
- Include more than one map if that would assist in presenting the information, consider including maps using satellite imagery as background if that would better show key catchment features, and consider including photographs if they would help understanding of features identified in the

'Description' section. For permeable catchments, consider including a hydrogeological map showing groundwater equipotential lines.
- Remember to give all figures a number and title and refer to them in the text.
- Consider changing the page orientation to landscape and the page size to A3 if necessary or including maps as a separate digital appendix

Catchment Description:

- Think about how runoff will be generated and what features are going to affect runoff from the contributing catchment reaching the watercourse. Include:

    - Topography
    - Climate
    - Geology
    - Soils
    - Land use
    - Any unusual features (e.g., reservoirs, historic mining) that may affect the flood hydrology.
    - In some cases, it may be useful to include reference to things such as amount of modelled reach that is culverted but remember that this is not a hydraulic modelling report and detail on hydraulic features, such as weir and culvert sizes, is not required.

2.3 Hydrometric Data

Source of flood peak data:

- This should be updated to the latest version of the dataset at the time of the assessment.

e.g., NRFA peak flows dataset, Version 11, released September 2022. This contains data up to water year 2020-21.

Gauging stations (flow and level):

- You only need to include gauges at or very near to the sites of flood estimates unless there is an exceptional reason to include other gauges.
- If you have data extracted from WISKI the datafile may only provide the digital data period of record, and the actual operating period of the gauge may be longer. You should check this using the NRFA website.

Watercourse	Station name	Gauging authority number	NRFA number	Catchment area (km²)	Type (rated / ultrasonic / level…)	Start of record and end if station closed

Data available at each flow gauging station:

- This table can be deleted if the study catchment is ungauged.
- A quality check of the data is not required if the gauge is in the NRFA, unless specifically called for in the project brief.
- There is no need to repeat everything in the NRFA station description, for example, weir length, wingwall height. Just add the key factors which will affect the quality of flood flow measurement and hence confidence in the data. For more detailed studies consider looking for other sources of information, for example, gauging authority rating review reports, station files held at CEH Wallingford, or reports on earlier flood studies.
- Any flood peak data not in the NRFA (e.g., extra stations, recent data or altered flows) should be provided in the appendix.
- Provide details of how peaks-over-threshold (POT) data has been derived in the appendix.

Station name	Data source	Data type	Start and end of flood peak record	Update for this study?	OK for QMED?	OK for pooling?	Data quality check needed?	Station and flow data quality summary
	e.g., NRFA or WISKI	*e.g., AMAX, POT, 15-minute*						

Updates or revisions to flood peak data:

- Tabulate any updated or revised flood peak series in the appendix and provide a summary here.

Data quality checks carried out:

- Provide full details of data quality checks in the appendix and summarise findings here.

Rating Equations:

- The Flood Estimation Guidelines provide suggestions on the information that should be collated and assessed for rating reviews (Section 2.1 ‘Rating reviews and improvements’).
- A site visit is an important component of any rating review.

Station name	Type of rating e.g., theoretical, empirical; degree of extrapolation	Rating review needed?	Comments and link to any rating reviews

Rating reviews:

- Provide full details of rating reviews and improvements in an additional report or the appendix.

Other data available and how it has been obtained:

- Check flow gaugings / spot flow gaugings are only required if you are reviewing a rating
- Historical flood data: a chronology and interpretation of the flood history should be included in the appendix or in an additional report (add references). The detail included will depend on requirements in the project scope. If there is a flow gauge within the study reach (or close by), consider if the historical flood data could be used to extend the systematic gauge record (see FEH Local guidance for more information).
- Potential evaporation data may be required if the ReFH Calibration Utility is being used.
- Other data or information could include groundwater, tides, channel widths, low flow statistics, sewer network data, or any other data used in your analysis. Add extra rows to the table if needed.

Type of data	Data relevant to this study?	Data available?	Source of data	Details
Check flow gaugings				
Historical flood data				

Type of data	Data relevant to this study?	Data available?	Source of data	Details
Flow or river level data for events				
Rainfall data for events				
Potential evaporation data				
Results from previous studies				
Other data or information				

2.4 Hydrological understanding of the catchment

- This section is an opportunity to assess any catchment river gauge data to provide an understanding of the hydrological behaviour of a watercourse.
- You should complete the conceptual model and unusual catchment features sections, even if there is no data available to plot.
- More information is provided in Section 2 of the Flood Estimation Guidelines.

Plots of flood peak data and interpretation:

- This could be the AMAX series or the POT series.
- Visually examine the time series and identify if there are, for example, outliers, apparent truncation of the flood peaks, trends or fluctuations in the data, step changes in the data, or unusually small flows. You should include an interpretation of these and other features.
- If there is more than one gauge in the study area, correlation plots can help to identify patterns or inconsistencies in the hydrological behaviour.
- You could add informative plots, for example, showing the seasonality of floods or the correlation of peak flows at different gauges.

Plots of flow data and interpretation:

- This could include, for example, annual flow hydrographs or flood events.
- Plots should be followed by an interpretation of the plots, for example, discussion of catchment processes, response time, propagation of a flood, and contributions from tributaries.
- If there is more than one gauge in the study area it can be useful to plot the data for all gauges on the same graph as this can aid understanding of the relationship between flow at different locations.

- These plots can be useful for checking the quality of the data and it is often helpful to plot flow and rainfall together as this may identify problems.

Plots of stage data and interpretation:

- Many catchments do not have flow gauges, but stage / level data may be available. This data can provide valuable information on the catchment response in the absence of flow data, for example estimating Tp from lag analysis.

Conceptual model:

- See Section 3.3 of the Flood Estimation Guidelines. Include information on factors such as:
    - Where are the main sites of interest?
    - What is likely to cause flooding at those locations? (e.g., peak flows, flood volumes, combinations of peaks, groundwater, snowmelt, tides…)
    - Might those locations flood from runoff generated on part of the catchment only, e.g., downstream of a reservoir?
    - Is there a need to consider temporary debris dams that could collapse?

Unusual catchment features:

- See Section 7 of the Flood Estimation Guidelines. Include information on factors such as:
    - highly permeable soils or geology
    - heavily urbanised land use
    - pumped watercourse
    - major reservoir influence (FARL<0.90)
    - flood storage areas, particularly those which are normally dry
    - historical mining or operational mining activities

2.5 Initial choice of approach

Are FEH methods appropriate?

- FEH methods may not be appropriate, e.g., for extremely heavily urbanised or complex catchments). Explain your decision.

Initial choice of method(s) and reasons:

- See Section 3 of the Flood Estimation Guidelines.
- Think about:

- the type of problem
- the type of catchment
- the type of data available

- Which methods are appropriate? If more than one method is appropriate will all be applied, and the results compared before a final decision is made? Will non-stationary methods be applied? Will different storm durations need to be considered / tested?

How will hydrograph shapes be derived if needed?

- For example, ReFH1 or ReFH2 shapes, average hydrograph shape from gauged data.
- If using average hydrograph shapes, how will inflows from different tributaries be phased?

Will the catchment be split into sub-catchments? If so, how?

- If the hydrological assessment is being undertaken to supply inflows to a hydraulic model, it is likely that a distributed approach will be taken, with the catchment split into sub-catchments and design flows routed from each sub-catchment.
- Think about what the split into sub-catchments will be based on, e.g., tributary confluences, changes in geology / urbanisation, key areas of interest, sewer outfalls.
- Will intervening area hydrographs be required and how will these be derived?
- If the catchment area changes significantly over the study reach, or tributaries are also being modelled, will different storm durations need to be considered / tested?

Software to be used:

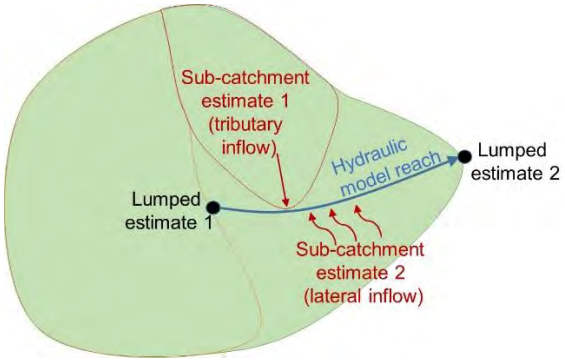
- See Section 1.2 of the Flood Estimation Guidelines
- Include version numbers
- Include software used for non-stationary analysis, if undertaken.

---

3. Locations where flood estimates are required

3.1 Summary of subject sites

- Include a map which shows the locations of the subject sites.
- Use site codes in all subsequent tables for clarity and to save space.
- Lumped catchments (L) are complete catchments draining to points at which design flows are required.
- Sub-catchments (S) are catchments or intervening areas that are being used as inputs to a distributed model. Details of these need to be included so that results can be fully reproduced and checked.
- This schematic diagram illustrates the difference between lumped and sub-catchment estimates:



Site code	Type of estimate: lumped (L) or sub-catchment (S)	Water-course	Site name / descrip-tion	Easting	Northing	AREA on FEH Web Service (km^2)	Revised AREA (if altered) (km^2)

3.2 Catchment Descriptors

Final catchment descriptors at each subject site:

- Include any changes made. Use **a different colour** to identify catchment descriptors which have been changed from the default values.

- Refer to Section 2.3 of the Flood Estimation Guidelines for suggestions on how to check and amend catchment descriptors. Any changes made must be recorded fully so that they can be checked and are reproducible.
- Include sub-catchments and intervening areas required for a distributed approach.

Site code	FARL	PROPWET	BFIHOST19	DPLBAR (km)	DPSBAR (m/km)	SAAR (mm)	URBEXT 1990	URBEXT 2000	FPEXT

Catchment boundary checks and revisions:

- Add maps if needed to aid explanation of any changes.

URBEXT source and method for updating:

- Explain the source of URBEXT used in the analysis (e.g., URBEXT1990, URBEXT2000, manually derived using URBAN50k). URBEXT1990 should only be used in ReFH1.
- If URBEXT values need to be substantially revised due to development or catchment boundary changes, see the URBAN50k method in Section 2.3 of the Flood Estimation Guidelines.
- Default URBEXT1990 and URBEXT2000 values should always be updated to the current year. Explain what method has been used (e.g., CPRE formula, manual derivation) and where (e.g., edited catchment descriptor files, updated within WinFAP software, updated within ReFH2 software).

BFIHOST source, checks and updates:

- BFIHOST19 should be used in the ReFH2 calculations, since the current release (ReFH2.3) was calibrated using BFIHOST19, and also in the FEH Statistical method, since this has been found to improve the results.
- Soil association maps can be used to check BFIHOST values, especially if significant changes have been made to catchment boundaries. Any changes made must be recorded fully so that they can be checked and are reproducible.
- If using other BFIHOST data, explain what has been used, why, and how it has been derived.

Checks and revisions to other catchment descriptors:

- Refer to Section 2.3 of the Flood Estimation Guidelines for suggestions on how to check and amend catchment descriptors.
- Any changes made must be recorded fully so that they can be checked and are reproducible.
- Include before and after tables if appropriate.

---

4. Stationary statistical methods

4.1 Method overview

What is the purpose of applying these methods?

- Include a brief summary of the reasons, specific to this study, for applying the method. *e.g., lumped estimates at key locations for the purpose of checking modelled peak flow estimates.*

What methods will be used to estimate QMED and growth curves?

- Include a brief summary of what methods will be used at which subject sites.
- More than one method may be tested at each site (e.g., comparing single site and pooled growth curves at a gauged site).
- Include all methods tested, even those ultimately rejected.

Site code	Methods used for QMED	Methods used for growth curves

4.2 Estimating QMED

QMED at gauged subject sites:

- See Section 4.2 of the Flood Estimation Guidelines.
- When QMED is estimated from short records (less than 14 years), it should also be adjusted for climatic variation. Refer to FEH Volume 3, chapter 20. Provide full details of the adjustment in the appendix.
- If you estimate QMED from peaks-over-threshold (POT) or low flow duration curve statistics (LF), add sufficient details in the appendix of the data sources and calculations to allow these to be fully reproduced.
- More than one method may be used at each site. Use a different row for each method.

Site code	Method (AM/ POT/LF)	Initial QMED (m^3/s)	Number of water years of data used	Adjustment for climatic variation?	Final QMED (m^3/s)

Methods: AM – Annual maxima; POT – Peaks over threshold; LF – Low flow (flow duration curve) statistics.

QMED at ungauged subject sites:

- See Section 4.2 of the Flood Estimation Guidelines.
- Only fill in the cells needed.
- If you estimate QMED from bankfull channel width, add sufficient details in the appendix of the data sources and calculations to allow these to be fully reproduced.
- More than one method may be used at each site. Use a different row for each method.

Site code	Method (CD/ DT/BCW)	Initial QMED (rural) from CDs (m^3/s)	Donors used (NRFA numbers)	Donor distances from subject centroid (km)	Individual donor weights	Combined and weighted donor adjustment factor	Urban adjustment factor	Final QMED (m^3/s)

Methods: CD - Catchment descriptors alone; DT - catchment descriptors with donor transfer; BCW - catchment descriptors with bankfull channel width.

Urban adjustment of QMED:

- List the method used for urban adjustment of subject and donor sites, if applicable (e.g., Kjeldsen (2010), WinFAP v4, WinFAP v5).
- List the parameters used for the urban adjustment. The standard values are listed below, and any amendments must be explained.
    - Impervious fraction for built-up areas, IF: 0.3
    - Percentage runoff for impervious surfaces, PR_{imp}: 70%
    - Method for calculating fractional urban cover, URBAN: updated URBEXT 2000

Search for donor sites:

- Provide details regarding how potential donors were selected and the reasons why they were chosen / rejected.
- Include a map if helpful, which shows the location of the study catchment and donor stations under consideration.
- Section 4.2 of the Flood Estimation Guidelines provides guidance on selecting a donor(s) for data transfer.
- Consider using POT and low flow stations as donors, especially if used as gauged subject sites.
- If using WinFAP to search for donor sites: the default URBEXT2000 threshold value for donors in WinFAP v5 is 0.03. Explain if you have changed the threshold, for example to enable a more urbanised donor site to be used.

Donor sites chosen and QMED adjustment factors:

- See Section 4.2 of the Flood Estimation Guidelines.
- When QMED is estimated from short records (less than 14 years), it should also be adjusted for climatic variation. Refer to FEH Volume 3, chapter 20. Provide full details of the adjustment in the appendix.
- If you estimate QMED from flow duration curve statistics (LF), add sufficient details in the appendix of the data sources and calculations to allow these to be fully reproduced.
- QMED from catchment descriptors is the 'as rural' value, i.e., with no urban adjustment factor applied. For urban donors, record whether and how the observed value of QMED has been "de-urbanised" for comparison with the as-rural estimate from catchment descriptors.
- The adjustment ratio in the table below is the adjustment in full, with no distance factor applied.

NRFA no.	Method (AM/ POT/LF)	Adjustment for climatic variation?	QMED from flow data (m^3/s)	De-urbanised QMED from flow data (m^3/s) (A)	QMED from catchment descriptors (m^3/s) (B)	Adjustment ratio (A/B)

Methods: AM – Annual maxima; POT – Peaks over threshold; LF – Low flow (flow duration curve) statistics.

4.3 Estimating growth curves

Derivation of growth curves at subject sites:

- See the Flood Estimation Guidelines Section 4.2.
- List all flood growth curves compared, including those ultimately rejected.
- If using historical methods, provide full calculation details in the appendix.
- An individual urban adjustment should be applied even if the same pooling group (including enhanced single-site analysis) has been applied to several sites, as each site is likely to have a different URBEXT2000 value and hence a different urban adjustment.
- A non-flood years adjustment (previously known as the “permeable” adjustment) should be considered if there are non-flood years in the stations in the pooling group that may make a significant difference to the results. Adjustments to remove the influence of non-flood years are carried out using the method in FEH Volume 3, chapter 19. This is valid only for the GLO distribution.
- More than one method may be used at each site. Use a different row for each method.
- Edit the list of methods if any alternatives were used and highlight the changes made.

Site code	Method (SS, P, ESS, H.)	If P or ESS, name of pooling group	Distribution used and reason for choice	Any urban or non-flood years adjustments	Parameters of distribution (location, scale and shape after adjustments)	Growth factor for 100-year return period

Methods: SS - Single Site; P - Pooled; ESS - Enhanced Single Site; H - Historical. Pooled and ESS growth curves were derived using the procedures from Science Report SC050050 (2008). Urban adjustments are carried out using the method of Kjeldsen (2010).

Flood frequency curve plots:

- Any relevant frequency plots, particularly showing any comparisons between single-site, enhanced single-site, and pooled growth curves (including flood peak data on the plot), should be shown here.

Derivation of pooling groups:

- Try to use as few groups as possible, this avoids step changes in flow estimates between flow estimation points for catchment-wide studies.
- Section 4.2 of the Flood Estimation Guidelines provides further details on reviewing pooling groups.
- Provide initial and final pooling group compositions in the appendix.
- If you increase the URBEXT2000 threshold from the default value of 0.03, include a justification and compare the results with those from an all-rural pooling group.
- L-moments are deurbanised by default in WinFAP v5.

Name of group	Site code from whose descriptors group was derived	Subject site treated as gauged? (ESS)	URBEXT2000 threshold applied to pooling group selection?	L-moments deurbanised (including subject site for ESS)?	Small catchment pooling procedure applied?

Methods: Unless otherwise stated, pooling groups were derived using the procedures from Science Report SC050050 (2008). The small catchment pooling procedure is given in the report on Phase 2 of project SC090031 (2021) and implemented in WINFAP v5.

Pooling group composition:

- If no changes were made, just say "none", although it is helpful to provide details of stations which were investigated even if they were ultimately retained.
- Provide original and final pooling group compositions in the appendix.
- Weighted L-moments should be the pooling group L-CV and L-Skew, after any changes were made to composition, but before any urban or non-flood years adjustments.

Name of group	Changes made to default pooling group, with reasons	Weighted average L-moments

4.4 Final choice of QMED and growth curves

Method choice and reasons:

- Record your final choices of method for QMED and growth curves.
- Consider spatial consistency. Check values to ensure they are consistent with observations at upstream or downstream gauging stations. In some situations, using the data transfer method and switching between pooling groups can lead to unrealistic step changes. See Flood Estimation Guidelines Section 4.2.

Site code	Final choice of QMED and reasons	Final choice of flood growth curve method and reasons

Final flood estimates from stationary statistical methods:

- Add or remove columns as needed to change the return periods to those used in the study.

Site code	2 50%	5 20%	10 10%	20 5%	30 3.3%	50 2%	75 1.3%	100 1%	200 0.5%	1000 0.1%

Flood peak in m^3/s for the return periods in years or AEP (%) events.

5. Non-stationary statistical methods

5.1 Method Overview

What is the purpose of applying these methods?

- Include a brief summary of the reasons, specific to this study, for applying the method. Refer to the Flood Estimation Guidelines Section 4.1 for guidance on when to consider non-stationary methods.

e.g., appraisal of fluvial flood alleviation scheme or FCERM strategy study; data considered to be potentially non-stationary.

What methods will be used?

- Include a brief summary of what methods will be used at which subject sites. Include all methods tested, even those ultimately rejected.
- Non-stationary methods can only be applied at gauged sites, but results could be transferred to nearby non-gauged sites as a donor.
- If using software other than the "nonstat" R Package, give details of how the methods were implemented and references.

Site code	If ungauged, which gauging station is being used?	Methods used to test for trends and change points	Methods used for non-stationary frequency analysis

5.2 Testing for trends and change points

- You can also use the Environment Agency's scoping template for non-stationary methods (LIT 56492) to record tests for trends and change points. Include this in the appendix and summarise findings below.

Non-parametric trend tests:

- The Mann-Kendall test is commonly used, but you may wish to consider other tests too.
- Tests can be sensitive to the start and end year of the timeseries. Consider testing a range of start and end years within the dataset (multi-temporal trend testing).
- Describe what tests have been carried out and their results. Include tables of results and plots.

Step change tests:

- The PELT and PETTITT tests are commonly used, but you may wish to consider other tests too.
- Describe what tests have been carried out and their results. Include tables of results and plots.

Split sample tests:

- The Mann-Whitney and Browne-Forsythe tests are commonly used, but you may wish to consider other tests too.
- Describe what tests have been carried out and their results. Include tables of results and plots if available.

Interpretation and conclusions:

- Consider:
    - Statistical and practical significance of any trends or change points.
    - If there is evidence of non-stationarity that the non-parametric tests have not detected (e.g., increases in the variance of the AMAX floods).
    - If there are any known or suspected physical reasons for trends or change points.
    - Spatial consistency between gauges. Results may not be spatially consistent if different time periods are being analysed, or if the cause of trends affects locations differently.
- Conclude whether non-stationary is suspected and whether a non-stationary frequency analysis is required.

5.3 Non-stationary frequency analysis

Selection of covariates:

- Consider using water year, climatic variables (e.g., annual or seasonal rainfall, North Atlantic Oscillation), and/or land cover variables (e.g., a timeseries of urban extent).
- Record which covariates have been used and why, including those ultimately rejected.
- Explain how physical covariates have been derived and include links to your sources of data. Data timeseries should be included in the appendix.

Fitting non-stationary models:

- Explain your choice of distribution and which parameters (scale, location, or both) were allowed to vary.
- Include tables of results and plots for all models tested, including those ultimately rejected.
- Describe the preferred statistical model and explain how it was chosen. It may be a stationary or a non-stationary model. Include statistical measures, hydrological reasoning, consistency across sites, visual inspection of P-P and Q-Q plots, confidence intervals and comparison with peak flow data.

Interpretation and conclusions:

- Explain what results have been extracted from the preferred model e.g., conditional flow estimates with time as covariate, integrated flow estimates applicable over the period of record, single-year flow estimates.
- Explain how these results should be understood and applied e.g., over which period of time.
- Explain how results should be adjusted for future climate change.
- What are the implications for any ungauged locations?

Final flood estimates from non-stationary statistical methods:

- Add or remove columns as needed to change the return periods to those used in this study.

Site code	2 50%	5 20%	10 10%	20 5%	30 3.3%	50 2%	75 1.3%	100 1%	200 0.5%	1000 0.1%

Flood peak in m^3/s for the return periods in years or AEP (%) events.

6. Revitalised flood hydrograph (ReFH1) method

6.1 Method Overview

What is the purpose of applying this method?

- Include a brief summary of the reasons, specific to this study, for applying the method.

e.g., lumped estimates at key locations for the purpose of checking modelled peak flow estimates, distributed approach to apply inflows to a hydraulic model, deriving hydrograph shapes only, extending the flood frequency curve out to extreme events (long return periods).

Rural and urban catchment sub-divisions:

- This section can be deleted if the catchment is essentially rural.
- If the catchment is urban:
    - Did you calculate paved areas using a method other than from URBEXT using the standard equations?
    - Did you allow for transfer of water via sewers across the topographic catchment boundary?

- If yes to either of these questions provide details which give sufficient information to understand the process applied and any assumptions made. It may be useful to include a map of sub-catchments here, if not provided earlier in the report.

6.2 Model Parameters

Summary of model parameters:

- List parameters for all site codes, including intervening areas and sub-catchments. Only include urban parameters Tp_{urban} and PR_{imp} where urban subdivisions are being used.
- Include a brief summary of what methods will be used at which subject sites. See Section 4.3 of the Flood Estimation Guidelines.
- More than one method may be tested at each site. Include all methods tested, even those ultimately rejected.
- If applying the method in Flood Modeller Pro, Tp_{urban} values are not directly specified by the user; the model works them out from the supplied URBEXT, DPLBAR, etc. It is simpler just to report Tp_{urban} rather than separate URBEXT, etc, values for rural and urban portions.

Site code	Method	Tp (hours) rural	Tp (hours) urban	Cmax (mm)	BL (hours)	BR	PR_{imp} %

Methods: OPT: Optimisation from event analysis, BR: Baseflow recession fitting, LAG: TP from lag analysis, CD: Catchment descriptors, DT: Data transfer, CAL: model calibration.

Analysis undertaken to derive model parameters:

- For any methods other than catchment descriptors, provide a description here and include full calculation details in the appendix.

6.3 Model inputs for design events

- Model inputs include rainfall data and initial conditions. These are a complete package and should only be amended in some circumstances. See Section 4.3 of the Flood Estimation Guidelines.
- ReFH may be applied for both lumped catchments and sub-catchments in a study. Different design events will be needed when considering lumped and sub-catchment sites. Complete the relevant sections as appropriate for your study.

Design events for lumped catchments:

- Storm durations detailed here should be the values for the individual catchments. Lumped flows should be generated using the storm duration relevant to each lumped catchment.
- Cini and BFO values only need to be listed if amended from default values.
- This section can be deleted if ReFH is not being applied for lumped catchments.

Site code	Rainfall DDF model	Urban or rural	Season of design event	Storm duration (hrs)	Initial soil moisture Cini	Initial baseflow BFO
	e.g., FEH13	*e.g., rural*	*e.g., winter*	*e.g., 7 hrs*	*e.g., default value*	*e.g., default value*

Design events for subcatchments and intervening areas:

- This table can be deleted if ReFH is not being applied for sub-catchments.
- This table is included to identify the storm which will be applied to all inflows to a distributed model (see Section 6.1 of the Flood Estimation Guidelines) and avoid the scenario of using a different storm for each inflow to the model.
- If there are multiple flood risk areas throughout the model it may be necessary to allow for different storms in different parts of the model by carrying out multiple runs. Each model run should use the same storm applied to all inflows.
- Use one row for each storm to be applied. If only one storm is to be applied, delete the additional rows.

Site code(s)	Rainfall DDF model	Season of design event	Storm duration (hrs)	Storm area for ARF	Areal reduction factor (ARF)	Reason for selecting storm
e.g., All	*e.g., FEH13*	*e.g., winter*	*e.g., 7 hrs*	*e.g., 120 km2*	*e.g., 0.98*	*e.g., Critical storm for Town X*

Storm duration testing:

- If storm duration testing using the hydraulic model is being undertaken add details of the results, for example, which duration(s) has been selected and why, what the process will be in terms of presenting model results if more than one duration is selected.

6.4 Final choice of ReFH1 flow estimates

Method choice and reasons:

- Record your final choices of method for model parameters and design inputs.
- You may have multiple choices of methods for lumped and distributed modelling.

Site code	Final choice of design inputs and model parameters
	e.g., model parameters from catchment descriptors with TP from lag analysis, critical storm duration 12 hours for distributed modelling and 8 hours for lumped catchment analysis

Final flood estimates from ReFH1 method:

- Add or remove columns as needed to change the return periods to those used in this study.
- Results only need to be provided here for lumped catchments, for comparison to other methods. Results for distributed catchments can be provided digitally but must still be provided to allow for checking.
- If you have modelled a catchment as urban, make sure you record the urbanised flows rather than the as-rural flows.

Site code	2 50%	5 20%	10 10%	20 5%	30 3.3%	50 2%	75 1.3%	100 1%	200 0.5%	1000 0.1%

Flood peak in m^3/s for the return periods in years or AEP (%) events.

7. Revitalised flood hydrograph 2 (ReFH2) method

7.1 Method Overview

What is the purpose of applying this method?

- Include a brief summary of the reasons, specific to this study, for applying the method.

e.g., lumped estimates at key locations for the purpose of checking modelled peak flow estimates, distributed approach to apply inflows to a hydraulic model, deriving hydrograph shapes only, extending the flood frequency curve out to extreme events (long return periods).

Rural and urban catchment sub-divisions:

- This section can be deleted if the catchment is essentially rural.
- If the catchment is urban:
    - Did you calculate paved areas using a method other than from URBEXT using the standard equations?
    - Did you allow for transfer of water via sewers across the topographic catchment boundary?

- If yes to either of these questions provide details which give sufficient information to understand the process applied and any assumptions made. It may be useful to include a map of sub-catchments here, if not provided earlier in the report.

Version of ReFH2 applied:

- Note which version of the ReFH2 model is being applied, change the example text below if needed.

e.g., ReFH2.3-FEH13 using the water balance option.

7.2 Model Parameters

Summary of model parameters:

- List parameters for all site codes, including intervening areas and sub-catchments.
- Include a brief summary of what methods will be used at which subject sites. See Section 4.3 of the Flood Estimation Guidelines.

- More than one method may be tested at each site. Include all methods tested, even those ultimately rejected.
- See the Flood Estimation Guidelines for recommended approaches for modelling urbanised catchments. You only need to provide the urban area, TP urban scaling factor, IF, IRF and DS parameters if modelling as urbanised.
- ReFH2 treats BR (baseflow recharge) as a state variable rather than a parameter, setting it automatically in order to conserve volume. The values of BR vary with return period and so are not reported here.

Site code	Method	Tp (hours) rural	Cmax (mm)	BL (hours)	Area modelled as urban (km2)	TP urban scaling factor	IF	IRF	DS

Methods: OPT: Optimisation from event analysis, BR: Baseflow recession fitting, LAG: TP from lag analysis, CD: Catchment descriptors, DT: Data transfer, CAL: model calibration.

Analysis undertaken to derive model parameters:

- For any methods other than catchment descriptors, provide a description here and include full calculation details in the appendix.

7.3 Model inputs for design events

- Model inputs include rainfall data and initial conditions. These are a complete package and should only be amended in some circumstances. See Section 4.3 of the Flood Estimation Guidelines.
- ReFH2 may be applied for both lumped catchments and sub-catchments in a study. Different design events will be needed when considering lumped and sub-catchment sites. Complete the relevant sections as appropriate for your study.

Design events for lumped catchments:

- Storm durations detailed here should be the values for the individual catchments. Lumped flows should be generated using the storm duration relevant to each lumped catchment.
- A summer storm should be used if the catchment is heavily urbanised (URBEXT2000 between 0.15 and 0.3) AND highly permeable (BFIHOST19>0.65).
- Cini and BFO values only need to be listed if amended from default values.

- This section can be deleted if ReFH2 is not being applied for lumped catchments.

Site code	Rainfall DDF model	Urban or rural	Highly permeable?	Season of design event	Storm duration (hrs)	Initial soil moisture Cini	Initial baseflow BFO
	e.g., FEH13	*e.g., rural*		*e.g., winter*	*e.g., 7 hrs*	*e.g., default value*	*e.g., default value*

Design events for subcatchments and intervening areas:

- This table can be deleted if ReFH2 is not being applied for sub-catchments.
- This table is included to identify the storm which will be applied to all inflows to a distributed model (see Section 6.1 of the Flood Estimation Guidelines) and avoid the scenario of using a different storm for each inflow to the model.
- If there are multiple flood risk areas throughout the model it may be necessary to allow for different storms in different parts of the model by carrying out multiple runs. Each model run should use the same storm applied to all inflows.
- Use one row for each storm to be applied. If only one storm is to be applied, delete the additional rows.

Site code(s)	Rainfall DDF model	Season of design event	Storm duration (hrs)	Storm area for ARF	Areal reduction factor ARF	Reason for selecting storm
e.g., All	*e.g., FEH13*	*e.g., winter*	*e.g., 7 hrs*	*e.g., 120 km2*	*e.g., 0.98*	*Critical storm for Town X*

Storm duration testing:

- If storm duration testing using the hydraulic model is being undertaken add details of the results, for example, which duration(s) has been selected and why, what the process will be in terms of presenting model results if more than one duration is selected.

7.4 Final choice of ReFH2 flow estimates

Method choice and reasons:

- Record your final choices of method for model parameters and design inputs. You may have multiple choices of methods for lumped and distributed modelling.

Site code	Final choice of design inputs and model parameters
	e.g., model parameters from catchment descriptors with TP from lag analysis, critical storm duration 12 hours for distributed modelling and 8 hours for lumped catchment analysis

Final flood estimates from ReFH2 method:

- Add or remove columns as needed to change the return periods to those used in this study.
- Results only need to be provided here for lumped catchments, for comparison to other methods. Results for distributed catchments can be provided digitally but must still be provided to allow for checking.
- If you have modelled a catchment as urban, make sure you record the urbanised flows rather than the as-rural flows.

Site code	2 50%	5 20%	10 10%	20 5%	30 3.3%	50 2%	75 1.3%	100 1%	200 0.5%	1000 0.1%

Flood peak in m^3/s for the return periods in years or AEP (%) events.

8. Other Rainfall-Runoff or Hydrograph Methods

- Use this section to include information on any other rainfall-runoff or hydrograph methods. Some examples are included below. Add or remove sections as needed. Provide full calculation details so that your workings are explained and reproducible.

8.1 Averaged Hydrograph Shapes

- You may be able to derive hydrograph shapes from gauged data, by averaging the hydrographs of major events, standardised by their peaks.
- See the Flood Estimation Guidelines section on hybrid methods for more details.

8.2 FSR-FEH Rainfall-Runoff Method

- The FSR/FEH rainfall-runoff method has been superseded by the ReFH methods in most cases. However, it may still be chosen in some applications, for example for reservoir safety studies or pumped catchments. See the Flood Estimation Guidelines for more details on these applications.

8.3 Direct Rainfall Modelling

- Direct rainfall modelling may be favoured in circumstances where flooding is generated mainly by overland run-off, for example in urbanised areas where surfaces are mostly impermeable.
- Refer to Section 6.2 of the Flood Estimation Guidelines for further guidance on direct rainfall modelling.

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9. Discussion and summary of results

9.1 Comparison of results from different methods

- Compare peak flows from preferred methods at key sites for selected return periods / AEP events.
- Adapt the table column headers to the methods and return periods you want to compare.

Site code	*e.g., Ratio of ReFH2 to stationary statistical peak, 50% AEP*	*e.g., Ratio of ReFH2 to stationary statistical peak, 1% AEP*	*Add other comparisons to additional columns*

9.2 Final choice of method

Choice of method and reasons:

- Include reference to type of study, nature of catchment and type of data available.
- If different methods are chosen for different site codes or return periods, explain why.

How will the 0.1% AEP flows be estimated?

- You may choose a different method for the 0.1% AEP event (see Section 6.6 of the Flood Estimation Guidelines). Explain how growth factors and peak flows have been calculated, if using a hybrid method.

How will the flows be applied to a hydraulic model?

- For example, will model inflows be adjusted to achieve a match with lumped flow estimates, or will the model be allowed to route inflows?

9.3 Final results

- Provide the final peak flow results here for all flow estimation points and design events, and give any other data or results needed for the next stage of the study.

- Include subcatchment and intervening catchment flows here or in digital files, to allow checking of the hydraulic model.
- If scaling factors have been used in a distributed model, provide full details of the original and final flows below or in the appendix.

Site code	2 50%	5 20%	10 10%	20 5%	30 3.3%	50 2%	75 1.3%	100 1%	200 0.5%	1000 0.1%

Flood peak in m^3/s for the return periods in years or AEP (%) events.

Design storms applied in the hydraulic model:

- Use this section if appropriate to record the ReFH1 or ReFH2 design storm parameters applied in the hydraulic model, if they are different to those recorded in the ReFH1 and ReFH2 sections of this report.
- You must apply a uniform storm duration and areal reduction factor across all subcatchments. Refer to the Flood Estimation Guidelines Section 6.1. This may result in a number of different design storms being modelled to give critical results at different locations in the catchment. List all details below.

Site code(s)	Season of design event	Storm duration (hrs)	Storm area for ARF (km2)	Return period(s)	Reason for selecting storm
e.g., All	*e.g., Winter*	*e.g., 6.5*	*e.g., 151*	*e.g., 2, 10, 50, 100*	*e.g., Town X*

Climate change allowances:

- Refer to online guidance on climate change allowances for flood risk assessments and projects.
- Provide information on:
    - What climate change allowances have been applied, *e.g., rainfall and/or flow allowances, source of data, river basin, epoch, and percentiles.*
    - How the climate change allowances have been applied, *e.g., applied to rainfall / flow hydrographs within the hydraulic modelling software using scaling factors.*

- For non-stationary methods, refer to the practitioner guidance available on the FCERM R&D web page and provide full details and justification for the approach chosen.

9.4 Checks

- See Section 3.5 of the Flood Estimation Guidelines.
- These checks are important as a way of ensuring that everything has been considered and that the results are sensible.
- All relevant sections should be completed for every study. Where sections are not relevant (where there are no flow gauges or previous studies, for example) a comment should be added to this effect rather than leaving a blank space.

Growth factor checks:

- What is the range of 1% AEP (100-year) growth factors? Is this realistic?
- What is the range of ratios for the 0.1% AEP (1000-year) over 1% AEP (100-year) flow?
- What reasons are there for variations in ratios between sites?

Site code	1% AEP growth factor	0.1% AEP / 1% AEP ratio

Specific discharge:

- What specific discharge (flow in l/s/ha) do the results equate to? Can you explain variations in specific discharges between different locations across the study area?

Site code	2 50%	5 20%	10 10%	20 5%	30 3.3%	50 2%	75 1.3%	100 1%	200 0.5%	1000 0.1%

Flood peak in l/s/ha for the return periods in years or AEP (%) events.

Spatial consistency of results:

- This will not be relevant for a study where there is only a single flow estimation point.

- See Section 6.1 of the Flood Estimation Guidelines. FEH methods are intended for application at individual sites and may not give spatially consistent results if applied to multiple sites along a river system.
- You should particularly check for consistency between upstream and downstream points and at confluences.

Return periods for notable historic floods:

- What do the results imply regarding the return periods / frequency of major events in the gauged record? This can help justify the choice of flood growth curve.
- If there is no flow data available, you can compare your design event hydraulic modelling results to observed level and flood extent data if available for major events.

Compatibility with longer-term flood history:

- Consider whether the implied frequency of flooding from your design event hydraulic modelling results is compatible with what is known of the flood history of the study area.

Comparisons with previous studies:

- Explain any differences and conclude which results should be preferred.
- This will not be relevant if there are no previous hydrological assessments.

Checks on hydraulic model results:

- Are flows generated by the hydraulic model consistent with those estimated from a lumped catchment FEH estimate at locations within the model reach?
- Have any scaling factors been applied to reconcile model results to the preferred flow estimates?

9.5 Assumptions, limitations, and uncertainty

- Careful thought should be put into identifying the specific assumptions and limitations applicable to the design peak flow estimates (and design hydrographs).
- Assessing and reporting on the uncertainty in the estimates is also very important.
- These sections should be completed for every study and never left blank.

Assumptions (specific to this study):

- See Section 5.2 of the Flood Estimation Guidelines.

- Assumptions should be specific to the study, have a large effect on the results, and can be tested. General assumptions do not need listing.

Limitations:

- See Section 5.3 of the Flood Estimation Guidelines.
- This could include applying methods outside of the range of catchment characteristics or return periods for which they were developed.

Uncertainty:

- See Section 5.4 of the Flood Estimation Guidelines.
- Uncertainties in the peak flow estimates should always be quantified if it is possible to do so for the method applied.
- Note that the confidence limits given in the Flood Estimation Guidelines assume that the AMAX flows follow a generalised logistic distribution. If you have fitted a different distribution, these confidence limits will not be applicable.
- Complete the table with flows from the uncertainty analysis. The default is the 95th percentile upper and lower bounds, but other estimates may need to be provided depending on the requirements of the study.

Site code	50% AEP Lower 95%	50% AEP Upper 95%	5% AEP Lower 95%	5% AEP Upper 95%	1% AEP Lower 95%	1% AEP Upper 95%	0.1% AEP Lower 95%	0.1% AEP Upper 95%

Upper and lower 95% confidence bounds for the flood peak in m^3/s for the AEP (%) events.

Suitability of results for future studies:

- With reference to the assumptions, limitations and uncertainties, comment on the suitability of these calculations for future studies, e.g., at nearby locations, or for different purposes such as detailed scheme design.

Recommendations for future work:

- Make recommendations for how assumptions, limitations and uncertainties could be reduced in future work, for example flow monitoring, rating reviews, etc.

10. Appendix

10.1 Digital files

- If you are submitting work commissioned by the Environment Agency or for review by the Environment Agency, you should be prepared to submit as digital files your input data, output data and project files (where these exist) from the software you have used in the flood estimation. Refer to Section 8.5 of the Flood Estimation Guidelines.
- Use this section to list the files you are submitting, if relevant.

Input data:

Project or calculation files:

Output data:

10.2 Other Supporting Information

- Include any additional information which best sits here rather than in the section text, for example, flood peak series, details of historical flood events, rating reviews, pooling groups, or details of flood event analysis. Include important information in the section text, for example, comparison of growth curves, or results of flood event analysis.

Kathryn Williams
Brentwood Borough Council
Development Control
Council Offices Ingrave Road
Brentwood
Essex
CM15 8AY

Our ref: AE/2023/128907/01-L01
Your ref: 23/01164/FUL

Date: 08 November 2023

Dear Kathryn

HYBRID PLANNING APPLICATION FOR 344 UNITS INCLUDING 35% AFFORDABLE HOUSING, SAFEGUARDED LAND FOR A 2FE PRIMARY SCHOOL AND EARLY YEARS FACILITY, PUBLIC OPEN SPACE AND ASSOCIATED LANDSCAPING, DRAINAGE AND HIGHWAYS INFRASTRUCTURE

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Your authority should ensure that the local Water Recycling Centre has sufficient capacity to accept foul drainage from the proposed development to ensure protection of the water environment including WFD waterbodies.

Residential

The location of this development is in an area of serious water stress (as identified in our report Water stressed areas - final classification). Across East Anglia we are also concerned that the rivers and groundwater, including chalk streams, are vulnerable to deterioration under Water Framework Directive, from groundwater abstraction. As a minimum, the higher standard of a maximum of 110 litres per person per day should be applied to this development as set out in the the Building Regulations &c. (Amendment) Regulations 2015. This standard is already a requirement of Policy BE03 (Carbon Reduction, Renewable Energy and Water Efficiency) of the emerging Local Plan and can be checked by Local Planning Authorities Building Regulations teams for compliance. However, the applicant should consider if a higher standard of water efficiency could be achieved, looking at all options including rainwater harvesting and greywater systems.

Should the development be permitted, we would expect you to ensure that the new buildings meet the highest levels of water efficiency standards, as per the policies in the adopted local plan.

Advice to applicant

Research has shown that it could cost as little as £6-9 per home to reach the more ambitious level of 110l/p/d. In addition, building water efficiency measures in to the development will lead to a reduction in water bills.

Using the water efficiency calculator in Part G of the Building Regulations a developer can calculate the devices and fittings required to ensure a home is built to the right

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specifications to meet the 110 requirement. The calculator can be found here: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/504207/BR_PDF_AD_G_2015_with_2016_amendments.pdf

Kathryn Williams
Brentwood Borough Council
Development Control
Council Offices Ingrave Road
Brentwood
Essex
CM15 8AY

Our ref: AE/2023/128907/02-L01
Your ref: 23/01164/FUL

Date: 13 February 2024

Dear Kathryn

HYBRID PLANNING APPLICATION FOR 344 UNITS INCLUDING 35% AFFORDABLE HOUSING, SAFEGUARDED LAND FOR A 2FE PRIMARY SCHOOL AND EARLY YEARS FACILITY, PUBLIC OPEN SPACE AND ASSOCIATED LANDSCAPING, DRAINAGE AND HIGHWAYS INFRASTRUCTURE

LAND NORTH OF SHENFIELD ALEXANDER LANE SHENFIELD ESSEX

Thank you for the consultation dated 23 January 2024. We have reviewed the documents as submitted and are maintaining our objection to this proposal.

Our previous response raised two main objection points. One related to Flood Risk Models, with the other relating to the culverting design. We can confirm we are removing the culverted related objection, but maintaining the Flood Risk Models objection until the below concerns are met. Further information can be found below.

Please see the documentation attached. This relates to the models we reviewed and is relevant to our response.

Flood Risk

We are maintaining our objection to this development until the flood risk concerns outlined below have been addressed.

Bespoke Flood Risk Modelling

The applicant submitted their bespoke flood risk modelling to us which has subsequently undergone a detailed review. This review determined that there were a number of issues with the quality of modelling which need to be resolved before the we can consider it appropriate for use as evidence to support a planning application. Please see details for how to address these issues below.

Overcoming our Objection

Amend the Flood Risk Modelling

The Flood Risk Modelling should be amended as detailed in the model review feedback. Please see the 3 attachments alongside this response.

For the applicant's flood risk modelling to be considered acceptable for use in planning, they must address all 'red' and 'amber' actions as detailed in the attached spreadsheets. Amendments must be made to both the hydrology and the hydraulic model (see the separate spreadsheets). In particular, key issues identified in the review include the following.

Please be aware this list is not exhaustive, and the applicant must address all actions identified in the review sheets:

- The applicant should provide some survey or proposed design drawings associated with the proposed development, particularly aspects which are likely to influence flood extents and depths such as the new Shenfield Watercourse Crossing. Without survey or drawings, we are unable to check that the structure has been modelled appropriately thereby limiting our confidence in the post-development model outputs.

- More information is required to justify and explain how adjustments to the model DTM have been defined.

- More information is required on the hydrology calculations and the final inflows used within the model as these do not appear to match the peak flow estimates in the reporting.

- There is some uncertainty around how 1D structures have been modelled – more information is required to ensure a full review can be undertaken.

- Are there any recorded flood extents or anecdotal/historical evidence of the site flooding that can be used to verify the model outputs and give further confidence in the peak flow estimates?

- The applicant should provide wet/dry comparison plots to enable us to fully review the flood risk associated with the development.

With regard to the hydrology review, it is recommended that the applicant studies the Environment Agency's Flood Estimation Guidelines and considers using the Flood Estimation Report template when updating their hydrology (attached). This template contains all of the information that the Agency's reviewers would expect to see accompanying a Flood Risk Assessment and we would advise that this is used to ensure there is sufficient reporting on the hydrological calculations.

Next steps

Once the applicant has amended their flood risk modelling and re-submitted, we will conduct a follow-up review to ensure all of the 'red' and 'amber' actions have been adequately addressed. Once the model has been signed-off as appropriate for use in planning, the applicant should update their FRA to reflect any changes.

At this point, we wish to be reconsulted to assess whether the development has been designed to be safe from flooding without increasing flood risk elsewhere. If this cannot be achieved, we are likely to maintain our objection to the application. Please be aware

that the production of a suitable flood risk model and FRA will not in itself result in the removal of an objection.

Culverting

We had objections to the culverting with this proposal. This point of objection surrounded the development being unlikely to be granted a Flood Risk Activity Permit. The proposal included the installation of a new culvert in a main river which could have the potential to cause environmental harm and therefore not be granted a Flood Risk Activity Permit.

In response to this objection point, the applicant has submitted site-specific details regarding the proposed culvert for review. We have reviewed this evidence and have determined that a clear-span bridge in this location would not be a viable alternative, and that the culvert design would in fact be acceptable in this location.

As stated prior, this objection point is therefore removed.

Ecological Impacts

We have reviewed the design of the culvert from an ecological perspective and appreciate that the design of the culvert structure and understand that a clear span bridge is not a viable option in this location.

The series of culvert openings (c. 4 m long) should allow fish passage, specifically of eels, particularly with the addition of a more natural channel bed. It should also be passable for water voles and otters if they are present in the area. We can therefore remove our previous objection.

Therefore, we remove our objection relating to the design of the culvert on these grounds.

Flood Risk Activity Permitting (FRAP)

The applicant may need an environmental permit for flood risk activities if they want to do work in, under, over or within 8 metres (m) from a fluvial main river and from any flood defence structure or culvert or 16m from a tidal main river and from any flood defence structure or culvert.

Application forms and further information can be found at: https://www.gov.uk/guidance/flood-risk-activities-environmental-permits. Anyone carrying out these activities without a permit where one is required, is breaking the law.

Asset Maintenance

We'd like to emphasize that inspection, maintenance and ownership of the culverts will remain the responsibility of the landowner, and thereby the risks associated with being unable to discharge those responsibilities.

If you are minded to approve the application contrary to this advice, we request that you contact us to allow further discussion and/or representations from us in line with the Town and Country Planning (Consultation) (England) Direction 2009.

We trust this advice is useful.

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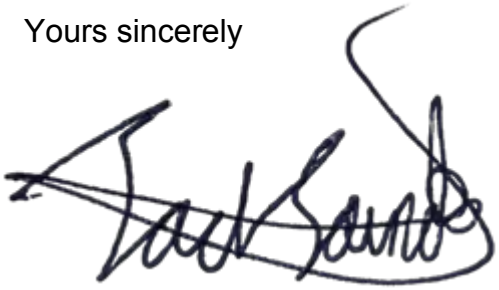
Yours sincerely



Mr Jack Saunders
Sustainable Places - Planning Advisor

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Team email: Planning.Eastanglia@environment-agency.gov.uk
Team phone number: 02030 255475

End

Kathryn Williams
Brentwood Borough Council
Development Control
Council Offices Ingrave Road
Brentwood
Essex
CM15 8AY

Our ref: AE/2023/128907/03-L01
Your ref: 23/01164/FUL

Date: 28 May 2024

Dear Kathryn

HYBRID PLANNING APPLICATION FOR 344 UNITS INCLUDING 35% AFFORDABLE HOUSING, SAFEGUARDED LAND FOR A 2FE PRIMARY SCHOOL AND EARLY YEARS FACILITY, PUBLIC OPEN SPACE AND ASSOCIATED LANDSCAPING, DRAINAGE AND HIGHWAYS INFRASTRUCTURE

LAND NORTH OF SHENFIELD ALEXANDER LANE SHENFIELD ESSEX

We refer to the updated model files which has now been submitted in support of this application. We have reviewed these files and reporting and are maintaining our objection on flood risk grounds as it does not adequately address the issues raised previously.

Further details are provided below, including the outstanding issues still to be addressed.

Flood Risk Models

Environment Agency detailed model review

Flood risk modelling undertaken by a third party has been used in support of this application and the Environment Agency has applied a risk-based approach to the assessment of this model. In this instance a detailed review has been carried out.

This is the 3rd review of this model that has been carried out. Please see a summary of our review comments below, with the full detailed review comments spreadsheets for the hydraulic model and hydrology provided along with this letter.

Hydraulic model review

Most of the issues previously identified have been addressed or justified.

For the proposed development scenario, there could do with improvements to their representation:

1) Levels used for access road at roundabout - no design drawing provided to confirm accuracy. However, the levels used to not tie in with existing road levels producing a 0.3m step. As the flooding is shown at this location, either justify the levels used or amend as necessary.

Cont/d..

2) Flow constriction layer approach is appropriate in principle. However, the current blockage applied/use of existing ground levels does not properly reflect the proposed design. Amend as necessary.

The points above appear to relate to Item 7.10 in the '2D Model Build' tab of the hydraulic model review spreadsheet which is a red action that needs to be addressed.

Hydrology model review

The addition of the FEH calculation record proforma has greatly helped. Most aspects previous marked amber or red are now satisfactory.

There are two outstanding issues that need to be addressed:

1) The fact that the pooling groups were derived without using the small catchments method, as raised on previous reviews. This point relates to Item 4.3.3 in the '4. Stationary statistical' tab of the hydrology review spreadsheet which is an red action that needs to be addressed.

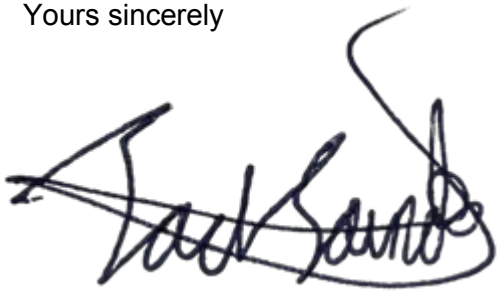
2) The decision to use a winter storm in ReFH2 despite the catchment that leads to most of the flood hazard being heavily urbanised. This point relates to Item 7.3.2 in the '7. ReFH2' tab of the hydrology review spreadsheet which is an amber action that needs to be addressed.

The hydraulic model and the hydrology are currently not suitable for use in planning purposes.

The Environment Agency has not undertaken a full assessment of the fitness for purpose of the modelling and can accept no liability for any errors or inadequacies in the model.

We trust this advice is useful.

Yours sincerely



Mr Jack Saunders
Sustainable Places - Planning Advisor

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Team phone number: 02030 255475

End

Kathryn Williams
Brentwood Borough Council
Development Control
Council Offices Ingrave Road
Brentwood
Essex
CM15 8AY

Our ref: AE/2023/128907/04-L01
Your ref: 23/01164/FUL

Date: 12 June 2024

Dear Kathryn

HYBRID PLANNING APPLICATION FOR 344 UNITS INCLUDING 35% AFFORDABLE HOUSING, SAFEGUARDED LAND FOR A 2FE PRIMARY SCHOOL AND EARLY YEARS FACILITY, PUBLIC OPEN SPACE AND ASSOCIATED LANDSCAPING, DRAINAGE AND HIGHWAYS INFRASTRUCTURE

LAND NORTH OF SHENFIELD ALEXANDER LANE SHENFIELD ESSEX

Thank you for all previous correspondence we've had regarding this application. We are removing our objection to the application and recommend that the following conditions are included in your decision. As per the National Planning Policy Framework, we would object to the application without these conditions included.

As stated in our previous response referenced AE/2023/128907/03 and dated 28 May 2024, the modelling undertaken was for the most part acceptable – although we did highlight that there were still some outstanding issues still to be addressed.

However, we deem it possible that these outstanding issues could be conditioned to ensure that both the modelling and flood risk assessment are completed to an acceptable standard before any works on the site commence.

Further information can be found in the Flood Risk section below.

Flood Risk

Recommended Planning Conditions

Condition 1

No development shall take place or commence until the outstanding issues relating to the flood risk modelling for the scheme have been approved in writing by the Environment Agency.

Reason for Condition 1

To appropriately model the impacts of flood risk related to the scheme which will form a basis for assessing the submitted Flood Risk Assessment.

Condition 2

Following the approval of the flood modelling, no development shall take place or commence until an updated Flood Risk Assessment (FRA) has been submitted to, and approved in writing by, the local planning authority and the Environment Agency. The FRA shall include a detailed design confirming levels used for the access road at the Chelmsford Road roundabout and the new crossing over the Shenfield Brook. The development shall be carried out in accordance with the approved flood risk assessment.

Reason for Condition 2

To reduce the risk of flooding to the proposed development and to prevent flooding elsewhere.

Condition 3

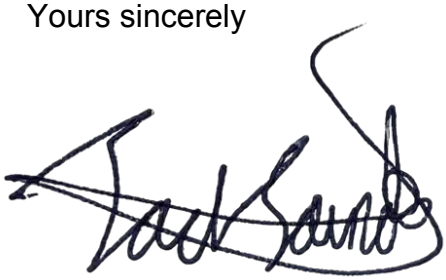
Prior to the completion of the development, a scheme to ensure the maintenance of the culverts at the Shenfield watercourse crossing will be submitted to, and approved in writing by, the local planning authority.

Reason for Condition 3

To reduce the risk of flooding to the proposed development and future users through culvert blockage.

We trust this advice is useful.

Yours sincerely



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Your ref: 23/01164/FUL

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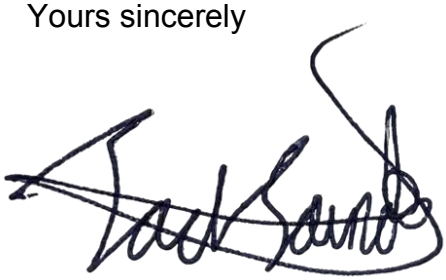

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End

Good aftern on,

Thank you for your email requesti g our comments on this applicati n. Please accept my apologies for the delay in responding. Unfortunately, due to capacity issues, we have not been able to provide our response yet. In addi on, I will be on annual leave for three weeks as of Monday 20 November. The earliest we can provide our full, detailed response would be during the week ending 15 December. I appreciate that this is late and may not be acceptable to you.

However, I have examined the Biodiversity Net Gain Assessment (Aspect Ecology) and can confirm that our positi n will be one of **objection**. This is due to the trading rules for hedgerows in the Defra Metric not being satis ed. The development will result in a signi cant net loss of hedgerow units. The BNG Assessment states:

> 5.1.2 In summary, the Metric calculates that the development will result in a net gain of 13.50 habitat units (16.33%) for habitat units, a net gain of 0.11 in hedgerow units (0.49%) and net gain of 0.57 watercourse units (22.35%) at the site.
>
> 5.1.4 The trading summary indicates that the rules are satisfied for habitats and the watercourse,
> albeit the hedgerow trading summary is not satisfied due to the loss of the very high and high distinctiveness hedgerows.

The permanent loss of very high and high dis nctiv ness hedgerows on a site which supports European protected species such as bats and hazel dormice is clearly not acceptable. In the current biodiversity crisis, it is imperati e that every effort is made to ensure that new developments are genuinely environmentally sustainable and do not result in the loss of priority habitats. It is our view that the current proposal is not environmentally sustainable and we advise that the masterplan should be reviewed. We believe that the number of houses proposed for the site has been over-estimate and the housing quantum assessment has not taken full account of the important habitats that need to be retained and protected.

We can provide a detailed response during w/e 15 December, as stated above. However, in the interim, I hope these brief comments will be of some assistance.

Kind regards,

Annie Gordon

16/11/23

Essex County
Fire & Rescue Service

Rick Hylton
Chief Fire Officer / Chief Executive

Brentwood Borough Council
Planning Department
Town Hall
Ingrave Road
Brentwood
Essex
CM15 8AY

South West Group Service Delivery Point
Basildon Fire Station
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SS14 1EH
Enquiries to : Garry Owles Fire Safety Officer

☎ 01376576700
✉ southwestgroupsdp@essex-fire.gov.uk
💻 www.essex-fire.gov.uk

Our Ref: 161051
Your Ref: 23/01164/FUL
Date: 9th November 2023

Dear Sir / Madam,

Town and Country Planning Act 1990
Town and Country Planning (Development Management Procedure) (England) Order 2015
The Essex Act 1987

Re: Land North of Shenfield Alexander Lane Shenfield Essex

I refer to your correspondence and consultation regarding the hybrid planning application for 344 units including 35% affordable housing, safeguarded land for a 2FE primary school and early years facility, public open space and associated landscaping, drainage and highways infrastructure as a result the application has been considered and the following observations are made.

Emergency Response Arrangements

Any such development on the scale of this proposal may have an impact on the Essex Police, Fire and Crime Commissioner Fire and Rescue Authority's (hereafter called "the Authority") Integrated Risk Management Plan (IRMP) which is the assessment of local risks to life and how effectively resources are used in a response to those risks. The IRMP amongst other issues outlines the changes the service plans to make in order to manage existing and emerging risks. The new development if approved will therefore need to be considered under future plans with regard emergency service access, emergency response turnout times, provision of water supplies for firefighting etc; therefore, this Authority should therefore be kept informed as the proposal evolves.

Initial Observations on Fire Service Access

Access for Fire Service purposes has been considered in accordance with The Essex Act 1987 - Clause 13(1)(a)(b) and The Building Regulations 2010.

The proposal does not appear to affect Fire Service access to existing premises in the vicinity and therefore in compliance with Clause 13 (1)(b) of The Act.

Fire Service access to all relevant areas of the development will be expected to be in full compliance with the requirements of the Building Regulations, Approved Document "B" Fire Safety Volumes 1 & 2 Sections B5 (and so address Clause 13 (1)(a) of The Act).

With such large residential developments please consider emergency services vehicular access in general when approving access road detail / widths etc along with parking allocations so as reduce as reasonably practical the amount of future on street parking to help ensure unimpeded access to the dwellings at all times should approval be given.

As the development includes construction of flats, schools and commercial premise etc where ultimate approval is given more detailed observations on access and facilities for the Fire Service will be considered at Building Regulation consultation stage, or in in response to future phased planning consultations whichever comes first.

Flood Plain Risk

It is acknowledged that most of the development site is in Flood Zone 1 (< 0.1% AEP). However, the lower-lying area along the Shenfield watercourse is within Flood Zones 2; the following statement with regard developments within any level of Flood Zone is submitted as part of this consultation response.

At present, Essex County Fire and Rescue Service (ECFRS) under the Fire and Rescue Services Act 2004 and the Fire and Rescue Services (Emergencies) Order 2007, does not have a statutory duty to respond to flooding issues.

However, ECFRS is committed to protecting the people of Essex and will always endeavour to respond to a flooding emergency based on a risk assessed approach.

Due to the limited availability of specialist water rescue resources during flooding incidents, ECFRS has, on recent previous occasions, had to limit their operational response to 'life threatening situations' only. We would not therefore support proposals that are likely to increase this situation or add to the volume of calls received.

Where however approval is given to any application that has an element of flooding risk, it is recommended that specialist advice is obtained and acted on accordingly by the applicant to mitigate any risk of flooding to the development in the future.

Water Supplies

Should the application be successful additional water supplies / fire hydrants for firefighting purposes will be required for this development. The architect or applicant is therefore urged to contact the Water Technical Officer at Service Headquarters, telephone 01376-576344 at the earliest opportunity to discuss the necessary requirements the Officer will then liaise with the local Water Authority for the area to make the appropriate arrangements.

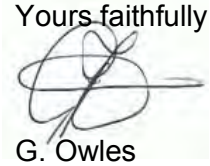
Sprinkler Systems

There is clear evidence that the installation of Automatic Water Suppression Systems (AWSS) can be effective in the rapid suppression of fires. Essex County Fire & Rescue Service (ECFRS) therefore uses every occasion to urge building owners and developers to consider the installation of AWSS. ECFRS are ideally placed to promote a better understanding of how fire protection measures can reduce the risk to life, business continuity and limit the impact of fire on the environment and to the local economy.

Even where not required under Building Regulations guidance, ECFRS would strongly recommend a risk-based approach to the inclusion of AWSS, which can substantially reduce the risk to life and of property loss. We also encourage developers to use them to allow design freedoms, where it can be demonstrated that there is an equivalent level of safety and that the functional requirements of the Regulations are met.

Subject to the above comments being acknowledged and where necessary confirmed the Essex Police, Fire and Crime Commissioner Fire and Rescue Authority has no further observations on the proposal at this stage.

Yours faithfully



G. Owles
Protection

Essex County
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Where however approval is given to any application that has an element of flooding risk, it is recommended that specialist advice is obtained and acted on accordingly by the applicant to mitigate any risk of flooding to the development in the future.

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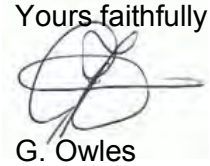
Even where not required under Building Regulations guidance, ECFRS would strongly recommend a risk-based approach to the inclusion of AWSS, which can substantially reduce the risk to life and of property loss. We also encourage developers to use them to allow design freedoms, where it can be demonstrated that there is an equivalent level of safety and that the functional requirements of the Regulations are met.

Subject to the above comments being acknowledged and where necessary confirmed the Essex Police, Fire and Crime Commissioner Fire and Rescue Authority has no further observations on the proposal at this stage.

Yours faithfully



G. Owles
Protection

Your Ref: 23/01164/FUL
Our Ref: CO/HT/TST/SD/BJ/BRW/16532
Date: 17 April 2024

cc (by email) Cllr Barry Aspinell

Essex County Council

Director for Highways and Transportation

For the attention of Kathryn Williams
Planning Services
Brentwood Borough Council

County Hall
Chelmsford
CM1 1QH

Recommendation

Application No:	BRW/23/01164/FUL
Applicant:	Croudace Homes Ltd
Site Location:	Land North of Shenfield, Alexander Lane, Shenfield
Proposal:	Hybrid planning application for 344 units including 35% affordable housing, safeguarded land for a 2FE primary school and early years facility, public open space and associated landscaping, drainage and highways infrastructure.

The documents accompanying the application have been duly considered and a number of site visits have been carried out since the site was first included in Brentwood Borough Council's Draft Local Plan.

There are some outstanding issues that the local Highway Authority, Essex County Council (ECC), would wish to see addressed before it can formally support the planning application.

Therefore, ECC would request Brentwood Borough Council to defer determination of the application until the following points have been resolved:

1. The Transport Assessment (TA) lacks robustness. Vehicle trip numbers for the proposed primary school are considered to have been significantly underestimated in the TA. The Highway Authority would also not agree with the distribution and assignment of those trips onto the local highway network. Furthermore, figures shown in Table 6.2 of the TA, which itself appears incomplete, do not correspond with the diagrams contained in Appendix V. The result is that traffic modelling will likely have exaggerated the capacity of some junctions within the study area and will need revisiting.

2. Following the road safety audit, a relocated pedestrian island has been provided to the north-east of the site access on Chelmsford Road. However, the two running lanes are only provided with 3 metre widths. As with the access for the neighbouring Redrow development site, the two running lanes should be provided with minimum 3.25m running lanes.

3. Shared accesses along the main spine road of the development must be provided with a minimum 5m width to ensure entering vehicles do not have to wait on-street for vehicles to exit. It is indicated that the internal roads will be put up for adoption by the Highway Authority, so to ensure highway safety, two vehicles must be able to pass each other comfortably at these access points.

4. The new bus stop on the Brentwood town centre-bound carriageway of Chelmsford Road to the south-west of the proposed site access roundabout is located immediately after a proposed toucan crossing. This does not allow for efficient traffic flow and could have safety implications. A bus layby should therefore be provided instead to negate the issue.

   Bus stop relocations have also been proposed to the north of the access roundabout. It is indicated that this is to provide improved coverage of bus services to the northern part of the development site. However, the Highway Authority is now looking to provide a bus route along the main spine road. This would remove this requirement, but will necessitate the provision of at least two bus stops to be designed into the proposed site layout heading towards Alexander Lane from Chelmsford Road (which can be on-street).

5. Suitable vehicle swept path diagrams for vehicles such as buses and refuse vehicles need to be provided for the updated site layout submitted in March 2024.

Informatives

The application includes a proposal to divert the existing public footpath no 86 through the site. The applicant is advised that any approval of the planning application will be conditional that an order to secure the diversion has been confirmed and the new route is constructed to the satisfaction of the Local Planning Authority prior to occupation.

The applicant is also advised that separate claims for new public rights of way through the site have been made. If upheld, it will have a material impact on the current proposals for the site.

.....

pp Director for Highways and Transportation
Enquiries to Brendan Johnston
Email: brendan.johnston2@essex.gov.uk

Your Ref: 23/01164/FUL
Our Ref: CO/HT/TST/SD/BJ/BRW/16532
Date: 24 June 2024

Essex County Council

Director for Highways and Transportation

cc (by email) Cllr Barry Aspinell
Essex Highways – SMO3

For the attention of Kathryn Williams
Planning Services
Brentwood Borough Council

County Hall
Chelmsford
CM1 1QH

Recommendation

Application No: BRW/23/01164/FUL

Applicant: Croudace Homes Ltd

Site Location: Land north of Alexander Lane, Shenfield

Proposal: Hybrid planning application for 344 units including 35% affordable housing, safeguarded land for a 2FE primary school and early years facility, public open space and associated landscaping, drainage and highways infrastructure

The documents submitted with the planning application have been duly considered and a number of site visits have been carried out. It is noted that the site is included in Brentwood Borough Council's adopted Local Plan of March 2022 (Site R03).

The proposals entail the provision of a site access on the A1023 Chelmsford Road via a new roundabout which fully complies with modern highway standards. There is an additional access from the south via a realigned Alexander Lane. Both have been satisfactorily safety-audited.

The proposals' parking provision falls marginally below the level to fully comply with Brentwood's adopted standards. However, Brentwood Borough Council, in their role as the parking authority, have indicated their wish to reduce carbon emissions and have not insisted on the full provision. The Highway Authority is prepared to accept this on the condition that, should any issues with parking on the highway outside the site arise post-development, the applicant should fund the cost of a Traffic Regulation Order to restrict such practice and thus ensure the future safety of all highway users.

The proposals include good pedestrian, cycling and public transport facilities which will help to link the site to Shenfield and the local area and should help to restrict private car trips in the immediate area.

A detailed Transport Assessment and a number of subsequent technical notes to answer questions and issues raised by the Highway Authority have been submitted by the applicant. Along with National Highways and Brentwood's own transport consultants who have also reviewed the impact of the development, we have now been satisfied that the proposals can be accommodated without a severe impact on the safety and efficiency of the local highway network, which is the NPPF criteria for refusing an application on highway grounds.

Therefore, from a highway and transportation perspective, the impact of the proposal is acceptable to the Highway Authority subject to the following requirements:

1. No development shall take place, including any ground works or demolition, until a Construction Management Plan has been submitted to, and approved in writing by, the local planning authority. The approved plan shall be adhered to throughout the construction period. The Plan shall provide for:

    i. vehicle routing
    ii. the parking of vehicles of site operatives and visitors
    iii. loading and unloading of plant and materials
    iv. storage of plant and materials used in constructing the development
    v. wheel and underbody washing facilities

    Reason: To ensure that on-road parking of these vehicles in the adjoining roads does not occur, that loose materials and spoil are not brought out onto the highway and that construction vehicles do not use unsuitable roads, in the interests of highway safety and Policy DM1 of the Highway Authority's Development Management Policies February 2011.

2. Prior to occupation of the proposed development, the main site access roundabout on the A1023 Chelmsford Road shall be provided as shown in principle in Drawing 152080/A/01 Rev J (within Appendix D of Vectos / SLR's Highways document dated 30th April 2024).

    Reason: To ensure that vehicles can enter and leave the highway in a controlled manner, in the interest of highway safety and in accordance with policy DM1 of the Development Management Policies as adopted as County Council Supplementary Guidance in February 2011.

3. Prior to occupation of the proposed development, the secondary site access on Alexander Lane shall be provided as shown in principle in Drawing 152080/PD11 Rev A (within Appendix G of Vectos / SLR's Transport Assessment of September 2023).

    Reason: To ensure that vehicles can enter and leave the highway in a controlled manner, in the interest of highway safety and in accordance with policy DM1 of the Development Management Policies as adopted as County Council Supplementary Guidance in February 2011.

4. Prior to occupation of the proposed development, the developer shall provide pedestrian and cyclist infrastructure at the Chelmsford Road access as shown in principle in Drawing 152080/A/01 Rev J (within Appendix D of Vectos / SLR's Highways document dated 30th April 2024). This includes a toucan signalised crossing of Chelmsford Road (also shown in principle in Drawing 152080/PD08 Rev A in Appendix F of the Transport Assessment).

    Reason: To provide safe and suitable access for pedestrians and cyclists, in accordance with Policies DM1 and DM9 of the Development Management Policies as adopted as County Council Supplementary Guidance in February 2011.

5. Prior to occupation of the proposed development, the developer shall provide a combined 3 metre wide footway / cycleway on the west side of Chelmsford Road from the proposed toucan crossing to a point immediately south of the Alexander Lane junction where the current designated cycleway ends, as shown in principle in Drawing 152080/SK03 (within Appendix G of Vectos / SLR's Highways document dated 30th April 2024). Full details are to be agreed with the Highway Authority.

    Reason: To provide pedestrians and cyclists with safe accessibility to nearby facilities and services in accordance with Policies DM1 and DM9 of the Development Management Policies as adopted as County Council Supplementary Guidance in February 2011.

6. In the event that this application receives planning permission and is developed ahead of the smaller residential development to the south of this site (application reference 24/00332/FUL,

which is also part of Local Plan Site R03), the developer shall fund a new 3.5 metre pedestrian footway / cycleway from southern edge of their site across Brentwood Borough-owned fields to link with the existing pedestrian footway on Alexander Lane (as shown indicatively in Drawing no 152080/PD12 Rev A in Appendix O of the Transport Assessment). The facility is to be provided prior to occupation.

Reason: To provide pedestrians and the mobility impaired with safe accessibility to nearby facilities and services in accordance with Policies DM1 and DM9 of the Development Management Policies as adopted as County Council Supplementary Guidance in February 2011.

7. The proposed Traffic Regulation Order to restrict the central section of Alexander Lane to pedestrians and cyclists is to be funded by the developer. As part of the proposals, the developer shall provide a turning head and bollards to ensure there is no vehicle access, as shown in principle in Drawing No 152080/PD14 Rev B (provided in response to the Stage 1 Road Safety Audit).

   Reason: To allow vehicles to turn safely and provide pedestrians and the mobility impaired with safe accessibility to nearby facilities and services in accordance with Policies DM1 and DM9 of the Development Management Policies as adopted as County Council Supplementary Guidance in February 2011.

8. Prior to occupation of the proposed development, the proposed pedestrian island together with dropped kerb and tactile paving to the northeast of the proposed access roundabout, shall be provided as shown in principle in Drawing 152080/PD19 Rev A (within Appendix C of Vectos / SLR's Highways document dated 23rd May 2024).

   Reason: To provide pedestrians and the mobility impaired with safe accessibility to nearby facilities and services in accordance with Policies DM1 and DM9 of the Development Management Policies as adopted as County Council Supplementary Guidance in February 2011.

9. Prior to occupation of the proposed development and as indicated in Drawing 152080/A/01 Rev J (within Appendix D of Vectos / SLR's Highways document dated 30th April 2024), two new bus stops shall be provided on the A1023 Chelmsford Road southwest of the proposed access roundabout. Both stops shall be provided with a shelter with lighting and flag attached, raised kerbs and Real Time Passenger Information display. Both stops shall be provided with bus stop clearway markings on the road and the southwest bound stop shall incorporate the removal of the existing traffic island southwest of the stop.

   Reason: To encourage trips by public transport and in the interest of accessibility, in accordance with Policies DM1 and DM9 of the Development Management Policies as adopted as County Council Supplementary Guidance in February 2011.

10. Prior to occupation of the proposed development, two new bus stops shall be provided on the main spine road through the development. One shall be provided close to the Chelmsford Road entrance to the development in an eastbound direction and the other at the southern end of the site in a southbound direction. Both stops shall be provided with a shelter with lighting and flag attached, raised kerbs and Real Time Passenger Information display. Full details of the locations are to be agreed with the Highway Authority.

    Reason: To encourage trips by public transport and in the interest of accessibility, in accordance with Policies DM1 and DM9 of the Development Management Policies as adopted as County Council Supplementary Guidance in February 2011.

11. Notwithstanding the Proposed Site Layout Drawing No 1643.100 Rev T, the proposed footway linking the south-east of the development site to the northern part of the proposed neighbouring development site (application reference 24/00332/FUL) shall be provided with a minimum width of 3m.

Reason: To enable both pedestrians and cyclists to use the facility safely together, in accordance with Policies DM1 and DM9 of the Development Management Policies as adopted as County Council Supplementary Guidance in February 2011.

12. Prior to commencement of Phase 2 of the development (as indicated in the Phasing Plan of March 2024), an order to secure the diversion of the existing definitive right of way (public footpath no 86, Brentwood Parish) through the site to a route to be agreed with the Local Planning Authority, has been confirmed and the new route is constructed to the satisfaction of the Local Planning Authority.

    Reason: To ensure the continued safe passage of pedestrians on the public right of way and accessibility in accordance with Policies DM1 and DM11 of the Development Management Policies as adopted as County Council Supplementary Guidance in February 2011.

13. As identified in Item T30 of Brentwood Borough Council's Infrastructure Delivery Plan, prior to occupation of the proposed development, the developer shall make a contribution of £121,641 (index linked) to Essex County Council towards the upgrade and installation of 'MOVA' at the traffic signals at the junction of the A1023 Chelmsford Road / Shenfield Road / A129 Hutton Road.

    Reason: To ensure deliverability of the wider infrastructure and highway capacity needs as set out in Brentwood's Infrastructure Delivery Plan and in accordance with Policy DM1 of the Highway Authority's Development Management Policies, adopted as County Council Supplementary Guidance in February 2011.

14. As identified in Item T10 of Brentwood Borough Council's Infrastructure Delivery Plan, prior to occupation of the proposed development, the developer shall make a contribution of £830,117 (index linked) to Essex County Council towards the delivery of improved pedestrian and cycling links from the site to Shenfield and the local area. This shall include, but not necessarily be limited to Alexander Lane, Oliver Road and Hunter Avenue.

    Reason: To ensure deliverability of the wider infrastructure needs as set out in Brentwood's Infrastructure Delivery Plan and provide pedestrians, cyclists and the mobility impaired with safe access to nearby facilities and services in accordance with Policy DM1 of the Highway Authority's Development Management Policies, adopted as County Council Supplementary Guidance in February 2011.

15. Prior to occupation of the proposed development, the developer shall make a contribution of £935,000 (index linked) to Essex County Council towards improving public transport links between the site and Shenfield, Brentwood and other destinations in the area.

    Reason: In the interests of reducing the need to travel by car and promoting sustainable development and transport in accordance with policies DM9 of the Highway Authority's Development Management Policies, adopted as County Council Supplementary Guidance in February 2011.

16. Prior to occupation of the proposed development, the developer shall pay for a Traffic Regulation Order together with the provision of the associated signage to extend the existing 30mph speed limit on the A1023 Chelmsford Road to a location north-east of the proposed site access roundabout. The precise location is to be agreed in consultation with the Highway Authority and shall include a gateway feature and road markings.

    Reason: In the interests of highway safety and Policy DM1 of the Highway Authority's Development Management Policies February 2011.

17. The proposed development shall not be occupied until such time as the vehicle parking area indicated on the approved plans, including any parking spaces for the mobility impaired, has been hard surfaced, sealed and marked out in parking bays. The vehicle parking area and associated turning area shall be retained in this form at all times. The vehicle parking shall

not be used for any purpose other than the parking of vehicles that are related to the use of the development unless otherwise agreed with the Local Planning Authority.

Reason: To ensure that on street parking of vehicles in the adjoining streets does not occur in the interests of highway safety and that appropriate parking is provided in accordance with Policy DM8 of the Development Management Policies as adopted as County Council Supplementary Guidance in February 2011.

18. Cycle parking shall be provided in accordance with Brentwood Borough Council's adopted standards. The approved facilities shall be secure, convenient, covered and provided prior to occupation and retained at all times.

    Reason: To ensure appropriate cycle parking is provided in the interest of highway safety and amenity in accordance with Policy DM8 of the Development Management Policies as adopted as County Council Supplementary Guidance in February 2011.

19. Prior to the first occupation of the development a contribution of £10,000 (ten thousand pounds index linked) shall be secured, to be potentially used by the South Essex Parking Partnership to implement suitable parking restrictions on surrounding roads if it transpires that there are issues with parking overspilling onto these roads after the development is complete. The monies are to be repaid after a period of 7 years if left unused.

    Reason: In the interests of highway safety and the need to ensure unwanted parking does not occur on the surrounding local highway network, and in accordance with Policies DM1 of the Highway Authority's Development Management Policies, adopted as County Council Supplementary Guidance in February 2011.

20. Prior to first occupation of the proposed development, the Developer shall submit an updated residential travel plan to the Local Planning Authority for approval in consultation with Essex County Council. Such approved travel plan shall be actively implemented for a minimum period from first occupation of the development until 1 year after final occupation. It shall be accompanied by an annual monitoring fee of £1,759.29 (index linked) to be paid to Essex County Council.

    Reason: In the interests of reducing the need to travel by car and promoting sustainable development and transport in accordance with policies DM9 and DM10 of the Highway Authority's Development Management Policies, adopted as County Council Supplementary Guidance in February 2011.

21. Prior to occupation of the development, the Developer shall be responsible for the provision and implementation of a Residential Travel Information Pack for sustainable transport to each dwelling, as approved by Essex County Council (to include six one day travel vouchers for use with the relevant local public transport operator).

    Reason: In the interests of reducing the need to travel by car and promoting sustainable development and transport in accordance with policies DM9 and DM10 of the Highway Authority's Development Management Policies, adopted as County Council Supplementary Guidance in February 2011

Informatives

All housing developments in Essex which would result in the creation of a new street (more than five dwelling units communally served by a single all-purpose access) will be subject to The Advance Payments Code, Highways Act, 1980. The Developer will be served with an appropriate Notice within 6 weeks of building regulations approval being granted and prior to the commencement of any development must provide guaranteed deposits which will ensure that the new street is constructed in accordance with acceptable specification sufficient to ensure future maintenance as a public highway.

The Public Right of Way network is protected by the Highways Act 1980. Any unauthorised interference with any route noted on the Definitive Map of PROW is considered to be a breach of this legislation. The public's

rights and ease of passage over public footpath no 86 (Brentwood Parish) shall be maintained free and unobstructed at all times to ensure the continued safe passage of the public on the definitive right of way.

The grant of planning permission does not automatically allow development to commence. In the event of works affecting the highway, none shall be permitted to commence until such time as they have been fully agreed with this Authority. In the interests of highway user safety this may involve the applicant requesting a temporary closure of the definitive route using powers included in the aforementioned Act. All costs associated with this shall be borne by the applicant and any damage caused to the route shall be rectified by the applicant within the timescale of the closure.

All or some of the above requirements may attract the need for a commuted sum towards their future maintenance (details to be agreed with the Highway Authority).

Owing to the configuration of some roads and accesses, some or all of the development roads may not be adopted by the Highway Authority.

The applicant should be aware that Public Right of Way claims have been made through the development site. Should any of these come to fruition, it will not be possible to deliver the whole scheme.

Arrangement shall be made for surface water drainage to be intercepted and disposed of separately so that it does not discharge from or onto the highway carriageway.

All work within or affecting the highway is to be laid out and constructed by prior arrangement with, and to the requirements and satisfaction of, the Highway Authority, details to be agreed before the commencement of works.

The applicants should be advised to contact the Development Management Team by email at development.management@essexhighways.org or by post to: SMO3 - Essex Highways, Childerditch Highways Depot, Hall Drive, Brentwood, Essex CM13 3HD.

……

pp Director for Highways and Transportation
Enquiries to Brendan Johnston

Historic England

Ms Kathryn Williams
Brentwood Borough Council
Town Hall
Ingrave Road
Brentwood
Essex
CM15 8AY

Direct Dial: 01223 582712

Our ref: **W:** P01568556

14 November 2023

Dear Ms Williams

T&CP (Development Management Procedure) (England) Order 2015
& Planning (Listed Buildings & Conservation Areas) Regulations 1990

LAND NORTH OF SHENFIELD, ALEXANDER LANE, SHENFIELD, ESSEX
Application No. 23/01164/FUL

Thank you for your letter of 8 November 2023 regarding the above application for planning permission.

Historic England provides advice when our engagement can add most value. In this case we are not offering advice. This should not be interpreted as comment on the merits of the application.

We suggest that you seek the views of your specialist conservation and archaeological advisers. You may also find it helpful to refer to our published advice at https://historicengland.org.uk/advice/find/

It is not necessary to consult us on this application again, unless there are material changes to the proposals. However, if you would like advice from us, please contact us to explain your request.

Yours sincerely

Sally Harper
Business Officer
E-mail: sally.harper@HistoricEngland.org.uk

Dear Federica

Croudace application - Officer's Meadow, Shenfield - 23/01164/FUL

Please find below comments on this application on behalf of the Council's Strategic Housing Delivery Team.

Local Plan Policy HP05: Affordable Housing

Quantum of affordable housing and tenures

The applicant's Planning Statement confirms the provision of 35% affordable housing, of which at least 86% is to be in the form of rent, which is welcome. Given current housing need, our expectation is that the majority of the rented housing will take the form of Social Rent with the minority taking the form of Affordable Rent such that this is the only position we will support in formalising the affordable housing in a section 106 agreement or planning obligation.

Housing mix, type and size

The applicant's Planning Statement states, among other things, that this application has evolved on the back of pre-application comments from Brentwood Borough Council (BBC) (paragraphs 1.23 – 1.25). Housing Services' written comments on 5 July and in a pre-application meeting on 6 July made it clear that a mix comprising 84% 1 and 2 beds as a percentage of the affordable would not be supported. The advice called for a mix of just under 65% which was deemed consistent with planning policy and housing need. This notwithstanding, the mix of 1 and 2 beds in the current application has increased to 88%.

The applicant quotes the Essex wide 2022 Strategic Housing Market Assessment (SHMA) in support of the housing mix. Housing services is of the view that the housing mix in this SHMA is more appropriate for town centre locations, while densities throughout the R03 Local Plan allocation are typically suburban; in this respect for example, the applicant's proposed density is cited as approximately 36 dwelling per hectare in its Planning Statement, which is consistent with a suburban density. The 2022 Brentwood Local Plan and current housing needs register requirements indicate an affordable housing mix comprising up to 65% 1 and 2 beds and this is an affordable mix housing services will support. We do not therefore support the current affordable mix.

Housing services has previously commented on 14 x 2 bed apartments @ 678 sqft (63 sqm) which are inherently problematic from a letting perspective in that they can only be let as 2b3p units, while housing need will require 2b4p units @ a minimum of 751 sqft (70 sqm). For ease of reference, the typology of these units is "2B Apt AFF". Housing services would again ask the applicant to review the allocation of these units as affordable; alternatively, consider if the relevant block(s) can be redesigned to accommodate 2b4p units.

Finally, again on the subject of unit size, when a random check of the accommodation schedule against drawings was carried out, discrepancies are evident. For example, the accommodation schedule has the 2 x affordable 4b houses @ 1,158 sqft on the accommodation schedule, while the size is given as 1,206 sqft on the relevant drawing (plots 96 and 97). This discrepancy and raises questions about the accuracy

of one or other source. For this and other reasons cited below, housing services is requesting the completion of a checklist to evidence compliance with HP06.

Distribution of affordable housing

Housing services confirmed in the July pre-application meeting and in its written comments that it could not support the distribution of the affordable housing in the applicant's pre-application proposal on the ground that it was in breach of both Local Plan policy HP05 and BBC's Supplementation Planning Document (SPD) on Planning Obligations.

The applicant's Planning Statement states there has been a "[r]econsideration of affordable units to avoid excessive clustering" (paragraph 1.25) and that the affordable housing is "[p]rovided in groups of no more that 12 to avoid clustering" (paragraph 5.14).

The distribution or location of the affordable housing is however, not dissimilar in the following respect (noting that the SPD treats affordable homes separated by an estate road as a single cluster):

- a cluster of 37 aff rdable homes opposite the School Plaza (now referred to as the 'Plaza');
- a cluster of 27 aff rdable homes at the Southern Gateway (now part of the 'Primary Street').

There has been an improvement in the distribution of the affordable housing north-east of the Plaza and 6 x Shared Ownership units have been introduced into the eastern spine of the site (now referred to as the 'Woodland Edge'), but housing services is of the view that: (i) the re-distribution does not go far enough; and (ii), the introduction of more family units and/or houses in the affordable mix offers the opportunity to address what remains a significant concentration of affordable units in the Plaza and, to a lesser extent, at the southern Gateway. These comments are set against the SPD policy requirement of clusters of no more than 12 or 15% of the total affordable mix, whichever is the lesser.

Local Plan Policy HP06: Standards for New Housing

The accuracy of the accommodation schedule as compared with drawings has been raised above. It is also the case that no layout dimensions are reproduced on the drawings and that they are only at scale when printed in A1. It is not possible for housing services to print the drawings in A1.

The Planning Statement claims compliance with HP06 in respect of the affordable unit compliance with the internal and external standards (paragraph 4.3), yet the plans and Design and Access Statement (DAS) confirm this is not the case in certain respects. For example, the DAS confirms deficiencies in external amenity space for apartments. Based on the excel accommodation schedule received from the applicant's agent on 25.10.23, all affordable houses appear to provide in excess of 25 sqm in external private amenity space so these comply. In terms of the apartments, I would make the following comments:

- The aff rdable apartments @ the Plaza and Southern Gateway do not meet the communal space standards.
- None of the aff rdable apartments comply with private amenity standards (this is not the case, by contrast, for the private apartments).
- Some aff rdable apartments have no private amenity space at all, i.e. plots – 44, 45, 46, 60, 63, 66, 69, 218, 220, 222, 301, 324 and 325.

- I would also questi n the useability of the communal amenity space for the a ordable apartments at the Plaza in par cular and would expect to see confirma n from the architect – supported by a sunlight and daylight assessment if the architect is not capable of evidencing – that all aff rdable apartments meet the sunlight and daylight requirements as set out in HP06. This should form part of the checklist I have referred to below.

It may be that there are mitigations in respect of some plots on the point of amenity space generally, but there is a clear breach of HP06 in respect of this application on the face of it, and indeed HP05 insofar as private and affordable apartments are being held to different standards in respect of private amenity space.

Just a note on the excel, plots 75 and 76 are labelled as affordable, but these are in fact private if you cross reference with all the drawings and note the fact there are 2 too many affordable units in the excel.

Overall, there is deficiency of information to confirm compliance of the affordable units with policy HP06 on a plot-by-plot basis, such that we would request that the applicant's planning consultant or architect produce a checklist based on the requirements of HP06, which measures compliance/non-compliance of the proposed affordable units on a plot-by-plot basis. Housing services will then be informed to take a view on the extent of any non-compliant areas. Moreover, compliance with HP06 is not something that in our view that can be left to condition. This would simply have the effect of presenting BBC with a fait accompli on these matters, i.e. it will be too late to object and/or to seek an improved position.

Car parking and cycle storage

Housing services will expect the same standard of provision on a tenure blind basis across the development, subject to the applicant's agreement with the Essex County Council (ECC) on the expected level of provision overall consistent with the requirements of the Essex Design Guide, including any departures from policy. We expect ECC to confirm this point.

Kind regards

National Highways Planning Response (NHPR 22-12)
Formal Recommendation to an Application for Planning Permission

From: Martin Fellows (Regional Director)
Operations Directorate
East Region
National Highways
PlanningEE@nationalhighways.co.uk

To: Brentwood Borough Council (FAO Kathryn Williams)
planning@brentwood.gov.uk

CC: transportplanning@dft.gov.uk
spatialplanning@nationalhighways.co.uk

Council's Reference: 23/01164/FUL
Location: Land North Of Shenfield Alexander Lane Shenfield Essex

Proposal: Hybrid planning application for 344 units including 35% affordable housing, safeguarded land for a 2FE primary school and early years facility, public open space and associated landscaping, drainage and highways infrastructure.

National Highways Ref: NH/24/04455

Referring to the consultation on a planning application dated 9th January 2024 referenced above, in the vicinity of the A12 that forms part of the Strategic Road Network, notice is hereby given that National Highways' formal recommendation is that we:

~~a) offer no objection (see reasons at Annex A);~~

~~b) recommend that conditions should be attached to any planning permission that may be granted (see Annex A – National Highways recommended Planning Conditions & reasons);~~

c) recommend that planning permission not be granted for a specified period (see reasons at Annex A);

~~d) recommend that the application be refused (see reasons at Annex A)~~

Highways Act 1980 Section 175B ~~is~~/is not relevant to this application.[1]

This represents National Highways' formal recommendation and is copied to the Department for Transport as per the terms of our Licence.

Should the Local Planning Authority not propose to determine the application in accordance with this recommendation they are required to consult the Secretary of State for Transport, as set out in the Town and Country Planning (Development Affecting Trunk Roads) Direction 2018, via transportplanning@dft.gov.uk and may not determine the application until the consultation process is complete.

The Local Planning Authority must also copy any consultation under the 2018 Direction to PlanningEE@nationalhighways.co.uk.

Signature: 	**Date: 15/01/2024**
Name: Mark Norman	**Position:** Spatial Planner
National Highways National Highways | Woodlands | Manton Lane | Bedford | MK41 7LW	

[1] Where relevant, further information will be provided within Annex A.

Annex A National Highways' assessment of the proposed development

National Highways has been appointed by the Secretary of State for Transport as a strategic highway company under the provisions of the Infrastructure Act 2015 and is the highway authority, traffic authority and street authority for the Strategic Road Network (SRN). The SRN is a critical national asset and as such we work to ensure that it operates and is managed in the public interest, both in respect of current activities and needs as well as in providing effective stewardship of its long-term operation and integrity.

It is recommended that the application should not be approved until 15th March 2024.

The proposed development it located approximately 500m to the south of A12 Junction 12, with a new access proposed off A1023 Chelmsford Road. National Highways notes that the land is part of the local plan site allocation, and it is proposed to include a number of parcels built out by a number of developers.

National Highways has requested additional time to be allocated in reviewing this planning application as we are currently unable to review the TA which has been submitted onto the planning portal due to a technical error on the planning application portal. In the meantime, we will look to review the flood risk assessment report (Aug 2023) to consider the potential impact of the scheme on the local SRN network in the vicinity of the site.

Consequently, the applicant will require further time to provide the information, hence we recommend the application be not determined before 15th March 2024. If we are in a position to respond earlier than this, we will withdraw this recommendation accordingly.

Standing advice to the local planning authority

The Climate Change Committee's 2022 Report to Parliament notes that for the UK to achieve net zero carbon status by 2050, action is needed to support a modal shift away from car travel. The NPPF supports this position, with paragraphs 73 and 105 prescribing that significant development should offer a genuine choice of transport modes, while paragraphs 104 and 110 advise that appropriate opportunities to promote walking, cycling and public transport should be taken up.

Moreover, the build clever and build efficiently criteria as set out in clause 6.1.4 of PAS2080 promote the use of low carbon materials and products, innovative design solutions and construction methods to minimise resource consumption.

These considerations should be weighed alongside any relevant Local Plan policies to ensure that planning decisions are in line with the necessary transition to net zero carbon.

National Highways Planning Response (NHPR 24-02)
Formal Recommendation to an Application for Planning Permission

From: Martin Fellows (Regional Director)
Operations Directorate
East Region
National Highways
PlanningEE@nationalhighways.co.uk

To: Brentwood Borough Council (FAO Kathryn Williams)
planning@brentwood.gov.uk

CC: transportplanning@dft.gov.uk
spatialplanning@nationalhighways.co.uk

Council's Reference: 23/01164/FUL

National Highways Ref: NH/24/04455

Location: Land North Of Shenfield Alexander Lane Shenfield Essex

Proposal: Hybrid planning application for 344 units including 35% affordable housing, safeguarded land for a 2FE primary school and early years facility, public open space and associated landscaping, drainage and highways infrastructure.

Referring to the consultation on a planning application dated 9th January 2024 referenced above, in the vicinity of the A12 that forms part of the Strategic Road Network, notice is hereby given that National Highways' formal recommendation is that we:

~~a) offer no objection (see reasons at Annex A);~~

~~b) recommend that conditions should be attached to any planning permission that may be granted (see Annex A – National Highways recommended Planning Conditions & reasons);~~

c) recommend that planning permission not be granted for a specified period (see reasons at Annex A);

~~d) recommend that the application be refused (see reasons at Annex A)~~

Highways Act 1980 Section 175B ~~is~~/is not relevant to this application.[1]

This represents National Highways' formal recommendation and is copied to the Department for Transport as per the terms of our Licence.

Should the Local Planning Authority not propose to determine the application in accordance with this recommendation they are required to consult the Secretary of State for Transport, as set out in the Town and Country Planning (Development Affecting Trunk Roads) Direction 2018, via transportplanning@dft.gov.uk and may not determine the application until the consultation process is complete.

The Local Planning Authority must also copy any consultation under the 2018 Direction to PlanningEE@nationalhighways.co.uk.

Signature: 	**Date: 13/03/2024**
Name: Mark Norman	**Position:** Spatial Planner
National Highways National Highways | Woodlands | Manton Lane | Bedford | MK41 7LW	

[1] Where relevant, further information will be provided within Annex A.

Annex A National Highways' assessment of the proposed development

National Highways has been appointed by the Secretary of State for Transport as a strategic highway company under the provisions of the Infrastructure Act 2015 and is the highway authority, traffic authority and street authority for the Strategic Road Network (SRN). The SRN is a critical national asset and as such we work to ensure that it operates and is managed in the public interest, both in respect of current activities and needs as well as in providing effective stewardship of its long-term operation and integrity.

Recommended Non-Approval

It is recommended that the application should not be approved until 18th June.

Reason

The proposed development it located approximately 500m to the south of A12 Junction 12, with a new access proposed off A1023 Chelmsford Road. National Highways notes that the land is part of the local plan site allocation, and it is proposed to include a number of parcels built out by a number of developers.

National Highways has requested additional time to be allocated in reviewing this planning application as we are currently unable to review the TA which has been submitted onto the planning portal due to a technical error on the planning application portal. In the meantime, we will look to review the flood risk assessment report (Aug 2023) to consider the potential impact of the scheme on the local SRN network in the vicinity of the site.

Also, with regard to the TA we would look to see the following details;

- **Policy Context -** We recommend that reference is made to the DfT Circular 01/2022, which provides guidance regarding how the impact of the proposed development on the SRN should be assessed together with 'The strategic road network and the delivery of sustainable development (National Highways and the strategic road network)'
- **Trip Generation -** We would like to the see the expected trip generation generated during both the construction and operational phase of the scheme. We request a robust assessment presenting the worst-case scenario with regards to trip generation undertaken.
- **Trip Distribution -** It is assumed that the methodology of traffic distribution will be based on 2011 Census 'Journey to Work' data for where the site is located (as set out within Appendix C of the TA). This is deemed as acceptable for the

data covering the movements. Alternatively, should a first principles approach to trip generation be taken, other sources of trip distribution information, for example through a gravity model, could be used to distribute different types of journey purpose. If this approach is taken it is recommended that the full methodology is outlined within the assessment documents for review. It should be noted, NH will look for clear justification for the proposed trip distribution and means to reduce the impact of the proposed development on the SRN network within the vicinity of the site.

- **Junction Assessment –** We note the applicant has proposed to assess A12 junction (A12/ Chelmsford Road/ Roman Road) we will look to review this as part of our TA review to consider the potential impact on the SRN.
- **Assessment years and TEMPro** – We agree within the proposed scope of the Assessment scenarios set out within Appendix C of the TA.
- **Committed Development –** We would like to see the list of schemes to include all the other parcels of land allocated within the Local Plan adjacent to the Scheme as well as any other schemes suggested by the local authority.

Consequently, the applicant will require further time to provide the information, hence we recommend the application be not determined before 18th June 2024. If we are in a position to respond earlier than this, we will withdraw this recommendation accordingly.

Standing advice to the local planning authority

The Climate Change Committee's 2022 Report to Parliament notes that for the UK to achieve net zero carbon status by 2050, action is needed to support a modal shift away from car travel. The NPPF supports this position, with paragraphs 74 and 109 prescribing that significant development should offer a genuine choice of transport modes, while paragraphs 108 and 114 advise that appropriate opportunities to promote walking, cycling and public transport should be taken up.

Moreover, the build clever and build efficiently criteria as set out in clause 6.1.4 of PAS2080 promote the use of low carbon materials and products, innovative design solutions and construction methods to minimise resource consumption.

These considerations should be weighed alongside any relevant Local Plan policies to ensure that planning decisions are in line with the necessary transition to net zero carbon.

We have managed to review the TA and our initial comments are below.

The proposed development it located approximately 500m to the south of A12 Junction 12, with a new access proposed off A1023 Chelmsford Road. National Highways notes that the land is part of the local plan site allocation, and it is proposed to include a number of parcels built out by a number of developers.

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Kind regards

Mark

Mark Norman
Spatial Planner
Network Operations
National Highways | Woodlands | Manton Lane | Bedford | MK41 7LW

22/03/24

National Highways Planning Response (NHPR 24-02)
Formal Recommendation to an Application for Planning Permission

From: Martin Fellows (Regional Director)
Operations Directorate
East Region
National Highways
PlanningEE@nationalhighways.co.uk

To: Brentwood Borough Council (FAO Kathryn Williams)
planning@brentwood.gov.uk

CC: transportplanning@dft.gov.uk
spatialplanning@nationalhighways.co.uk

Council's Reference: 23/01164/FUL

National Highways Ref: NH/24/04455

Location: Land North Of Shenfield Alexander Lane Shenfield Essex

Proposal: Hybrid planning application for 344 units including 35% affordable housing, safeguarded land for a 2FE primary school and early years facility, public open space and associated landscaping, drainage and highways infrastructure.

Referring to the consultation on a planning application dated 9th January 2024 referenced above, in the vicinity of the A12 that forms part of the Strategic Road Network, notice is hereby given that National Highways' formal recommendation is that we:

a) ~~offer no objection (see reasons at Annex A~~);

b) recommend that conditions should be attached to any planning permission that may be granted (see Annex A – National Highways recommended Planning Conditions & reasons);

~~c) recommend that planning permission not be granted for a specified period (see reasons at Annex A);~~

~~d) recommend that the application be refused (see reasons at Annex A)~~

Highways Act 1980 Section 175B ~~is~~/is not relevant to this application.[1]

This represents National Highways' formal recommendation and is copied to the Department for Transport as per the terms of our Licence.

Should the Local Planning Authority not propose to determine the application in accordance with this recommendation they are required to consult the Secretary of State for Transport, as set out in the Town and Country Planning (Development Affecting Trunk Roads) Direction 2018, via transportplanning@dft.gov.uk and may not determine the application until the consultation process is complete.

The Local Planning Authority must also copy any consultation under the 2018 Direction to PlanningEE@nationalhighways.co.uk.

Signature: 	**Date: June 2024**
Name: Mark Norman	**Position:** Spatial Planner
National Highways National Highways | Woodlands | Manton Lane | Bedford | MK41 7LW	

[1] Where relevant, further information will be provided within Annex A.

Annex A National Highways' assessment of the proposed development

National Highways has been appointed by the Secretary of State for Transport as a strategic highway company under the provisions of the Infrastructure Act 2015 and is the highway authority, traffic authority and street authority for the Strategic Road Network (SRN). The SRN is a critical national asset and as such we work to ensure that it operates and is managed in the public interest, both in respect of current activities and needs as well as in providing effective stewardship of its long-term operation and integrity.

The following condition is recomended

> No part of the development herby approved shall be brought into use unless and until the Travel Plan has been approved in writing by the Local Planning Authority who shall consult with Essex County Council as Highways Authority.
>
> The Travel Plan shall be in line with prevailing policy and best practice and shall as a minimum include:-
>
> - The identification of targets for trip reduction and modal Shift
> - The methods employed to meet these targets
> - The mechanisms for monitoring and review
> - The mechanisms and review
> - The penalties to be applied in the event that targets are not met
> - The mechanisms for mitigation
> - Implementation of the travel plan to an agreed timescale or timetable and its operation thereafter
> - Mechanisms to secure variations to the Travel plan following monitoring and reviews
>
> **Reason:**
>
> To ensure that the A12 continues to serve its purpose as a part of a national system for through traffic in accordance with Section 10 of the Highways Act 1980, and to satisfy the reasonable

It should be noted that this site forms part of a larger area allocated in the Local Plan and consequently it will need to be considered in that context and the overall need to provide mitigation for the whole of the local plan sites. The local plan identified that cumulatively the identified sites required the A12 J12 to be converted to signal control, although it is accepted this development on its own does not require this the planning committee are advised to seek an appropriate contribution from this development towards this scheme.

Standing advice to the local planning authority

The Climate Change Committee's 2022 Report to Parliament notes that for the UK to achieve net zero carbon status by 2050, action is needed to support a modal shift away from car travel. The NPPF supports this position, with paragraphs 74 and 109 prescribing that significant development should offer a genuine choice of transport modes, while paragraphs 108 and 114 advise that appropriate opportunities to promote walking, cycling and public transport should be taken up.

Moreover, the build clever and build efficiently criteria as set out in clause 6.1.4 of PAS2080 promote the use of low carbon materials and products, innovative design solutions and construction methods to minimise resource consumption.

These considerations should be weighed alongside any relevant Local Plan policies to ensure that planning decisions are in line with the necessary transition to net zero carbon.

Annex A – Additional advice

Natural England offers the following additional advice:

Landscape
Paragraph 174 of the National Planning Policy Framework (NPPF) highlights the need to protect and enhance valued landscapes through the planning system. This application may present opportunities to protect and enhance locally valued landscapes, including any local landscape designations. You may want to consider whether any local landscape features or characteristics (such as ponds, woodland, or dry-stone walls) could be incorporated into the development to respond to and enhance local landscape character and distinctiveness, in line with any local landscape character assessments. Where the impacts of development are likely to be significant, a Landscape & Visual Impact Assessment should be provided with the proposal to inform decision making. We refer you to the Landscape Institute Guidelines for Landscape and Visual Impact Assessment for further guidance.

Best and most versatile agricultural land and soils
Local planning authorities are responsible for ensuring that they have sufficient detailed agricultural land classification (ALC) information to apply NPPF policies (Paragraphs 174 and 175). This is the case regardless of whether the proposed development is sufficiently large to consult Natural England. Further information is contained in GOV.UK guidance Agricultural Land Classification information is available on the Magic website on the Data.Gov.uk website. If you consider the proposal has significant implications for further loss of 'best and most versatile' agricultural land, we would be pleased to discuss the matter further.

Guidance on soil protection is available in the Defra Construction Code of Practice for the Sustainable Use of Soils on Construction Sites, and we recommend its use in the design and construction of development, including any planning conditions. For mineral working and landfilling separate guidance on soil protection for site restoration and aftercare is available on Gov.uk website. Detailed guidance on soil handling for mineral sites is contained in the Institute of Quarrying *Good Practice Guide for Handling Soils in Mineral Workings*.

Should the development proceed, we advise that the developer uses an appropriately experienced soil specialist to advise on, and supervise soil handling, including identifying when soils are dry enough to be handled and how to make the best use of soils on site.

Protected Species
Natural England has produced standing advice[1] to help planning authorities understand the impact of particular developments on protected species. We advise you to refer to this advice. Natural England will only provide bespoke advice on protected species where they form part of a Site of Special Scientific Interest or in exceptional circumstances.

Local sites and priority habitats and species
You should consider the impacts of the proposed development on any local wildlife or geodiversity sites, in line with paragraphs 175 and179 of the NPPF and any relevant development plan policy. There may also be opportunities to enhance local sites and improve their connectivity. Natural England does not hold locally specific information on local sites and recommends further information is obtained from appropriate bodies such as the local records centre, wildlife trust, geoconservation groups or recording societies.

Priority habitats and Species are of particular importance for nature conservation and are included in the England Biodiversity List published under section 41 of the Natural Environment and Rural Communities Act 2006. Most priority habitats will be mapped either as Sites of Special Scientific Interest, on the Magic website or as Local Wildlife Sites. List of priority habitats and species can be found on Gov.uk.
Natural England does not routinely hold species data, such data should be collected when impacts on priority habitats or species are considered likely. Consideration should also be given to the potential environmental value of brownfield sites, often found in urban areas and former industrial land, further information including links to the open mosaic habitats inventory can be found here.

[1] https://www.gov.uk/protected-species-and-sites-how-to-review-planning-proposals

Annex A – Additional advice

Ancient woodland, ancient and veteran trees
You should consider any impacts on ancient woodland and ancient and veteran trees in line with paragraph 180 of the NPPF. Natural England maintains the Ancient Woodland Inventory which can help identify ancient woodland. Natural England and the Forestry Commission have produced standing advice for planning authorities in relation to ancient woodland and ancient and veteran trees. It should be taken into account by planning authorities when determining relevant planning applications. Natural England will only provide bespoke advice on ancient woodland, ancient and veteran trees where they form part of a Site of Special Scientific Interest or in exceptional circumstances.

Biodiversity and wider environmental gains
Development should provide net gains for biodiversity in line with the NPPF paragraphs 174(d), 179 and 180. It is anticipated that major development (defined in the NPPF glossary) will be required by law to deliver a biodiversity gain of at least 10% from January 2024 and that this requirement will be extended to smaller scale development in April 2024. For nationally significant infrastructure projects (NSIPs) it is anticipated that the requirement for biodiversity net gain will be implemented from 2025.

Further information on the timetable for mandatory biodiversity net gain can be found here. Further general information on biodiversity net gain can be found here.

The Government's Biodiversity Metric should be used to calculate biodiversity losses and gains for terrestrial and intertidal habitats and can be used to inform any development project. For small development sites the Small Sites Metric may be used. This is a simplified version of the Biodiversity Metric and is designed for use where certain criteria are met.

We advise you to follow the mitigation hierarchy as set out in paragraph 180 of the NPPF and firstly consider what existing habitats within the site can be retained or enhanced. Where on-site measures are not possible, provision off-site will need to be considered.

Development also provides opportunities to secure wider biodiversity enhancements and environmental gains, as outlined in the NPPF (paragraphs 8, 73, 104, 120,174, 175 and 180). Opportunities for enhancement might include Incorporating features to support specific species within the design of new buildings such as swift or bat boxes or designing lighting to encourage wildlife. .

Natural England's Environmental Benefits from Nature tool may be used to identify opportunities to enhance wider benefits from nature and to avoid and minimise any negative impacts. It is designed to work alongside the Biodiversity Metric and is available as a beta test version.

Further information on biodiversity net gain, the mitigation hierarchy and wider environmental net gain can be found in government Planning Practice Guidance.

Green Infrastructure
Natural England's Green Infrastructure Framework provides evidence-based advice and tools on how to design, deliver and manage green infrastructure (GI) . GI should create and maintain green liveable places that enable people to experience and connect with nature, and that offer everyone, wherever they live, access to good quality parks, greenspaces, recreational, walking and cycling routes that are inclusive, safe, welcoming, well-managed and accessible for all. GI provision should enhance ecological networks, support ecosystems services and connect as a living network at local, regional and national scales.

Development should be designed to meet the 15 Green Infrastructure Principles. The Green Infrastructure Standards can be used to inform the quality, quantity and type of green infrastructure to be provided. Major development should have a GI plan including a long-term delivery and management plan. Relevant aspects of local authority green infrastructure strategies should be delivered where appropriate.

GI mapping resources are available here and here. These can be used to help assess deficiencies in greenspace provision and identify priority locations for new GI provision.

Annex A – Additional advice

Access and Recreation
Natural England encourages any proposal to incorporate measures to help improve people's access to the natural environment. Measures such as reinstating existing footpaths together with the creation of new footpaths and bridleways should be considered. Links to urban fringe areas should also be explored to strengthen access networks, reduce fragmentation, and promote wider green infrastructure.

Rights of Way, Access land, Coastal access and National Trails
Paragraphs 100 and 174 of the NPPF highlight the important of public rights of way and access. Development should consider potential impacts on access land, common land, rights of way and coastal access routes in the vicinity of the development. Consideration should also be given to the potential impacts on the any nearby National Trails. The National Trails website www.nationaltrail.co.uk provides information including contact details for the National Trail Officer. Appropriate mitigation measures should be incorporated for any adverse impacts.

Biodiversity duty
Your authority has a duty to have regard to conserving biodiversity as part of your decision making. Conserving biodiversity can also include restoration or enhancement to a population or habitat. Further information is available here.

Tracey Balcombe

From: SM-NE-Consultations (NE) <consultations@naturalengland.org.uk>
Sent: 09 November 2023 09:38
To: Planning Team, Brentwood Borough Council
Subject: FW: 23/01164/FUL - Land North Of Shenfield, Alexander Lane, Shenfield, Essex
Attachments: Annex A to standard letters - Oct 23 FINAL.pdf

Dear Tanya

Application ref:23/01164/FUL
Our ref:454958

Thank you for your email.

Natural England has no specific comments to make on this proposal or issue. Please refer to our general advice in the Annex attached.

The lack of comment from Natural England does not imply that there are no impacts on the natural environment, but only that the proposals are not likely to result in significant impacts on statutory designated nature conservation sites or landscapes. It is for the local planning authority to determine whether or not the proposals are consistent with national and local policies on the natural environment. Other bodies and individuals may be able to provide information and advice on the environmental value of sites and the impacts of development proposals to assist the decision making process. We advise local planning authorities to obtain specialist ecological or other environmental advice when determining the environmental impacts of development.
We recommend that local planning authorities use Natural England's Site of Special Scientific Interest Impact Risk Zones (available on Magic and as a downloadable dataset) prior to consultation with Natural England. Further guidance on when to consult Natural England on planning and development proposals is available on gov.uk at:
https://www.gov.uk/guidance/local-planning-authorities-get-environmental-advice
https://www.gov.uk/guidance/developers-get-environmental-advice-on-your-planning-proposals
https://www.gov.uk/guidance/consulting-on-neighbourhood-plans-and-development-orders

Kind regards
Natural England Consultations Team

From: Planning Team, Brentwood Borough Council <planning@brentwood.gov.uk>
Sent: 08 November 2023 17:10
Subject: 23/01164/FUL - Land North Of Shenfield, Alexander Lane, Shenfield, Essex

Good afternoon,

I am writing in relation to the above application for Land North of Shenfield Croudace, 23/01164/FUL: Hybrid planning application for 344 units including 35% affordable housing, safeguarded land for a 2FE primary school and early years facility, public open space and associated landscaping, drainage and highways infrastructure.

It is nearing the end of the consultation period and we have not received all consultee responses back yet.

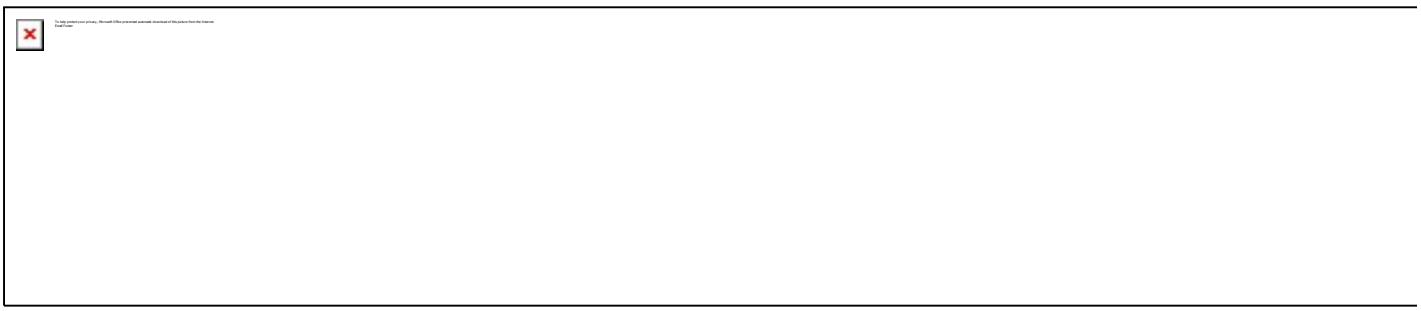
Please can you ensure you submit your final comments by the end of this week. If you have already submitted your final comments, please ignore this email.

Kind regards,
Tanya

Tanya Eastwood I Planning Administration Assistant I Brentwood Borough Council

Find out information and advice on planning and permissions on our website

Find out more about cost of living support | Brentwood Council
Find out more about cost of living support | Rochford Council



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Biodiversity duty
Your authority has a duty to have regard to conserving biodiversity as part of your decision making. Conserving biodiversity can also include restoration or enhancement to a population or habitat. Further information is available here.

Mid and South Essex Integrated Care System

NHS
Mid and South Essex

Our ref: 23/01164/CB
Your ref: 23/01164/FUL

EMAIL ONLY
planning@brentwood.gov.uk

Brentwood Borough Council
Town Hall
Ingrave Road
Brentwood
Essex CM5 8AY

Phoenix Court
Christopher Martin Road
Fryerns
Basildon
Essex SS14 3EZ

Catherine Bicknell
Email: Catherine.bicknell@nhs.net

9 November 2023

Dear Sir / Madam

Planning Application: 23/01164/FUL
Hybrid planning application for 344 units including 35% affordable housing, safeguarded land for a 2FE primary school and early years facility, public open space and associated landscaping, drainage and highways infrastructure.
Land North of Shenfield Alexander Lane Shenfield Essex

1.0 Further to a review of the application details the following comments are made in regard to the primary healthcare provision on behalf of the health partners of the Mid and South Essex Integrated Care System (ICS).

2.0 Existing Healthcare Position Proximate to the Planning Application Site

2.1 The proposed development is likely to have an impact on the services of the Surgeries which operate within the vicinity of the application site. The GP practices do not have capacity for the additional growth resulting from this development and cumulative development in the area.

2.2 The proposed development will be likely to have an impact on the NHS funding programme for the delivery of primary healthcare provision within this area and specifically within the health catchment of the development. The ICS would therefore expect these impacts to be fully assessed and mitigated.

3.0 Review of Planning Application

3.1 The health impact assessment submitted in support of the planning application provides baseline health information and then assesses the impact of the

proposed development. The baseline information includes a review of primary care capacity which shows that the GP practices in the vicinity of the development are operating over-capacity.

3.2 The assessment matrix considers the development impacts against themes, including access to health and social care services and other social infrastructure. In response to the question, does the proposal assess the impact on health and social care services and has have local NHS organisations been contacted regarding existing and planned healthcare capacity, the assessment identifies that there are 5 GP practices within 2km of the application site. The assessment acknowledges that all of the practices are operating over capacity but says that there are other healthcare facilities in the surrounding area that could be accessed by the new population. However, the facilities cited do not provide suitable alternatives for primary care services and the impact on primary care capacity should be mitigated. The assessment does recommend that the need for financial contributions towards healthcare are discussed with the Council, which is welcomed.

4.0 Assessment of Development Impact on Existing Healthcare Provision

4.1 The existing GP practices do not have capacity to accommodate the additional growth resulting from the proposed development. The development could generate approximately 826 new residents and subsequently increase demand upon existing constrained services.

4.2 The primary healthcare services directly impacted by the proposed development and the current capacity position are shown in Table 1.

Table 1: Summary of position for healthcare services within a 2km radius of the proposed development

GP surgeries within 2km	Weighted List Size [1]	NIA (m^2) [2]	Capacity [3] needed for current weighted list size	Spare Capacity (NIA m^2) [4]
Mount Avenue Surgery	12,017	438.4	824.0	-385.6
Rockleigh Court Surgery	6,205	161.0	425.5	-264.5
Existing floorspace excess/deficit			Existing deficit of 650.1m^2	

Notes:

1. The weighted list size of the GP Practice based on the Carr-Hill formula; this figure more accurately reflects the need of a practice in terms of resource and space and may be slightly lower or higher than the actual patient list.
2. Current Net Internal Area occupied by the Practice
3. Based on 120m² per 1750 patients (this is considered the current optimal list size for a single GP within the Mid and South Essex STP). Space requirement aligned to DH guidance within "Health Building Note 11-01: facilities for Primary and Community Care Services"
4. Based on existing weighted list size

4.3 Table 1 shows that the capacity of primary healthcare facilities in the area of the proposed development is already below the recognised standards of provision for the existing population. Additional population growth in the area resulting from new development would add to the deficit and so would be unsustainable if unmitigated.

5.0 Healthcare Needs Arising From the Proposed Development

5.1 Table 2 shows the population likely to be generated from the proposed development, the primary care floorspace needed to support this additional population and the costs of doing so. Using the accepted standards set out below the table, the capital required to create additional floorspace for support the population arising from the proposed development is calculated to be £170,700.

Table 2: Capital Cost calculation of additional health services arising from the development proposal

Additional Population Growth (344 dwellings) [5]	Additional floorspace required to meet growth (m²) [6]	Capital required to create additional floor space (£) [7]
826	56.6	170,700

Notes:

5. Calculated using the Brentwood Borough average household size of 2.4 taken from the 2011 Census: Rooms, bedrooms and central heating, local authorities in England and Wales (rounded to the nearest whole number).
6. Based on 120m² per 1750 patients (this is considered the current optimal list size for a single GP within the Mid & South Essex STP). Space requirement aligned to DH guidance within "Health Building Note 11-01: facilities for Primary and Community Care Services"
7. Based on BCIS cost multiplier (£3,015) for new build and extensions to health centres and hospitals using rates for gross internal floor area for the building costs including prelims updated to 01/01/2022 and rebased for Essex, rounded to nearest £100.

5.2 The development would have an impact on healthcare provision in the area where there is already a deficit of primary care facilities. If unmitigated, the development would be unsustainable. Planning obligations could be used to secure contributions to mitigate these impacts and make an otherwise unacceptable development acceptable in relation to healthcare provision.

5.3 The ICS therefore requests that the sum of £170,700 be secured through a planning obligation in the form of a S106 agreement is linked to any grant of planning permission in order to increase capacity for the benefit of patients of the Primary Care Network operating in the area. This may be achieved through any combination of extension, reconfiguration or relocation of premises.

6.0 Conclusions

6.1 The ICS has identified that the development will give rise to a need for additional healthcare provision to mitigate impacts arising from the development and requests that these are secured through a S106 legal agreement attached to any grant of planning permission. In the absence of such mitigation the development would impose an unsustainable burden on local healthcare services.

6.2 The terms set out above are considered appropriate having regard to the formulated needs arising from the development and the ICS is satisfied that the basis and value of the developer contribution sought is consistent with the policy and tests for imposing planning obligations set out in the NPPF.

6.3 The health partners of the ICS look forward to working with the applicant and the Council to satisfactorily address the issues raised in this consultation response and would appreciate acknowledgement of the safe receipt of this letter.

Yours faithfully

Catherine Bicknell

Planning Policy Manager

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Kathryn Williams
Managing Director
Kew Planning on behalf of
Brentwood Borough Council
Brentwood
Essex
CM18 8AY

16/11/2023

Dear Kathryn,

Ref: 23/01164/FUL – Hybrid application for 344no units and outline for safeguarded land for a 2FE Primary School with Early Years, Land North of Chelmsford Road, Shenfield – CROUDACE (R03)

Thank you for consulting us on the Hybrid application for the above proposed development.

We understand that this application is a hybrid which requests full permission for 344no dwellings and an outline permission for the safeguarded land for a 2FE Primary School with Early Years. The outline element provides no details, and all matters are reserved.

A sister application has also been submitted which requests outline planning permission, under Ref: 23/01159/OUT, for the safeguarded land for the 2FE Primary School, with all matters reserved. Our comments on this proposal will be issued separately.

Our response below follows a meeting we attended with you, the applicants and some of the other consultees on 9th November 2023, to discuss the scheme and to understand how the application is progressing. This application follows many pre-applications meetings and responses we have provided as the scheme and the Masterplan have evolved.

We are pleased to see some of our comments have been addressed, notably the re-location of the NEAP to a more centralised area within the proposed parkland, and the improvement in the north-south cycleway connection through the site. We are also pleased to see the details of the Western Gateway Building finalised and creating a strong sense of arrival and identity to the development. However, as discussed in the meeting, we still have some concerns with the proposed layout details which are explained in more detail below.

The following Urban Design comments are based on the current Masterplan, Drawings, Design and Access Statement and other associated documents.

Policy Background

The National Planning Policy Framework Section 12 requires that developments:

- Function well
- Are visually attractive as a result of good architecture, layout and appropriate landscaping.
- Are sympathetic to local character, including the historic built character, while not preventing increased densities.
- Create a strong sense of place through definition of streets and distinctive forms.

- Optimise the potential of the site to create an appropriate amount and mix of development.
- Create places that are safe, inclusive and accessible.
- Are consistent with the principles set out in the National Design Guide.

Locally, the site in question is an allocated site in the Brentwood Local Plan, 2022, under Policy R03 - Land North of Shenfield. The Policy stipulates that development should provide 825 new homes (in total), around 2.1 hectares of land for a co-located primary school and early years and childcare nursery, around 60-bed residential care home or an appropriate mix of specialist accommodation to meet identified needs, in accordance with policy HP04, 5% self-build and custom build across the entire allocation areas, and around 2ha of land for employment purposes which may include light industrial, offices, research and development (within Class E) or other sui generis employment uses which are compatible with the residential development.

The policy also lists a set of development principles which are expected from any planning application submission.

The policy requires development:

a. To be accompanied by a comprehensive masterplan and phasing strategy to inform detailed proposal as they come forward.
b. Be of a design quality and layout that reflects its key gateway location, particularly the land near to junction 12, A12
c. Provide vehicular access via Chelmsford Road (A1023) and Alexander Lane;
d. Allow, if possible, for the diversion of Alexander Lane to create a quiet lane for pedestrians and cyclists, with the provision for new and improved route through the development site linking to Chelmsford Road;
e. Enhance walking, cycling and public transport services with Shenfield station and local services and facilities in the wider area, including Brentwood Town Centre;
f. Provide well-connected internal road layouts which allow for good accessibility
g. Provide new multi-functional green infrastructure including public open space in accordance with Policies NE02 and NE05;
h. Maintain and enhance Public Rights of Way within the site and to the wider area;
i. Protect and where appropriate enhance the Local Wildlife Site (Arnold's Wood).
j. Provide for appropriate landscaping and buffers along sensitive boundaries adjoining the A12 and railway line.

And.

k. Be designed to ensure a coherent functional relationship with the existing development, which should be well integrated into the layout of the overall masterplan.

Our comments are laid out in the following sections:

Site Background

We would like to commend the applicant's design team in further developing the concept and strategy for this parcel following previous pre-application iterations and meetings which we had considerable involvement in and the opportunity to offer urban design advice to encourage and improve the quality of the built environment.

The scheme was also presented to the EQRP which took place on 7th June 2023 where the Panel reviewed all of the development schemes and the Masterplan. The agreed Masterplan is dated July 2023 and is the current version which all of the phases within this strategic allocated site will be assessed against.

It is noted that the scheme proposes the same number of units as per the last pre-application scheme, i.e., for 344no. units. The application also includes the outline element for the primary school (with all matters reserved).

In essence we have reviewed the proposed scheme in light of the comments we made in our last pre-application advice and include comments on some of the house types proposed.

Character, Identity & Layout

The relevant sections from the NDG are:

- C1 calls for designs which understand and relate well to local built environment character, views, layout, form, scale and appearance.
- I1 encourages buildings which respond well to local character and identity through appreciation of existing built form, height scale, massing and relationships between buildings. This includes the scale and proportions of proposals, façade design, patterns and proportions of fenestration and their details.
- I3 encourages the siting of buildings within the landscape, the arrangement of layout and grain, landscape spaces, movement network, development blocks, scale, form, proportions and materials to create distinct characters and a memorable sense of place.

The proposed overall layout remains largely the same as in the last pre-application iteration. The main access is served from the Chelmsford Road from a new roundabout, and there will also be a secondary access from Alexander Lane, which is to be downgraded and made into a quieter route serving predominantly cyclists and pedestrians and minimal vehicle movements.

We are pleased to see that the character and identity of the scheme has been further developed since the last pre-application scheme. A Character Area plan has been submitted which identifies 4 main sub character areas:

- Primary Streets
- Plaza
- Mews
- Green Edge (Woodland Edge and The Lanes)

We consider that the development has a strong identity which is welcomed and aims to reflect the local vernacular of Shenfield, whilst taking on modern approaches and design details, particularly in materiality, which is defined across this phase.

We consider that the Boulevard (Primary Street) character still lacks an organic flow which was mentioned by the EQRP. There are pinch points along the boulevard route, namely outside plots 265 and 266 and 87 and 88 which restrict the road width along the Boulevard route and impacts how movement travels along here. We question whether these pinch points are necessary and what they add to the character of the Primary Streets sub character area.

In relation to plots 31 – 33, against the school boundary, could these house types be split into a semi-detached and detached arrangement so that the associated car parking can be tucked in between the buildings? The car parking arrangement up against the school boundary does not conform to good urban design principles and a re-arrangement of this would solve this issue.

In relation to garden sizes and accessibility, we raised at the meeting a safety concern in relation to plots 26, 29, 92, 99, 107, 123, 251, 254 and 276, all of which have convoluted alley ways, as they are a middle plot within a terrace form. These alleyways also impact on garden sizes, creating awkward shapes that detract from the usability of the space. In the meeting it was understood that these are limited plots, and the alley ways only serve 1 dwelling. However, we advised that this arrangement does not conform to good urban design principles and would advise that guidance is sought from the Secure by Design Officers to ensure that they would not encourage any undesirable behaviour.

The Western Gateway

We are pleased that the building typology has now been finalised for this important gateway building into the site from Chelmsford Road. The steep pitched roof form and brick detailing are positive features

and we can see how our previous advice on looking at the new Brentwood School building has inspired the scheme and its contextual connection with the wider area. The green cladding creates a theme for the gateway building which continues throughout the Plaza sub character area and brings an identity to the scheme which also helps with wayfinding and legibility. We consider that this also works positively with the predominant red brick of the Plaza character area. We consider that the strong built form continues through plots 19 -24. We would suggest grouping the upper floor windows in a brickwork frame to give the house types more definition and expression. The brickwork should have clear rationale behind its placement and extent.

We are concerned that the rear car parking court, behind the western gateway building and plots 19 - 24 does not appear to be well-overlooked. In our meeting, it was understood that there are drainage crates underneath this area which cannot be moved, which is unfortunate as we consider that the parking arrangement to serve these units could be improved. Given the SuDS strategy is not yet agreed, it is questioned if there would be scope to amend the location of these drainage crates for the benefits of increasing passive surveillance to this area.

School Plaza Area

The relevant sections from the NDG are:

- B3 encourages destinations in accessible locations for people to share spaces and come together as a community
- P1 encourages well located, attractive and high- quality public spaces.
- P2 encourages proposals that produce safe and secure public spaces through the definition of spaces by buildings, active frontages, and natural surveillance.
- U1 encourages developments which promote social inclusivity through removal of potential barriers to and encouraging accessibility.

The School Plaza area is intended to function as the heart of the development, a space where people can meet and socialise and provide an area which promotes well-being and happiness. It is also an important interface with the future school and will be used by children in connection with the school. This space therefore has a lot of potential for being multi-functional via its different users, both during the day, and at night-time.

We consider that the interface with the school still remains unresolved, and that the boundary with this Plaza is somewhat awkward running tight against the built form and the veteran oak tree buffer zone. We understand that further discussions still need to take place in relation to the school and how this will be delivered. However, we would encourage the applicant's design team to consider opening up the Plaza to the north and straightening the boundary with the school to allow the Plaza to function better. Much will depend on the final position of the school on the site and how the school will be designed, as well as consideration of where and how the servicing of the school will take place.

The seated planting area in the middle of the Plaza is dominated by trees, we would recommend further consideration of how this space could be better landscaped, using appropriate planting species, not only restricted to trees, but also thinking about providing landscaping that will help with solar shading, and providing sensory variety throughout the seasons. Given the extent of hardstanding surrounding the trees, their planting method will also need to be considered to ensure their success. The seating around this area is welcome, however, how can this be expanded across the plaza so that the seating is not concentrated within an area. We welcome the seating area around the oak veteran tree buffer, although this is limited, and we would like to see more street furniture to be able to offer to residents and encourage the use of this space. The street furniture should be integrated into the landscaping and the design well-considered. Trees could be added as a linear feature to the south of the Plaza. We would recommend consideration of how this would space function when the school is closed.

Lighting is vitally important to this space, consideration should be had to the lighting strategy for this area, as we can only see ambient lighting around the seating areas. We would encourage the applicant's design team to consider the safety and security of this space and how it will function not only during the day but at night when it could potentially be the meeting point for people wanting to go

into Shenfield and beyond. We would also emphasise the need to ensure that the space offers a sense of security for all members of society and that the street furniture and landscaping features reflect this, and that people feel safe in this space. We would refer you to the recent guidance produced in the Essex Design Guide: https://www.essexdesignguide.co.uk/supplementary-guidance/women-and-girls-safety-in-the-public-realm/. We hope this provides some useful guidance in how to design successful public spaces.

NEAP & LEAP

The relevant sections from the NDG are:

- N1 encourages the provision of a network of high-quality green open spaces with a variety of landscapes and activities, including play.

We are pleased to see that the NEAP has been re-located from behind the SuDs area to within the Parkland area and adjacent to the connection routes in response to our previous concern about it being too far away from the main heart of the development and not being well over-looked. We would advise to consider careful landscaping and the planting of trees around this area to ensure that it does not become enclosed and invisible. We are also pleased to see that there are numerous entrance and exit points around the area, which are important to avoid anti-social behaviour and to encourage free flow through the NEAP and connection through the rest of the site and beyond. The positioning of the LEAP is in accordance with the agreed Masterplan, on the edge of the attenuation basin. We would advise that details of how this will be safeguarded from the attenuation basin are provided to ensure the safety of its future users. We would advise that the equipment to be provided on the NEAP and LEAP is adequate and aligns with the Council's requirements for play areas.

Connectivity

The relevant sections from the NDG are:

- M1 and M2 encourage a connected network of streets for all forms of travel including walking and cycling.
- M1 calls for a clear hierarchy in the streets and other routes so that people can easily find their way around.

We are pleased to see that the north-south cycle route has improved. The permeability plan shows a public cycle route connecting north-south and joining at Chelmsford Road, from the Parkland. In the meeting, we queried why the route does not join the roundabout at the main access, and we understand that this was for safety reasons, which we support and would rather encourage routes to follow for a safer arrangement. The connection with Chelmsford Road would encourage cyclists to continue into Shenfield and beyond, to the north towards the Redrow development and to the south onto Alexander Lane. In relation to other connections, the permeability plans clearly demonstrate good pedestrian connectivity through the site, including vehicle routes and crossing points.

Notwithstanding the comment above about the positive overall connectivity across the site, we consider that there is a missed opportunity to create an East-West pedestrian and cycle connection as shown in the image below:

We consider that this would give more permeability to those units that are served off the private drives, which would also improve the connection from those coming through Arnold's Wood.

We are also disappointed that the additional connection through to the Stonebond Phase has not been provided and this is also a missed opportunity to help unite the phases through these connections.

Landscaping, SuDs & Trees

The relevant sections from the NDG are:

- The NDG Section N1 encourages well considered landscaping which addresses the wider context, how spaces are connected, contributes to green infrastructure, has well integrated drainage, encourages biodiversity, and has the ability to support a range of activities such as learning and play.
- N2& N3 encourage the improvement and enhancement of water management including sustainable drainage, green and brown roofs.

We are pleased to see that an overall Landscape Masterplan has been submitted as per our previous advice, which is supplemented by the sections within the DAS and appears to reflect the vision as set out within the agreed Masterplan. The proposed landscaping of the site was discussed at the meeting with further input from the Council's Trees and Landscaping Officer. The landscape masterplan appears quite well detailed, with added tree planting along the Boulevard and secondary routes. However, we would encourage reviewing the landscaping strategy around plots 111 – 120 and 134 – 143 as it appears to be limited in landscaping here compared with other areas. The tree-lined Boulevard (and Primary Street) is positive and helps to create a sense of place whilst providing solar shading and biodiversity benefits. We would also advise that providing a variety of species, that are resilient, across the site and within the parkland area will contribute towards the development's green credentials and provide a pleasant, inviting environment for residents and anyone visiting the site. We would recommend that a robust Landscape Maintenance strategy is secured to ensure the longevity of the strategy and so that the features are sustainable as the development ages and the climate continues to change.

We note than an additional oak tree will be planted adjacent to the veteran oak tree as a legacy and one that should continue to thrive once the veteran oak no longer survives. We welcome this approach and from an urban design perspective, this would help to retain the strong feature within the Plaza area and also as a landmark feature to help with wayfinding. As mentioned above, we consider that a more suitable landscaping strategy for the School Plaza would be an opportunity to better define the space in relation to its many functions.

The Boardwalk across the northern SuDs basin is considered to be a positive design approach as this would tie in with the edge of the ancient woodland character and the transition between this phase and

the Redrow phase to which it connects. We would recommend that clarification is sought on its future maintenance and is secured as a planning condition.

We would also like more consideration given to the landscaping around the pumping station to avoid this becoming an incongruous feature within the street scape, particularly given the verdant character of its surroundings.

Car & Cycle Parking

The relevant section in the NDG is:

- M3 encourages well considered parking, and servicing which is convenient but does not undermine the streetscape.

The car parking provision appears to accord with the Essex Design Guide standards. We would advise that the Council is satisfied that adequate cycle parking is provided for all of the residential units and the apartment blocks, as illustrated on the parking layout plan.

We note that the number of visitor car parking spaces have been halved. We are concerned that there are still some visitor car parking spaces among the central tree band, which we have previously advised against as this can encourage ad-hoc parking potentially on the RPA of the trees, and to the detriment of the visual amenity of the area. Could these be re-positioned elsewhere, away from the trees. We would question whether spaces V13 and V14 would work given its position on a slight bend in the road. Also, V6 appears to be randomly positioned outside plots 275 – 277. Spaces V61 and V62 are also off a shared surface, and it is questioned who would maintain these spaces i.e. will they be adopted by the highway authority?

House types and Materiality

The relevant sections from the NDG are:

- I1 encourages buildings which respond well to local character and identity through appreciation of existing built form, height scale, massing and relationships between buildings. This includes the scale and proportions of proposals, façade design, patterns and proportions of fenestration and their details.
- I3 encourages the siting of buildings within the landscape, the arrangement of layout and grain, landscape spaces, movement network, development blocks, scale, form, proportions, and materials to create distinct characters and a memorable sense of place.
- Section B encourages the use of height, density, and arrangement of buildings to create destinations, increased legibility, and proposals that are proportionate to the spaces they overlook while being sensitive to the existing landscape and built form context.
- B1 encourages a compact form of development.
- B2 encourages well defined streets with consistent building lines, heights related to street widths, and plenty of active frontage consistent with local character.

Overall, the general architectural approach and house types are supported. It is considered that the development has a strong identity which is carried through the site and translated through the different sub character areas. The architectural connection from the Chelmsford Road and Alexander Lane perimeters are clearly legible which is positive. The street scenes submitted provide a good visual interpretation of how some parts of the development will shape up, including one particular street scene (CC – part C) that shows the transition between the Primary Street character area to the Mews character area in built form and house typology. In relation to the street scenes provided we would comment as follows:

Street Scene AA – BB (School Plaza character) – This relates to the western gateway building that we mentioned earlier in our response which is considered to being a strong identity to the development alongside materiality, colour, scale and brick detailing, which continues through to plots 19 – 24. The

light green cladding is a sympathetic nod to the verdant landscape-led character of the development and is considered to mark this gateway clearly and positively.

Street Scene CC (Mews character) – The identity of the development continues through this street scene with the green cladding on particular elements of the house types. Plot 74 has a very strong vertical emphasis and a parapet, against plot 75 which is flatter with a horizontal emphasis. There is variety in the roof scape with varying heights. Plots 79 & 80 and 85 & 86 have a strong cladding which splits the dwelling in two with a high roof line. However, it is considered that the cladding appears slightly excessive in comparison to the other more modest variations in materials within the street scene and would benefit from being broken up. It is also considered that the dormers are set too low within the roof leaving a very high roof plane. Nevertheless, this street scene shows a helpful transition between the character areas from plot 100 and 103 and 105 from modern to traditional (From Primary Street to Mews character areas). The Green Street – Mews Streets shown in the Masterplan illustrates examples of house types which show a mix of typologies which appears to be reflected in these house types.

Street Scene DD – (Mews character) – This is a traditional approach with expressed gables, varying in rood scape. Is plot 110 supposed to be higher than plot 109? (The roof line looks broken - could be a mis print?). Materiality is more mixed along here with render, buff brick, red brick, grey and red roof tiles to bring variety, individuality, and interest.

Street Scene EE – (Primary Street character into Green Edge) – The green cladding is included within this street scene to reflect the development's identity. There is a variety of materials all long here. Plots 158 and 159 are quite busy with materials and we would suggest reducing the number of different material types to avoid competing with each other visually and appearing over-whelmed. These plots would benefit from a greater depth to the ground floor as the segregation of render/brick at present, creates a top-heavy appearance to the dwelling. We would recommend removing the render and retaining the red brick as the predominant material. The green cladding accents on plots 150 – 155 works well and are supported. The fenestration treatments generally across the street scene could benefit from additional articulation and accentuation through the inclusion of sills and lintels. We also consider that the design of the roof on plot 149 could be improved, as in the street scene, the roof looks somewhat squat and we would advise that the roof pitch could be lifted as the same height as the gable end.

Street Scene FF – (Green Edge/Woodland Edge character) – Plots 170 – 172 are a traditional typology. The Masterplan envisages house types which include chimneys as features, which are not shown in the proposed house types along here. We discussed this in the meeting, and we understand that these are not supported in lifetime homes as they will not serve a traditional fireplace and as such are not required. However, we have seen examples where other household utilities utilise the chimney breast so that it is not possible to use this as a fireplace and we would recommend that this be explored to allow for the inclusion of chimneys to these dwelling types. The NDG highlights roofscapes as important features for good design. If chimneys are not to be included, we would encourage the applicant's design team to ensure that there is sufficient variety and interest at roof level, and this is justified to the Council.

Street Scene GG (Green Edge Character) – Traditional typology with varied house types have been included. However, it is question whether the 4 different types of door canopies are necessary. We would refer you back to the Masterplan where the photo examples show house types which include chimneys in the roof scape. We consider that these features would help with the overall traditional approach and to reflect the local vernacular which is clearly shown in the photos in the Masterplan. If these are not forthcoming, we would recommend further justification from the applicant. We would also welcome amendments to the materials of plots 226 and 233 as the weatherboarding appears to terminate at a point which creates a squat appearance to the ground floor. It may be prudent to approach the materials to these dwellings similarly to plots 214 and 215. Additionally, the fenestration patterns to plot 230 could benefit from greater symmetry (see the Essex Design Guide, architectural details section in relation to window symmetry).

Street Scene HH (Green Edge Character) – Plots 302 – 310, 311 – 319 and 320 – 323 – Southern gateway fronting Alexander Lane (The Lanes). Narrow expressed gables with the iconic green cladding accented onto elements of the façade create a positive and distinguished appearance to this street

scene. This would be in addition to the grey cladding against a red brick and contrast red roof tile. The vertical emphasis is positive. The same approach is taken on plots 320 -323, however the verticality emphasis appears to be lost as the building is lower in height which causes some visual awkwardness due to the drop in height between plots 311 – 319 and 320 – 323. The combination of the materials is also a concern and could be limited. It is also questioned how this building would relate to the southern gateway building on the Stonebond phase. It would be useful to see the street scene extended to show this.

Street Scene JJ (Primary Street character – with Mews Character for plots 292, 294, 295 off a private drive) – The grey cladding from the gateway buildings and then the use of the green cladding along the Primary Street on large elements on plots 296, 293, 291, 288, 287 is causing a concern as it appears too heavy against the choice of the other materials and would recommend limiting the use of the green cladding on these house types to avoid over-whelming them in this material. However, we would question the design of the roof on plots 287, 293 & 296 (as in plot 149 mentioned above), we consider that the roof slope could be lifted in height to match the gable. The contemporary house types along here harmonise against those at the main western gateway entrance which helps with identity and legibility. The rationale of the green cladding to plots 302-310 at ground floor is not understood as it does not appear to be highlighting a particular feature. It may be of benefit to the scheme to maintain this as grey cladding.

Conclusion

In conclusion, we are pleased to see that a number of positive moves have been made since the last pre-application scheme including:

- Finalising the design of the western gateway building and creating a strong identity for the development using appropriate materials.
- Re-locating the NEAP to a more centralised area within the Parkland where it will be well-over-looked and would encourage use.
- Improvement of the north-south cycle connection through the site.
- Positive and sympathetic house types using repetitive materials to strengthen the development's identity and improve legibility.

However, there are still a number of remaining issues which we encourage to be resolved:

- The Primary Street (Boulevard) still lacks an organic flow as recommended by the EQRP.
- The interface with the School from the School Plaza remains unresolved and an opportunity to open up the Plaza to the north could help improve the relationship with the boundary to the school site.
- The landscaping and lighting of the School Plaza requires further review to ensure safety and security and so that the space functions successfully as the heart of the development.
- Could plots 31 – 33 be slightly re-arranged into a semi-detached and detached arrangement so that the car parking can be tucked in between the plots?
- Recommend review of plots 26, 29, 92, 99, 107, 123, 251, 254 and 276 in relation to accessibility, garden sizes, and safety.
- Some of the materiality on some of the house types could be limited to avoid them being over-whelmed by lots of competing materials.
- The East-West connection is a missed opportunity.
- The additional pedestrian and cycle connection through to the Stonebond phase is a missed opportunity.
- Recommend review of the visitor car parking spaces so that they do not impact on trees and are not located on bends in the road.

We look forward to reviewing this scheme again as it evolves.

Yours Sincerely,

Angela Briggs BA(Hons) MATP
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N.B. This letter is advisory and should only be considered as the opinion formed by specialist staff in relation to the particular matter.

All communications are in accordance with Place Services Standard Terms and Conditions.

Name: Kathryn Williams
Brentwood Planning Office
via E mail to: planning@brentwood.gov.uk
Ref:23/01164/FUL

Andrew Simpson
Designing Out Crime Office
Essex Police HQ
Springfield
Chelmsford
Tel.07971 902227
Date: 25th October 2023

Land North of Shenfield, Alexander Lane, Shenfield, Essex

23/01164/FUL Hybrid planning application for 344 units including 35% affordable housing, safeguarded land for a 2FE primary school and early years facility, public open space and associated landscaping, drainage and highways infrastructure.

Dear Ms Williams,

The 'Essex Police – Designing out Crime Office (DOCO) welcomes the opportunity to make comment on the proposed development of land north of Shenfield, Alexander Lane, Shenfield.

Good design and early co-ordination, incorporating 'Crime Prevention Through Environmental Design' (CPTED) principles, can avoid the conflicts that may be expensive or impossible to resolve once the construction phase is complete. CPTED forms part of Police Crime Prevention Initiatives (PCPI) which is the official UK Police Security Initiative.

Essex Police considers that it is important that, if approved, this development project is designed incorporating the maximum achievable benefit of CPTED for which Secured by Design (SBD) is the preferred enabler.

We strongly recommend that the applicant seeks to achieve the relevant Secured by Design accreditation detailed within the current Secured by Design Homes guide (updated in 2023) for the development; (https://www.securedbydesign.com/guidance/design-guides) provides full details.

It is important that design and security specifications are risk commensurate and provide an effective and realistic level of physical security that is commensurate with the risk posed by crime and anti-social behaviour (ASB).

Consequently, we would particularly like to discuss the following areas:

Physical Security and Access control

We would request consultation regarding proposals to ensure the safety and security for residents of the various dwellings within the development at the appropriate time within the planning process.

Additionally, further clarity in relation to access control for communal doors and communal space within the apartment blocks is also sought. We are interested in the level of security that is to be provided for both the cycle storage and bin storage areas for the apartments as well as the arrangements for mail delivery within the buildings.

Electrical Vehicle Charging

There is detail within the plans for Electrical Vehicle Charging Points (EVCP's); Essex Police recommend that consideration is given to the security provision for the EVCP's. Early consideration will mitigate the opportunities associated with crime relating to this comparatively new vehicle fuel power provision. We would welcome consultation regarding the infrastructure, proposals, and management of EV charging points.

Landscape plan

Public realm spaces are designed where safety and security are subliminal to the user of that space. The DOCO would welcome the opportunity to liaise regarding the over-all permeability of the site and the green architecture and appropriate landscaping plan. We are particularly interested in the access, use and management of the proposed public realm spaces surrounding the southern and eastern flanks of the site.

School drop-off/pick up plan

Although we are aware that a separate planning application has been submitted in relation to the proposed school shown within the plans, we have significant concerns regarding the impact of the school on the proposed housing element of the development.

The county of Essex has numerous schools, particularly primary schools, where considerable problems are caused through traffic congestion in the mornings and afternoon, coinciding with the beginning and end of school time.

Anti-social behaviour caused through inconsiderate vehicle parking and driver behaviour by those dropping off and picking up children from school can be very impactive on those living close to educational premises.

On inspection of the plans within the application there does not appear to be an area in the vicinity of the school that will cope with vehicle movement/parking and the mass arrival and departure of

children at the beginning and end of the school day. Essex Police would like to understand the parking and drop off/pick up plan for those with children at the proposed school.

We urge the applicant to engage with the Essex Police Roads Policing department to discuss the impact of the school on the road infrastructure in this area; it is important to understand not only the impact of increased traffic on the area within the development but also potential parking/traffic displacement to surrounding areas.

We would welcome the opportunity for engagement with the design team to discuss the security design aspects of the development to ensure provision of a safe and secure environment for the future.

If you or the developer/applicant has any queries relating to the above or regarding means to adopt designing out crime practices, please contact the team via email designingoutcrime@essex.pnn.police.uk.

We look forward to hearing from the applicant to discuss this matter.

Yours sincerely,

Andrew Simpson

Designing Out Crime Officer
Local Policing Support Unit
Essex Police HQ

Officers Meadow
Essex County Council Consultation Response

N20/152080
23rd May 2024

Introduction

1. Vectos has been appointed by Croudace Homes Ltd, to provide transport and highways advice in relation to the development at Officers Meadows, which forms part of the Land North of Shenfield allocated site within Brentwood Local Plan (2016-2033) as part of Policy R03.

2. The site lies within the administrative boundary of Essex County Council (ECC) and Brentwood Borough Council (BBC).

3. The development description for this full application is as follows:

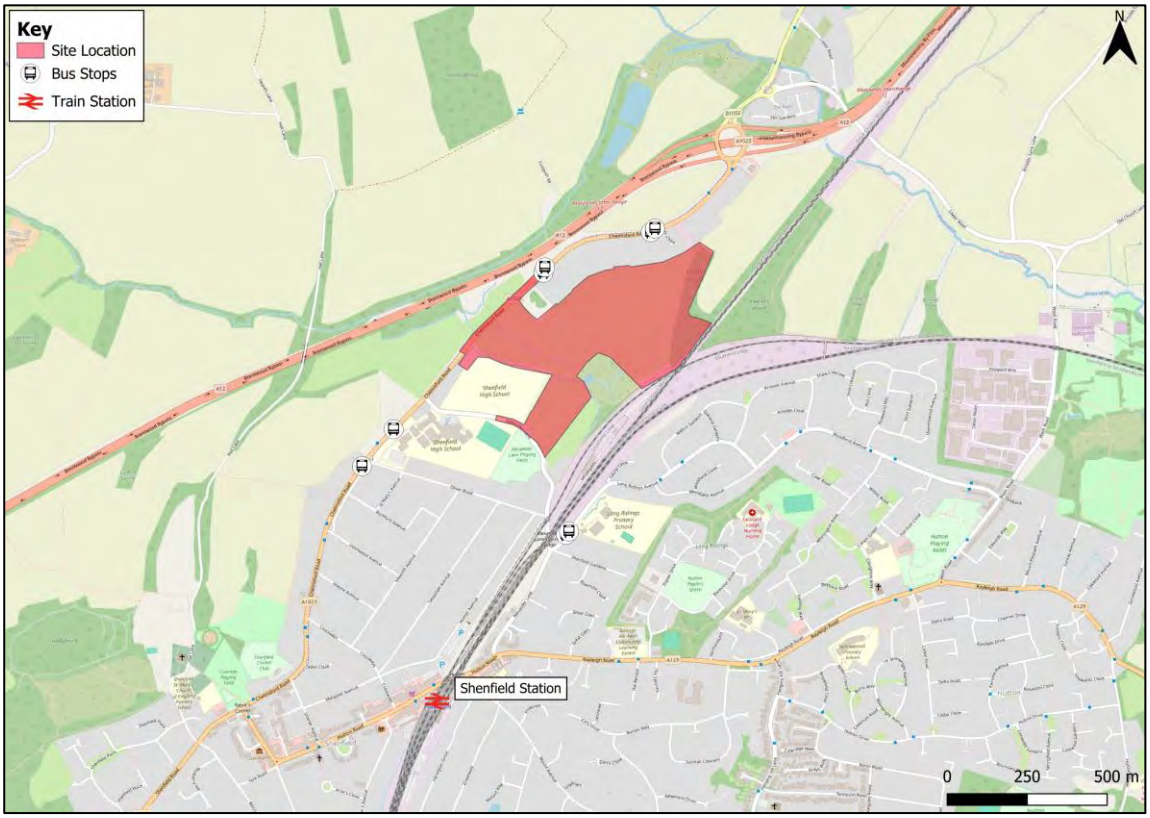
   "Full planning application for 344 units including 35% affordable housing, safeguarded land for a 2FE primary school and early years facility, public open space and associated landscaping, drainage and highways infrastructure."

4. The site is located to the north of Shenfield town centre and is proposed to have vehicle access from both the A12 Chelmsford Road and Alexander Lane. Pedestrian and cycle access are also provided via these access points. Further pedestrian and cycling accesses are provided via dedicated connections to these two roads and connections to the wider site allocation through the land owned by Stonebond Properties and Redrow Homes. The site location can be found in **Figure 1** below.

5. A planning application was submitted setting out the proposals in September 2023 with planning reference 23/01164/FULLPA and 23/01159/OUT. Essex County Council (ECC) Highways provided a previous set of comments on the application, dated 17th April 2024. Vectos responded to these in a technical note on 30th April 2024. Several of the points were resolved through this process.

6. This note has been prepared in response to comments raised by Essex County Council (ECC) within the email dated May 16th, 2024. The ECC consultation response can be viewed at **Appendix A**. The comments raised by ECC are provided below in *italics* with Vectos response following it.

Figure 1: Local Site Location



ECC Comments

Primary School Trip Numbers

7. *The applicant has provided a rebuttal to the suggestion that their Transport Assessment underestimates primary school trip numbers. Unfortunately, we have a fundamental difference opinion on this issue and the Highway Authority is not prepared to accept that a school of some 420 pupils will only generate 32 trips in the morning peak hour, i.e. 25 parents' trips and 7 staff trips. ECC has carried out its own review of primary schools in suburban and edge of town locations in England (outside Greater London), i.e. similar locations as the Croudace site, using the industry-wide accepted TRICS database. Our findings for the 8am to 9am peak hour were as follows:*

   — *Suburban and edge of town arrivals; 0.256 trips per pupil = 107 arrivals for a 420 pupil school.*

   — *Suburban and edge of town departures; 0.224 trips per pupil = 94 departures for a 420 pupil school.*

8. *As a sense check, we also examined all primary schools in England outside Greater London with the following findings:*

- *All primary schools arrivals; 0.318 trips per pupil = 133 arrivals for a 420 pupil school.*
- *All primary school departures; 0.271 trips per pupil = 114 departures for a 420 pupil school.*

9. *We do, however, consider the first set of figures for suburban and edge of town schools to be entirely appropriate to use. The applicant argues that the development is designed so that active travel is the first choice for residents and there will be excellent public transport provision. However, it does not consider that a) walking thresholds for children of primary school age is much lower than for adults, b) the catchment area of the school will extend far beyond the R03 site, c) parents often drive their kids to school either for security purposes or because they are headed to their workplace afterwards, and d) staff numbers are not restricted to just teachers, but also cleaning, catering, administration etc (the suggestion that only 14 staff trips arrive between 7am and 9am is therefore not credible for a 420 pupil school).*

10. *ECC therefore remains of the opinion that the applicant has not undertaken a suitably robust assessment of the school's impact. If the applicant is unwilling to consider this further, we may be left with the unfortunate option to recommend refusal based on insufficient evidence.*

Vectos Response

11. As set out above and within the Transport Assessment (TA) we do not agree that the school would attract this level of external vehicle trips as the school is designed to accommodate the demand from the allocation (see appendix S of the TA). This states that circa 40% of the demand for the school will be from the allocation therefore only 60% would come from outside the allocation. These remaining trips are all then estimated to come from external areas within 1-2 miles. As such we do not agree on the approach suggested by ECC.

12. However, to allow ECC to make a decision on the application, a sensitivity test has been run based on the numbers of trips set out by ECC in the AM Peak only.

13. Vectos have undertaken a sensitivity test using the trip rates set out by ECC. It has been assumed the trip rates provided are vehicle trip rates and therefore no mode split analysis has been applied and to be robust no internalisation of these vehicle trips has been applied. To be clear, this is a very worst case and in our view is overly robust as 40% of the movements would actually originate within the allocation and would not be car trips.

14. Vehicle trip rates derived from TRICs will account for all movements to and from the school including teachers. We have therefore removed our previously estimated teacher trips. We have therefore modelled 108 arrival and 94 departures during the AM peak.

15. The trip distribution has been reviewed based on our analysis and therefore the school trips have been estimated to mainly arrive from Shenfield. As such 97% of trips will travel to the site via Chelmsford Road northbound or Alexander Lane northbound. It has been assumed that 3% of school trips will come from north of the A12.

16. All other factors including trip distribution and growth factors remain unchanged.

17. Full modelling results can be found in **Appendix B**.

18. We have updated the traffic impact assessment undertaken within the submitted Transport Assessment (September 2023). For reference the junctions assessed are:

- A1023 Chelmsford Road/ Site Access – roundabout
- A1023 Chelmsford Road / Oliver Road – priority junction;
- A1023 Chelmsford Road / Hutton Road / A1023 Shenfield Road – signalised junction;
- A129 Rayleigh Road/ Alexander Lane – mini-roundabout;
- Alexander Lane / Long Ridings Avenue – priority junction;
- Oliver Road / Alexander Lane – priority junction;
- A1023 Chelmsford Road / Alexander Lane – priority junction; and
- A12 Junction 12 – roundabout.

Western Site Access / Chelmsford Road Roundabout Junction

19. The results of the Western Site Access / Chelmsford Road roundabout junction can be seen in **Table 1.**

Table 1 – Western Site Access / Chelmsford Road Roundabout Modelling Results

Arm	TA AM		Sensitivity AM	
	Q (Veh)	RFC	Q (Veh)	RFC
2028 Base + Proposed Development				
Chelmsford Road (N)	4	0.78	4	0.81
Site Access	1	0.37	1	0.42
Chelmsford Road (S)	1	0.48	2	0.62
2028 Base + Committed Development+ Proposed Development				
Chelmsford Road (N)	4	0.81	5	0.84
Site Access	1	0.38	1	0.43
Chelmsford Road (S)	1	0.50	2	0.64

20. The results show that all arms remain below an RFC 1.00 and therefore indicate spare capacity at the junction. The maximum RFC is 0.84 during the AM peak, which is a 0.03 increase from the TA results (0.81 maximum). The queue on this arm has increased by 1 vehicle when compared to the TA results. This is an immaterial impact the local highway network.

A1023 Chelmsford Road / Oliver Road – Priority Junction

21. The results of the A1023 Chelmsford Road / Oliver Road priority junction can be seen in **Table 2.**

Table 2 – A1023 Chelmsford Road / Oliver Road Priority Junction Modelling Results

Arm	TA AM		Sensitivity AM	
	Q (Veh)	RFC	Q (Veh)	RFC
2028 Base				
Oliver Road	2	0.62	2	0.62
Chelmsford Road	1	0.31	1	0.31
2028 Base + Proposed Development				
Oliver Road	4	0.78	4	0.82
Chelmsford Road	1	0.34	1	0.34
2028 Base + Committed Development+ Proposed Development				
Chelmsford Road	5	0.82	6	0.87
Oliver Road	1	0.34	1	0.35

22. The results show that all arms remain below an RFC 1.00 and therefore indicate spare capacity at the junction. The maximum RFC is 0.87 during the AM peak, which is a 0.05 increase from the TA results (0.82 maximum). The queue on this arm has increased by 1 vehicle when compared to the TA results. This is an immaterial impact the local highway network.

A1023 Chelmsford Road / Hutton Road / A1023 Shenfield Road – Signalised Junction

23. The results of the A1023 Chelmsford Road / Hutton Road / A1023 Shenfield Road signalised junction can be seen in **Table 3**.

Table 3 – A1023 Chelmsford Road / Hutton Road / A1023 Shenfield Road Modelling Results

Arm	TA AM		Sensitivity AM	
	Q (pcu)	DoS%	Q (pcu)	DoS%
2028 Base				
A1023 Shenfield	17	74.2	17	74.2
Chelmsford Road	13	74.2	13	74.2
Hutton Road	7	74.2	7	74.2
2028 Base + Proposed Development				
A1023 Shenfield	19	78.1	19	78.1
Chelmsford Road	17	79.2	17	79.2
Hutton Road	8	76.0	8	76.0
2028 Base + Committed Development+ Proposed Development				
A1023 Shenfield	19	75.9	19	75.9
Chelmsford Road	15	77.3	15	77.3
Hutton Road	7	76.4	7	76.4

24. The results show that all arms remain below an DoS of 100% and therefore indicate spare capacity at the junction. The DoS and queues remain the same when comparing the TA and sensitivity test results for all scenarios. The impact on the road network is immaterial.

A129 Rayleigh Road/ Alexander Lane – Mini-Roundabout

25. The results of the A129 Rayleigh Road/ Alexander Lane – mini-roundabout can be seen in **Table 4**.

Table 4– A129 Rayleigh Road/ Alexander Lane – Mini-Roundabout Modelling Results

Arm	TA AM		Sensitivity AM	
	Q (Veh)	RFC	Q (Veh)	RFC
2028 Base				
Rayleigh Road (E)	2	0.71	2	0.71
Rayleigh Road (W)	2	0.58	2	0.58
Alexander Lane	2	0.64	2	0.64
2028 Base + Proposed Development				
Rayleigh Road (E)	3	0.72	3	0.74
Rayleigh Road (W)	2	0.60	2	0.64
Alexander Lane	3	0.68	3	0.74
2028 Base + Committed Development+ Proposed Development				
Rayleigh Road (E)	3	0.73	3	0.75
Rayleigh Road (W)	2	0.60	2	0.65
Alexander Lane	3	0.69	3	0.75

26. The results show that all arms operate within capacity. The maximum RFC is 0.75 during the AM peak (Alexander Lane), which is a 0.06 increase from the TA results (0.69 maximum). The level of queueing remains the same at 3 vehicles. Therefore, this will not have a significant impact the local highway network.

Alexander Lane / Long Ridings Avenue – Priority Junction

27. The results of the Alexander Lane / Long Ridings Avenue priority junction can be seen in **Table 5**.

Table 5– Alexander Lane / Long Ridings Avenue – Priority Junction Modelling Results

Arm	TA AM		Sensitivity AM	
	Q (Veh)	RFC	Q (Veh)	RFC
2028 Base				
Long Ridings Avenue	1	0.30	1	0.30
Alexander Lane	1	0.10	1	0.10
2028 Base + Proposed Development				
Long Ridings Avenue	1	0.31	1	0.32
Alexander Lane	1	0.10	1	0.10
2028 Base + Committed Development+ Proposed Development				
Long Ridings Avenue	1	0.31	1	0.32
Alexander Lane	1	0.10	1	0.11

28. The results show that all arms operate within capacity. The maximum RFC is 0.32 during the AM peak, which is a 0.01 increase from the TA results (0.31 maximum). The level of queueing remains the same at 1 vehicle. Therefore, this will not have a significant impact the local highway network.

Oliver Road / Alexander Lane – Priority Junction

29. The results of the Oliver Road / Alexander Lane – Priority Junction priority junction can be seen in **Table 6**.

Table 6– Oliver Road / Alexander Lane – Priority Junction Modelling Results

Arm	TA AM		Sensitivity AM	
	Q (Veh)	RFC	Q (Veh)	RFC
2028 Base				
Oliver Road	1	0.53	1	0.53
Alexander Road	0	0.03	0	0.03
2028 Base + Proposed Development				
Oliver Road	2	0.60	2	0.62
Alexander Road	1	0.03	1	0.03
2028 Base + Committed Development+ Proposed Development				
Oliver Road	2	0.61	2	0.63
Alexander Road	1	0.03	1	0.03

30. The results show that all arms operate within capacity. The maximum RFC is 0.63 during the AM peak, which is a 0.02 increase from the TA results (0.61 maximum). The level of queueing remains the same at 1 vehicle. Therefore, this will not have a significant impact the local highway network.

A12 Junction 2 – Roundabout

31. The results of the A12 Junction 2 roundabout can be seen in Table 7.

Table 7 – A12 Junction 12 Modelling Results

Arm	TA AM		Sensitivity AM	
	Q (Veh)	RFC	Q (Veh)	RFC
2033 Base				
A12 (E)	13	0.92	13	0.92
Chelmsford Road	1	0.50	2	0.50
A12 (W)	1	0.46	2	0.46
Roman Road	2	0.59	2	0.59
2028 Base + Proposed Development + Committed Development				
A12 (E)	29	0.99	29	0.99
Chelmsford Road	2	0.61	2	0.61
A12 (W)	1	0.47	1	0.47
Roman Road	2	0.64	2	0.64
2033 Base + Proposed Development + Committed Development				
A12 (E)	33	0.99	33	0.99
Chelmsford Road	2	0.61	2	0.61
A12 (W)	1	0.48	1	0.48
Roman Road	3	0.65	3	0.65

32. All scenarios operate within capacity. There is no change in RFC or queueing based on the sensitivity test. The conclusions remain the same as in the TA. The predicted average queue length does not exceed the length of the slip road, which is circa 450m to the diverge and 186m worth of vehicles queuing. This allows sufficient length for vehicles to decelerate and stop at the back of the queue, and thus there are not safety risks with regards to the future traffic anticipated.

Running Lanes at Pedestrian Island on Chelmsford Road

33. *It is noted that the applicant has addressed ECC's request that 3.25m wide running lanes are provided. No further action is required.*

Vectos Response

34. This is noted.

Shared Access Widths on Main Spine Road

35. *The applicant has provided swept path diagrams to demonstrate that two vehicles can pass each other at the shared accesses. The diagrams only confirm that any such movements will be extremely tight with collisions very possible and dwell time on the main carriageway very likely. Although this issue is not a reason for recommending refusal of the application, the applicant needs to be aware that it could preclude the spine road's adoption by the Highway Authority.*

Vectos Response

36. The swept path analysis presented shows that two vehicles are able to move past each other at the shared accesses. It should be considered that these routes will be very lightly trafficked and therefore the occurrence of two vehicles arriving and departing are the same time will be rare.

37. When this does occur the mostly likely situation will be either they will make the manoeuvre together or if they do not feel comfortable one vehicle will wait whilst the other enter/exits the shared access. This is a very common occurrence on the UK road network and the effects are considered inconsequential.

38. In relation to adoption, as part of the detailed design, the developer will work with the Highway Authority as technical approver and where any issues are identified appropriate amendments can be made at that time.

Provision of a Bus Stop Layby Southwest of Site Access Roundabout

39. *It's stated that this was considered but there was insufficient space within the public highway to provide a layby whilst retaining a 2m wide footway. However, it appears from the drawing that any additional land required for the stop would fall within the red line of the development. Clarification is therefore sought on this possibility. In the meantime, we will also consult ECC's Passenger Transport team on the acceptability of an on-street bus cage and also with our Network Assurance team (who manage the highway network in Essex) on any implications of the proposed removal of the traffic island to enable it.*

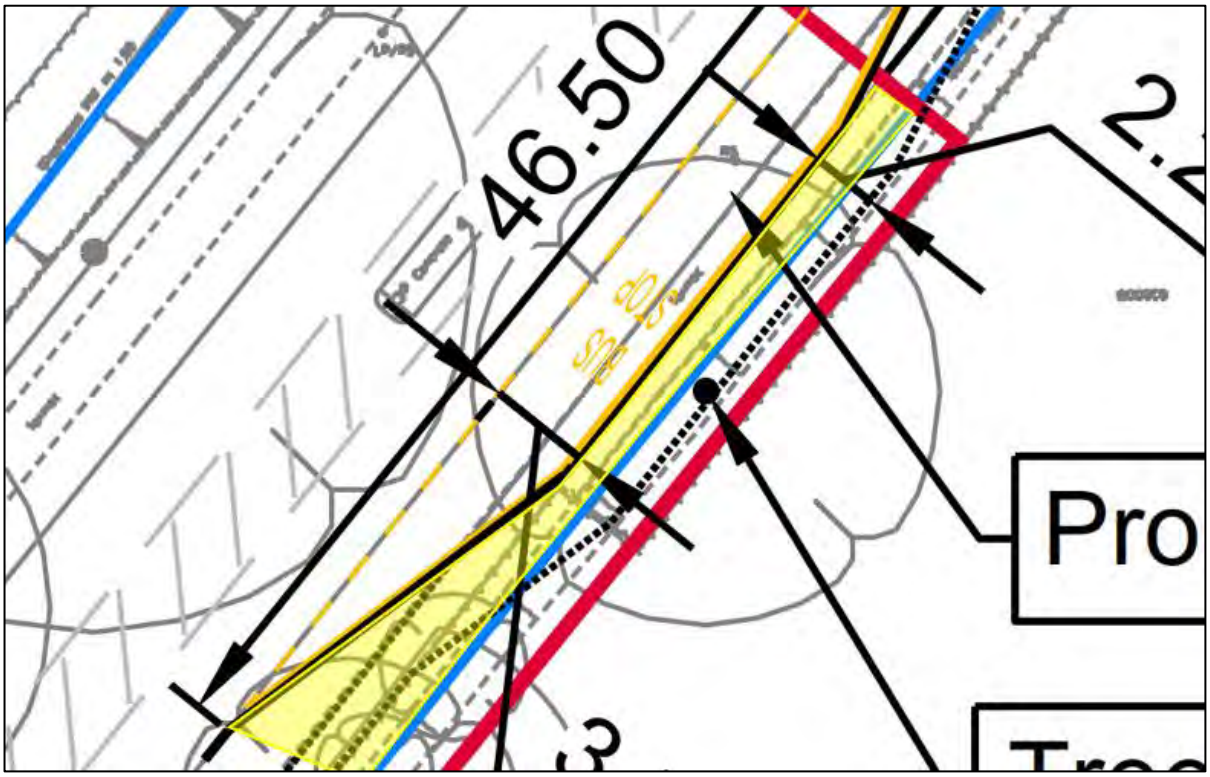
40. Provision of a bus layby was considered in our previous response note, dated 30/04/2024. We note in this response there is insufficient land to provide the layby and maintain a 2m wide footway. Given

the anticipated increase in pedestrian use of this section of Chelmsford Road as a result of the proposals, it is considered that maintaining an acceptable footway width is a priority.

41. In the above comment, ECC have noted that the bus layby *'would fall within the red line of the development'.* **Figure 2** below highlights there is a strip of unregistered land between the site's red line boundary and the blue line denoting the highway boundary. A review of the highway boundary information provided to us from ECC it is clear this land falls outside of the highway boundary as well as the clients ownership (see yellow section in **Figure 2** below).

42. If we were to provide a layby within the land within our control the footway would be required to be narrowed to do so. Reviewing the space available the footway width achievable would be approximately 1m which is substandard. Furthermore, upon our review if the layby is to be provided a culvert would be required due to the drainage ditch present which is not desirable. Therefore, we are unable to deliver this layby within the land within our control (highway boundary and the client's ownership).

Figure 2: Proposed Layby Design



Review of Surrounding Bus Stops

43. A review of the existing bus stops along Chelmsford Road has also been undertaken. None of the existing bus stops have laybys provided and therefore there is a precedent of buses stopping to drop off and pick up passengers within the carriageway. Existing road users will be familiar with this arrangement and move around the buses where possible.

44. On average, the bus stops on Chelmsford Road have a bus stopping approximately every 20minutes which equates to 3 buses per hour. This will not cause a significant delay on the network and therefore a bus cage is deemed acceptable.

45. The only exception on Chelmsford Road is the High School bus stop where typically there would be longer dwell times of buses due to dedicated school services. It should be noted the development will be providing walking and cycling routes for secondary school children living within the site for that attend the school. Therefore, this will not be exacerbated by the development.

46. In light of this, there is the opportunity to retain an on-carriageway bus cage and remove a section of the central hatching and splitter island as previously proposed. This will effectively widen the running lane and enable the free flow of traffic when a bus is stopped in the bus cage. The alternative design including swept path analysis was provided in our previous response note dated 30th April 2024 at Appendix D and is repeated within this response at **Appendix C**. The swept path demonstrates that cars can safely navigate around a stopped bus, preventing any congestion. Vectos would support either the existing design or this alternative design as both are deliverable.

Swept Path Diagrams

47. I note from Jane Piper's e-mail that there is a bus swept path diagram. I'm not in receipt of this drawing, so please can it be provided? At least one of the refuse vehicles modelled is almost as long as a bus, so we have a reasonable idea. From the diagrams that I am in receipt of, there is one that indicates that a turning head needs to be extended (adjacent to Plot 215). Will this be incorporated into a subsequent drawing?

Vectos Response

48. The updated swept path analysis of a bus travelling along the spine road has been included at **Appendix C**. It was previously included at Appendix F of our response note issued 30th April 2024.

49. The turning head adjacent at Plot 215 does not require extending, the vehicle wheels remain within the turning head to carry out a three-point manoeuvre. It is only the vehicle cassis overhanging that turning head.

Sustainable Transport Improvements

50. Noted and proposals are agreed in principle. The improved footway / cycleway on Chelmsford Road will require internal consultation; it's possible that it a Stage 1 road safety audit will be required. Signage as shown for the Alexander Lane / Hunter Avenue route should also include the Oliver Road route too.

Vectos Response

51. This is noted. A road safety audit of the lining and signing strategy for Alexander Lane/Hunter Avenue will be undertaken when required. A road safety audit will be completed for the Chelmsford Road cycle route once the internal consultation has been completed.

Conclusion

52. In conclusion:

- A sensitivity test in relation to primary school trip generation based on the trip rates provided by ECC has been undertaken in the AM Peak hour. The results of the impact assessment show that there are no material changes to the analysis set out within the TA and no changes to the site access junction design are required. Therefore, the conclusions of the TA remain valid.
- In relation to providing a bus layby, the required land falls outside of the highway boundary as well as the clients ownership. Therefore, it is not possible to deliver a bus layby.
- An alternative option has been drawn where it is proposed to retain an on-carriageway bus cage and remove a section of the central hatching and splitter island as previously proposed. This will effectively widen the running lane and enable the free flow of traffic when a bus is stopped in the bus cage. Cars can navigate effectively around a stopped bus. Either the original drawing (152080/A/01 Rev H) or this alternative arrangement (152080/A/01 Rev J) would be acceptable.
- A road safety audit will be undertaken of the signing and lining proposals on Alexander Lane/Hunter Avenue/Oliver Road when required. A road safety audit will be undertaken once internal consultation has been completed on the Chelmsford Road proposals.
- All other points raised by Essex Highways have been noted and will be actioned when relevant.

APPENDIX A

From: Kathryn Williams <Kathryn@kewplanning.co.uk>
Sent: Thursday, May 16, 2024 7:42 AM
To: Ben Yallop <Ben.Yallop@croudace.co.uk>; Federica Ambrosini <federica@kewplanning.co.uk>; Piper, Jane <jane.piper@stantec.com>
Cc: Shanshan Li <Shanshan@kewplanning.co.uk>
Subject: Re: Land at Shenfield, Croudace - tomorrow's meeting

Hi Ben / Jane,

Update on items outstanding:

1. IDP clarifications being finalised with Sport England and Highways.
2. Conditions – being progressed.
3. Legal agreement – in hand and Nicky is speaking to Alison today on a few points.
4. Committee report – is being prepared. Please note you will not have sight of any working draft and it will only be finalised when all responses from consultees are in and we can make a full recommendation.

Below are comments from Essex Highways, which will need immediate addressing as we have a fundamental disagreement on the trip data produced for the school, which will lead to a highways objection.

I have read through the most recent highways submission from Croudace and my reaction is somewhat mixed. Without further ado, I'll take each issue in the order that they appear in their technical note;

Primary School Trip Numbers
The applicant has provided a rebuttal to the suggestion that their Transport Assessment underestimates primary school trip numbers. Unfortunately, we have a fundamental difference opinion on this issue and the Highway Authority is not prepared to accept that a school of some 420 pupils will only generate 32 trips in the morning peak hour, i.e. 25 parents' trips and 7 staff trips. ECC has carried out its own review of primary schools in suburban and edge of town locations in England (outside Greater London), i.e. similar locations as the Croudace site, using the industry-wide accepted TRICS database. Our findings for the 8am to 9am peak hour were as follows:

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All primary schools arrivals; 0.318 trips per pupil = 133 arrivals for a 420 pupil school.
All primary school departures; 0.271 trips per pupil = 114 departures for a 420 pupil school.

Whilst we wouldn't see it as appropriate to use the figures for all primary schools, it is a useful indicator of the level of trips that such schools can generate in the country. We do, however, consider the first set of figures for suburban and edge of town schools to be entirely appropriate to use. The applicant argues that the development is designed so that active travel is the first choice for residents and there will be excellent public transport provision. However, it does not consider that a) walking thresholds for children of primary school age is much lower than for adults, b) the catchment area of the school will extend far beyond the R03 site, c) parents often drive their kids to school either for security purposes or because they are headed to their workplace afterwards, and d) staff numbers are not restricted to just teachers, but also cleaning, catering, administration etc (the suggestion that only 14 staff trips arrive between 7am and 9am is therefore not credible for a 420 pupil school).

ECC therefore remains of the opinion that the applicant has not undertaken a suitably robust assessment of the school's impact. If the applicant is unwilling to consider this further, we may be left with the unfortunate

option to recommend refusal based on insufficient evidence.

Running lanes at pedestrian island on Chelmsford Road
It is noted that the applicant has addressed ECC's request that 3.25m wide running lanes are provided. No further action is required.

Shared access widths on main spine road
The applicant has provided swept path diagrams to demonstrate that two vehicle can pass each other at the shared accesses. The diagrams only confirm that any such movements will be extremely tight with collisions very possible and dwell time on the main carriageway very likely. Although this issue is not a reason for recommending refusal of the application, the applicant needs to be aware that it could preclude the spine road's adoption by the Highway Authority.

Provision of a bus stop layby south-west of site access roundabout
It's stated that this was considered but there was insufficient space within the public highway to provide a layby whilst retaining a 2m wide footway. However, it appears from the drawing that any additional land required for the stop would fall within the red line of the development. Clarification is therefore sought on this possibility. In the meantime, we will also consult ECC's Passenger Transport team on the acceptability of an on-street bus cage and also with our Network Assurance team (who manage the highway network in Essex) on any implications of the proposed removal of the traffic island to enable it.

Swept path diagrams
I note from Jane Piper's e-mail that there is a bus swept path diagram. I'm not in receipt of this drawing, so please can it be provided? At least one of the refuse vehicles modelled is almost as long as a bus, so we have a reasonable idea. From the diagrams that I am in receipt of, there is one that indicates that a turning head needs to be extended (adjacent to Plot 215). Will this be incorporated into a subsequent drawing?

ECC Bus Proposals
Applicant's acceptance is noted.

Sustainable Transport Improvements
Noted and proposals are agreed in principle. The improved footway / cycleway on Chelmsford Road will require internal consultation; it's possible that it a Stage 1 road safety audit will be required. Signage as shown for the Alexander Lane / Hunter Avenue route should also include the Oliver Road route too.

I think that's as much as I can say at the moment. As detailed, I will need to consult internally on a couple of matters. The issue of the impact of the primary school is my main concern at the moment though.

Kind regards

Kathryn

APPENDIX B

Junctions 9

ARCADY 9 - Roundabout Module

Version: 9.5.2.1013

Filename: 20240521 Chelmsford Road - Site Access V3.j9
Path: \\slr.local\eu\Offices\UK\London\Vectos\Projects\Projects\150000\152080 - Shenfield\MODELLING\20240521 - Updated School Sensitvity Assessment
Report generation date: 21/05/2024 16:43:36

Summary of junction performance

	AM				PM			
	Queue (Veh)	Delay (s)	RFC	LOS	Queue (Veh)	Delay (s)	RFC	LOS
	2028 + Dev							
1 - Chelmsford Road (North)	4.2	11.17	0.81	B	1.2	4.53	0.55	A
2 - Site Access	0.7	8.36	0.42	A	0.2	4.55	0.19	A
3 - Chelmsford Road (South)	1.6	6.64	0.62	A	1.3	5.83	0.57	A
	2028 + Comm + Dev							
1 - Chelmsford Road (North)	5.0	13.02	0.84	B	1.3	4.69	0.56	A
2 - Site Access	0.8	8.89	0.43	A	0.2	4.65	0.19	A
3 - Chelmsford Road (South)	1.7	6.96	0.64	A	1.5	6.26	0.60	A

There are warnings associated with one or more model runs - see the 'Data Errors and Warnings' tables for each Analysis or Demand Set.

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

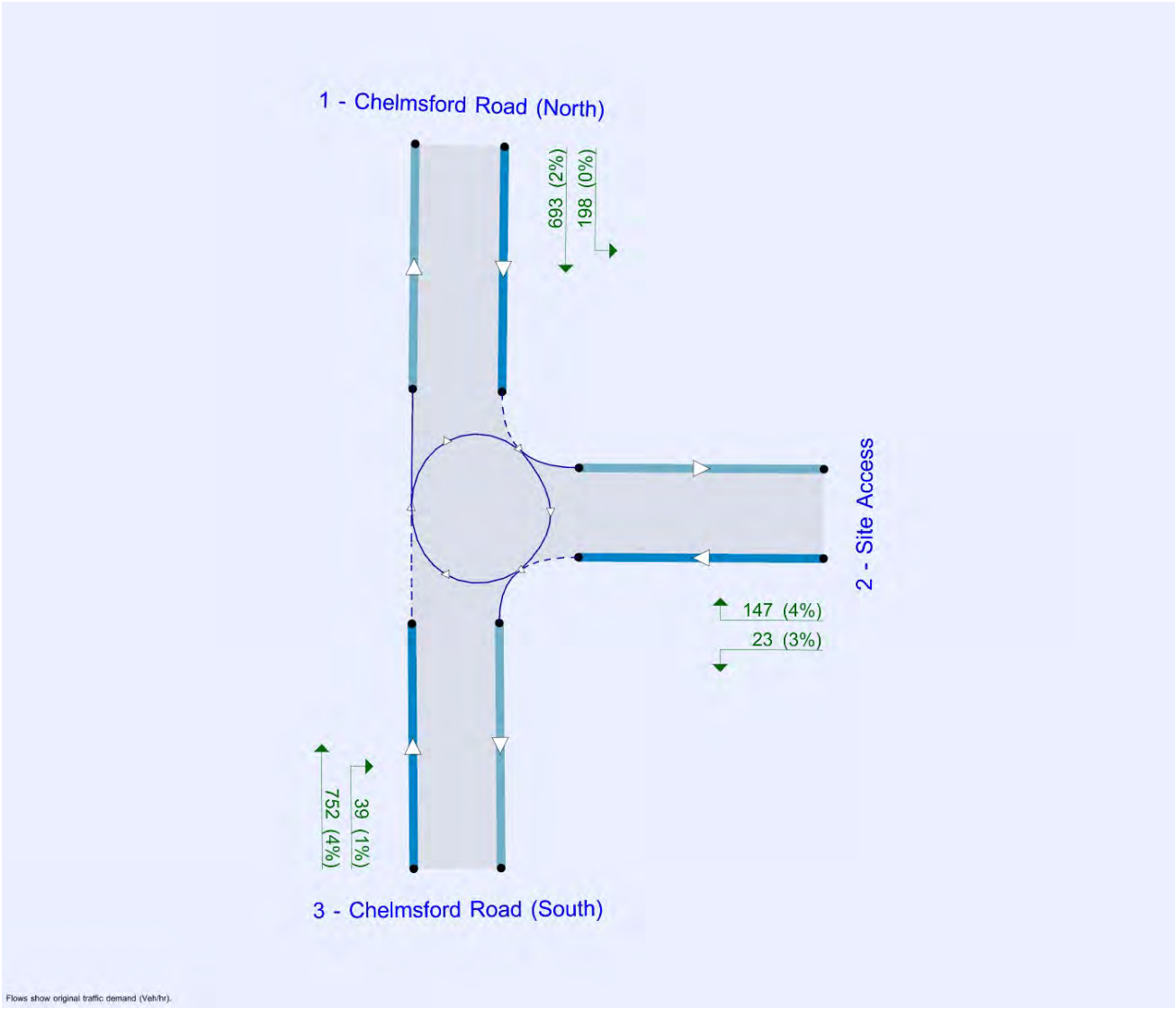
File summary

File Description

Title	
Location	
Site number	
Date	23/08/2023
Version	
Status	(new file)
Identifier	
Client	
Jobnumber	
Enumerator	SLR\Sean.GwynThomas
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

Calculate Queue Percentiles	Calculate residual capacity	RFC Threshold	Average Delay threshold (s)	Queue threshold (PCU)
		0.85	36.00	20.00

Demand Set Summary

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)
D1	2028 + Dev	AM	ONE HOUR	07:45	09:15	15
D2	2028 + Dev	PM	ONE HOUR	16:45	18:15	15
D3	2028 + Comm + Dev	AM	ONE HOUR	07:45	09:15	15
D4	2028 + Comm + Dev	PM	ONE HOUR	16:45	18:15	15

Analysis Set Details

ID	Network flow scaling factor (%)
A1	100.000

2028 + Dev, AM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Geometry	1 - Chelmsford Road (North) - Roundabout Geometry	Effective flare length is over 30m, which is outside the normal range. Treat capacities with increasing caution.

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (s)	Junction LOS
1	Site Access - Chelsmford Road	Standard Roundabout		1, 2, 3	9.28	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Arms

Arms

Arm	Name	Description
1	Chelmsford Road (North)	
2	Site Access	
3	Chelmsford Road (South)	

Roundabout Geometry

Arm	V - Approach road half-width (m)	E - Entry width (m)	l' - Effective flare length (m)	R - Entry radius (m)	D - Inscribed circle diameter (m)	PHI - Conflict (entry) angle (deg)	Exit only
1 - Chelmsford Road (North)	3.00	7.40	35.6	25.0	38.0	42.0	
2 - Site Access	3.65	6.85	6.9	30.0	38.0	42.0	
3 - Chelmsford Road (South)	4.14	7.15	11.2	22.5	38.0	55.0	

Slope / Intercept / Capacity

Roundabout Slope and Intercept used in model

Arm	Final slope	Final intercept (PCU/hr)
1 - Chelmsford Road (North)	0.658	1805
2 - Site Access	0.590	1458
3 - Chelmsford Road (South)	0.602	1603

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

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)
D1	2028 + Dev	AM	ONE HOUR	07:45	09:15	15

Vehicle mix source	PCU Factor for a HV (PCU)
HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Use O-D data	Average Demand (Veh/hr)	Scaling Factor (%)
1 - Chelmsford Road (North)		✓	1248	100.000
2 - Site Access		✓	279	100.000
3 - Chelmsford Road (South)		✓	794	100.000

Origin-Destination Data

Demand (Veh/hr)

		To		
		1 - Chelmsford Road (North)	2 - Site Access	3 - Chelmsford Road (South)
From	1 - Chelmsford Road (North)	0	189	1059
	2 - Site Access	200	0	79
	3 - Chelmsford Road (South)	722	72	0

Vehicle Mix

Heavy Vehicle Percentages

		To		
		1 - Chelmsford Road (North)	2 - Site Access	3 - Chelmsford Road (South)
From	1 - Chelmsford Road (North)	0	0	4
	2 - Site Access	1	0	0
	3 - Chelmsford Road (South)	4	1	0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (s)	Max Queue (Veh)	Max LOS
1 - Chelmsford Road (North)	0.81	11.17	4.2	B
2 - Site Access	0.42	8.36	0.7	A
3 - Chelmsford Road (South)	0.62	6.64	1.6	A

Main Results for each time segment

07:45 - 08:00

Arm	Total Demand (Veh/hr)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	End queue (Veh)	Delay (s)	Unsignalised level of service
1 - Chelmsford Road (North)	940	54	1711	0.549	935	1.2	4.611	A
2 - Site Access	210	793	964	0.218	209	0.3	4.759	A
3 - Chelmsford Road (South)	598	150	1457	0.410	595	0.7	4.160	A

08:00 - 08:15

Arm	Total Demand (Veh/hr)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	End queue (Veh)	Delay (s)	Unsignalised level of service
1 - Chelmsford Road (North)	1122	65	1704	0.658	1119	1.9	6.127	A
2 - Site Access	251	950	869	0.289	250	0.4	5.814	A
3 - Chelmsford Road (South)	714	179	1440	0.496	713	1.0	4.940	A

08:15 - 08:30

Arm	Total Demand (Veh/hr)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	End queue (Veh)	Delay (s)	Unsignalised level of service
1 - Chelmsford Road (North)	1374	79	1695	0.811	1365	4.0	10.663	B
2 - Site Access	307	1159	742	0.414	306	0.7	8.242	A
3 - Chelmsford Road (South)	874	219	1417	0.617	872	1.6	6.575	A

08:30 - 08:45

Arm	Total Demand (Veh/hr)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	End queue (Veh)	Delay (s)	Unsignalised level of service
1 - Chelmsford Road (North)	1374	79	1695	0.811	1374	4.2	11.175	B
2 - Site Access	307	1166	737	0.417	307	0.7	8.365	A
3 - Chelmsford Road (South)	874	220	1416	0.617	874	1.6	6.638	A

08:45 - 09:00

Arm	Total Demand (Veh/hr)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	End queue (Veh)	Delay (s)	Unsignalised level of service
1 - Chelmsford Road (North)	1122	65	1704	0.659	1131	2.0	6.377	A
2 - Site Access	251	959	863	0.291	252	0.4	5.902	A
3 - Chelmsford Road (South)	714	181	1439	0.496	716	1.0	4.995	A

09:00 - 09:15

Arm	Total Demand (Veh/hr)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	End queue (Veh)	Delay (s)	Unsignalised level of service
1 - Chelmsford Road (North)	940	54	1711	0.549	942	1.2	4.704	A
2 - Site Access	210	800	960	0.219	211	0.3	4.806	A
3 - Chelmsford Road (South)	598	151	1457	0.410	599	0.7	4.203	A

2028 + Dev, PM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Geometry	1 - Chelmsford Road (North) - Roundabout Geometry	Effective flare length is over 30m, which is outside the normal range. Treat capacities with increasing caution.

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (s)	Junction LOS
1	Site Access - Chelsmford Road	Standard Roundabout		1, 2, 3	5.09	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)
D2	2028 + Dev	PM	ONE HOUR	16:45	18:15	15

Vehicle mix source	PCU Factor for a HV (PCU)
HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Use O-D data	Average Demand (Veh/hr)	Scaling Factor (%)
1 - Chelmsford Road (North)		✓	867	100.000
2 - Site Access		✓	170	100.000
3 - Chelmsford Road (South)		✓	753	100.000

Origin-Destination Data

Demand (Veh/hr)

		To		
		1 - Chelmsford Road (North)	2 - Site Access	3 - Chelmsford Road (South)
From	1 - Chelmsford Road (North)	0	198	669
	2 - Site Access	147	0	23
	3 - Chelmsford Road (South)	714	39	0

Vehicle Mix

Heavy Vehicle Percentages

		To		
		1 - Chelmsford Road (North)	2 - Site Access	3 - Chelmsford Road (South)
From	1 - Chelmsford Road (North)	0	0	2
	2 - Site Access	4	0	2
	3 - Chelmsford Road (South)	4	1	0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (s)	Max Queue (Veh)	Max LOS
1 - Chelmsford Road (North)	0.55	4.53	1.2	A
2 - Site Access	0.19	4.55	0.2	A
3 - Chelmsford Road (South)	0.57	5.83	1.3	A

Main Results for each time segment

16:45 - 17:00

Arm	Total Demand (Veh/hr)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	End queue (Veh)	Delay (s)	Unsignalised level of service
1 - Chelmsford Road (North)	653	29	1758	0.371	650	0.6	3.243	A
2 - Site Access	128	502	1114	0.115	127	0.1	3.646	A
3 - Chelmsford Road (South)	567	110	1477	0.384	564	0.6	3.934	A

17:00 - 17:15

Arm	Total Demand (Veh/hr)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	End queue (Veh)	Delay (s)	Unsignalised level of service
1 - Chelmsford Road (North)	779	35	1754	0.444	779	0.8	3.685	A
2 - Site Access	153	601	1057	0.145	153	0.2	3.981	A
3 - Chelmsford Road (South)	677	132	1464	0.462	676	0.9	4.563	A

17:15 - 17:30

Arm	Total Demand (Veh/hr)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	End queue (Veh)	Delay (s)	Unsignalised level of service
1 - Chelmsford Road (North)	955	43	1749	0.546	953	1.2	4.512	A
2 - Site Access	187	735	979	0.191	187	0.2	4.545	A
3 - Chelmsford Road (South)	829	162	1446	0.573	827	1.3	5.799	A

17:30 - 17:45

Arm	Total Demand (Veh/hr)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	End queue (Veh)	Delay (s)	Unsignalised level of service
1 - Chelmsford Road (North)	955	43	1749	0.546	955	1.2	4.530	A
2 - Site Access	187	737	978	0.191	187	0.2	4.551	A
3 - Chelmsford Road (South)	829	162	1446	0.573	829	1.3	5.834	A

17:45 - 18:00

Arm	Total Demand (Veh/hr)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	End queue (Veh)	Delay (s)	Unsignalised level of service
1 - Chelmsford Road (North)	779	35	1754	0.444	781	0.8	3.706	A
2 - Site Access	153	603	1056	0.145	153	0.2	3.988	A
3 - Chelmsford Road (South)	677	132	1464	0.462	679	0.9	4.596	A

18:00 - 18:15

Arm	Total Demand (Veh/hr)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	End queue (Veh)	Delay (s)	Unsignalised level of service
1 - Chelmsford Road (North)	653	29	1758	0.371	654	0.6	3.263	A
2 - Site Access	128	504	1113	0.115	128	0.1	3.655	A
3 - Chelmsford Road (South)	567	111	1477	0.384	568	0.6	3.964	A

2028 + Comm + Dev, AM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Geometry	1 - Chelmsford Road (North) - Roundabout Geometry	Effective flare length is over 30m, which is outside the normal range. Treat capacities with increasing caution.

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (s)	Junction LOS
1	Site Access - Chelsmford Road	Standard Roundabout		1, 2, 3	10.46	B

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)
D3	2028 + Comm + Dev	AM	ONE HOUR	07:45	09:15	15

Vehicle mix source	PCU Factor for a HV (PCU)
HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Use O-D data	Average Demand (Veh/hr)	Scaling Factor (%)
1 - Chelmsford Road (North)		✓	1290	100.000
2 - Site Access		✓	279	100.000
3 - Chelmsford Road (South)		✓	818	100.000

Origin-Destination Data

Demand (Veh/hr)

		To		
		1 - Chelmsford Road (North)	2 - Site Access	3 - Chelmsford Road (South)
From	1 - Chelmsford Road (North)	0	193	1097
	2 - Site Access	200	0	79
	3 - Chelmsford Road (South)	745	73	0

Vehicle Mix

Heavy Vehicle Percentages

		To		
		1 - Chelmsford Road (North)	2 - Site Access	3 - Chelmsford Road (South)
From	1 - Chelmsford Road (North)	0	0	4
	2 - Site Access	1	0	0
	3 - Chelmsford Road (South)	4	0	0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (s)	Max Queue (Veh)	Max LOS
1 - Chelmsford Road (North)	0.84	13.02	5.0	B
2 - Site Access	0.43	8.89	0.8	A
3 - Chelmsford Road (South)	0.64	6.96	1.7	A

Main Results for each time segment

07:45 - 08:00

Arm	Total Demand (Veh/hr)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	End queue (Veh)	Delay (s)	Unsignalised level of service
1 - Chelmsford Road (North)	971	55	1710	0.568	966	1.3	4.802	A
2 - Site Access	210	821	947	0.222	209	0.3	4.871	A
3 - Chelmsford Road (South)	616	150	1459	0.422	613	0.7	4.242	A

08:00 - 08:15

Arm	Total Demand (Veh/hr)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	End queue (Veh)	Delay (s)	Unsignalised level of service
1 - Chelmsford Road (North)	1160	66	1704	0.681	1157	2.1	6.542	A
2 - Site Access	251	983	848	0.296	250	0.4	6.014	A
3 - Chelmsford Road (South)	735	179	1441	0.510	734	1.0	5.083	A

08:15 - 08:30

Arm	Total Demand (Veh/hr)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	End queue (Veh)	Delay (s)	Unsignalised level of service
1 - Chelmsford Road (North)	1420	80	1694	0.838	1409	4.8	12.192	B
2 - Site Access	307	1199	717	0.428	306	0.7	8.750	A
3 - Chelmsford Road (South)	901	219	1418	0.635	898	1.7	6.888	A

08:30 - 08:45

Arm	Total Demand (Veh/hr)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	End queue (Veh)	Delay (s)	Unsignalised level of service
1 - Chelmsford Road (North)	1420	80	1694	0.838	1420	5.0	13.018	B
2 - Site Access	307	1207	712	0.431	307	0.8	8.887	A
3 - Chelmsford Road (South)	901	220	1417	0.635	901	1.7	6.962	A

08:45 - 09:00

Arm	Total Demand (Veh/hr)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	End queue (Veh)	Delay (s)	Unsignalised level of service
1 - Chelmsford Road (North)	1160	66	1703	0.681	1171	2.2	6.897	A
2 - Site Access	251	996	841	0.298	252	0.4	6.126	A
3 - Chelmsford Road (South)	735	181	1441	0.510	738	1.1	5.145	A

09:00 - 09:15

Arm	Total Demand (Veh/hr)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	End queue (Veh)	Delay (s)	Unsignalised level of service
1 - Chelmsford Road (North)	971	55	1710	0.568	975	1.3	4.917	A
2 - Site Access	210	829	943	0.223	211	0.3	4.921	A
3 - Chelmsford Road (South)	616	151	1458	0.422	617	0.7	4.287	A

2028 + Comm + Dev, PM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Geometry	1 - Chelmsford Road (North) - Roundabout Geometry	Effective flare length is over 30m, which is outside the normal range. Treat capacities with increasing caution.

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (s)	Junction LOS
1	Site Access - Chelsmford Road	Standard Roundabout		1, 2, 3	5.36	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)
D4	2028 + Comm + Dev	PM	ONE HOUR	16:45	18:15	15

Vehicle mix source	PCU Factor for a HV (PCU)
HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Use O-D data	Average Demand (Veh/hr)	Scaling Factor (%)
1 - Chelmsford Road (North)		✓	891	100.000
2 - Site Access		✓	170	100.000
3 - Chelmsford Road (South)		✓	791	100.000

Origin-Destination Data

Demand (Veh/hr)

		To		
		1 - Chelmsford Road (North)	2 - Site Access	3 - Chelmsford Road (South)
From	1 - Chelmsford Road (North)	0	198	693
	2 - Site Access	147	0	23
	3 - Chelmsford Road (South)	752	39	0

Vehicle Mix

Heavy Vehicle Percentages

		To		
		1 - Chelmsford Road (North)	2 - Site Access	3 - Chelmsford Road (South)
From	1 - Chelmsford Road (North)	0	0	2
	2 - Site Access	4	0	3
	3 - Chelmsford Road (South)	4	1	0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (s)	Max Queue (Veh)	Max LOS
1 - Chelmsford Road (North)	0.56	4.69	1.3	A
2 - Site Access	0.19	4.65	0.2	A
3 - Chelmsford Road (South)	0.60	6.26	1.5	A

Main Results for each time segment

16:45 - 17:00

Arm	Total Demand (Veh/hr)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	End queue (Veh)	Delay (s)	Unsignalised level of service
1 - Chelmsford Road (North)	671	29	1758	0.382	668	0.6	3.297	A
2 - Site Access	128	520	1102	0.116	127	0.1	3.690	A
3 - Chelmsford Road (South)	596	110	1477	0.403	593	0.7	4.059	A

17:00 - 17:15

Arm	Total Demand (Veh/hr)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	End queue (Veh)	Delay (s)	Unsignalised level of service
1 - Chelmsford Road (North)	801	35	1754	0.457	800	0.8	3.770	A
2 - Site Access	153	622	1043	0.147	153	0.2	4.043	A
3 - Chelmsford Road (South)	711	132	1464	0.486	710	0.9	4.768	A

17:15 - 17:30

Arm	Total Demand (Veh/hr)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	End queue (Veh)	Delay (s)	Unsignalised level of service
1 - Chelmsford Road (North)	981	43	1749	0.561	979	1.3	4.666	A
2 - Site Access	187	762	962	0.195	187	0.2	4.642	A
3 - Chelmsford Road (South)	871	162	1446	0.602	869	1.5	6.212	A

17:30 - 17:45

Arm	Total Demand (Veh/hr)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	End queue (Veh)	Delay (s)	Unsignalised level of service
1 - Chelmsford Road (North)	981	43	1749	0.561	981	1.3	4.687	A
2 - Site Access	187	763	962	0.195	187	0.2	4.648	A
3 - Chelmsford Road (South)	871	162	1446	0.602	871	1.5	6.260	A

17:45 - 18:00

Arm	Total Demand (Veh/hr)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	End queue (Veh)	Delay (s)	Unsignalised level of service
1 - Chelmsford Road (North)	801	35	1754	0.457	803	0.8	3.789	A
2 - Site Access	153	624	1042	0.147	153	0.2	4.053	A
3 - Chelmsford Road (South)	711	132	1464	0.486	713	1.0	4.811	A

18:00 - 18:15

Arm	Total Demand (Veh/hr)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	End queue (Veh)	Delay (s)	Unsignalised level of service
1 - Chelmsford Road (North)	671	29	1758	0.382	672	0.6	3.316	A
2 - Site Access	128	522	1101	0.116	128	0.1	3.700	A
3 - Chelmsford Road (South)	596	111	1477	0.403	597	0.7	4.095	A

Junctions 9

PICADY 9 - Priority Intersection Module

Version: 9.5.2.1013

For sales and distribution information, program advice and maintenance, contact TRL:
+44 (0)1344 379777 software@trl.co.uk www.trlsoftware.co.uk

Filename: 20240521 Chelmsford Road - Oliver Road V1.j9
Path: \\slr.local\eu\Offices\UK\London\Vectos\Projects\Projects\150000\152080 - Shenfield\MODELLING\20240521 - Updated School Sensitvity Assessment
Report generation date: 21/05/2024 16:38:27

Summary of junction performance

	AM					PM				
	Set ID	Queue (Veh)	Delay (s)	RFC	LOS	Set ID	Queue (Veh)	Delay (s)	RFC	LOS
	2022 Base									
Stream B-AC	D1	1.6	34.49	0.62	D	D2	0.6	15.77	0.37	C
Stream C-AB		0.5	12.37	0.31	B		0.1	8.17	0.13	A
	2028 Base									
Stream B-AC	D3	1.6	34.49	0.62	D	D4	0.6	15.77	0.37	C
Stream C-AB		0.5	12.37	0.31	B		0.1	8.17	0.13	A
	2028 Base + Dev									
Stream B-AC	D5	4.1	82.26	0.82	F	D6	0.8	19.91	0.46	C
Stream C-AB		0.5	13.80	0.34	B		0.2	8.42	0.13	A
	2028 Base + Comm									
Stream B-AC	D7	1.9	39.83	0.66	E	D8	0.7	17.27	0.40	C
Stream C-AB		0.5	12.60	0.32	B		0.1	8.28	0.13	A
	2028 Base + Comm + Dev									
Stream B-AC	D9	1.2	17.10	0.55	C	D10	1.0	22.26	0.50	C
Stream C-AB		0.0	6.56	0.03	A		0.2	8.54	0.14	A

There are warnings associated with one or more model runs - see the 'Data Errors and Warnings' tables for each Analysis or Demand Set.

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

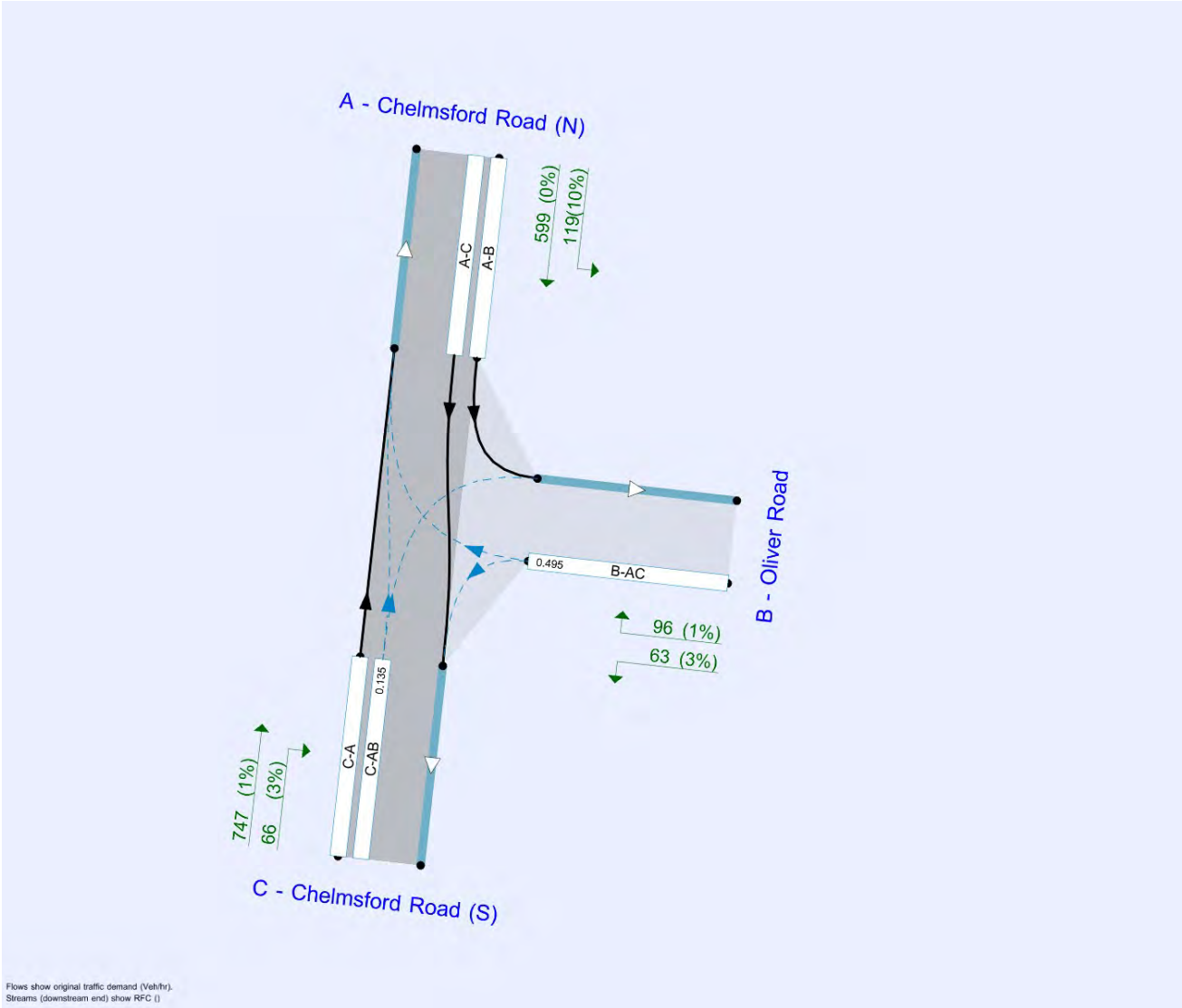
File summary

File Description

Title	
Location	
Site number	
Date	02/02/2023
Version	
Status	(new file)
Identifier	
Client	
Jobnumber	
Enumerator	EUR\George.Magnisalis
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 period length (min)	Time segment length (min)	Run automatically
D1	2022 Base	AM	DIRECT	08:00	09:30	90	15	✓
D2	2022 Base	PM	DIRECT	17:00	18:30	90	15	✓
D3	2028 Base	AM	DIRECT	08:00	09:30	90	15	✓
D4	2028 Base	PM	DIRECT	17:00	18:30	90	15	✓
D5	2028 Base + Dev	AM	DIRECT	08:00	09:30	90	15	✓
D6	2028 Base + Dev	PM	DIRECT	17:00	18:30	90	15	✓
D7	2028 Base + Comm	AM	DIRECT	08:00	09:30	90	15	✓
D8	2028 Base + Comm	PM	DIRECT	17:00	18:30	90	15	✓
D9	2028 Base + Comm + Dev	AM	DIRECT	08:00	09:30	90	15	✓
D10	2028 Base + Comm + Dev	PM	DIRECT	17:00	18:30	90	15	✓

Analysis Set Details

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

2022 Base, AM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Profile Type	D1 - 2022 Base, AM	The DIRECT profile type is intended to be used for demand that varies over time. You are using it with the 'Use O-D data' option, but your O-D data does not vary over time. Are you sure this is correct?

Junction Network

Junctions

Junction	Name	Junction type	Major road direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	Chelmsford Rd_Oliver Rd Priority Junction	T-Junction	Two-way		4.06	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Arms

Arms

Arm	Name	Description	Arm type
A	Chelmsford Road (N)		Major
B	Oliver Road		Minor
C	Chelmsford Road (S)		Major

Major Arm Geometry

Arm	Width of carriageway (m)	Has kerbed central reserve	Has right turn bay	Width for right turn (m)	Visibility for right turn (m)	Blocks?	Blocking queue (PCU)
C - Chelmsford Road (S)	6.35		✓	2.98	117.1	✓	8.00

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

Minor Arm Geometry

Arm	Minor arm type	Lane width (m)	Visibility to left (m)	Visibility to right (m)
B - Oliver Road	One lane	3.86	68	66

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	578	0.104	0.262	0.165	0.375
B-C	723	0.109	0.276	-	-
C-B	696	0.266	0.266	-	-

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 period length (min)	Time segment length (min)	Run automatically
D1	2022 Base	AM	DIRECT	08:00	09:30	90	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	Scaling Factor (%)
A - Chelmsford Road (N)		DIRECT	✓	100.000
B - Oliver Road		DIRECT	✓	100.000
C - Chelmsford Road (S)		DIRECT	✓	100.000

Origin-Destination Data

Demand (Veh/hr)

		To		
		A - Chelmsford Road (N)	B - Oliver Road	C - Chelmsford Road (S)
From	A - Chelmsford Road (N)	0	186	738
	B - Oliver Road	99	0	70
	C - Chelmsford Road (S)	568	133	0

Vehicle Mix

Heavy Vehicle Percentages

		To		
		A - Chelmsford Road (N)	B - Oliver Road	C - Chelmsford Road (S)
From	A - Chelmsford Road (N)	0	16	1
	B - Oliver Road	1	0	0
	C - Chelmsford Road (S)	5	4	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-AC	0.62	34.49	1.6	D	169	253
C-AB	0.31	12.37	0.5	B	133	200
C-A					568	852
A-B					186	279
A-C					738	1107

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-AC	169	42	274	0.617	163	0.0	1.5	31.092	D
C-AB	133	33	424	0.314	131	0.0	0.4	12.222	B
C-A	568	142			568				
A-B	186	47			186				
A-C	738	185			738				

08:15 - 08:30

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	169	42	273	0.619	169	1.5	1.5	34.232	D
C-AB	133	33	424	0.314	133	0.4	0.5	12.367	B
C-A	568	142			568				
A-B	186	47			186				
A-C	738	185			738				

08:30 - 08:45

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	169	42	273	0.619	169	1.5	1.6	34.392	D
C-AB	133	33	424	0.314	133	0.5	0.5	12.369	B
C-A	568	142			568				
A-B	186	47			186				
A-C	738	185			738				

08:45 - 09:00

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	169	42	273	0.619	169	1.6	1.6	34.446	D
C-AB	133	33	424	0.314	133	0.5	0.5	12.369	B
C-A	568	142			568				
A-B	186	47			186				
A-C	738	185			738				

09:00 - 09:15

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	169	42	273	0.619	169	1.6	1.6	34.475	D
C-AB	133	33	424	0.314	133	0.5	0.5	12.369	B
C-A	568	142			568				
A-B	186	47			186				
A-C	738	185			738				

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-AC	169	42	273	0.619	169	1.6	1.6	34.491	D
C-AB	133	33	424	0.314	133	0.5	0.5	12.369	B
C-A	568	142			568				
A-B	186	47			186				
A-C	738	185			738				

2022 Base, PM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Profile Type	D2 - 2022 Base, PM	The DIRECT profile type is intended to be used for demand that varies over time. You are using it with the 'Use O-D data' option, but your O-D data does not vary over time. Are you sure this is correct?

Junction Network

Junctions

Junction	Name	Junction type	Major road direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	Chelmsford Rd_Oliver Rd Priority Junction	T-Junction	Two-way		1.71	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time period length (min)	Time segment length (min)	Run automatically
D2	2022 Base	PM	DIRECT	17:00	18:30	90	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	Scaling Factor (%)
A - Chelmsford Road (N)		DIRECT	✓	100.000
B - Oliver Road		DIRECT	✓	100.000
C - Chelmsford Road (S)		DIRECT	✓	100.000

Origin-Destination Data

Demand (Veh/hr)

		To		
		A - Chelmsford Road (N)	B - Oliver Road	C - Chelmsford Road (S)
From	A - Chelmsford Road (N)	0	98	556
	B - Oliver Road	72	0	61
	C - Chelmsford Road (S)	688	64	0

Vehicle Mix

Heavy Vehicle Percentages

		To		
		A - Chelmsford Road (N)	B - Oliver Road	C - Chelmsford Road (S)
From	A - Chelmsford Road (N)	0	11	0
	B - Oliver Road	0	0	3
	C - Chelmsford Road (S)	1	3	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-AC	0.37	15.77	0.6	C	133	199
C-AB	0.13	8.17	0.1	A	64	96
C-A					688	1032
A-B					98	147
A-C					556	834

Main Results for each time segment

17:00 - 17:15

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	133	33	361	0.368	131	0.0	0.6	15.460	C
C-AB	64	16	505	0.127	63	0.0	0.1	8.151	A
C-A	688	172			688				
A-B	98	25			98				
A-C	556	139			556				

17:15 - 17:30

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	133	33	361	0.368	133	0.6	0.6	15.765	C
C-AB	64	16	505	0.127	64	0.1	0.1	8.171	A
C-A	688	172			688				
A-B	98	25			98				
A-C	556	139			556				

17:30 - 17:45

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	133	33	361	0.368	133	0.6	0.6	15.770	C
C-AB	64	16	505	0.127	64	0.1	0.1	8.171	A
C-A	688	172			688				
A-B	98	25			98				
A-C	556	139			556				

17:45 - 18:00

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	133	33	361	0.368	133	0.6	0.6	15.772	C
C-AB	64	16	505	0.127	64	0.1	0.1	8.171	A
C-A	688	172			688				
A-B	98	25			98				
A-C	556	139			556				

18:00 - 18:15

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	133	33	361	0.368	133	0.6	0.6	15.771	C
C-AB	64	16	505	0.127	64	0.1	0.1	8.171	A
C-A	688	172			688				
A-B	98	25			98				
A-C	556	139			556				

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-AC	133	33	361	0.368	133	0.6	0.6	15.771	C
C-AB	64	16	505	0.127	64	0.1	0.1	8.171	A
C-A	688	172			688				
A-B	98	25			98				
A-C	556	139			556				

2028 Base, AM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Profile Type	D3 - 2028 Base, AM	The DIRECT profile type is intended to be used for demand that varies over time. You are using it with the 'Use O-D data' option, but your O-D data does not vary over time. Are you sure this is correct?

Junction Network

Junctions

Junction	Name	Junction type	Major road direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	Chelmsford Rd_Oliver Rd Priority Junction	T-Junction	Two-way		4.06	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 period length (min)	Time segment length (min)	Run automatically
D3	2028 Base	AM	DIRECT	08:00	09:30	90	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	Scaling Factor (%)
A - Chelmsford Road (N)		DIRECT	✓	100.000
B - Oliver Road		DIRECT	✓	100.000
C - Chelmsford Road (S)		DIRECT	✓	100.000

Origin-Destination Data

Demand (Veh/hr)

		To		
		A - Chelmsford Road (N)	B - Oliver Road	C - Chelmsford Road (S)
From	A - Chelmsford Road (N)	0	186	738
	B - Oliver Road	99	0	70
	C - Chelmsford Road (S)	568	133	0

Vehicle Mix

Heavy Vehicle Percentages

		To		
		A - Chelmsford Road (N)	B - Oliver Road	C - Chelmsford Road (S)
From	A - Chelmsford Road (N)	0	16	1
	B - Oliver Road	1	0	0
	C - Chelmsford Road (S)	5	4	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-AC	0.62	34.49	1.6	D	169	253
C-AB	0.31	12.37	0.5	B	133	200
C-A					568	852
A-B					186	279
A-C					738	1107

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-AC	169	42	274	0.617	163	0.0	1.5	31.092	D
C-AB	133	33	424	0.314	131	0.0	0.4	12.222	B
C-A	568	142			568				
A-B	186	47			186				
A-C	738	185			738				

08:15 - 08:30

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	169	42	273	0.619	169	1.5	1.5	34.232	D
C-AB	133	33	424	0.314	133	0.4	0.5	12.367	B
C-A	568	142			568				
A-B	186	47			186				
A-C	738	185			738				

08:30 - 08:45

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	169	42	273	0.619	169	1.5	1.6	34.392	D
C-AB	133	33	424	0.314	133	0.5	0.5	12.369	B
C-A	568	142			568				
A-B	186	47			186				
A-C	738	185			738				

08:45 - 09:00

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	169	42	273	0.619	169	1.6	1.6	34.446	D
C-AB	133	33	424	0.314	133	0.5	0.5	12.369	B
C-A	568	142			568				
A-B	186	47			186				
A-C	738	185			738				

09:00 - 09:15

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	169	42	273	0.619	169	1.6	1.6	34.475	D
C-AB	133	33	424	0.314	133	0.5	0.5	12.369	B
C-A	568	142			568				
A-B	186	47			186				
A-C	738	185			738				

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-AC	169	42	273	0.619	169	1.6	1.6	34.491	D
C-AB	133	33	424	0.314	133	0.5	0.5	12.369	B
C-A	568	142			568				
A-B	186	47			186				
A-C	738	185			738				

2028 Base, PM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Profile Type	D4 - 2028 Base, PM	The DIRECT profile type is intended to be used for demand that varies over time. You are using it with the 'Use O-D data' option, but your O-D data does not vary over time. Are you sure this is correct?

Junction Network

Junctions

Junction	Name	Junction type	Major road direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	Chelmsford Rd_Oliver Rd Priority Junction	T-Junction	Two-way		1.71	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time period length (min)	Time segment length (min)	Run automatically
D4	2028 Base	PM	DIRECT	17:00	18:30	90	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	Scaling Factor (%)
A - Chelmsford Road (N)		DIRECT	✓	100.000
B - Oliver Road		DIRECT	✓	100.000
C - Chelmsford Road (S)		DIRECT	✓	100.000

Origin-Destination Data

Demand (Veh/hr)

		To		
		A - Chelmsford Road (N)	B - Oliver Road	C - Chelmsford Road (S)
From	A - Chelmsford Road (N)	0	98	556
	B - Oliver Road	72	0	61
	C - Chelmsford Road (S)	688	64	0

Vehicle Mix

Heavy Vehicle Percentages

		To		
		A - Chelmsford Road (N)	B - Oliver Road	C - Chelmsford Road (S)
From	A - Chelmsford Road (N)	0	11	0
	B - Oliver Road	0	0	3
	C - Chelmsford Road (S)	1	3	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-AC	0.37	15.77	0.6	C	133	199
C-AB	0.13	8.17	0.1	A	64	96
C-A					688	1032
A-B					98	147
A-C					556	834

Main Results for each time segment

17:00 - 17:15

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	133	33	361	0.368	131	0.0	0.6	15.460	C
C-AB	64	16	505	0.127	63	0.0	0.1	8.151	A
C-A	688	172			688				
A-B	98	25			98				
A-C	556	139			556				

17:15 - 17:30

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	133	33	361	0.368	133	0.6	0.6	15.765	C
C-AB	64	16	505	0.127	64	0.1	0.1	8.171	A
C-A	688	172			688				
A-B	98	25			98				
A-C	556	139			556				

17:30 - 17:45

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	133	33	361	0.368	133	0.6	0.6	15.770	C
C-AB	64	16	505	0.127	64	0.1	0.1	8.171	A
C-A	688	172			688				
A-B	98	25			98				
A-C	556	139			556				

17:45 - 18:00

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	133	33	361	0.368	133	0.6	0.6	15.772	C
C-AB	64	16	505	0.127	64	0.1	0.1	8.171	A
C-A	688	172			688				
A-B	98	25			98				
A-C	556	139			556				

18:00 - 18:15

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	133	33	361	0.368	133	0.6	0.6	15.771	C
C-AB	64	16	505	0.127	64	0.1	0.1	8.171	A
C-A	688	172			688				
A-B	98	25			98				
A-C	556	139			556				

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-AC	133	33	361	0.368	133	0.6	0.6	15.771	C
C-AB	64	16	505	0.127	64	0.1	0.1	8.171	A
C-A	688	172			688				
A-B	98	25			98				
A-C	556	139			556				

2028 Base + Dev, AM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Profile Type	D5 - 2028 Base + Dev, AM	The DIRECT profile type is intended to be used for demand that varies over time. You are using it with the 'Use O-D data' option, but your O-D data does not vary over time. Are you sure this is correct?

Junction Network

Junctions

Junction	Name	Junction type	Major road direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	Chelmsford Rd_Oliver Rd Priority Junction	T-Junction	Two-way		8.57	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 period length (min)	Time segment length (min)	Run automatically
D5	2028 Base + Dev	AM	DIRECT	08:00	09:30	90	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	Scaling Factor (%)
A - Chelmsford Road (N)		DIRECT	✓	100.000
B - Oliver Road		DIRECT	✓	100.000
C - Chelmsford Road (S)		DIRECT	✓	100.000

Origin-Destination Data

Demand (Veh/hr)

		To		
		A - Chelmsford Road (N)	B - Oliver Road	C - Chelmsford Road (S)
From	A - Chelmsford Road (N)	0	213	817
	B - Oliver Road	116	0	72
	C - Chelmsford Road (S)	620	136	0

Vehicle Mix

Heavy Vehicle Percentages

		To		
		A - Chelmsford Road (N)	B - Oliver Road	C - Chelmsford Road (S)
From	A - Chelmsford Road (N)	0	14	1
	B - Oliver Road	1	0	0
	C - Chelmsford Road (S)	4	4	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-AC	0.82	82.26	4.1	F	188	282
C-AB	0.34	13.80	0.5	B	136	204
C-A					620	930
A-B					213	320
A-C					817	1226

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-AC	188	47	231	0.814	175	0.0	3.2	56.300	F
C-AB	136	34	397	0.343	134	0.0	0.5	13.596	B
C-A	620	155			620				
A-B	213	53			213				
A-C	817	204			817				

08:15 - 08:30

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	188	47	230	0.817	186	3.2	3.6	75.569	F
C-AB	136	34	397	0.343	136	0.5	0.5	13.801	B
C-A	620	155			620				
A-B	213	53			213				
A-C	817	204			817				

08:30 - 08:45

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	188	47	230	0.817	187	3.6	3.9	79.057	F
C-AB	136	34	397	0.343	136	0.5	0.5	13.803	B
C-A	620	155			620				
A-B	213	53			213				
A-C	817	204			817				

08:45 - 09:00

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	188	47	230	0.817	187	3.9	4.0	80.684	F
C-AB	136	34	397	0.343	136	0.5	0.5	13.803	B
C-A	620	155			620				
A-B	213	53			213				
A-C	817	204			817				

09:00 - 09:15

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	188	47	230	0.817	188	4.0	4.1	81.635	F
C-AB	136	34	397	0.343	136	0.5	0.5	13.803	B
C-A	620	155			620				
A-B	213	53			213				
A-C	817	204			817				

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-AC	188	47	230	0.817	188	4.1	4.1	82.262	F
C-AB	136	34	397	0.343	136	0.5	0.5	13.803	B
C-A	620	155			620				
A-B	213	53			213				
A-C	817	204			817				

2028 Base + Dev, PM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Profile Type	D6 - 2028 Base + Dev, PM	The DIRECT profile type is intended to be used for demand that varies over time. You are using it with the 'Use O-D data' option, but your O-D data does not vary over time. Are you sure this is correct?

Junction Network

Junctions

Junction	Name	Junction type	Major road direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	Chelmsford Rd_Oliver Rd Priority Junction	T-Junction	Two-way		2.24	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 period length (min)	Time segment length (min)	Run automatically
D6	2028 Base + Dev	PM	DIRECT	17:00	18:30	90	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	Scaling Factor (%)
A - Chelmsford Road (N)		DIRECT	✓	100.000
B - Oliver Road		DIRECT	✓	100.000
C - Chelmsford Road (S)		DIRECT	✓	100.000

Origin-Destination Data

Demand (Veh/hr)

		To		
		A - Chelmsford Road (N)	B - Oliver Road	C - Chelmsford Road (S)
From	A - Chelmsford Road (N)	0	116	579
	B - Oliver Road	91	0	63
	C - Chelmsford Road (S)	713	66	0

Vehicle Mix

Heavy Vehicle Percentages

		To		
		A - Chelmsford Road (N)	B - Oliver Road	C - Chelmsford Road (S)
From	A - Chelmsford Road (N)	0	10	0
	B - Oliver Road	1	0	3
	C - Chelmsford Road (S)	1	3	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-AC	0.46	19.91	0.8	C	154	231
C-AB	0.13	8.42	0.2	A	66	99
C-A					713	1069
A-B					116	174
A-C					579	869

Main Results for each time segment

17:00 - 17:15

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	154	39	335	0.460	151	0.0	0.8	19.221	C
C-AB	66	17	494	0.134	65	0.0	0.2	8.393	A
C-A	713	178			713				
A-B	116	29			116				
A-C	579	145			579				

17:15 - 17:30

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	154	39	335	0.460	154	0.8	0.8	19.886	C
C-AB	66	17	494	0.134	66	0.2	0.2	8.416	A
C-A	713	178			713				
A-B	116	29			116				
A-C	579	145			579				

17:30 - 17:45

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	154	39	335	0.460	154	0.8	0.8	19.900	C
C-AB	66	17	494	0.134	66	0.2	0.2	8.416	A
C-A	713	178			713				
A-B	116	29			116				
A-C	579	145			579				

17:45 - 18:00

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	154	39	335	0.460	154	0.8	0.8	19.906	C
C-AB	66	17	494	0.134	66	0.2	0.2	8.416	A
C-A	713	178			713				
A-B	116	29			116				
A-C	579	145			579				

18:00 - 18:15

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	154	39	335	0.460	154	0.8	0.8	19.908	C
C-AB	66	17	494	0.134	66	0.2	0.2	8.416	A
C-A	713	178			713				
A-B	116	29			116				
A-C	579	145			579				

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-AC	154	39	335	0.460	154	0.8	0.8	19.908	C
C-AB	66	17	494	0.134	66	0.2	0.2	8.416	A
C-A	713	178			713				
A-B	116	29			116				
A-C	579	145			579				

2028 Base + Comm, AM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Profile Type	D7 - 2028 Base + Comm, AM	The DIRECT profile type is intended to be used for demand that varies over time. You are using it with the 'Use O-D data' option, but your O-D data does not vary over time. Are you sure this is correct?

Junction Network

Junctions

Junction	Name	Junction type	Major road direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	Chelmsford Rd_Oliver Rd Priority Junction	T-Junction	Two-way		4.51	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 period length (min)	Time segment length (min)	Run automatically
D7	2028 Base + Comm	AM	DIRECT	08:00	09:30	90	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	Scaling Factor (%)
A - Chelmsford Road (N)		DIRECT	✓	100.000
B - Oliver Road		DIRECT	✓	100.000
C - Chelmsford Road (S)		DIRECT	✓	100.000

Origin-Destination Data

Demand (Veh/hr)

		To		
		A - Chelmsford Road (N)	B - Oliver Road	C - Chelmsford Road (S)
From	A - Chelmsford Road (N)	0	188	756
	B - Oliver Road	102	0	70
	C - Chelmsford Road (S)	590	133	0

Vehicle Mix

Heavy Vehicle Percentages

		To		
		A - Chelmsford Road (N)	B - Oliver Road	C - Chelmsford Road (S)
From	A - Chelmsford Road (N)	0	16	1
	B - Oliver Road	1	0	0
	C - Chelmsford Road (S)	5	4	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-AC	0.66	39.83	1.9	E	172	258
C-AB	0.32	12.60	0.5	B	133	200
C-A					590	885
A-B					188	282
A-C					756	1134

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-AC	172	43	263	0.654	165	0.0	1.7	34.879	D
C-AB	133	33	419	0.318	131	0.0	0.5	12.441	B
C-A	590	147			590				
A-B	188	47			188				
A-C	756	189			756				

08:15 - 08:30

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	172	43	262	0.656	172	1.7	1.8	39.358	E
C-AB	133	33	419	0.318	133	0.5	0.5	12.593	B
C-A	590	147			590				
A-B	188	47			188				
A-C	756	189			756				

08:30 - 08:45

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	172	43	262	0.656	172	1.8	1.8	39.640	E
C-AB	133	33	419	0.318	133	0.5	0.5	12.596	B
C-A	590	147			590				
A-B	188	47			188				
A-C	756	189			756				

08:45 - 09:00

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	172	43	262	0.656	172	1.8	1.8	39.742	E
C-AB	133	33	419	0.318	133	0.5	0.5	12.596	B
C-A	590	147			590				
A-B	188	47			188				
A-C	756	189			756				

09:00 - 09:15

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	172	43	262	0.656	172	1.8	1.9	39.799	E
C-AB	133	33	419	0.318	133	0.5	0.5	12.596	B
C-A	590	147			590				
A-B	188	47			188				
A-C	756	189			756				

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-AC	172	43	262	0.656	172	1.9	1.9	39.829	E
C-AB	133	33	419	0.318	133	0.5	0.5	12.596	B
C-A	590	147			590				
A-B	188	47			188				
A-C	756	189			756				

2028 Base + Comm, PM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Profile Type	D8 - 2028 Base + Comm, PM	The DIRECT profile type is intended to be used for demand that varies over time. You are using it with the 'Use O-D data' option, but your O-D data does not vary over time. Are you sure this is correct?

Junction Network

Junctions

Junction	Name	Junction type	Major road direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	Chelmsford Rd_Oliver Rd Priority Junction	T-Junction	Two-way		1.83	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 period length (min)	Time segment length (min)	Run automatically
D8	2028 Base + Comm	PM	DIRECT	17:00	18:30	90	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	Scaling Factor (%)
A - Chelmsford Road (N)		DIRECT	✓	100.000
B - Oliver Road		DIRECT	✓	100.000
C - Chelmsford Road (S)		DIRECT	✓	100.000

Origin-Destination Data

Demand (Veh/hr)

		To		
		A - Chelmsford Road (N)	B - Oliver Road	C - Chelmsford Road (S)
From	A - Chelmsford Road (N)	0	101	576
	B - Oliver Road	77	0	61
	C - Chelmsford Road (S)	721	64	0

Vehicle Mix

Heavy Vehicle Percentages

		To		
		A - Chelmsford Road (N)	B - Oliver Road	C - Chelmsford Road (S)
From	A - Chelmsford Road (N)	0	11	0
	B - Oliver Road	0	0	3
	C - Chelmsford Road (S)	1	3	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-AC	0.40	17.27	0.7	C	138	207
C-AB	0.13	8.28	0.1	A	64	96
C-A					721	1081
A-B					101	152
A-C					576	864

Main Results for each time segment

17:00 - 17:15

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	138	35	347	0.398	135	0.0	0.6	16.851	C
C-AB	64	16	499	0.128	63	0.0	0.1	8.264	A
C-A	721	180			721				
A-B	101	25			101				
A-C	576	144			576				

17:15 - 17:30

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	138	35	346	0.398	138	0.6	0.7	17.258	C
C-AB	64	16	499	0.128	64	0.1	0.1	8.285	A
C-A	721	180			721				
A-B	101	25			101				
A-C	576	144			576				

17:30 - 17:45

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	138	35	346	0.398	138	0.7	0.7	17.267	C
C-AB	64	16	499	0.128	64	0.1	0.1	8.285	A
C-A	721	180			721				
A-B	101	25			101				
A-C	576	144			576				

17:45 - 18:00

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	138	35	346	0.398	138	0.7	0.7	17.266	C
C-AB	64	16	499	0.128	64	0.1	0.1	8.285	A
C-A	721	180			721				
A-B	101	25			101				
A-C	576	144			576				

18:00 - 18:15

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	138	35	346	0.398	138	0.7	0.7	17.269	C
C-AB	64	16	499	0.128	64	0.1	0.1	8.285	A
C-A	721	180			721				
A-B	101	25			101				
A-C	576	144			576				

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-AC	138	35	346	0.398	138	0.7	0.7	17.268	C
C-AB	64	16	499	0.128	64	0.1	0.1	8.285	A
C-A	721	180			721				
A-B	101	25			101				
A-C	576	144			576				

2028 Base + Comm + Dev, AM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Profile Type	D9 - 2028 Base + Comm + Dev, AM	The DIRECT profile type is intended to be used for demand that varies over time. You are using it with the 'Use O-D data' option, but your O-D data does not vary over time. Are you sure this is correct?

Junction Network

Junctions

Junction	Name	Junction type	Major road direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	Chelmsford Rd_Oliver Rd Priority Junction	T-Junction	Two-way		5.02	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time period length (min)	Time segment length (min)	Run automatically
D9	2028 Base + Comm + Dev	AM	DIRECT	08:00	09:30	90	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	Scaling Factor (%)
A - Chelmsford Road (N)		DIRECT	✓	100.000
B - Oliver Road		DIRECT	✓	100.000
C - Chelmsford Road (S)		DIRECT	✓	100.000

Origin-Destination Data

Demand (Veh/hr)

		To		
		A - Chelmsford Road (N)	B - Oliver Road	C - Chelmsford Road (S)
From	A - Chelmsford Road (N)	0	220	158
	B - Oliver Road	246	0	13
	C - Chelmsford Road (S)	216	16	0

Vehicle Mix

Heavy Vehicle Percentages

		To		
		A - Chelmsford Road (N)	B - Oliver Road	C - Chelmsford Road (S)
From	A - Chelmsford Road (N)	0	14	1
	B - Oliver Road	1	0	0
	C - Chelmsford Road (S)	4	4	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-AC	0.55	17.10	1.2	C	259	388
C-AB	0.03	6.56	0.0	A	16	24
C-A					216	324
A-B					220	330
A-C					158	237

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-AC	259	65	469	0.552	254	0.0	1.2	16.397	C
C-AB	16	4	565	0.028	16	0.0	0.0	6.558	A
C-A	216	54			216				
A-B	220	55			220				
A-C	158	40			158				

08:15 - 08:30

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	259	65	469	0.552	259	1.2	1.2	17.081	C
C-AB	16	4	565	0.028	16	0.0	0.0	6.560	A
C-A	216	54			216				
A-B	220	55			220				
A-C	158	40			158				

08:30 - 08:45

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	259	65	469	0.552	259	1.2	1.2	17.094	C
C-AB	16	4	565	0.028	16	0.0	0.0	6.560	A
C-A	216	54			216				
A-B	220	55			220				
A-C	158	40			158				

08:45 - 09:00

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	259	65	469	0.552	259	1.2	1.2	17.099	C
C-AB	16	4	565	0.028	16	0.0	0.0	6.560	A
C-A	216	54			216				
A-B	220	55			220				
A-C	158	40			158				

09:00 - 09:15

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	259	65	469	0.552	259	1.2	1.2	17.102	C
C-AB	16	4	565	0.028	16	0.0	0.0	6.560	A
C-A	216	54			216				
A-B	220	55			220				
A-C	158	40			158				

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-AC	259	65	469	0.552	259	1.2	1.2	17.104	C
C-AB	16	4	565	0.028	16	0.0	0.0	6.560	A
C-A	216	54			216				
A-B	220	55			220				
A-C	158	40			158				

2028 Base + Comm + Dev, PM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Profile Type	D10 - 2028 Base + Comm + Dev, PM	The DIRECT profile type is intended to be used for demand that varies over time. You are using it with the 'Use O-D data' option, but your O-D data does not vary over time. Are you sure this is correct?

Junction Network

Junctions

Junction	Name	Junction type	Major road direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	Chelmsford Rd_Oliver Rd Priority Junction	T-Junction	Two-way		2.44	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 period length (min)	Time segment length (min)	Run automatically
D10	2028 Base + Comm + Dev	PM	DIRECT	17:00	18:30	90	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	Scaling Factor (%)
A - Chelmsford Road (N)		DIRECT	✓	100.000
B - Oliver Road		DIRECT	✓	100.000
C - Chelmsford Road (S)		DIRECT	✓	100.000

Origin-Destination Data

Demand (Veh/hr)

		To		
		A - Chelmsford Road (N)	B - Oliver Road	C - Chelmsford Road (S)
From	A - Chelmsford Road (N)	0	119	599
	B - Oliver Road	96	0	63
	C - Chelmsford Road (S)	747	66	0

Vehicle Mix

Heavy Vehicle Percentages

		To		
		A - Chelmsford Road (N)	B - Oliver Road	C - Chelmsford Road (S)
From	A - Chelmsford Road (N)	0	10	0
	B - Oliver Road	1	0	3
	C - Chelmsford Road (S)	1	3	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-AC	0.50	22.26	1.0	C	159	239
C-AB	0.14	8.54	0.2	A	66	99
C-A					747	1120
A-B					119	179
A-C					599	899

Main Results for each time segment

17:00 - 17:15

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	159	40	321	0.495	155	0.0	0.9	21.290	C
C-AB	66	17	488	0.135	65	0.0	0.2	8.512	A
C-A	747	187			747				
A-B	119	30			119				
A-C	599	150			599				

17:15 - 17:30

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	159	40	321	0.496	159	0.9	1.0	22.220	C
C-AB	66	17	488	0.135	66	0.2	0.2	8.536	A
C-A	747	187			747				
A-B	119	30			119				
A-C	599	150			599				

17:30 - 17:45

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	159	40	321	0.496	159	1.0	1.0	22.245	C
C-AB	66	17	488	0.135	66	0.2	0.2	8.536	A
C-A	747	187			747				
A-B	119	30			119				
A-C	599	150			599				

17:45 - 18:00

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	159	40	321	0.496	159	1.0	1.0	22.251	C
C-AB	66	17	488	0.135	66	0.2	0.2	8.536	A
C-A	747	187			747				
A-B	119	30			119				
A-C	599	150			599				

18:00 - 18:15

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	159	40	321	0.496	159	1.0	1.0	22.256	C
C-AB	66	17	488	0.135	66	0.2	0.2	8.536	A
C-A	747	187			747				
A-B	119	30			119				
A-C	599	150			599				

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-AC	159	40	321	0.496	159	1.0	1.0	22.258	C
C-AB	66	17	488	0.135	66	0.2	0.2	8.536	A
C-A	747	187			747				
A-B	119	30			119				
A-C	599	150			599				

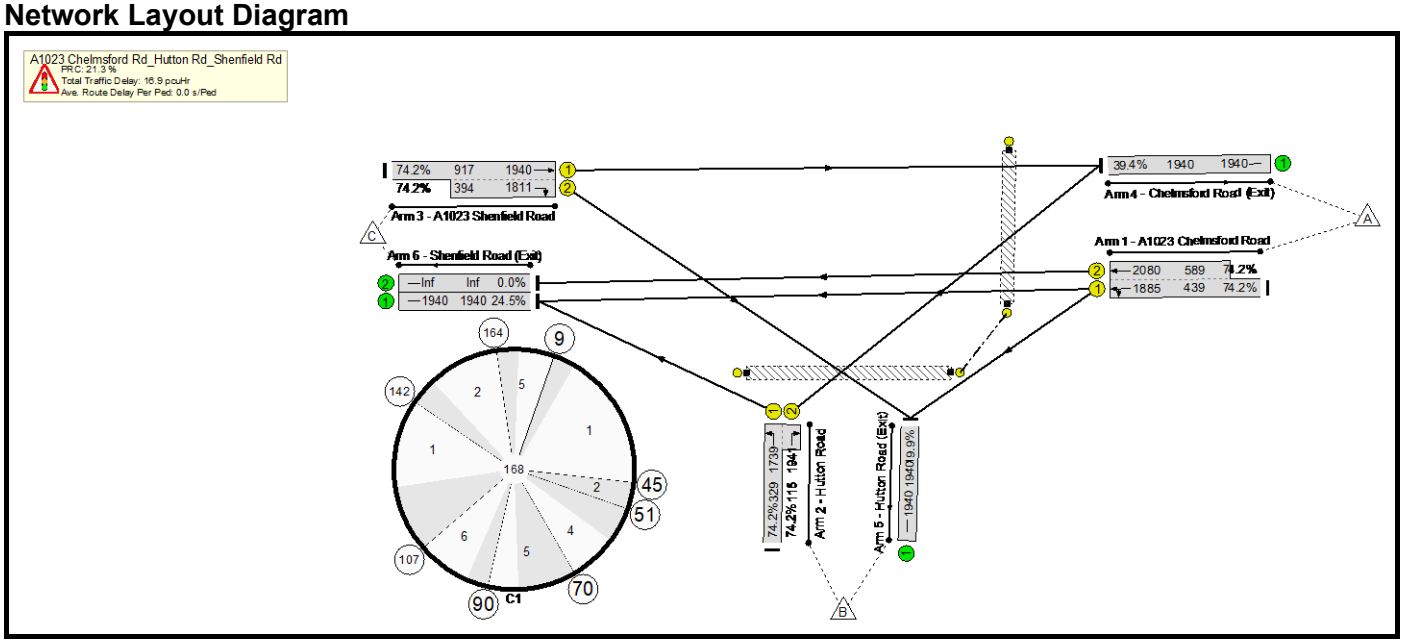
Basic Results Summary

User and Project Details

Project:	
Title:	**Shenfield**
Location:	
Additional detail:	
File name:	20240521 152080 - A1023 Chelmsford Rd_Hutton Rd_Shenfield Rd Junction - BS update - V1.lsg3x
Author:	Ben Stone
Company:	SLR
Address:	

Scenario 1: '2022 Base AM Peak' (FG1: '2022 Base AM Peak', Plan 1: 'Network Control Plan 1')

Network Layout Diagram



Basic Results Summary

Network Results

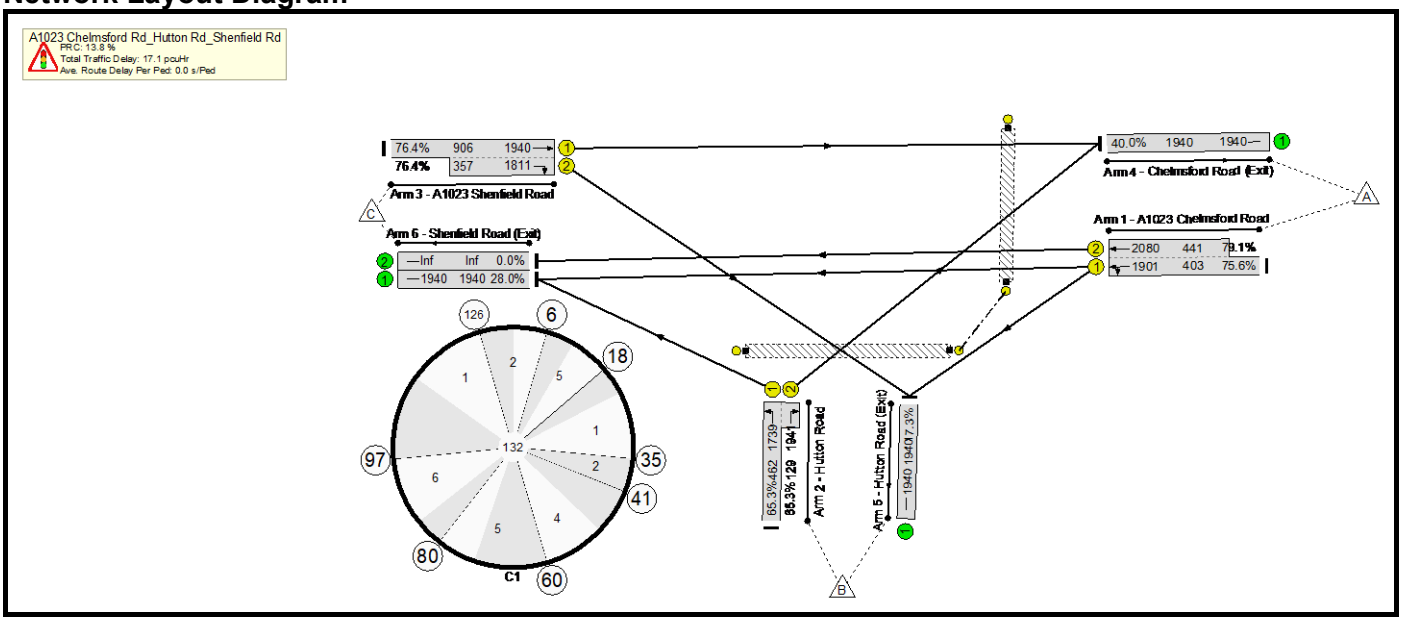
Item	Lane Description	Lane Type	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Mean Max Queue (pcu)
Network: Shenfield	-	-	-		-	-	-	-	-	-	**74.2%**	**0**	**0**	**0**	**16.9**	-	-
A1023 Chelmsford Rd_Hutton Rd_Shenfield Rd	-	-	-		-	-	-	-	-	-	**74.2%**	**0**	**0**	**0**	**16.9**	-	-
1/1+1/2	A1023 Chelmsford Road Left Ahead	U	C		2	51	-	763	1885:2080	439+589	74.2 : 74.2%	-	-	-	7.1	33.7	13.1
2/1+2/2	Hutton Road Right Left	U	E D		2	68:15	-	329	1739:1941	329+115	74.2 : 74.2%	-	-	-	3.4	37.3	6.8
3/1+3/2	A1023 Shenfield Road Ahead Right	U	A B		2	106:37	-	972	1940:1811	917+394	74.2 : 74.2%	-	-	-	5.8	21.4	16.9
4/1	Chelmsford Road (Exit)	U	-		-	-	-	765	1940	1940	39.4%	-	-	-	0.3	1.5	0.3
5/1	Hutton Road (Exit)	U	-		-	-	-	387	1940	1940	19.9%	-	-	-	0.1	1.2	0.1
6/1	Shenfield Road (Exit)	U	-		-	-	-	475	1940	1940	24.5%	-	-	-	0.2	1.2	0.2
Ped Link: P1	Chelmsford Road	-	G		1	11	-	0	-	0	0.0%	-	-	-	-	-	-
Ped Link: P2	Hutton Road	-	F		1	12	-	0	-	0	0.0%	-	-	-	-	-	-

C1 PRC for Signalled Lanes (%): 21.3 Total Delay for Signalled Lanes (pcuHr): 16.33 Cycle Time (s): 168
PRC Over All Lanes (%): 21.3 Total Delay Over All Lanes(pcuHr): 16.94

Basic Results Summary

Scenario 2: '2022 Base PM Peak' (FG2: '2022 Base PM Peak', Plan 1: 'Network Control Plan 1')

Network Layout Diagram



Basic Results Summary

Network Results

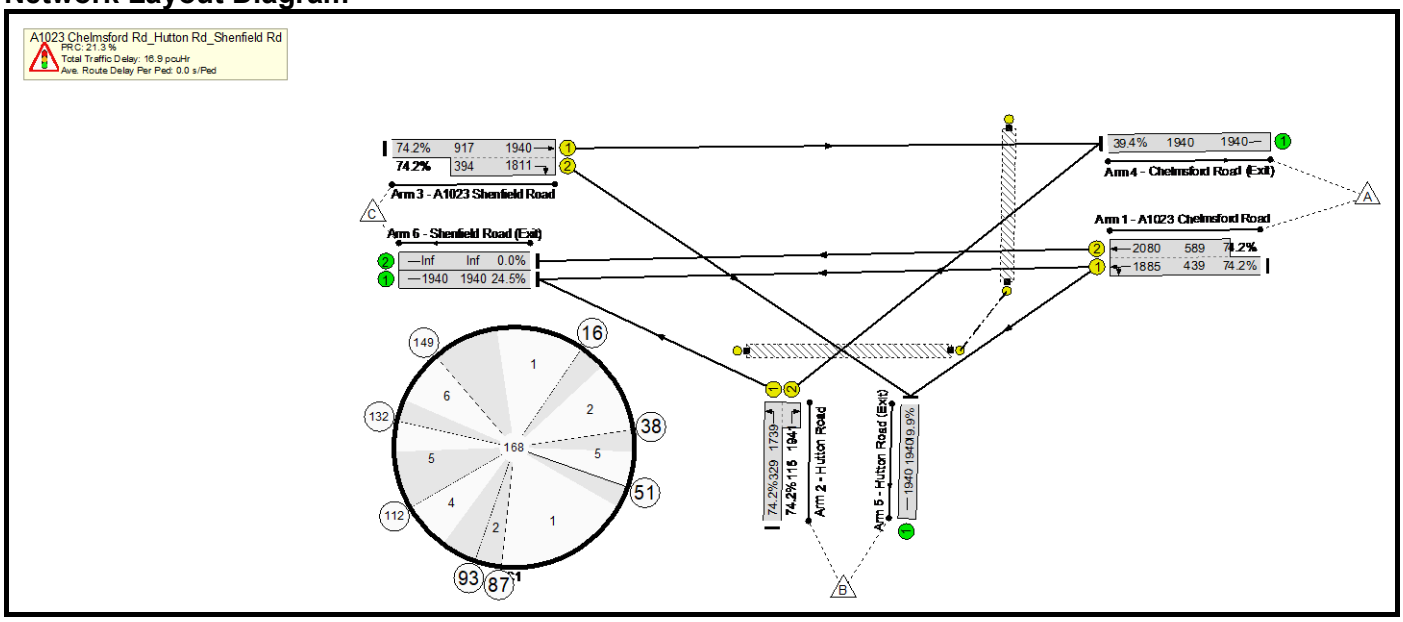
Item	Lane Description	Lane Type	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Mean Max Queue (pcu)
Network: Shenfield	-	-	-		-	-	-	-	-	-	**79.1%**	**0**	**0**	**0**	**17.1**	-	-
A1023 Chelmsford Rd_Hutton Rd_Shenfield Rd	-	-	-		-	-	-	-	-	-	**79.1%**	**0**	**0**	**0**	**17.1**	-	-
1/1+1/2	A1023 Chelmsford Road Left Ahead	U	C		2	26	-	654	1901:2080	403+441	75.6 : 79.1%	-	-	-	7.1	39.2	10.5
2/1+2/2	Hutton Road Right Left	U	E D		2	57:14	-	386	1739:1941	462+129	65.3 : 65.3%	-	-	-	2.8	25.7	7.1
3/1+3/2	A1023 Shenfield Road Ahead Right	U	A B		2	71:27	-	965	1940:1811	906+357	76.4 : 76.4%	-	-	-	6.6	24.7	17.5
4/1	Chelmsford Road (Exit)	U	-		-	-	-	776	1940	1940	40.0%	-	-	-	0.3	1.5	0.3
5/1	Hutton Road (Exit)	U	-		-	-	-	336	1940	1940	17.3%	-	-	-	0.1	1.1	0.1
6/1	Shenfield Road (Exit)	U	-		-	-	-	544	1940	1940	28.0%	-	-	-	0.2	1.3	0.2
Ped Link: P1	Chelmsford Road	-	G		1	11	-	0	-	0	0.0%	-	-	-	-	-	-
Ped Link: P2	Hutton Road	-	F		1	12	-	0	-	0	0.0%	-	-	-	-	-	-

C1 PRC for Signalled Lanes (%): 13.8 Total Delay for Signalled Lanes (pcuHr): 16.50 Cycle Time (s): 132
PRC Over All Lanes (%): 13.8 Total Delay Over All Lanes(pcuHr): 17.13

Basic Results Summary

Scenario 3: '2028 Base AM Peak' (FG3: '2028 Base AM Peak', Plan 1: 'Network Control Plan 1')

Network Layout Diagram



Basic Results Summary

Network Results

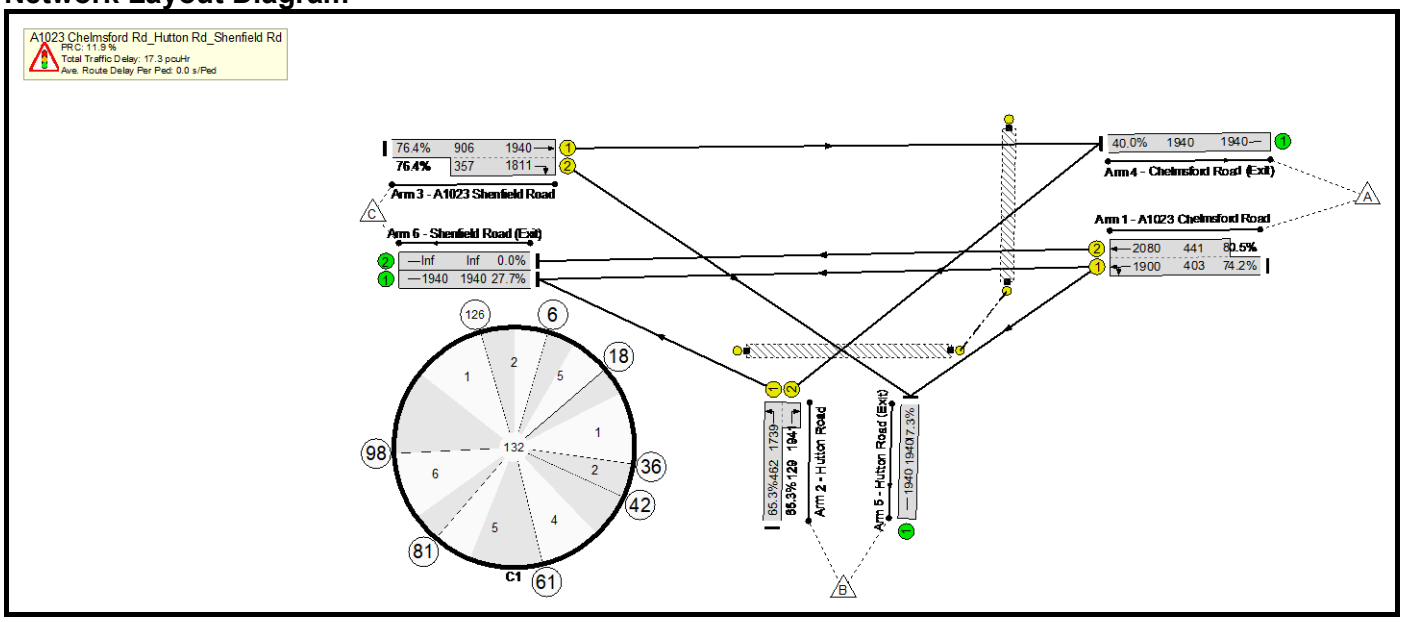
Item	Lane Description	Lane Type	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Mean Max Queue (pcu)
Network: Shenfield	-	-	-		-	-	-	-	-	-	**74.2%**	**0**	**0**	**0**	**16.9**	-	-
A1023 Chelmsford Rd_Hutton Rd_Shenfield Rd	-	-	-		-	-	-	-	-	-	**74.2%**	**0**	**0**	**0**	**16.9**	-	-
1/1+1/2	A1023 Chelmsford Road Left Ahead	U	C		2	51	-	763	1885:2080	439+589	74.2 : 74.2%	-	-	-	7.1	33.7	13.1
2/1+2/2	Hutton Road Right Left	U	E D		2	68:15	-	329	1739:1941	329+115	74.2 : 74.2%	-	-	-	3.4	37.3	6.8
3/1+3/2	A1023 Shenfield Road Ahead Right	U	A B		2	106:37	-	972	1940:1811	917+394	74.2 : 74.2%	-	-	-	5.8	21.4	16.9
4/1	Chelmsford Road (Exit)	U	-		-	-	-	765	1940	1940	39.4%	-	-	-	0.3	1.5	0.3
5/1	Hutton Road (Exit)	U	-		-	-	-	387	1940	1940	19.9%	-	-	-	0.1	1.2	0.1
6/1	Shenfield Road (Exit)	U	-		-	-	-	475	1940	1940	24.5%	-	-	-	0.2	1.2	0.2
Ped Link: P1	Chelmsford Road	-	G		1	11	-	0	-	0	0.0%	-	-	-	-	-	-
Ped Link: P2	Hutton Road	-	F		1	12	-	0	-	0	0.0%	-	-	-	-	-	-

C1 PRC for Signalled Lanes (%): 21.3 Total Delay for Signalled Lanes (pcuHr): 16.33 Cycle Time (s): 168
PRC Over All Lanes (%): 21.3 Total Delay Over All Lanes(pcuHr): 16.94

Basic Results Summary

Scenario 4: '2028 Base PM Peak' (FG4: '2028 Base PM Peak', Plan 1: 'Network Control Plan 1')

Network Layout Diagram



Basic Results Summary

Network Results

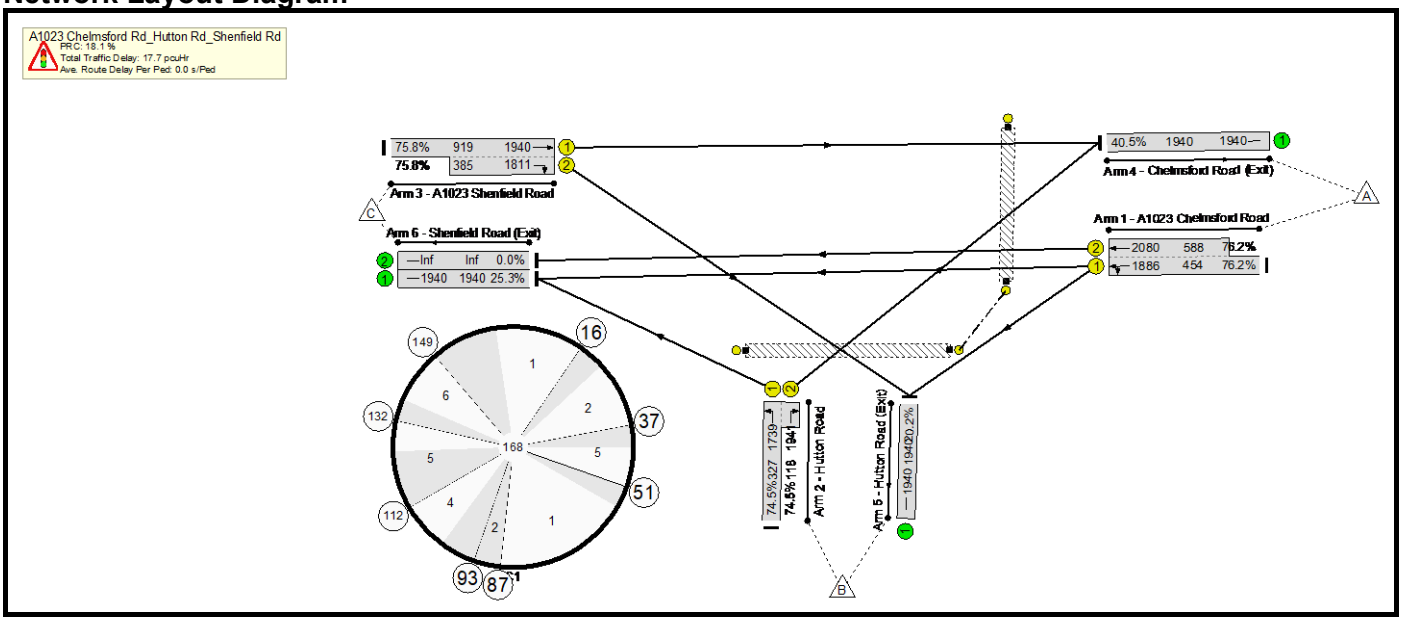
Item	Lane Description	Lane Type	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Mean Max Queue (pcu)
Network: Shenfield	-	-	-		-	-	-	-	-	-	**80.5%**	**0**	**0**	**0**	**17.3**	-	-
A1023 Chelmsford Rd_Hutton Rd_Shenfield Rd	-	-	-		-	-	-	-	-	-	**80.5%**	**0**	**0**	**0**	**17.3**	-	-
1/1+1/2	A1023 Chelmsford Road Left Ahead	U	C		2	26	-	654	1900:2080	403+441	74.2 : 80.5%	-	-	-	7.3	40.3	10.6
2/1+2/2	Hutton Road Right Left	U	E D		2	57:14	-	386	1739:1941	462+129	65.3 : 65.3%	-	-	-	2.7	25.5	7.0
3/1+3/2	A1023 Shenfield Road Ahead Right	U	A B		2	71:27	-	965	1940:1811	906+357	76.4 : 76.4%	-	-	-	6.6	24.6	17.5
4/1	Chelmsford Road (Exit)	U	-		-	-	-	776	1940	1940	40.0%	-	-	-	0.3	1.5	0.3
5/1	Hutton Road (Exit)	U	-		-	-	-	336	1940	1940	17.3%	-	-	-	0.1	1.1	0.1
6/1	Shenfield Road (Exit)	U	-		-	-	-	538	1940	1940	27.7%	-	-	-	0.2	1.3	0.2
Ped Link: P1	Chelmsford Road	-	G		1	11	-	0	-	0	0.0%	-	-	-	-	-	-
Ped Link: P2	Hutton Road	-	F		1	12	-	0	-	0	0.0%	-	-	-	-	-	-

C1 PRC for Signalled Lanes (%): 11.9 Total Delay for Signalled Lanes (pcuHr): 16.63 Cycle Time (s): 132
PRC Over All Lanes (%): 11.9 Total Delay Over All Lanes(pcuHr): 17.26

Basic Results Summary

Scenario 5: '2028 Base + Committed AM Peak' (FG5: '2028 Base + Committed AM Peak', Plan 1: 'Network Control Plan 1')

Network Layout Diagram



Basic Results Summary

Network Results

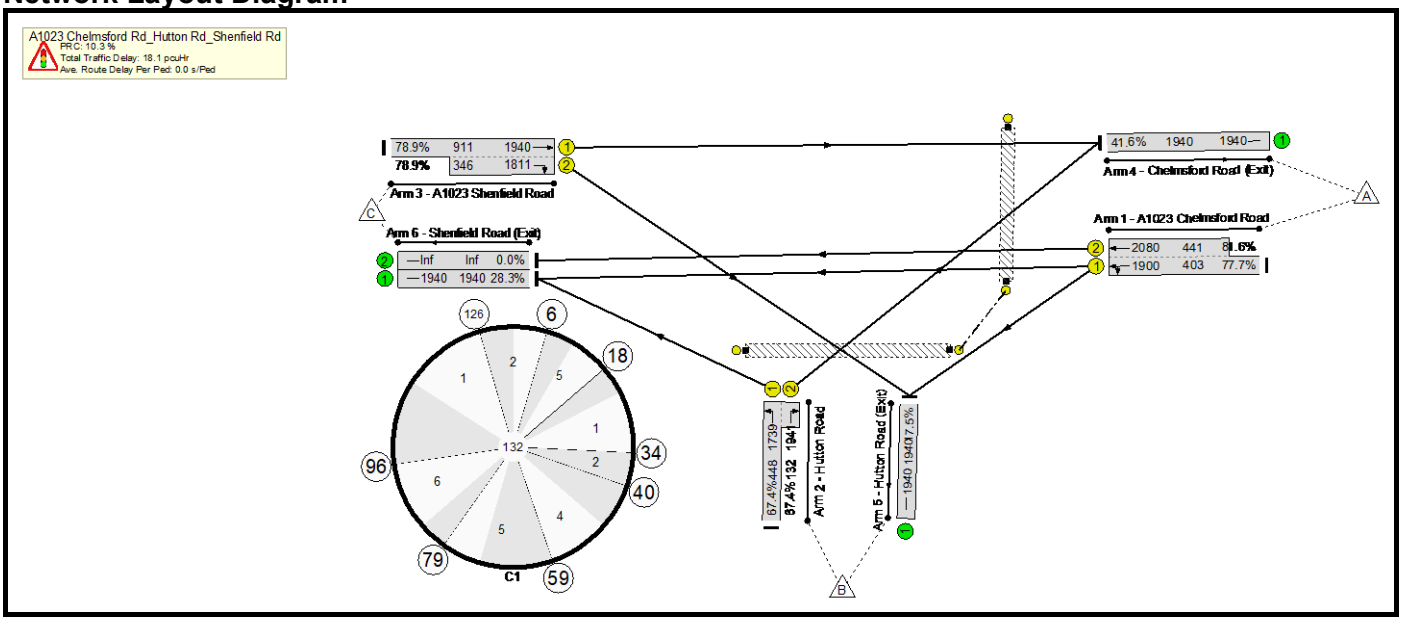
Item	Lane Description	Lane Type	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Mean Max Queue (pcu)
Network: Shenfield	-	-	-		-	-	-	-	-	-	**76.2%**	**0**	**0**	**0**	**17.7**	-	-
A1023 Chelmsford Rd_Hutton Rd_Shenfield Rd	-	-	-		-	-	-	-	-	-	**76.2%**	**0**	**0**	**0**	**17.7**	-	-
1/1+1/2	A1023 Chelmsford Road Left Ahead	U	C		2	51	-	794	1886:2080	454+588	76.2 : 76.2%	-	-	-	7.6	34.4	13.8
2/1+2/2	Hutton Road Right Left	U	E D		2	68:16	-	332	1739:1941	327+118	74.5 : 74.5%	-	-	-	3.5	37.4	6.8
3/1+3/2	A1023 Shenfield Road Ahead Right	U	A B		2	105:36	-	989	1940:1811	919+385	75.8 : 75.8%	-	-	-	6.1	22.0	18.0
4/1	Chelmsford Road (Exit)	U	-		-	-	-	785	1940	1940	40.5%	-	-	-	0.3	1.6	0.3
5/1	Hutton Road (Exit)	U	-		-	-	-	392	1940	1940	20.2%	-	-	-	0.1	1.2	0.1
6/1	Shenfield Road (Exit)	U	-		-	-	-	490	1940	1940	25.3%	-	-	-	0.2	1.2	0.2
Ped Link: P1	Chelmsford Road	-	G		1	11	-	0	-	0	0.0%	-	-	-	-	-	-
Ped Link: P2	Hutton Road	-	F		1	12	-	0	-	0	0.0%	-	-	-	-	-	-

C1 PRC for Signalled Lanes (%): 18.1 Total Delay for Signalled Lanes (pcuHr): 17.11 Cycle Time (s): 168
PRC Over All Lanes (%): 18.1 Total Delay Over All Lanes(pcuHr): 17.74

Basic Results Summary

Scenario 6: '2028 Base + Committed PM Peak' (FG6: '2028 Base + Committed PM Peak', Plan 1: 'Network Control Plan 1')

Network Layout Diagram



Basic Results Summary

Network Results

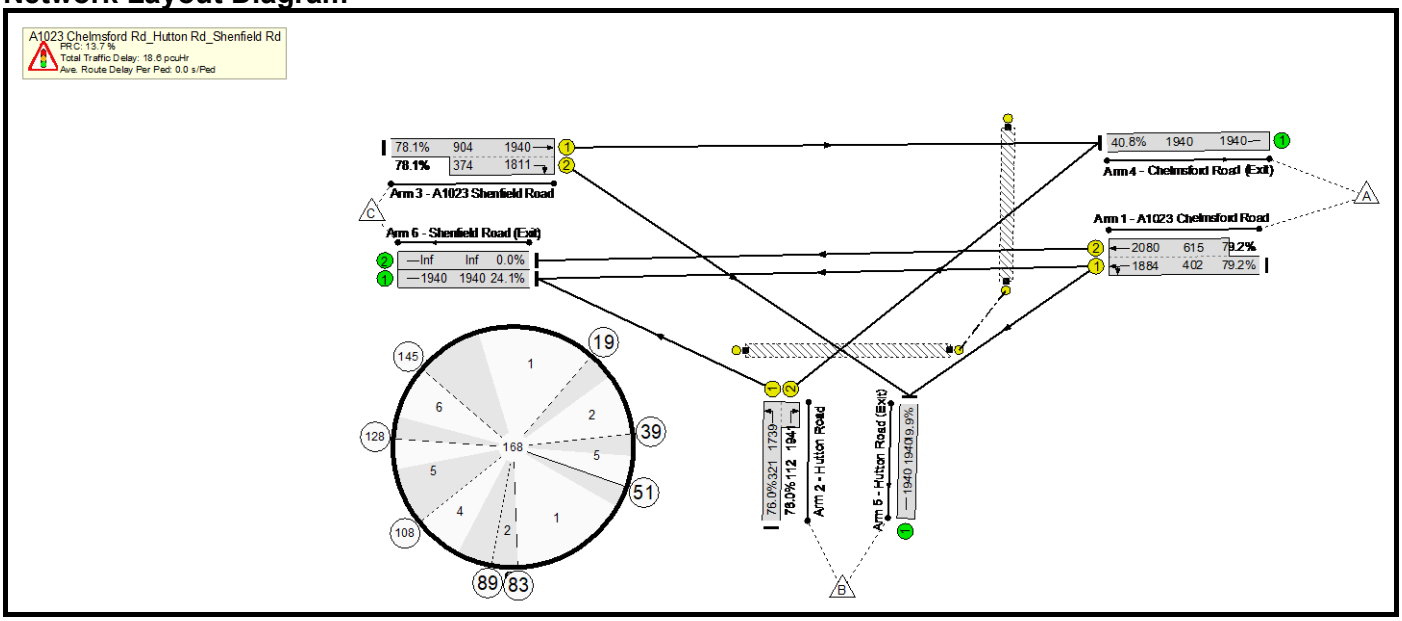
Item	Lane Description	Lane Type	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Mean Max Queue (pcu)
Network: Shenfield	-	-	-		-	-	-	-	-	-	**81.6%**	**0**	**0**	**0**	**18.1**	-	-
A1023 Chelmsford Rd_Hutton Rd_Shenfield Rd	-	-	-		-	-	-	-	-	-	**81.6%**	**0**	**0**	**0**	**18.1**	-	-
1/1+1/2	A1023 Chelmsford Road Left Ahead	U	C		2	26	-	673	1900:2080	403+441	77.7 : 81.6%	-	-	-	7.5	40.2	11.0
2/1+2/2	Hutton Road Right Left	U	E D		2	57:14	-	391	1739:1941	448+132	67.4 : 67.4%	-	-	-	2.9	26.8	7.4
3/1+3/2	A1023 Shenfield Road Ahead Right	U	A B		2	71:27	-	992	1940:1811	911+346	78.9 : 78.9%	-	-	-	7.1	25.6	19.2
4/1	Chelmsford Road (Exit)	U	-		-	-	-	808	1940	1940	41.6%	-	-	-	0.4	1.6	0.4
5/1	Hutton Road (Exit)	U	-		-	-	-	339	1940	1940	17.5%	-	-	-	0.1	1.1	0.1
6/1	Shenfield Road (Exit)	U	-		-	-	-	549	1940	1940	28.3%	-	-	-	0.2	1.3	0.2
Ped Link: P1	Chelmsford Road	-	G		1	11	-	0	-	0	0.0%	-	-	-	-	-	-
Ped Link: P2	Hutton Road	-	F		1	12	-	0	-	0	0.0%	-	-	-	-	-	-

C1 PRC for Signalled Lanes (%): 10.3 Total Delay for Signalled Lanes (pcuHr): 17.49 Cycle Time (s): 132
PRC Over All Lanes (%): 10.3 Total Delay Over All Lanes(pcuHr): 18.15

Basic Results Summary

Scenario 7: '2028 Base + Development AM Peak' (FG7: '2028 Base + Development AM Peak', Plan 1: 'Network Control Plan 1')

Network Layout Diagram



Basic Results Summary

Network Results

Item	Lane Description	Lane Type	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Mean Max Queue (pcu)
Network: Shenfield	-	-	-		-	-	-	-	-	-	**79.2%**	**0**	**0**	**0**	**18.6**	-	-
A1023 Chelmsford Rd_Hutton Rd_Shenfield Rd	-	-	-		-	-	-	-	-	-	**79.2%**	**0**	**0**	**0**	**18.6**	-	-
1/1+1/2	A1023 Chelmsford Road Left Ahead	U	C		2	54	-	805	1884:2080	402+615	79.2 : 79.2%	-	-	-	7.9	35.3	17.0
2/1+2/2	Hutton Road Right Left	U	E D		2	65:14	-	329	1739:1941	321+112	76.0 : 76.0%	-	-	-	3.7	40.4	7.8
3/1+3/2	A1023 Shenfield Road Ahead Right	U	A B		2	107:35	-	998	1940:1811	904+374	78.1 : 78.1%	-	-	-	6.4	23.0	18.7
4/1	Chelmsford Road (Exit)	U	-		-	-	-	791	1940	1940	40.8%	-	-	-	0.3	1.6	0.3
5/1	Hutton Road (Exit)	U	-		-	-	-	387	1940	1940	19.9%	-	-	-	0.1	1.2	0.1
6/1	Shenfield Road (Exit)	U	-		-	-	-	467	1940	1940	24.1%	-	-	-	0.2	1.2	0.2
Ped Link: P1	Chelmsford Road	-	G		1	11	-	0	-	0	0.0%	-	-	-	-	-	-
Ped Link: P2	Hutton Road	-	F		1	12	-	0	-	0	0.0%	-	-	-	-	-	-

C1

PRC for Signalled Lanes (%): 13.7
PRC Over All Lanes (%): 13.7

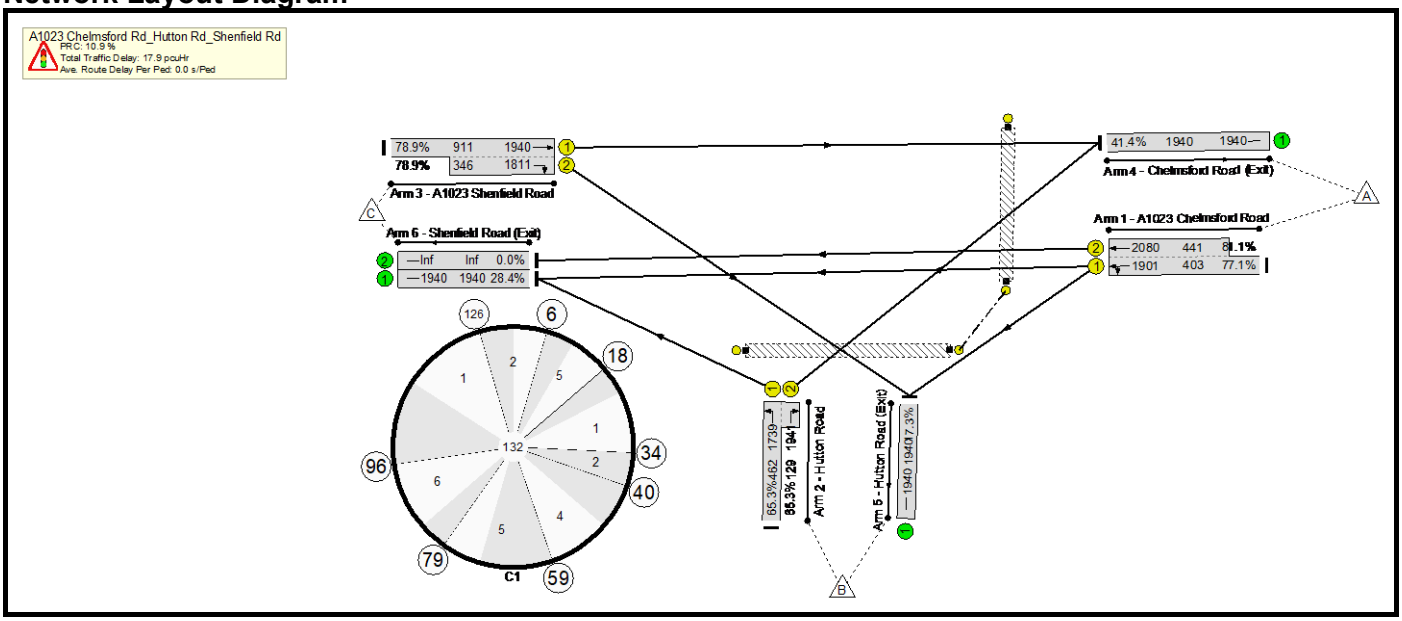
Total Delay for Signalled Lanes (pcuHr): 17.96
Total Delay Over All Lanes(pcuHr): 18.59

Cycle Time (s): 168

Basic Results Summary

Scenario 8: '2028 Base + Development PM Peak' (FG8: '2028 Base + Development PM Peak', Plan 1: 'Network Control Plan 1')

Network Layout Diagram



Basic Results Summary

Network Results

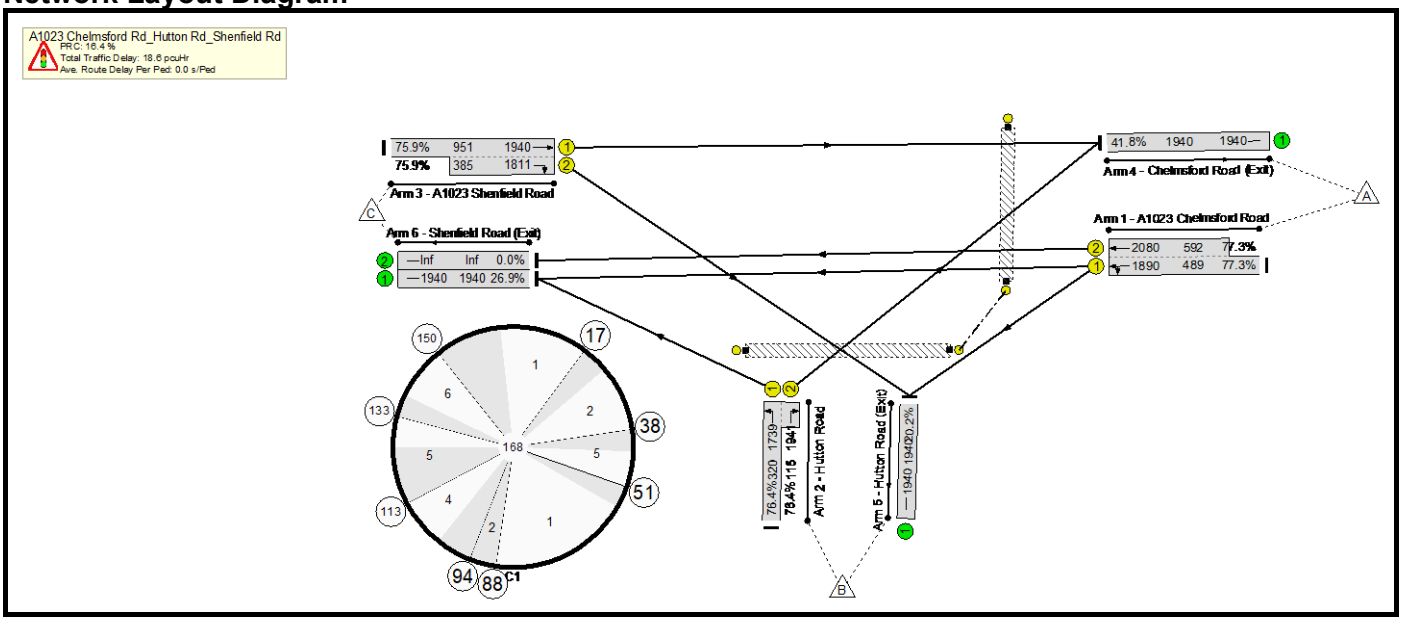
Item	Lane Description	Lane Type	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Mean Max Queue (pcu)
Network: Shenfield	-	-	-		-	-	-	-	-	-	**81.1%**	**0**	**0**	**0**	**17.9**	-	-
A1023 Chelmsford Rd_Hutton Rd_Shenfield Rd	-	-	-		-	-	-	-	-	-	**81.1%**	**0**	**0**	**0**	**17.9**	-	-
1/1+1/2	A1023 Chelmsford Road Left Ahead	U	C		2	26	-	669	1901:2080	403+441	77.1 : 81.1%	-	-	-	7.4	39.9	10.9
2/1+2/2	Hutton Road Right Left	U	E D		2	57:14	-	386	1739:1941	462+129	65.3 : 65.3%	-	-	-	2.8	26.0	7.2
3/1+3/2	A1023 Shenfield Road Ahead Right	U	A B		2	71:27	-	992	1940:1811	911+346	78.9 : 78.9%	-	-	-	7.1	25.6	19.2
4/1	Chelmsford Road (Exit)	U	-		-	-	-	803	1940	1940	41.4%	-	-	-	0.4	1.6	0.4
5/1	Hutton Road (Exit)	U	-		-	-	-	336	1940	1940	17.3%	-	-	-	0.1	1.1	0.1
6/1	Shenfield Road (Exit)	U	-		-	-	-	550	1940	1940	28.4%	-	-	-	0.2	1.3	0.2
Ped Link: P1	Chelmsford Road	-	G		1	11	-	0	-	0	0.0%	-	-	-	-	-	-
Ped Link: P2	Hutton Road	-	F		1	12	-	0	-	0	0.0%	-	-	-	-	-	-

C1 PRC for Signalled Lanes (%): 10.9 Total Delay for Signalled Lanes (pcuHr): 17.26 Cycle Time (s): 132
PRC Over All Lanes (%): 10.9 Total Delay Over All Lanes(pcuHr): 17.92

Basic Results Summary

Scenario 9: '2028 Base + Comm + Dev AM Peak' (FG9: '2028 Base + Comm + Dev AM Peak', Plan 1: 'Network Control Plan 1')

Network Layout Diagram



Basic Results Summary

Network Results

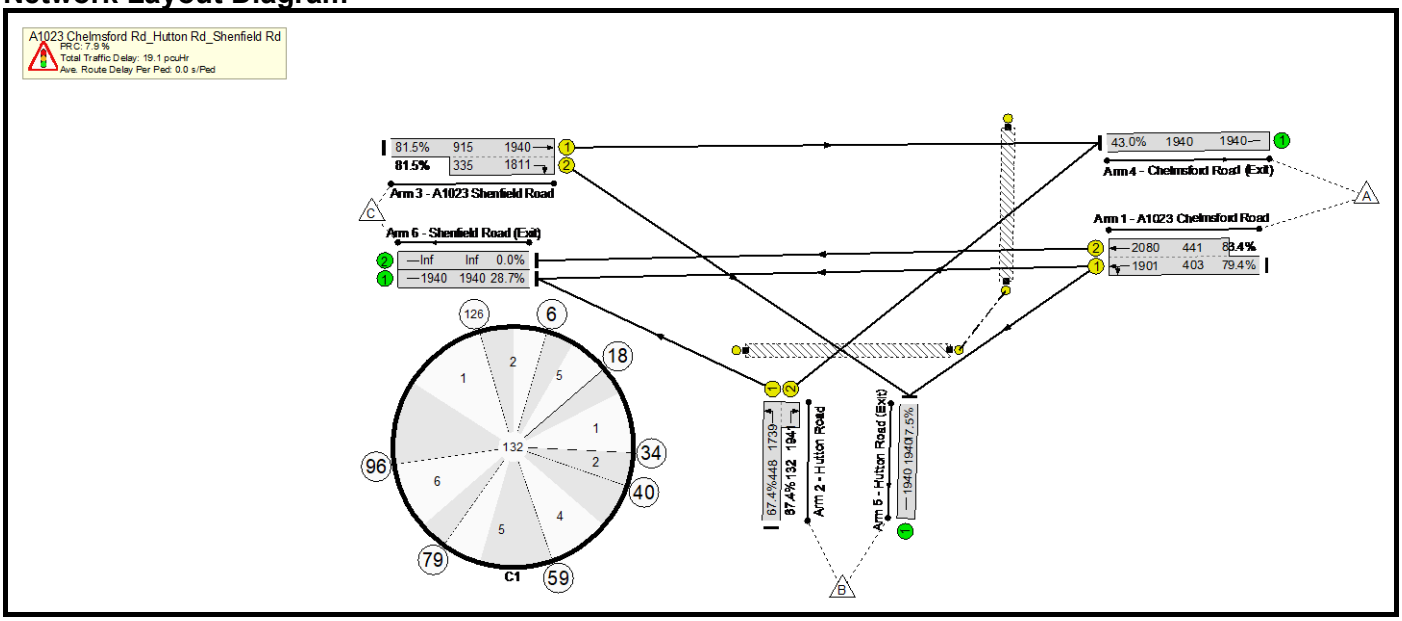
Item	Lane Description	Lane Type	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Mean Max Queue (pcu)
Network: Shenfield	-	-	-		-	-	-	-	-	-	**77.3%**	**0**	**0**	**0**	**18.6**	-	-
A1023 Chelmsford Rd_Hutton Rd_Shenfield Rd	-	-	-		-	-	-	-	-	-	**77.3%**	**0**	**0**	**0**	**18.6**	-	-
1/1+1/2	A1023 Chelmsford Road Left Ahead	U	C		2	52	-	836	1890:2080	489+592	77.3 : 77.3%	-	-	-	8.1	35.0	14.6
2/1+2/2	Hutton Road Right Left	U	E D		2	67:15	-	332	1739:1941	320+115	76.4 : 76.4%	-	-	-	3.6	39.3	7.0
3/1+3/2	A1023 Shenfield Road Ahead Right	U	A B		2	106:36	-	1014	1940:1811	951+385	75.9 : 75.9%	-	-	-	6.2	21.9	19.4
4/1	Chelmsford Road (Exit)	U	-		-	-	-	810	1940	1940	41.8%	-	-	-	0.4	1.6	0.4
5/1	Hutton Road (Exit)	U	-		-	-	-	392	1940	1940	20.2%	-	-	-	0.1	1.2	0.1
6/1	Shenfield Road (Exit)	U	-		-	-	-	522	1940	1940	26.9%	-	-	-	0.2	1.3	0.2
Ped Link: P1	Chelmsford Road	-	G		1	11	-	0	-	0	0.0%	-	-	-	-	-	-
Ped Link: P2	Hutton Road	-	F		1	12	-	0	-	0	0.0%	-	-	-	-	-	-

C1 PRC for Signalled Lanes (%): 16.4 Total Delay for Signalled Lanes (pcuHr): 17.91 Cycle Time (s): 168
PRC Over All Lanes (%): 16.4 Total Delay Over All Lanes(pcuHr): 18.58

Basic Results Summary

Scenario 10: '2028 Base + Comm + Dev PM Peak' (FG10: '2028 Base + Comm + Dev PM Peak', Plan 1: 'Network Control Plan 1')

Network Layout Diagram



Basic Results Summary

Network Results

Item	Lane Description	Lane Type	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Mean Max Queue (pcu)
Network: Shenfield	-	-	-		-	-	-	-	-	-	**83.4%**	**0**	**0**	**0**	**19.1**	-	-
A1023 Chelmsford Rd_Hutton Rd_Shenfield Rd	-	-	-		-	-	-	-	-	-	**83.4%**	**0**	**0**	**0**	**19.1**	-	-
1/1+1/2	A1023 Chelmsford Road Left Ahead	U	C		2	26	-	688	1901:2080	403+441	79.4 : 83.4%	-	-	-	7.9	41.5	11.5
2/1+2/2	Hutton Road Right Left	U	E D		2	57:14	-	391	1739:1941	448+132	67.4 : 67.4%	-	-	-	2.9	26.8	7.4
3/1+3/2	A1023 Shenfield Road Ahead Right	U	A B		2	71:27	-	1019	1940:1811	915+335	81.5 : 81.5%	-	-	-	7.6	26.7	20.8
4/1	Chelmsford Road (Exit)	U	-		-	-	-	835	1940	1940	43.0%	-	-	-	0.4	1.6	0.4
5/1	Hutton Road (Exit)	U	-		-	-	-	339	1940	1940	17.5%	-	-	-	0.1	1.1	0.1
6/1	Shenfield Road (Exit)	U	-		-	-	-	556	1940	1940	28.7%	-	-	-	0.2	1.3	0.2
Ped Link: P1	Chelmsford Road	-	G		1	11	-	0	-	0	0.0%	-	-	-	-	-	-
Ped Link: P2	Hutton Road	-	F		1	12	-	0	-	0	0.0%	-	-	-	-	-	-

C1 PRC for Signalled Lanes (%): 7.9 Total Delay for Signalled Lanes (pcuHr): 18.39 Cycle Time (s): 132
PRC Over All Lanes (%): 7.9 Total Delay Over All Lanes(pcuHr): 19.08

Junctions 9

ARCADY 9 - Roundabout Module

Version: 9.5.2.1013

For sales and distribution information, program advice and maintenance, contact TRL:
+44 (0)1344 379777 software@trl.co.uk www.trlsoftware.co.uk

Filename: 20240521 Alexander Lane - Rayleigh Road Mini-Roundabout V1.j9
Path: \\slr.local\eu\Offices\UK\London\Vectos\Projects\Projects\150000\152080 - Shenfield\MODELLING\20240521 - Updated School Sensitvity Assessment
Report generation date: 21/05/2024 16:34:25

Summary of junction performance

	AM					PM				
	Set ID	Queue (Veh)	Delay (s)	RFC	LOS	Set ID	Queue (Veh)	Delay (s)	RFC	LOS
	2022 Base									
C - Rayleigh Road (E)	D1	2.4	15.62	0.71	C	D2	1.1	8.66	0.51	A
A - Rayleigh Road (W)		1.4	9.63	0.58	A		1.7	10.82	0.64	B
B - Alexander Lane		1.8	16.72	0.64	C		0.9	12.16	0.46	B
	2028 Base									
C - Rayleigh Road (E)	D3	2.4	15.62	0.71	C	D4	1.1	8.66	0.51	A
A - Rayleigh Road (W)		1.4	9.63	0.58	A		1.7	10.82	0.64	B
B - Alexander Lane		1.8	16.72	0.64	C		0.9	12.16	0.46	B
	2028 Base + Dev									
C - Rayleigh Road (E)	D5	2.8	18.33	0.74	C	D6	1.1	8.91	0.53	A
A - Rayleigh Road (W)		1.8	11.45	0.64	B		1.8	11.22	0.65	B
B - Alexander Lane		2.8	23.05	0.74	C		0.9	12.58	0.48	B
	2028 Base + Comm									
C - Rayleigh Road (E)	D7	2.5	15.91	0.71	C	D8	1.1	8.80	0.52	A
A - Rayleigh Road (W)		1.4	9.72	0.58	A		1.8	10.93	0.64	B
B - Alexander Lane		1.8	17.27	0.65	C		0.9	12.19	0.47	B
	2028 Base + Comm + Dev									
C - Rayleigh Road (E)	D9	2.9	18.68	0.75	C	D10	1.1	9.06	0.53	A
A - Rayleigh Road (W)		1.8	11.58	0.65	B		1.9	11.32	0.65	B
B - Alexander Lane		2.9	23.95	0.75	C		0.9	12.69	0.49	B

There are warnings associated with one or more model runs - see the 'Data Errors and Warnings' tables for each Analysis or Demand Set.

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

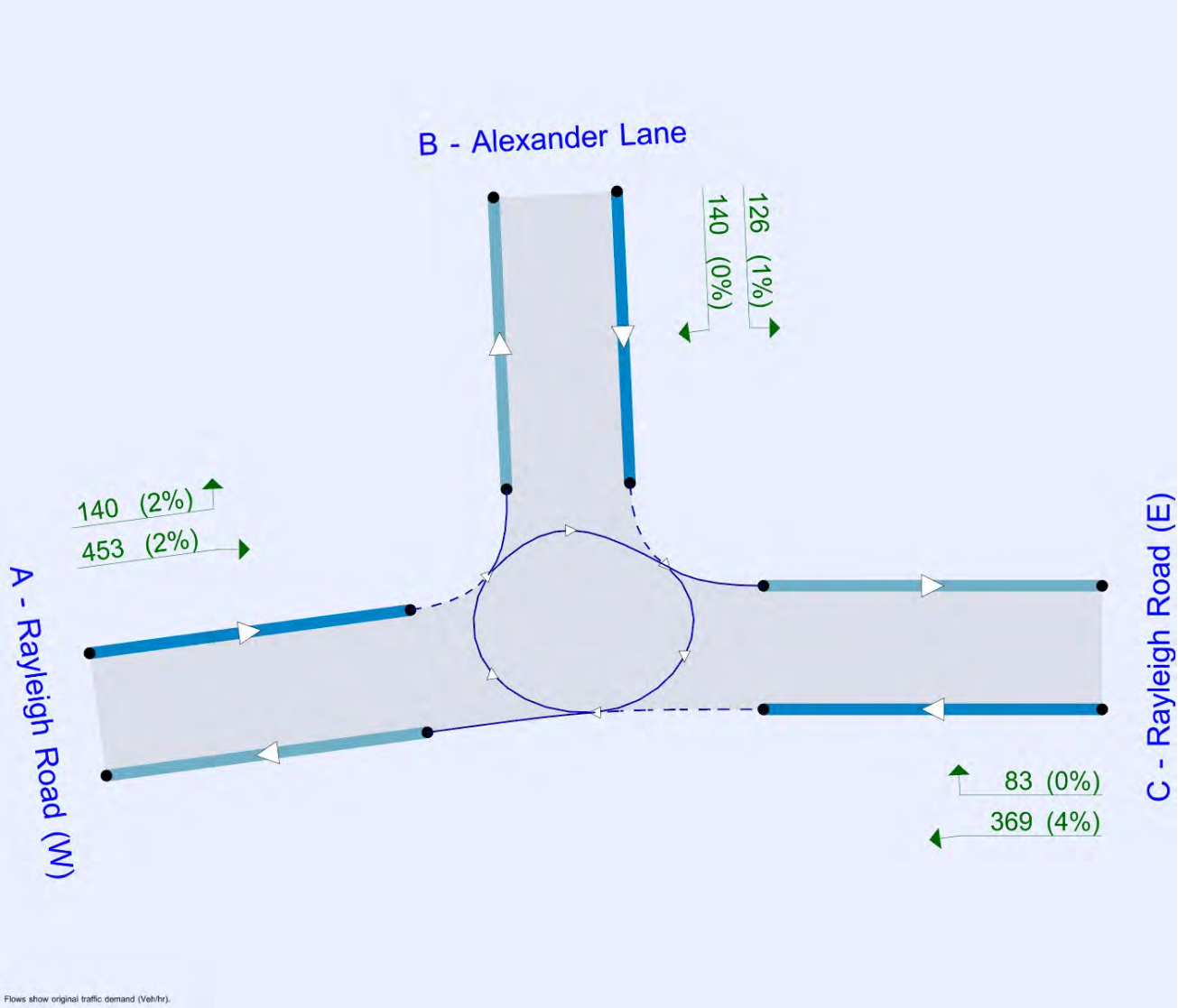
File summary

File Description

Title	
Location	
Site number	
Date	02/02/2023
Version	
Status	(new file)
Identifier	
Client	
Jobnumber	
Enumerator	EUR\George.Magnisalis
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

Mini-roundabout model	Vehicle length (m)	Calculate Queue Percentiles	Calculate detailed queueing delay	Calculate residual capacity	RFC Threshold	Average Delay threshold (s)	Queue threshold (PCU)
JUNCTIONS 9	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 period length (min)	Time segment length (min)	Run automatically
D1	2022 Base	AM	DIRECT	08:00	09:30	90	15	✓
D2	2022 Base	PM	DIRECT	17:00	18:30	90	15	✓
D3	2028 Base	AM	DIRECT	08:00	09:30	90	15	✓
D4	2028 Base	PM	DIRECT	17:00	18:30	90	15	✓
D5	2028 Base + Dev	AM	DIRECT	08:00	09:30	90	15	✓
D6	2028 Base + Dev	PM	DIRECT	17:00	18:30	90	15	✓
D7	2028 Base + Comm	AM	DIRECT	08:00	09:30	90	15	✓
D8	2028 Base + Comm	PM	DIRECT	17:00	18:30	90	15	✓
D9	2028 Base + Comm + Dev	AM	DIRECT	08:00	09:30	90	15	✓
D10	2028 Base + Comm + Dev	PM	DIRECT	17:00	18:30	90	15	✓

Analysis Set Details

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

2022 Base, AM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Profile Type	D1 - 2022 Base, AM	The DIRECT profile type is intended to be used for demand that varies over time. You are using it with the 'Use O-D data' option, but your O-D data does not vary over time. Are you sure this is correct?

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (s)	Junction LOS
1	Rayleigh Rd_Alexander Ln Mini Rbt	Mini-roundabout		C, A, B	13.80	B

Junction Network Options

Driving side	Lighting	Road surface	In London
Left	Normal/unknown	Normal/unknown	

Arms

Arms

Arm	Name	Description
C	Rayleigh Road (E)	
A	Rayleigh Road (W)	
B	Alexander Lane	

Mini Roundabout Geometry

Arm	Approach road half-width (m)	Minimum approach road half-width (m)	Entry width (m)	Effective flare length (m)	Distance to next arm (m)	Entry corner kerb line distance (m)	Gradient over 50m (%)	Kerbed central island
C - Rayleigh Road (E)	3.90	3.90	3.90	0.0	16.70	15.50	0.0	
A - Rayleigh Road (W)	3.70	3.70	6.00	2.0	13.10	10.50	0.0	
B - Alexander Lane	2.60	2.60	5.00	4.6	13.30	10.00	0.0	

Slope / Intercept / Capacity

Roundabout Slope and Intercept used in model

Arm	Final slope	Final intercept (PCU/hr)
C - Rayleigh Road (E)	0.656	974
A - Rayleigh Road (W)	0.638	987
B - Alexander Lane	0.611	843

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

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time period length (min)	Time segment length (min)	Run automatically
D1	2022 Base	AM	DIRECT	08:00	09:30	90	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	Scaling Factor (%)
C - Rayleigh Road (E)		DIRECT	✓	100.000
A - Rayleigh Road (W)		DIRECT	✓	100.000
B - Alexander Lane		DIRECT	✓	100.000

Origin-Destination Data

Demand (Veh/hr)

		To		
		C - Rayleigh Road (E)	A - Rayleigh Road (W)	B - Alexander Lane
From	C - Rayleigh Road (E)	1	440	119
	A - Rayleigh Road (W)	380	0	130
	B - Alexander Lane	147	234	0

Vehicle Mix

Heavy Vehicle Percentages

		To		
		C - Rayleigh Road (E)	A - Rayleigh Road (W)	B - Alexander Lane
From	C - Rayleigh Road (E)	0	4	3
	A - Rayleigh Road (W)	3	0	2
	B - Alexander Lane	3	0	0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (s)	Max Queue (Veh)	Max LOS	Average Demand (Veh/hr)	Total Junction Arrivals (Veh)
C - Rayleigh Road (E)	0.71	15.62	2.4	C	560	840
A - Rayleigh Road (W)	0.58	9.63	1.4	A	510	765
B - Alexander Lane	0.64	16.72	1.8	C	381	572

Main Results for each time segment

08:00 - 08:15

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
C - Rayleigh Road (E)	560	140	230	793	0.706	551	521	0.0	2.3	14.388	B
A - Rayleigh Road (W)	510	128	118	885	0.576	505	663	0.0	1.3	9.338	A
B - Alexander Lane	381	95	377	599	0.636	374	246	0.0	1.7	15.621	C

08:15 - 08:30

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
C - Rayleigh Road (E)	560	140	234	790	0.709	560	528	2.3	2.4	15.553	C
A - Rayleigh Road (W)	510	128	120	884	0.577	510	674	1.3	1.3	9.620	A
B - Alexander Lane	381	95	381	596	0.639	381	249	1.7	1.7	16.668	C

08:30 - 08:45

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
C - Rayleigh Road (E)	560	140	234	790	0.709	560	528	2.4	2.4	15.595	C
A - Rayleigh Road (W)	510	128	120	884	0.577	510	674	1.3	1.4	9.624	A
B - Alexander Lane	381	95	381	596	0.639	381	249	1.7	1.7	16.699	C

08:45 - 09:00

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
C - Rayleigh Road (E)	560	140	234	790	0.709	560	528	2.4	2.4	15.608	C
A - Rayleigh Road (W)	510	128	120	884	0.577	510	674	1.4	1.4	9.625	A
B - Alexander Lane	381	95	381	596	0.639	381	249	1.7	1.7	16.709	C

09:00 - 09:15

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
C - Rayleigh Road (E)	560	140	234	790	0.709	560	528	2.4	2.4	15.614	C
A - Rayleigh Road (W)	510	128	120	884	0.577	510	674	1.4	1.4	9.627	A
B - Alexander Lane	381	95	381	596	0.639	381	249	1.7	1.8	16.713	C

09:15 - 09:30

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
C - Rayleigh Road (E)	560	140	234	790	0.709	560	528	2.4	2.4	15.618	C
A - Rayleigh Road (W)	510	128	120	884	0.577	510	674	1.4	1.4	9.627	A
B - Alexander Lane	381	95	381	596	0.639	381	249	1.8	1.8	16.716	C

2022 Base, PM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Profile Type	D2 - 2022 Base, PM	The DIRECT profile type is intended to be used for demand that varies over time. You are using it with the 'Use O-D data' option, but your O-D data does not vary over time. Are you sure this is correct?

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (s)	Junction LOS
1	Rayleigh Rd_Alexander Ln Mini Rbt	Mini-roundabout		C, A, B	10.34	B

Junction Network Options

Driving side	Lighting	Road surface	In London
Left	Normal/unknown	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 period length (min)	Time segment length (min)	Run automatically
D2	2022 Base	PM	DIRECT	17:00	18:30	90	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	Scaling Factor (%)
C - Rayleigh Road (E)		DIRECT	✓	100.000
A - Rayleigh Road (W)		DIRECT	✓	100.000
B - Alexander Lane		DIRECT	✓	100.000

Origin-Destination Data

Demand (Veh/hr)

		To		
		C - Rayleigh Road (E)	A - Rayleigh Road (W)	B - Alexander Lane
From	C - Rayleigh Road (E)	1	364	74
	A - Rayleigh Road (W)	452	1	132
	B - Alexander Lane	122	132	3

Vehicle Mix

Heavy Vehicle Percentages

		To		
		C - Rayleigh Road (E)	A - Rayleigh Road (W)	B - Alexander Lane
From	C - Rayleigh Road (E)	0	4	0
	A - Rayleigh Road (W)	2	0	2
	B - Alexander Lane	1	0	67

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (s)	Max Queue (Veh)	Max LOS	Average Demand (Veh/hr)	Total Junction Arrivals (Veh)
C - Rayleigh Road (E)	0.51	8.66	1.1	A	439	658
A - Rayleigh Road (W)	0.64	10.82	1.7	B	585	877
B - Alexander Lane	0.46	12.16	0.9	B	257	385

Main Results for each time segment

17:00 - 17:15

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
C - Rayleigh Road (E)	439	110	134	856	0.513	435	568	0.0	1.0	8.470	A
A - Rayleigh Road (W)	585	146	77	918	0.637	578	492	0.0	1.7	10.394	B
B - Alexander Lane	257	64	449	556	0.462	254	207	0.0	0.8	11.772	B

17:15 - 17:30

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
C - Rayleigh Road (E)	439	110	136	855	0.514	439	575	1.0	1.0	8.653	A
A - Rayleigh Road (W)	585	146	78	918	0.637	585	497	1.7	1.7	10.808	B
B - Alexander Lane	257	64	454	553	0.465	257	209	0.8	0.9	12.151	B

17:30 - 17:45

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
C - Rayleigh Road (E)	439	110	136	855	0.514	439	575	1.0	1.0	8.655	A
A - Rayleigh Road (W)	585	146	78	918	0.637	585	497	1.7	1.7	10.815	B
B - Alexander Lane	257	64	454	553	0.465	257	209	0.9	0.9	12.157	B

17:45 - 18:00

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
C - Rayleigh Road (E)	439	110	136	855	0.514	439	575	1.0	1.1	8.657	A
A - Rayleigh Road (W)	585	146	78	918	0.637	585	497	1.7	1.7	10.817	B
B - Alexander Lane	257	64	454	553	0.465	257	209	0.9	0.9	12.158	B

18:00 - 18:15

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
C - Rayleigh Road (E)	439	110	136	855	0.514	439	575	1.1	1.1	8.657	A
A - Rayleigh Road (W)	585	146	78	918	0.637	585	497	1.7	1.7	10.819	B
B - Alexander Lane	257	64	454	553	0.465	257	209	0.9	0.9	12.160	B

18:15 - 18:30

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
C - Rayleigh Road (E)	439	110	136	855	0.514	439	575	1.1	1.1	8.657	A
A - Rayleigh Road (W)	585	146	78	918	0.637	585	497	1.7	1.7	10.819	B
B - Alexander Lane	257	64	454	553	0.465	257	209	0.9	0.9	12.160	B

2028 Base, AM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Profile Type	D3 - 2028 Base, AM	The DIRECT profile type is intended to be used for demand that varies over time. You are using it with the 'Use O-D data' option, but your O-D data does not vary over time. Are you sure this is correct?

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (s)	Junction LOS
1	Rayleigh Rd_Alexander Ln Mini Rbt	Mini-roundabout		C, A, B	13.80	B

Junction Network Options

Driving side	Lighting	Road surface	In London
Left	Normal/unknown	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 period length (min)	Time segment length (min)	Run automatically
D3	2028 Base	AM	DIRECT	08:00	09:30	90	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	Scaling Factor (%)
C - Rayleigh Road (E)		DIRECT	✓	100.000
A - Rayleigh Road (W)		DIRECT	✓	100.000
B - Alexander Lane		DIRECT	✓	100.000

Origin-Destination Data

Demand (Veh/hr)

		To		
		C - Rayleigh Road (E)	A - Rayleigh Road (W)	B - Alexander Lane
From	C - Rayleigh Road (E)	1	440	119
	A - Rayleigh Road (W)	380	0	130
	B - Alexander Lane	147	234	0

Vehicle Mix

Heavy Vehicle Percentages

		To		
		C - Rayleigh Road (E)	A - Rayleigh Road (W)	B - Alexander Lane
From	C - Rayleigh Road (E)	0	4	3
	A - Rayleigh Road (W)	3	0	2
	B - Alexander Lane	3	0	0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (s)	Max Queue (Veh)	Max LOS	Average Demand (Veh/hr)	Total Junction Arrivals (Veh)
C - Rayleigh Road (E)	0.71	15.62	2.4	C	560	840
A - Rayleigh Road (W)	0.58	9.63	1.4	A	510	765
B - Alexander Lane	0.64	16.72	1.8	C	381	572

Main Results for each time segment

08:00 - 08:15

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
C - Rayleigh Road (E)	560	140	230	793	0.706	551	521	0.0	2.3	14.388	B
A - Rayleigh Road (W)	510	128	118	885	0.576	505	663	0.0	1.3	9.338	A
B - Alexander Lane	381	95	377	599	0.636	374	246	0.0	1.7	15.621	C

08:15 - 08:30

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
C - Rayleigh Road (E)	560	140	234	790	0.709	560	528	2.3	2.4	15.553	C
A - Rayleigh Road (W)	510	128	120	884	0.577	510	674	1.3	1.3	9.620	A
B - Alexander Lane	381	95	381	596	0.639	381	249	1.7	1.7	16.668	C

08:30 - 08:45

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
C - Rayleigh Road (E)	560	140	234	790	0.709	560	528	2.4	2.4	15.595	C
A - Rayleigh Road (W)	510	128	120	884	0.577	510	674	1.3	1.4	9.624	A
B - Alexander Lane	381	95	381	596	0.639	381	249	1.7	1.7	16.699	C

08:45 - 09:00

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
C - Rayleigh Road (E)	560	140	234	790	0.709	560	528	2.4	2.4	15.608	C
A - Rayleigh Road (W)	510	128	120	884	0.577	510	674	1.4	1.4	9.625	A
B - Alexander Lane	381	95	381	596	0.639	381	249	1.7	1.7	16.709	C

09:00 - 09:15

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
C - Rayleigh Road (E)	560	140	234	790	0.709	560	528	2.4	2.4	15.614	C
A - Rayleigh Road (W)	510	128	120	884	0.577	510	674	1.4	1.4	9.627	A
B - Alexander Lane	381	95	381	596	0.639	381	249	1.7	1.8	16.713	C

09:15 - 09:30

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
C - Rayleigh Road (E)	560	140	234	790	0.709	560	528	2.4	2.4	15.618	C
A - Rayleigh Road (W)	510	128	120	884	0.577	510	674	1.4	1.4	9.627	A
B - Alexander Lane	381	95	381	596	0.639	381	249	1.8	1.8	16.716	C

2028 Base, PM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Profile Type	D4 - 2028 Base, PM	The DIRECT profile type is intended to be used for demand that varies over time. You are using it with the 'Use O-D data' option, but your O-D data does not vary over time. Are you sure this is correct?

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (s)	Junction LOS
1	Rayleigh Rd_Alexander Ln Mini Rbt	Mini-roundabout		C, A, B	10.34	B

Junction Network Options

Driving side	Lighting	Road surface	In London
Left	Normal/unknown	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 period length (min)	Time segment length (min)	Run automatically
D4	2028 Base	PM	DIRECT	17:00	18:30	90	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	Scaling Factor (%)
C - Rayleigh Road (E)		DIRECT	✓	100.000
A - Rayleigh Road (W)		DIRECT	✓	100.000
B - Alexander Lane		DIRECT	✓	100.000

Origin-Destination Data

Demand (Veh/hr)

		To		
		C - Rayleigh Road (E)	A - Rayleigh Road (W)	B - Alexander Lane
From	C - Rayleigh Road (E)	1	364	74
	A - Rayleigh Road (W)	452	1	132
	B - Alexander Lane	122	132	3

Vehicle Mix

Heavy Vehicle Percentages

		To		
		C - Rayleigh Road (E)	A - Rayleigh Road (W)	B - Alexander Lane
From	C - Rayleigh Road (E)	0	4	0
	A - Rayleigh Road (W)	2	0	2
	B - Alexander Lane	1	0	67

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (s)	Max Queue (Veh)	Max LOS	Average Demand (Veh/hr)	Total Junction Arrivals (Veh)
C - Rayleigh Road (E)	0.51	8.66	1.1	A	439	658
A - Rayleigh Road (W)	0.64	10.82	1.7	B	585	877
B - Alexander Lane	0.46	12.16	0.9	B	257	385

Main Results for each time segment

17:00 - 17:15

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
C - Rayleigh Road (E)	439	110	134	856	0.513	435	568	0.0	1.0	8.470	A
A - Rayleigh Road (W)	585	146	77	918	0.637	578	492	0.0	1.7	10.394	B
B - Alexander Lane	257	64	449	556	0.462	254	207	0.0	0.8	11.772	B

17:15 - 17:30

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
C - Rayleigh Road (E)	439	110	136	855	0.514	439	575	1.0	1.0	8.653	A
A - Rayleigh Road (W)	585	146	78	918	0.637	585	497	1.7	1.7	10.808	B
B - Alexander Lane	257	64	454	553	0.465	257	209	0.8	0.9	12.151	B

17:30 - 17:45

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
C - Rayleigh Road (E)	439	110	136	855	0.514	439	575	1.0	1.0	8.655	A
A - Rayleigh Road (W)	585	146	78	918	0.637	585	497	1.7	1.7	10.815	B
B - Alexander Lane	257	64	454	553	0.465	257	209	0.9	0.9	12.157	B

17:45 - 18:00

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
C - Rayleigh Road (E)	439	110	136	855	0.514	439	575	1.0	1.1	8.657	A
A - Rayleigh Road (W)	585	146	78	918	0.637	585	497	1.7	1.7	10.817	B
B - Alexander Lane	257	64	454	553	0.465	257	209	0.9	0.9	12.158	B

18:00 - 18:15

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
C - Rayleigh Road (E)	439	110	136	855	0.514	439	575	1.1	1.1	8.657	A
A - Rayleigh Road (W)	585	146	78	918	0.637	585	497	1.7	1.7	10.819	B
B - Alexander Lane	257	64	454	553	0.465	257	209	0.9	0.9	12.160	B

18:15 - 18:30

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
C - Rayleigh Road (E)	439	110	136	855	0.514	439	575	1.1	1.1	8.657	A
A - Rayleigh Road (W)	585	146	78	918	0.637	585	497	1.7	1.7	10.819	B
B - Alexander Lane	257	64	454	553	0.465	257	209	0.9	0.9	12.160	B

2028 Base + Dev, AM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Profile Type	D5 - 2028 Base + Dev, AM	The DIRECT profile type is intended to be used for demand that varies over time. You are using it with the 'Use O-D data' option, but your O-D data does not vary over time. Are you sure this is correct?

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (s)	Junction LOS
1	Rayleigh Rd_Alexander Ln Mini Rbt	Mini-roundabout		C, A, B	17.14	C

Junction Network Options

Driving side	Lighting	Road surface	In London
Left	Normal/unknown	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 period length (min)	Time segment length (min)	Run automatically
D5	2028 Base + Dev	AM	DIRECT	08:00	09:30	90	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	Scaling Factor (%)
C - Rayleigh Road (E)		DIRECT	✓	100.000
A - Rayleigh Road (W)		DIRECT	✓	100.000
B - Alexander Lane		DIRECT	✓	100.000

Origin-Destination Data

Demand (Veh/hr)

		To		
		C - Rayleigh Road (E)	A - Rayleigh Road (W)	B - Alexander Lane
From	C - Rayleigh Road (E)	1	440	122
	A - Rayleigh Road (W)	380	0	189
	B - Alexander Lane	155	286	0

Vehicle Mix

Heavy Vehicle Percentages

		To		
		C - Rayleigh Road (E)	A - Rayleigh Road (W)	B - Alexander Lane
From	C - Rayleigh Road (E)	0	4	2
	A - Rayleigh Road (W)	3	0	2
	B - Alexander Lane	3	0	0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (s)	Max Queue (Veh)	Max LOS	Average Demand (Veh/hr)	Total Junction Arrivals (Veh)
C - Rayleigh Road (E)	0.74	18.33	2.8	C	563	844
A - Rayleigh Road (W)	0.64	11.45	1.8	B	569	853
B - Alexander Lane	0.74	23.05	2.8	C	441	662

Main Results for each time segment

08:00 - 08:15

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
C - Rayleigh Road (E)	563	141	279	763	0.738	553	528	0.0	2.6	16.366	C
A - Rayleigh Road (W)	569	142	121	885	0.643	562	711	0.0	1.7	10.930	B
B - Alexander Lane	441	110	376	600	0.735	431	306	0.0	2.6	20.255	C

08:15 - 08:30

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
C - Rayleigh Road (E)	563	141	286	759	0.742	562	536	2.6	2.8	18.185	C
A - Rayleigh Road (W)	569	142	123	883	0.644	569	725	1.7	1.8	11.428	B
B - Alexander Lane	441	110	381	597	0.739	440	311	2.6	2.7	22.819	C

08:30 - 08:45

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
C - Rayleigh Road (E)	563	141	286	759	0.742	563	536	2.8	2.8	18.280	C
A - Rayleigh Road (W)	569	142	123	883	0.644	569	726	1.8	1.8	11.438	B
B - Alexander Lane	441	110	381	597	0.739	441	311	2.7	2.7	22.960	C

08:45 - 09:00

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
C - Rayleigh Road (E)	563	141	286	759	0.742	563	536	2.8	2.8	18.310	C
A - Rayleigh Road (W)	569	142	123	883	0.644	569	726	1.8	1.8	11.443	B
B - Alexander Lane	441	110	381	597	0.739	441	311	2.7	2.8	23.009	C

09:00 - 09:15

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
C - Rayleigh Road (E)	563	141	286	759	0.742	563	536	2.8	2.8	18.324	C
A - Rayleigh Road (W)	569	142	123	883	0.644	569	726	1.8	1.8	11.442	B
B - Alexander Lane	441	110	381	597	0.739	441	311	2.8	2.8	23.032	C

09:15 - 09:30

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
C - Rayleigh Road (E)	563	141	286	759	0.742	563	536	2.8	2.8	18.334	C
A - Rayleigh Road (W)	569	142	123	883	0.644	569	726	1.8	1.8	11.446	B
B - Alexander Lane	441	110	381	597	0.739	441	311	2.8	2.8	23.046	C

2028 Base + Dev, PM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Profile Type	D6 - 2028 Base + Dev, PM	The DIRECT profile type is intended to be used for demand that varies over time. You are using it with the 'Use O-D data' option, but your O-D data does not vary over time. Are you sure this is correct?

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (s)	Junction LOS
1	Rayleigh Rd_Alexander Ln Mini Rbt	Mini-roundabout		C, A, B	10.70	B

Junction Network Options

Driving side	Lighting	Road surface	In London
Left	Normal/unknown	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 period length (min)	Time segment length (min)	Run automatically
D6	2028 Base + Dev	PM	DIRECT	17:00	18:30	90	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	Scaling Factor (%)
C - Rayleigh Road (E)		DIRECT	✓	100.000
A - Rayleigh Road (W)		DIRECT	✓	100.000
B - Alexander Lane		DIRECT	✓	100.000

Origin-Destination Data

Demand (Veh/hr)

		To		
		C - Rayleigh Road (E)	A - Rayleigh Road (W)	B - Alexander Lane
From	C - Rayleigh Road (E)	1	364	82
	A - Rayleigh Road (W)	452	1	139
	B - Alexander Lane	125	139	3

Vehicle Mix

Heavy Vehicle Percentages

		To		
		C - Rayleigh Road (E)	A - Rayleigh Road (W)	B - Alexander Lane
From	C - Rayleigh Road (E)	0	4	0
	A - Rayleigh Road (W)	2	0	2
	B - Alexander Lane	1	0	67

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (s)	Max Queue (Veh)	Max LOS	Average Demand (Veh/hr)	Total Junction Arrivals (Veh)
C - Rayleigh Road (E)	0.53	8.91	1.1	A	447	671
A - Rayleigh Road (W)	0.65	11.22	1.8	B	592	888
B - Alexander Lane	0.48	12.58	0.9	B	267	400

Main Results for each time segment

17:00 - 17:15

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
C - Rayleigh Road (E)	447	112	141	852	0.525	443	571	0.0	1.1	8.704	A
A - Rayleigh Road (W)	592	148	85	913	0.648	585	499	0.0	1.8	10.745	B
B - Alexander Lane	267	67	449	557	0.480	263	221	0.0	0.9	12.137	B

17:15 - 17:30

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
C - Rayleigh Road (E)	447	112	143	851	0.525	447	578	1.1	1.1	8.909	A
A - Rayleigh Road (W)	592	148	86	913	0.649	592	504	1.8	1.8	11.210	B
B - Alexander Lane	267	67	454	553	0.483	267	224	0.9	0.9	12.564	B

17:30 - 17:45

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
C - Rayleigh Road (E)	447	112	143	851	0.525	447	578	1.1	1.1	8.911	A
A - Rayleigh Road (W)	592	148	86	913	0.649	592	504	1.8	1.8	11.219	B
B - Alexander Lane	267	67	454	553	0.483	267	224	0.9	0.9	12.575	B

17:45 - 18:00

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
C - Rayleigh Road (E)	447	112	143	851	0.525	447	578	1.1	1.1	8.913	A
A - Rayleigh Road (W)	592	148	86	913	0.649	592	504	1.8	1.8	11.222	B
B - Alexander Lane	267	67	454	553	0.483	267	224	0.9	0.9	12.574	B

18:00 - 18:15

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
C - Rayleigh Road (E)	447	112	143	851	0.525	447	578	1.1	1.1	8.913	A
A - Rayleigh Road (W)	592	148	86	913	0.649	592	504	1.8	1.8	11.224	B
B - Alexander Lane	267	67	454	553	0.483	267	224	0.9	0.9	12.577	B

18:15 - 18:30

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
C - Rayleigh Road (E)	447	112	143	851	0.525	447	578	1.1	1.1	8.913	A
A - Rayleigh Road (W)	592	148	86	913	0.649	592	504	1.8	1.8	11.224	B
B - Alexander Lane	267	67	454	553	0.483	267	224	0.9	0.9	12.577	B

2028 Base + Comm, AM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Profile Type	D7 - 2028 Base + Comm, AM	The DIRECT profile type is intended to be used for demand that varies over time. You are using it with the 'Use O-D data' option, but your O-D data does not vary over time. Are you sure this is correct?

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (s)	Junction LOS
1	Rayleigh Rd_Alexander Ln Mini Rbt	Mini-roundabout		C, A, B	14.09	B

Junction Network Options

Driving side	Lighting	Road surface	In London
Left	Normal/unknown	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 period length (min)	Time segment length (min)	Run automatically
D7	2028 Base + Comm	AM	DIRECT	08:00	09:30	90	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	Scaling Factor (%)
C - Rayleigh Road (E)		DIRECT	✓	100.000
A - Rayleigh Road (W)		DIRECT	✓	100.000
B - Alexander Lane		DIRECT	✓	100.000

Origin-Destination Data

Demand (Veh/hr)

		To		
		C - Rayleigh Road (E)	A - Rayleigh Road (W)	B - Alexander Lane
From	C - Rayleigh Road (E)	1	442	120
	A - Rayleigh Road (W)	383	0	130
	B - Alexander Lane	150	236	0

Vehicle Mix

Heavy Vehicle Percentages

		To		
		C - Rayleigh Road (E)	A - Rayleigh Road (W)	B - Alexander Lane
From	C - Rayleigh Road (E)	0	4	3
	A - Rayleigh Road (W)	3	0	2
	B - Alexander Lane	3	0	0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (s)	Max Queue (Veh)	Max LOS	Average Demand (Veh/hr)	Total Junction Arrivals (Veh)
C - Rayleigh Road (E)	0.71	15.91	2.5	C	563	844
A - Rayleigh Road (W)	0.58	9.72	1.4	A	513	769
B - Alexander Lane	0.65	17.27	1.8	C	386	579

Main Results for each time segment

08:00 - 08:15

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
C - Rayleigh Road (E)	563	141	232	792	0.711	554	527	0.0	2.3	14.609	B
A - Rayleigh Road (W)	513	128	119	885	0.580	508	666	0.0	1.3	9.423	A
B - Alexander Lane	386	96	380	597	0.647	379	247	0.0	1.7	16.063	C

08:15 - 08:30

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
C - Rayleigh Road (E)	563	141	236	789	0.713	563	534	2.3	2.4	15.839	C
A - Rayleigh Road (W)	513	128	121	883	0.581	513	678	1.3	1.4	9.713	A
B - Alexander Lane	386	96	384	594	0.649	386	250	1.7	1.8	17.212	C

08:30 - 08:45

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
C - Rayleigh Road (E)	563	141	236	789	0.714	563	534	2.4	2.4	15.885	C
A - Rayleigh Road (W)	513	128	121	883	0.581	513	678	1.4	1.4	9.720	A
B - Alexander Lane	386	96	384	594	0.649	386	250	1.8	1.8	17.250	C

08:45 - 09:00

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
C - Rayleigh Road (E)	563	141	236	789	0.714	563	534	2.4	2.5	15.900	C
A - Rayleigh Road (W)	513	128	121	883	0.581	513	678	1.4	1.4	9.719	A
B - Alexander Lane	386	96	384	594	0.649	386	250	1.8	1.8	17.260	C

09:00 - 09:15

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
C - Rayleigh Road (E)	563	141	236	789	0.714	563	534	2.5	2.5	15.907	C
A - Rayleigh Road (W)	513	128	121	883	0.581	513	678	1.4	1.4	9.721	A
B - Alexander Lane	386	96	384	594	0.649	386	250	1.8	1.8	17.266	C

09:15 - 09:30

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
C - Rayleigh Road (E)	563	141	236	789	0.714	563	534	2.5	2.5	15.910	C
A - Rayleigh Road (W)	513	128	121	883	0.581	513	678	1.4	1.4	9.721	A
B - Alexander Lane	386	96	384	594	0.649	386	250	1.8	1.8	17.269	C

2028 Base + Comm, PM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Profile Type	D8 - 2028 Base + Comm, PM	The DIRECT profile type is intended to be used for demand that varies over time. You are using it with the 'Use O-D data' option, but your O-D data does not vary over time. Are you sure this is correct?

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (s)	Junction LOS
1	Rayleigh Rd_Alexander Ln Mini Rbt	Mini-roundabout		C, A, B	10.43	B

Junction Network Options

Driving side	Lighting	Road surface	In London
Left	Normal/unknown	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 period length (min)	Time segment length (min)	Run automatically
D8	2028 Base + Comm	PM	DIRECT	17:00	18:30	90	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	Scaling Factor (%)
C - Rayleigh Road (E)		DIRECT	✓	100.000
A - Rayleigh Road (W)		DIRECT	✓	100.000
B - Alexander Lane		DIRECT	✓	100.000

Origin-Destination Data

Demand (Veh/hr)

		To		
		C - Rayleigh Road (E)	A - Rayleigh Road (W)	B - Alexander Lane
From	C - Rayleigh Road (E)	1	369	76
	A - Rayleigh Road (W)	453	1	133
	B - Alexander Lane	122	132	3

Vehicle Mix

Heavy Vehicle Percentages

		To		
		C - Rayleigh Road (E)	A - Rayleigh Road (W)	B - Alexander Lane
From	C - Rayleigh Road (E)	0	4	0
	A - Rayleigh Road (W)	2	0	2
	B - Alexander Lane	1	0	67

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (s)	Max Queue (Veh)	Max LOS	Average Demand (Veh/hr)	Total Junction Arrivals (Veh)
C - Rayleigh Road (E)	0.52	8.80	1.1	A	446	669
A - Rayleigh Road (W)	0.64	10.93	1.8	B	587	880
B - Alexander Lane	0.47	12.19	0.9	B	257	385

Main Results for each time segment

17:00 - 17:15

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
C - Rayleigh Road (E)	446	112	134	856	0.521	442	569	0.0	1.1	8.604	A
A - Rayleigh Road (W)	587	147	79	917	0.640	580	497	0.0	1.7	10.487	B
B - Alexander Lane	257	64	450	556	0.462	254	210	0.0	0.8	11.793	B

17:15 - 17:30

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
C - Rayleigh Road (E)	446	112	136	855	0.522	446	576	1.1	1.1	8.800	A
A - Rayleigh Road (W)	587	147	80	916	0.641	587	502	1.7	1.8	10.915	B
B - Alexander Lane	257	64	455	552	0.465	257	212	0.8	0.9	12.180	B

17:30 - 17:45

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
C - Rayleigh Road (E)	446	112	136	855	0.522	446	576	1.1	1.1	8.802	A
A - Rayleigh Road (W)	587	147	80	916	0.641	587	502	1.8	1.8	10.921	B
B - Alexander Lane	257	64	455	552	0.465	257	212	0.9	0.9	12.183	B

17:45 - 18:00

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
C - Rayleigh Road (E)	446	112	136	855	0.522	446	576	1.1	1.1	8.804	A
A - Rayleigh Road (W)	587	147	80	916	0.641	587	502	1.8	1.8	10.923	B
B - Alexander Lane	257	64	455	552	0.465	257	212	0.9	0.9	12.183	B

18:00 - 18:15

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
C - Rayleigh Road (E)	446	112	136	855	0.522	446	576	1.1	1.1	8.804	A
A - Rayleigh Road (W)	587	147	80	916	0.641	587	502	1.8	1.8	10.926	B
B - Alexander Lane	257	64	455	552	0.465	257	212	0.9	0.9	12.186	B

18:15 - 18:30

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
C - Rayleigh Road (E)	446	112	136	855	0.522	446	576	1.1	1.1	8.804	A
A - Rayleigh Road (W)	587	147	80	916	0.641	587	502	1.8	1.8	10.926	B
B - Alexander Lane	257	64	455	552	0.465	257	212	0.9	0.9	12.186	B

2028 Base + Comm + Dev, AM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Profile Type	D9 - 2028 Base + Comm + Dev, AM	The DIRECT profile type is intended to be used for demand that varies over time. You are using it with the 'Use O-D data' option, but your O-D data does not vary over time. Are you sure this is correct?

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (s)	Junction LOS
1	Rayleigh Rd_Alexander Ln Mini Rbt	Mini-roundabout		C, A, B	17.57	C

Junction Network Options

Driving side	Lighting	Road surface	In London
Left	Normal/unknown	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 period length (min)	Time segment length (min)	Run automatically
D9	2028 Base + Comm + Dev	AM	DIRECT	08:00	09:30	90	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	Scaling Factor (%)
C - Rayleigh Road (E)		DIRECT	✓	100.000
A - Rayleigh Road (W)		DIRECT	✓	100.000
B - Alexander Lane		DIRECT	✓	100.000

Origin-Destination Data

Demand (Veh/hr)

		To		
		C - Rayleigh Road (E)	A - Rayleigh Road (W)	B - Alexander Lane
From	C - Rayleigh Road (E)	1	442	123
	A - Rayleigh Road (W)	383	0	189
	B - Alexander Lane	158	287	0

Vehicle Mix

Heavy Vehicle Percentages

		To		
		C - Rayleigh Road (E)	A - Rayleigh Road (W)	B - Alexander Lane
From	C - Rayleigh Road (E)	0	4	2
	A - Rayleigh Road (W)	3	0	2
	B - Alexander Lane	3	0	0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (s)	Max Queue (Veh)	Max LOS	Average Demand (Veh/hr)	Total Junction Arrivals (Veh)
C - Rayleigh Road (E)	0.75	18.68	2.9	C	566	849
A - Rayleigh Road (W)	0.65	11.58	1.8	B	572	858
B - Alexander Lane	0.75	23.95	2.9	C	445	668

Main Results for each time segment

08:00 - 08:15

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
C - Rayleigh Road (E)	566	142	280	763	0.742	555	533	0.0	2.7	16.599	C
A - Rayleigh Road (W)	572	143	122	884	0.647	565	714	0.0	1.8	11.043	B
B - Alexander Lane	445	111	379	598	0.744	434	307	0.0	2.7	20.861	C

08:15 - 08:30

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
C - Rayleigh Road (E)	566	142	287	759	0.746	565	542	2.7	2.8	18.514	C
A - Rayleigh Road (W)	572	143	124	883	0.648	572	728	1.8	1.8	11.562	B
B - Alexander Lane	445	111	384	595	0.748	444	312	2.7	2.8	23.681	C

08:30 - 08:45

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
C - Rayleigh Road (E)	566	142	287	758	0.746	566	542	2.8	2.9	18.618	C
A - Rayleigh Road (W)	572	143	124	883	0.648	572	729	1.8	1.8	11.573	B
B - Alexander Lane	445	111	384	595	0.748	445	312	2.8	2.9	23.847	C

08:45 - 09:00

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
C - Rayleigh Road (E)	566	142	287	758	0.746	566	542	2.9	2.9	18.651	C
A - Rayleigh Road (W)	572	143	124	883	0.648	572	729	1.8	1.8	11.578	B
B - Alexander Lane	445	111	384	595	0.748	445	312	2.9	2.9	23.903	C

09:00 - 09:15

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
C - Rayleigh Road (E)	566	142	287	758	0.746	566	542	2.9	2.9	18.667	C
A - Rayleigh Road (W)	572	143	124	883	0.648	572	729	1.8	1.8	11.578	B
B - Alexander Lane	445	111	384	595	0.748	445	312	2.9	2.9	23.932	C

09:15 - 09:30

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
C - Rayleigh Road (E)	566	142	287	758	0.746	566	542	2.9	2.9	18.676	C
A - Rayleigh Road (W)	572	143	124	883	0.648	572	729	1.8	1.8	11.580	B
B - Alexander Lane	445	111	384	595	0.748	445	312	2.9	2.9	23.948	C

2028 Base + Comm + Dev, PM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Profile Type	D10 - 2028 Base + Comm + Dev, PM	The DIRECT profile type is intended to be used for demand that varies over time. You are using it with the 'Use O-D data' option, but your O-D data does not vary over time. Are you sure this is correct?

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (s)	Junction LOS
1	Rayleigh Rd_Alexander Ln Mini Rbt	Mini-roundabout		C, A, B	10.81	B

Junction Network Options

Driving side	Lighting	Road surface	In London
Left	Normal/unknown	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 period length (min)	Time segment length (min)	Run automatically
D10	2028 Base + Comm + Dev	PM	DIRECT	17:00	18:30	90	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	Scaling Factor (%)
C - Rayleigh Road (E)		DIRECT	✓	100.000
A - Rayleigh Road (W)		DIRECT	✓	100.000
B - Alexander Lane		DIRECT	✓	100.000

Origin-Destination Data

Demand (Veh/hr)

		To		
		C - Rayleigh Road (E)	A - Rayleigh Road (W)	B - Alexander Lane
From	C - Rayleigh Road (E)	1	369	83
	A - Rayleigh Road (W)	453	1	140
	B - Alexander Lane	126	140	3

Vehicle Mix

Heavy Vehicle Percentages

		To		
		C - Rayleigh Road (E)	A - Rayleigh Road (W)	B - Alexander Lane
From	C - Rayleigh Road (E)	0	4	0
	A - Rayleigh Road (W)	2	0	2
	B - Alexander Lane	1	0	67

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (s)	Max Queue (Veh)	Max LOS	Average Demand (Veh/hr)	Total Junction Arrivals (Veh)
C - Rayleigh Road (E)	0.53	9.06	1.1	A	453	680
A - Rayleigh Road (W)	0.65	11.32	1.9	B	594	891
B - Alexander Lane	0.49	12.69	0.9	B	269	403

Main Results for each time segment

17:00 - 17:15

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
C - Rayleigh Road (E)	453	113	142	851	0.532	449	573	0.0	1.1	8.841	A
A - Rayleigh Road (W)	594	148	86	913	0.651	587	504	0.0	1.8	10.827	B
B - Alexander Lane	269	67	449	556	0.484	265	223	0.0	0.9	12.244	B

17:15 - 17:30

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
C - Rayleigh Road (E)	453	113	144	850	0.533	453	580	1.1	1.1	9.058	A
A - Rayleigh Road (W)	594	148	87	912	0.651	594	510	1.8	1.8	11.311	B
B - Alexander Lane	269	67	455	553	0.487	269	226	0.9	0.9	12.679	B

17:30 - 17:45

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
C - Rayleigh Road (E)	453	113	144	850	0.533	453	580	1.1	1.1	9.060	A
A - Rayleigh Road (W)	594	148	87	912	0.651	594	510	1.8	1.8	11.306	B
B - Alexander Lane	269	67	455	553	0.487	269	226	0.9	0.9	12.686	B

17:45 - 18:00

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
C - Rayleigh Road (E)	453	113	144	850	0.533	453	580	1.1	1.1	9.062	A
A - Rayleigh Road (W)	594	148	87	912	0.651	594	510	1.8	1.9	11.314	B
B - Alexander Lane	269	67	455	553	0.487	269	226	0.9	0.9	12.689	B

18:00 - 18:15

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
C - Rayleigh Road (E)	453	113	144	850	0.533	453	580	1.1	1.1	9.062	A
A - Rayleigh Road (W)	594	148	87	912	0.651	594	510	1.9	1.9	11.313	B
B - Alexander Lane	269	67	455	553	0.487	269	226	0.9	0.9	12.691	B

18:15 - 18:30

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
C - Rayleigh Road (E)	453	113	144	850	0.533	453	580	1.1	1.1	9.062	A
A - Rayleigh Road (W)	594	148	87	912	0.651	594	510	1.9	1.9	11.316	B
B - Alexander Lane	269	67	455	553	0.487	269	226	0.9	0.9	12.691	B

Junctions 9

PICADY 9 - Priority Intersection Module

Version: 9.5.2.1013

For sales and distribution information, program advice and maintenance, contact TRL:
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Filename: 20240521 Alexander Lane - Long Ridings Avenue V1.j9
Path: \\slr.local\eu\Offices\UK\London\Vectos\Projects\Projects\150000\152080 - Shenfield\MODELLING\20240521 - Updated School Sensitvity Assessment
Report generation date: 21/05/2024 16:28:59

Summary of junction performance

	AM					PM				
	Set ID	Queue (Veh)	Delay (s)	RFC	LOS	Set ID	Queue (Veh)	Delay (s)	RFC	LOS
	2022 Base									
Stream B-AC	D1	0.4	11.71	0.30	B	D2	0.2	9.55	0.18	A
Stream C-B		0.1	7.70	0.10	A		0.1	7.56	0.09	A
	2028 Base									
Stream B-AC	D3	0.4	11.71	0.30	B	D4	0.2	9.55	0.18	A
Stream C-B		0.1	7.70	0.10	A		0.1	7.56	0.09	A
	2028 Base + Dev									
Stream B-AC	D5	0.5	12.88	0.32	B	D6	0.2	9.76	0.19	A
Stream C-B		0.1	7.96	0.10	A		0.1	7.60	0.09	A
	2028 Base + Comm									
Stream B-AC	D7	0.4	11.84	0.30	B	D8	0.2	9.66	0.19	A
Stream C-B		0.1	7.73	0.10	A		0.1	7.57	0.09	A
	2028 Base + Comm + Dev									
Stream B-AC	D9	0.5	13.03	0.32	B	D10	0.2	9.87	0.20	A
Stream C-B		0.1	7.98	0.11	A		0.1	7.61	0.09	A

There are warnings associated with one or more model runs - see the 'Data Errors and Warnings' tables for each Analysis or Demand Set.

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	02/02/2023
Version	
Status	(new file)
Identifier	
Client	
Jobnumber	
Enumerator	EUR\George.Magnisalis
Description	

Units

Distance units	Speed units	Traffic units input	Traffic units results	Flow units	Average delay units	Total delay units	Rate of delay units
m	kph	Veh	Veh	perHour	s	-Min	perMin

Analysis Options

Vehicle length (m)	Calculate Queue Percentiles	Calculate detailed queueing delay	Calculate residual capacity	RFC Threshold	Average Delay threshold (s)	Queue threshold (PCU)
5.75				0.85	36.00	20.00

Demand Set Summary

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time period length (min)	Time segment length (min)	Run automatically
D1	2022 Base	AM	DIRECT	08:00	09:30	90	15	✓
D2	2022 Base	PM	DIRECT	17:00	18:30	90	15	✓
D3	2028 Base	AM	DIRECT	08:00	09:30	90	15	✓
D4	2028 Base	PM	DIRECT	17:00	18:30	90	15	✓
D5	2028 Base + Dev	AM	DIRECT	08:00	09:30	90	15	✓
D6	2028 Base + Dev	PM	DIRECT	17:00	18:30	90	15	✓
D7	2028 Base + Comm	AM	DIRECT	08:00	09:30	90	15	✓
D8	2028 Base + Comm	PM	DIRECT	17:00	18:30	90	15	✓
D9	2028 Base + Comm + Dev	AM	DIRECT	08:00	09:30	90	15	✓
D10	2028 Base + Comm + Dev	PM	DIRECT	17:00	18:30	90	15	✓

Analysis Set Details

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

2022 Base, AM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Profile Type	D1 - 2022 Base, AM	The DIRECT profile type is intended to be used for demand that varies over time. You are using it with the 'Use O-D data' option, but your O-D data does not vary over time. Are you sure this is correct?

Junction Network

Junctions

Junction	Name	Junction type	Major road direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	Alexander Ln_Long Ridings Ave Priority Junction	T-Junction	Two-way		2.51	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Arms

Arms

Arm	Name	Description	Arm type
A	Alexander Lane (N)		Major
B	Long Ridings Avenue		Minor
C	Alexander Lane (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 - Alexander Lane (S)	6.15			108.8		-

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

Minor Arm Geometry

Arm	Minor arm type	Lane width (m)	Visibility to left (m)	Visibility to right (m)
B - Long Ridings Avenue	One lane	4.28	32	52

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	579	0.105	0.265	0.167	0.379
B-C	741	0.113	0.285	-	-
C-B	637	0.245	0.245	-	-

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 period length (min)	Time segment length (min)	Run automatically
D1	2022 Base	AM	DIRECT	08:00	09:30	90	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	Scaling Factor (%)
A - Alexander Lane (N)		DIRECT	✓	100.000
B - Long Ridings Avenue		DIRECT	✓	100.000
C - Alexander Lane (S)		DIRECT	✓	100.000

Origin-Destination Data

Demand (Veh/hr)

		To		
		A - Alexander Lane (N)	B - Long Ridings Avenue	C - Alexander Lane (S)
From	A - Alexander Lane (N)	0	92	292
	B - Long Ridings Avenue	127	0	2
	C - Alexander Lane (S)	195	53	0

Vehicle Mix

Heavy Vehicle Percentages

		To		
		A - Alexander Lane (N)	B - Long Ridings Avenue	C - Alexander Lane (S)
From	A - Alexander Lane (N)	0	1	2
	B - Long Ridings Avenue	0	0	50
	C - Alexander Lane (S)	2	4	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-AC	0.30	11.71	0.4	B	129	194
C-A					195	293
C-B	0.10	7.70	0.1	A	53	80
A-B					92	138
A-C					292	438

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-AC	129	32	437	0.296	127	0.0	0.4	11.584	B
C-A	195	49			195				
C-B	53	13	520	0.102	53	0.0	0.1	7.689	A
A-B	92	23			92				
A-C	292	73			292				

08:15 - 08:30

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	129	32	436	0.296	129	0.4	0.4	11.709	B
C-A	195	49			195				
C-B	53	13	520	0.102	53	0.1	0.1	7.702	A
A-B	92	23			92				
A-C	292	73			292				

08:30 - 08:45

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	129	32	436	0.296	129	0.4	0.4	11.712	B
C-A	195	49			195				
C-B	53	13	520	0.102	53	0.1	0.1	7.702	A
A-B	92	23			92				
A-C	292	73			292				

08:45 - 09:00

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	129	32	436	0.296	129	0.4	0.4	11.712	B
C-A	195	49			195				
C-B	53	13	520	0.102	53	0.1	0.1	7.702	A
A-B	92	23			92				
A-C	292	73			292				

09:00 - 09:15

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	129	32	436	0.296	129	0.4	0.4	11.712	B
C-A	195	49			195				
C-B	53	13	520	0.102	53	0.1	0.1	7.702	A
A-B	92	23			92				
A-C	292	73			292				

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-AC	129	32	436	0.296	129	0.4	0.4	11.712	B
C-A	195	49			195				
C-B	53	13	520	0.102	53	0.1	0.1	7.702	A
A-B	92	23			92				
A-C	292	73			292				

2022 Base, PM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Profile Type	D2 - 2022 Base, PM	The DIRECT profile type is intended to be used for demand that varies over time. You are using it with the 'Use O-D data' option, but your O-D data does not vary over time. Are you sure this is correct?

Junction Network

Junctions

Junction	Name	Junction type	Major road direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	Alexander Ln_Long Ridings Ave Priority Junction	T-Junction	Two-way		1.82	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time period length (min)	Time segment length (min)	Run automatically
D2	2022 Base	PM	DIRECT	17:00	18:30	90	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	Scaling Factor (%)
A - Alexander Lane (N)		DIRECT	✓	100.000
B - Long Ridings Avenue		DIRECT	✓	100.000
C - Alexander Lane (S)		DIRECT	✓	100.000

Origin-Destination Data

Demand (Veh/hr)

		To		
		A - Alexander Lane (N)	B - Long Ridings Avenue	C - Alexander Lane (S)
From	A - Alexander Lane (N)	0	99	214
	B - Long Ridings Avenue	81	0	2
	C - Alexander Lane (S)	191	46	0

Vehicle Mix

Heavy Vehicle Percentages

		To		
		A - Alexander Lane (N)	B - Long Ridings Avenue	C - Alexander Lane (S)
From	A - Alexander Lane (N)	0	3	1
	B - Long Ridings Avenue	0	0	50
	C - Alexander Lane (S)	1	7	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-AC	0.18	9.55	0.2	A	83	124
C-A					191	287
C-B	0.09	7.56	0.1	A	46	69
A-B					99	149
A-C					214	321

Main Results for each time segment

17:00 - 17:15

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	83	21	460	0.180	82	0.0	0.2	9.501	A
C-A	191	48			191				
C-B	46	12	522	0.088	46	0.0	0.1	7.543	A
A-B	99	25			99				
A-C	214	54			214				

17:15 - 17:30

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	83	21	460	0.180	83	0.2	0.2	9.547	A
C-A	191	48			191				
C-B	46	12	522	0.088	46	0.1	0.1	7.555	A
A-B	99	25			99				
A-C	214	54			214				

17:30 - 17:45

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	83	21	460	0.180	83	0.2	0.2	9.547	A
C-A	191	48			191				
C-B	46	12	522	0.088	46	0.1	0.1	7.555	A
A-B	99	25			99				
A-C	214	54			214				

17:45 - 18:00

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	83	21	460	0.180	83	0.2	0.2	9.547	A
C-A	191	48			191				
C-B	46	12	522	0.088	46	0.1	0.1	7.555	A
A-B	99	25			99				
A-C	214	54			214				

18:00 - 18:15

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	83	21	460	0.180	83	0.2	0.2	9.547	A
C-A	191	48			191				
C-B	46	12	522	0.088	46	0.1	0.1	7.555	A
A-B	99	25			99				
A-C	214	54			214				

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-AC	83	21	460	0.180	83	0.2	0.2	9.547	A
C-A	191	48			191				
C-B	46	12	522	0.088	46	0.1	0.1	7.555	A
A-B	99	25			99				
A-C	214	54			214				

2028 Base, AM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Profile Type	D3 - 2028 Base, AM	The DIRECT profile type is intended to be used for demand that varies over time. You are using it with the 'Use O-D data' option, but your O-D data does not vary over time. Are you sure this is correct?

Junction Network

Junctions

Junction	Name	Junction type	Major road direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	Alexander Ln_Long Ridings Ave Priority Junction	T-Junction	Two-way		2.51	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 period length (min)	Time segment length (min)	Run automatically
D3	2028 Base	AM	DIRECT	08:00	09:30	90	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	Scaling Factor (%)
A - Alexander Lane (N)		DIRECT	✓	100.000
B - Long Ridings Avenue		DIRECT	✓	100.000
C - Alexander Lane (S)		DIRECT	✓	100.000

Origin-Destination Data

Demand (Veh/hr)

		To		
		A - Alexander Lane (N)	B - Long Ridings Avenue	C - Alexander Lane (S)
From	A - Alexander Lane (N)	0	92	292
	B - Long Ridings Avenue	127	0	2
	C - Alexander Lane (S)	195	53	0

Vehicle Mix

Heavy Vehicle Percentages

		To		
		A - Alexander Lane (N)	B - Long Ridings Avenue	C - Alexander Lane (S)
From	A - Alexander Lane (N)	0	1	2
	B - Long Ridings Avenue	0	0	50
	C - Alexander Lane (S)	2	4	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-AC	0.30	11.71	0.4	B	129	194
C-A					195	293
C-B	0.10	7.70	0.1	A	53	80
A-B					92	138
A-C					292	438

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-AC	129	32	437	0.296	127	0.0	0.4	11.584	B
C-A	195	49			195				
C-B	53	13	520	0.102	53	0.0	0.1	7.689	A
A-B	92	23			92				
A-C	292	73			292				

08:15 - 08:30

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	129	32	436	0.296	129	0.4	0.4	11.709	B
C-A	195	49			195				
C-B	53	13	520	0.102	53	0.1	0.1	7.702	A
A-B	92	23			92				
A-C	292	73			292				

08:30 - 08:45

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	129	32	436	0.296	129	0.4	0.4	11.712	B
C-A	195	49			195				
C-B	53	13	520	0.102	53	0.1	0.1	7.702	A
A-B	92	23			92				
A-C	292	73			292				

08:45 - 09:00

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	129	32	436	0.296	129	0.4	0.4	11.712	B
C-A	195	49			195				
C-B	53	13	520	0.102	53	0.1	0.1	7.702	A
A-B	92	23			92				
A-C	292	73			292				

09:00 - 09:15

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	129	32	436	0.296	129	0.4	0.4	11.712	B
C-A	195	49			195				
C-B	53	13	520	0.102	53	0.1	0.1	7.702	A
A-B	92	23			92				
A-C	292	73			292				

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-AC	129	32	436	0.296	129	0.4	0.4	11.712	B
C-A	195	49			195				
C-B	53	13	520	0.102	53	0.1	0.1	7.702	A
A-B	92	23			92				
A-C	292	73			292				

2028 Base, PM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Profile Type	D4 - 2028 Base, PM	The DIRECT profile type is intended to be used for demand that varies over time. You are using it with the 'Use O-D data' option, but your O-D data does not vary over time. Are you sure this is correct?

Junction Network

Junctions

Junction	Name	Junction type	Major road direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	Alexander Ln_Long Ridings Ave Priority Junction	T-Junction	Two-way		1.82	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time period length (min)	Time segment length (min)	Run automatically
D4	2028 Base	PM	DIRECT	17:00	18:30	90	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	Scaling Factor (%)
A - Alexander Lane (N)		DIRECT	✓	100.000
B - Long Ridings Avenue		DIRECT	✓	100.000
C - Alexander Lane (S)		DIRECT	✓	100.000

Origin-Destination Data

Demand (Veh/hr)

		To		
		A - Alexander Lane (N)	B - Long Ridings Avenue	C - Alexander Lane (S)
From	A - Alexander Lane (N)	0	99	214
	B - Long Ridings Avenue	81	0	2
	C - Alexander Lane (S)	191	46	0

Vehicle Mix

Heavy Vehicle Percentages

		To		
		A - Alexander Lane (N)	B - Long Ridings Avenue	C - Alexander Lane (S)
From	A - Alexander Lane (N)	0	3	1
	B - Long Ridings Avenue	0	0	50
	C - Alexander Lane (S)	1	7	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-AC	0.18	9.55	0.2	A	83	124
C-A					191	287
C-B	0.09	7.56	0.1	A	46	69
A-B					99	149
A-C					214	321

Main Results for each time segment

17:00 - 17:15

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	83	21	460	0.180	82	0.0	0.2	9.501	A
C-A	191	48			191				
C-B	46	12	522	0.088	46	0.0	0.1	7.543	A
A-B	99	25			99				
A-C	214	54			214				

17:15 - 17:30

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	83	21	460	0.180	83	0.2	0.2	9.547	A
C-A	191	48			191				
C-B	46	12	522	0.088	46	0.1	0.1	7.555	A
A-B	99	25			99				
A-C	214	54			214				

17:30 - 17:45

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	83	21	460	0.180	83	0.2	0.2	9.547	A
C-A	191	48			191				
C-B	46	12	522	0.088	46	0.1	0.1	7.555	A
A-B	99	25			99				
A-C	214	54			214				

17:45 - 18:00

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	83	21	460	0.180	83	0.2	0.2	9.547	A
C-A	191	48			191				
C-B	46	12	522	0.088	46	0.1	0.1	7.555	A
A-B	99	25			99				
A-C	214	54			214				

18:00 - 18:15

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	83	21	460	0.180	83	0.2	0.2	9.547	A
C-A	191	48			191				
C-B	46	12	522	0.088	46	0.1	0.1	7.555	A
A-B	99	25			99				
A-C	214	54			214				

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-AC	83	21	460	0.180	83	0.2	0.2	9.547	A
C-A	191	48			191				
C-B	46	12	522	0.088	46	0.1	0.1	7.555	A
A-B	99	25			99				
A-C	214	54			214				

2028 Base + Dev, AM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Profile Type	D5 - 2028 Base + Dev, AM	The DIRECT profile type is intended to be used for demand that varies over time. You are using it with the 'Use O-D data' option, but your O-D data does not vary over time. Are you sure this is correct?

Junction Network

Junctions

Junction	Name	Junction type	Major road direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	Alexander Ln_Long Ridings Ave Priority Junction	T-Junction	Two-way		2.35	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 period length (min)	Time segment length (min)	Run automatically
D5	2028 Base + Dev	AM	DIRECT	08:00	09:30	90	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	Scaling Factor (%)
A - Alexander Lane (N)		DIRECT	✓	100.000
B - Long Ridings Avenue		DIRECT	✓	100.000
C - Alexander Lane (S)		DIRECT	✓	100.000

Origin-Destination Data

Demand (Veh/hr)

		To		
		A - Alexander Lane (N)	B - Long Ridings Avenue	C - Alexander Lane (S)
From	A - Alexander Lane (N)	0	95	352
	B - Long Ridings Avenue	128	0	2
	C - Alexander Lane (S)	257	53	0

Vehicle Mix

Heavy Vehicle Percentages

		To		
		A - Alexander Lane (N)	B - Long Ridings Avenue	C - Alexander Lane (S)
From	A - Alexander Lane (N)	0	1	2
	B - Long Ridings Avenue	0	0	50
	C - Alexander Lane (S)	2	4	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-AC	0.32	12.88	0.5	B	130	195
C-A					257	386
C-B	0.10	7.96	0.1	A	53	80
A-B					95	143
A-C					352	528

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-AC	130	33	410	0.317	128	0.0	0.5	12.709	B
C-A	257	64			257				
C-B	53	13	505	0.105	53	0.0	0.1	7.945	A
A-B	95	24			95				
A-C	352	88			352				

08:15 - 08:30

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	130	33	410	0.317	130	0.5	0.5	12.876	B
C-A	257	64			257				
C-B	53	13	505	0.105	53	0.1	0.1	7.960	A
A-B	95	24			95				
A-C	352	88			352				

08:30 - 08:45

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	130	33	410	0.317	130	0.5	0.5	12.878	B
C-A	257	64			257				
C-B	53	13	505	0.105	53	0.1	0.1	7.960	A
A-B	95	24			95				
A-C	352	88			352				

08:45 - 09:00

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	130	33	410	0.317	130	0.5	0.5	12.878	B
C-A	257	64			257				
C-B	53	13	505	0.105	53	0.1	0.1	7.960	A
A-B	95	24			95				
A-C	352	88			352				

09:00 - 09:15

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	130	33	410	0.317	130	0.5	0.5	12.878	B
C-A	257	64			257				
C-B	53	13	505	0.105	53	0.1	0.1	7.960	A
A-B	95	24			95				
A-C	352	88			352				

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-AC	130	33	410	0.317	130	0.5	0.5	12.878	B
C-A	257	64			257				
C-B	53	13	505	0.105	53	0.1	0.1	7.960	A
A-B	95	24			95				
A-C	352	88			352				

2028 Base + Dev, PM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Profile Type	D6 - 2028 Base + Dev, PM	The DIRECT profile type is intended to be used for demand that varies over time. You are using it with the 'Use O-D data' option, but your O-D data does not vary over time. Are you sure this is correct?

Junction Network

Junctions

Junction	Name	Junction type	Major road direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	Alexander Ln_Long Ridings Ave Priority Junction	T-Junction	Two-way		1.82	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time period length (min)	Time segment length (min)	Run automatically
D6	2028 Base + Dev	PM	DIRECT	17:00	18:30	90	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	Scaling Factor (%)
A - Alexander Lane (N)		DIRECT	✓	100.000
B - Long Ridings Avenue		DIRECT	✓	100.000
C - Alexander Lane (S)		DIRECT	✓	100.000

Origin-Destination Data

Demand (Veh/hr)

		To		
		A - Alexander Lane (N)	B - Long Ridings Avenue	C - Alexander Lane (S)
From	A - Alexander Lane (N)	0	100	225
	B - Long Ridings Avenue	84	0	2
	C - Alexander Lane (S)	206	46	0

Vehicle Mix

Heavy Vehicle Percentages

		To		
		A - Alexander Lane (N)	B - Long Ridings Avenue	C - Alexander Lane (S)
From	A - Alexander Lane (N)	0	3	1
	B - Long Ridings Avenue	0	0	50
	C - Alexander Lane (S)	0	7	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-AC	0.19	9.76	0.2	A	86	129
C-A					206	309
C-B	0.09	7.60	0.1	A	46	69
A-B					100	150
A-C					225	338

Main Results for each time segment

17:00 - 17:15

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	86	21	455	0.189	85	0.0	0.2	9.707	A
C-A	206	52			206				
C-B	46	12	520	0.089	46	0.0	0.1	7.588	A
A-B	100	25			100				
A-C	225	56			225				

17:15 - 17:30

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	86	21	455	0.189	86	0.2	0.2	9.758	A
C-A	206	52			206				
C-B	46	12	520	0.089	46	0.1	0.1	7.599	A
A-B	100	25			100				
A-C	225	56			225				

17:30 - 17:45

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	86	21	455	0.189	86	0.2	0.2	9.758	A
C-A	206	52			206				
C-B	46	12	520	0.089	46	0.1	0.1	7.599	A
A-B	100	25			100				
A-C	225	56			225				

17:45 - 18:00

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	86	21	455	0.189	86	0.2	0.2	9.758	A
C-A	206	52			206				
C-B	46	12	520	0.089	46	0.1	0.1	7.599	A
A-B	100	25			100				
A-C	225	56			225				

18:00 - 18:15

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	86	21	455	0.189	86	0.2	0.2	9.758	A
C-A	206	52			206				
C-B	46	12	520	0.089	46	0.1	0.1	7.599	A
A-B	100	25			100				
A-C	225	56			225				

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-AC	86	21	455	0.189	86	0.2	0.2	9.758	A
C-A	206	52			206				
C-B	46	12	520	0.089	46	0.1	0.1	7.599	A
A-B	100	25			100				
A-C	225	56			225				

2028 Base + Comm, AM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Profile Type	D7 - 2028 Base + Comm, AM	The DIRECT profile type is intended to be used for demand that varies over time. You are using it with the 'Use O-D data' option, but your O-D data does not vary over time. Are you sure this is correct?

Junction Network

Junctions

Junction	Name	Junction type	Major road direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	Alexander Ln_Long Ridings Ave Priority Junction	T-Junction	Two-way		2.53	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 period length (min)	Time segment length (min)	Run automatically
D7	2028 Base + Comm	AM	DIRECT	08:00	09:30	90	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	Scaling Factor (%)
A - Alexander Lane (N)		DIRECT	✓	100.000
B - Long Ridings Avenue		DIRECT	✓	100.000
C - Alexander Lane (S)		DIRECT	✓	100.000

Origin-Destination Data

Demand (Veh/hr)

		To		
		A - Alexander Lane (N)	B - Long Ridings Avenue	C - Alexander Lane (S)
From	A - Alexander Lane (N)	0	95	295
	B - Long Ridings Avenue	129	0	2
	C - Alexander Lane (S)	197	53	0

Vehicle Mix

Heavy Vehicle Percentages

		To		
		A - Alexander Lane (N)	B - Long Ridings Avenue	C - Alexander Lane (S)
From	A - Alexander Lane (N)	0	1	2
	B - Long Ridings Avenue	0	0	50
	C - Alexander Lane (S)	2	4	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-AC	0.30	11.84	0.4	B	131	197
C-A					197	296
C-B	0.10	7.73	0.1	A	53	80
A-B					95	143
A-C					295	443

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-AC	131	33	435	0.301	129	0.0	0.4	11.711	B
C-A	197	49			197				
C-B	53	13	519	0.102	53	0.0	0.1	7.712	A
A-B	95	24			95				
A-C	295	74			295				

08:15 - 08:30

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	131	33	435	0.301	131	0.4	0.4	11.842	B
C-A	197	49			197				
C-B	53	13	519	0.102	53	0.1	0.1	7.726	A
A-B	95	24			95				
A-C	295	74			295				

08:30 - 08:45

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	131	33	435	0.301	131	0.4	0.4	11.845	B
C-A	197	49			197				
C-B	53	13	519	0.102	53	0.1	0.1	7.726	A
A-B	95	24			95				
A-C	295	74			295				

08:45 - 09:00

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	131	33	435	0.301	131	0.4	0.4	11.845	B
C-A	197	49			197				
C-B	53	13	519	0.102	53	0.1	0.1	7.726	A
A-B	95	24			95				
A-C	295	74			295				

09:00 - 09:15

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	131	33	435	0.301	131	0.4	0.4	11.845	B
C-A	197	49			197				
C-B	53	13	519	0.102	53	0.1	0.1	7.726	A
A-B	95	24			95				
A-C	295	74			295				

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-AC	131	33	435	0.301	131	0.4	0.4	11.845	B
C-A	197	49			197				
C-B	53	13	519	0.102	53	0.1	0.1	7.726	A
A-B	95	24			95				
A-C	295	74			295				

2028 Base + Comm, PM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Profile Type	D8 - 2028 Base + Comm, PM	The DIRECT profile type is intended to be used for demand that varies over time. You are using it with the 'Use O-D data' option, but your O-D data does not vary over time. Are you sure this is correct?

Junction Network

Junctions

Junction	Name	Junction type	Major road direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	Alexander Ln_Long Ridings Ave Priority Junction	T-Junction	Two-way		1.85	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time period length (min)	Time segment length (min)	Run automatically
D8	2028 Base + Comm	PM	DIRECT	17:00	18:30	90	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	Scaling Factor (%)
A - Alexander Lane (N)		DIRECT	✓	100.000
B - Long Ridings Avenue		DIRECT	✓	100.000
C - Alexander Lane (S)		DIRECT	✓	100.000

Origin-Destination Data

Demand (Veh/hr)

		To		
		A - Alexander Lane (N)	B - Long Ridings Avenue	C - Alexander Lane (S)
From	A - Alexander Lane (N)	0	101	216
	B - Long Ridings Avenue	84	0	2
	C - Alexander Lane (S)	194	46	0

Vehicle Mix

Heavy Vehicle Percentages

		To		
		A - Alexander Lane (N)	B - Long Ridings Avenue	C - Alexander Lane (S)
From	A - Alexander Lane (N)	0	3	1
	B - Long Ridings Avenue	0	0	50
	C - Alexander Lane (S)	1	7	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-AC	0.19	9.66	0.2	A	86	129
C-A					194	291
C-B	0.09	7.57	0.1	A	46	69
A-B					101	152
A-C					216	324

Main Results for each time segment

17:00 - 17:15

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	86	21	459	0.187	85	0.0	0.2	9.606	A
C-A	194	49			194				
C-B	46	12	521	0.088	46	0.0	0.1	7.558	A
A-B	101	25			101				
A-C	216	54			216				

17:15 - 17:30

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	86	21	459	0.187	86	0.2	0.2	9.656	A
C-A	194	49			194				
C-B	46	12	521	0.088	46	0.1	0.1	7.570	A
A-B	101	25			101				
A-C	216	54			216				

17:30 - 17:45

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	86	21	459	0.187	86	0.2	0.2	9.656	A
C-A	194	49			194				
C-B	46	12	521	0.088	46	0.1	0.1	7.570	A
A-B	101	25			101				
A-C	216	54			216				

17:45 - 18:00

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	86	21	459	0.187	86	0.2	0.2	9.656	A
C-A	194	49			194				
C-B	46	12	521	0.088	46	0.1	0.1	7.570	A
A-B	101	25			101				
A-C	216	54			216				

18:00 - 18:15

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	86	21	459	0.187	86	0.2	0.2	9.656	A
C-A	194	49			194				
C-B	46	12	521	0.088	46	0.1	0.1	7.570	A
A-B	101	25			101				
A-C	216	54			216				

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-AC	86	21	459	0.187	86	0.2	0.2	9.656	A
C-A	194	49			194				
C-B	46	12	521	0.088	46	0.1	0.1	7.570	A
A-B	101	25			101				
A-C	216	54			216				

2028 Base + Comm + Dev, AM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Profile Type	D9 - 2028 Base + Comm + Dev, AM	The DIRECT profile type is intended to be used for demand that varies over time. You are using it with the 'Use O-D data' option, but your O-D data does not vary over time. Are you sure this is correct?

Junction Network

Junctions

Junction	Name	Junction type	Major road direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	Alexander Ln_Long Ridings Ave Priority Junction	T-Junction	Two-way		2.38	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 period length (min)	Time segment length (min)	Run automatically
D9	2028 Base + Comm + Dev	AM	DIRECT	08:00	09:30	90	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	Scaling Factor (%)
A - Alexander Lane (N)		DIRECT	✓	100.000
B - Long Ridings Avenue		DIRECT	✓	100.000
C - Alexander Lane (S)		DIRECT	✓	100.000

Origin-Destination Data

Demand (Veh/hr)

		To		
		A - Alexander Lane (N)	B - Long Ridings Avenue	C - Alexander Lane (S)
From	A - Alexander Lane (N)	0	97	355
	B - Long Ridings Avenue	130	0	2
	C - Alexander Lane (S)	259	53	0

Vehicle Mix

Heavy Vehicle Percentages

		To		
		A - Alexander Lane (N)	B - Long Ridings Avenue	C - Alexander Lane (S)
From	A - Alexander Lane (N)	0	1	2
	B - Long Ridings Avenue	0	0	50
	C - Alexander Lane (S)	2	4	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-AC	0.32	13.03	0.5	B	132	198
C-A					259	389
C-B	0.11	7.98	0.1	A	53	80
A-B					97	146
A-C					355	533

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-AC	132	33	408	0.323	130	0.0	0.5	12.856	B
C-A	259	65			259				
C-B	53	13	504	0.105	53	0.0	0.1	7.966	A
A-B	97	24			97				
A-C	355	89			355				

08:15 - 08:30

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	132	33	408	0.323	132	0.5	0.5	13.032	B
C-A	259	65			259				
C-B	53	13	504	0.105	53	0.1	0.1	7.981	A
A-B	97	24			97				
A-C	355	89			355				

08:30 - 08:45

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	132	33	408	0.323	132	0.5	0.5	13.035	B
C-A	259	65			259				
C-B	53	13	504	0.105	53	0.1	0.1	7.981	A
A-B	97	24			97				
A-C	355	89			355				

08:45 - 09:00

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	132	33	408	0.323	132	0.5	0.5	13.035	B
C-A	259	65			259				
C-B	53	13	504	0.105	53	0.1	0.1	7.981	A
A-B	97	24			97				
A-C	355	89			355				

09:00 - 09:15

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	132	33	408	0.323	132	0.5	0.5	13.035	B
C-A	259	65			259				
C-B	53	13	504	0.105	53	0.1	0.1	7.981	A
A-B	97	24			97				
A-C	355	89			355				

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-AC	132	33	408	0.323	132	0.5	0.5	13.035	B
C-A	259	65			259				
C-B	53	13	504	0.105	53	0.1	0.1	7.981	A
A-B	97	24			97				
A-C	355	89			355				

2028 Base + Comm + Dev, PM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Profile Type	D10 - 2028 Base + Comm + Dev, PM	The DIRECT profile type is intended to be used for demand that varies over time. You are using it with the 'Use O-D data' option, but your O-D data does not vary over time. Are you sure this is correct?

Junction Network

Junctions

Junction	Name	Junction type	Major road direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	Alexander Ln_Long Ridings Ave Priority Junction	T-Junction	Two-way		1.85	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time period length (min)	Time segment length (min)	Run automatically
D10	2028 Base + Comm + Dev	PM	DIRECT	17:00	18:30	90	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	Scaling Factor (%)
A - Alexander Lane (N)		DIRECT	✓	100.000
B - Long Ridings Avenue		DIRECT	✓	100.000
C - Alexander Lane (S)		DIRECT	✓	100.000

Origin-Destination Data

Demand (Veh/hr)

		To		
		A - Alexander Lane (N)	B - Long Ridings Avenue	C - Alexander Lane (S)
From	A - Alexander Lane (N)	0	102	227
	B - Long Ridings Avenue	87	0	2
	C - Alexander Lane (S)	209	46	0

Vehicle Mix

Heavy Vehicle Percentages

		To		
		A - Alexander Lane (N)	B - Long Ridings Avenue	C - Alexander Lane (S)
From	A - Alexander Lane (N)	0	3	1
	B - Long Ridings Avenue	0	0	50
	C - Alexander Lane (S)	0	7	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-AC	0.20	9.87	0.2	A	89	133
C-A					209	314
C-B	0.09	7.61	0.1	A	46	69
A-B					102	153
A-C					227	341

Main Results for each time segment

17:00 - 17:15

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	89	22	454	0.196	88	0.0	0.2	9.817	A
C-A	209	52			209				
C-B	46	12	519	0.089	46	0.0	0.1	7.603	A
A-B	102	26			102				
A-C	227	57			227				

17:15 - 17:30

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	89	22	454	0.196	89	0.2	0.2	9.871	A
C-A	209	52			209				
C-B	46	12	519	0.089	46	0.1	0.1	7.615	A
A-B	102	26			102				
A-C	227	57			227				

17:30 - 17:45

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	89	22	454	0.196	89	0.2	0.2	9.871	A
C-A	209	52			209				
C-B	46	12	519	0.089	46	0.1	0.1	7.615	A
A-B	102	26			102				
A-C	227	57			227				

17:45 - 18:00

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	89	22	454	0.196	89	0.2	0.2	9.871	A
C-A	209	52			209				
C-B	46	12	519	0.089	46	0.1	0.1	7.615	A
A-B	102	26			102				
A-C	227	57			227				

18:00 - 18:15

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	89	22	454	0.196	89	0.2	0.2	9.871	A
C-A	209	52			209				
C-B	46	12	519	0.089	46	0.1	0.1	7.615	A
A-B	102	26			102				
A-C	227	57			227				

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-AC	89	22	454	0.196	89	0.2	0.2	9.871	A
C-A	209	52			209				
C-B	46	12	519	0.089	46	0.1	0.1	7.615	A
A-B	102	26			102				
A-C	227	57			227				

Junctions 9

PICADY 9 - Priority Intersection Module

Version: 9.5.2.1013

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Filename: 20240521 Alexander Lane - Oliver Road.j9
Path: \\slr.local\eu\Offices\UK\London\Vectos\Projects\Projects\150000\152080 - Shenfield\MODELLING\20240521 - Updated School Sensitvity Assessment
Report generation date: 21/05/2024 16:32:02

Summary of junction performance

	AM					PM				
	Set ID	Queue (Veh)	Delay (s)	RFC	LOS	Set ID	Queue (Veh)	Delay (s)	RFC	LOS
	2022 Base									
Stream B-AC	D1	1.1	17.82	0.53	C	D2	0.9	16.22	0.47	C
Stream C-AB		0.0	6.75	0.03	A		0.0	6.61	0.01	A
	2028 Base									
Stream B-AC	D3	1.1	17.82	0.53	C	D4	0.9	16.22	0.47	C
Stream C-AB		0.0	6.75	0.03	A		0.0	6.61	0.01	A
	2028 Base + Dev									
Stream B-AC	D5	1.6	23.24	0.62	C	D6	1.1	17.87	0.52	C
Stream C-AB		0.0	6.93	0.03	A		0.0	6.67	0.01	A
	2028 Base + Comm									
Stream B-AC	D7	1.2	18.35	0.54	C	D8	0.9	16.46	0.48	C
Stream C-AB		0.0	6.76	0.03	A		0.0	6.63	0.01	A
	2028 Base + Comm + Dev									
Stream B-AC	D9	1.7	24.12	0.63	C	D10	1.1	18.09	0.53	C
Stream C-AB		0.0	6.94	0.03	A		0.0	6.68	0.01	A

There are warnings associated with one or more model runs - see the 'Data Errors and Warnings' tables for each Analysis or Demand Set.

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

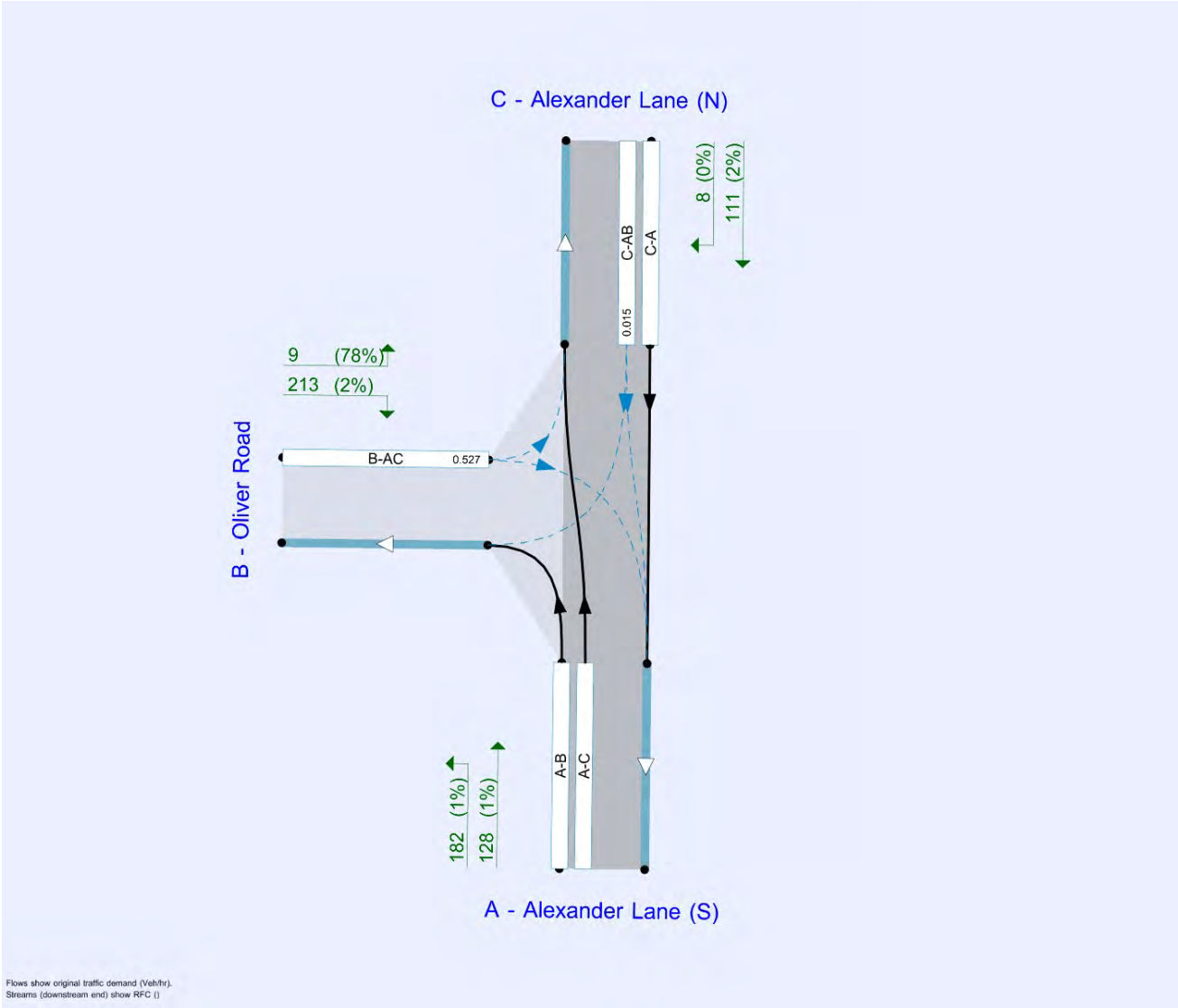
File summary

File Description

Title	
Location	
Site number	
Date	02/02/2023
Version	
Status	(new file)
Identifier	
Client	
Jobnumber	
Enumerator	EUR\George.Magnisalis
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 period length (min)	Time segment length (min)	Run automatically
D1	2022 Base	AM	DIRECT	07:30	09:00	90	15	✓
D2	2022 Base	PM	DIRECT	17:00	18:30	90	15	✓
D3	2028 Base	AM	DIRECT	07:30	09:00	90	15	✓
D4	2028 Base	PM	DIRECT	17:00	18:30	90	15	✓
D5	2028 Base + Dev	AM	DIRECT	07:30	09:00	90	15	✓
D6	2028 Base + Dev	PM	DIRECT	17:00	18:30	90	15	✓
D7	2028 Base + Comm	AM	DIRECT	07:30	09:00	90	15	✓
D8	2028 Base + Comm	PM	DIRECT	17:00	18:30	90	15	✓
D9	2028 Base + Comm + Dev	AM	DIRECT	07:30	09:00	90	15	✓
D10	2028 Base + Comm + Dev	PM	DIRECT	17:00	18:30	90	15	✓

Analysis Set Details

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

2022 Base, AM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Profile Type	D1 - 2022 Base, AM	The DIRECT profile type is intended to be used for demand that varies over time. You are using it with the 'Use O-D data' option, but your O-D data does not vary over time. Are you sure this is correct?

Junction Network

Junctions

Junction	Name	Junction type	Major road direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	Alexander Ln_Oliver Rd Priority Junction	T-Junction	Two-way		5.57	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Arms

Arms

Arm	Name	Description	Arm type
A	Alexander Lane (S)		Major
B	Oliver Road		Minor
C	Alexander Lane (N)		Major

Major Arm Geometry

Arm	Width of carriageway (m)	Has kerbed central reserve	Has right turn bay	Visibility for right turn (m)	Blocks?	Blocking queue (PCU)
C - Alexander Lane (N)	6.10			79.5	✓	1.00

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

Minor Arm Geometry

Arm	Minor arm type	Lane width (m)	Visibility to left (m)	Visibility to right (m)
B - Oliver Road	One lane	3.08	16	26

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	499	0.091	0.229	0.144	0.327
B-C	645	0.098	0.249	-	-
C-B	620	0.239	0.239	-	-

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

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

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

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time period length (min)	Time segment length (min)	Run automatically
D1	2022 Base	AM	DIRECT	07:30	09:00	90	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	Scaling Factor (%)
A - Alexander Lane (S)		DIRECT	✓	100.000
B - Oliver Road		DIRECT	✓	100.000
C - Alexander Lane (N)		DIRECT	✓	100.000

Origin-Destination Data

Demand (Veh/hr)

		To		
		A - Alexander Lane (S)	B - Oliver Road	C - Alexander Lane (N)
From	A - Alexander Lane (S)	0	198	114
	B - Oliver Road	211	0	13
	C - Alexander Lane (N)	181	16	0

Vehicle Mix

Heavy Vehicle Percentages

		To		
		A - Alexander Lane (S)	B - Oliver Road	C - Alexander Lane (N)
From	A - Alexander Lane (S)	0	1	2
	B - Oliver Road	1	0	0
	C - Alexander Lane (N)	2	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-AC	0.53	17.82	1.1	C	224	336
C-AB	0.03	6.75	0.0	A	16	24
C-A					181	271
A-B					198	297
A-C					114	171

Main Results for each time segment

07:30 - 07:45

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	224	56	426	0.526	220	0.0	1.1	17.128	C
C-AB	16	4	550	0.029	16	0.0	0.0	6.744	A
C-A	181	45			181				
A-B	198	50			198				
A-C	114	29			114				

07:45 - 08:00

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	224	56	426	0.526	224	1.1	1.1	17.800	C
C-AB	16	4	550	0.029	16	0.0	0.0	6.749	A
C-A	181	45			181				
A-B	198	50			198				
A-C	114	29			114				

08:00 - 08:15

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	224	56	426	0.526	224	1.1	1.1	17.814	C
C-AB	16	4	550	0.029	16	0.0	0.0	6.749	A
C-A	181	45			181				
A-B	198	50			198				
A-C	114	29			114				

08:15 - 08:30

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	224	56	426	0.526	224	1.1	1.1	17.819	C
C-AB	16	4	550	0.029	16	0.0	0.0	6.749	A
C-A	181	45			181				
A-B	198	50			198				
A-C	114	29			114				

08:30 - 08:45

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	224	56	426	0.526	224	1.1	1.1	17.821	C
C-AB	16	4	550	0.029	16	0.0	0.0	6.746	A
C-A	181	45			181				
A-B	198	50			198				
A-C	114	29			114				

08:45 - 09:00

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	224	56	426	0.526	224	1.1	1.1	17.823	C
C-AB	16	4	550	0.029	16	0.0	0.0	6.746	A
C-A	181	45			181				
A-B	198	50			198				
A-C	114	29			114				

2022 Base, PM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Profile Type	D2 - 2022 Base, PM	The DIRECT profile type is intended to be used for demand that varies over time. You are using it with the 'Use O-D data' option, but your O-D data does not vary over time. Are you sure this is correct?

Junction Network

Junctions

Junction	Name	Junction type	Major road direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	Alexander Ln_Oliver Rd Priority Junction	T-Junction	Two-way		5.48	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time period length (min)	Time segment length (min)	Run automatically
D2	2022 Base	PM	DIRECT	17:00	18:30	90	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	Scaling Factor (%)
A - Alexander Lane (S)		DIRECT	✓	100.000
B - Oliver Road		DIRECT	✓	100.000
C - Alexander Lane (N)		DIRECT	✓	100.000

Origin-Destination Data

Demand (Veh/hr)

		To		
		A - Alexander Lane (S)	B - Oliver Road	C - Alexander Lane (N)
From	A - Alexander Lane (S)	0	156	131
	B - Oliver Road	190	0	9
	C - Alexander Lane (N)	120	8	0

Vehicle Mix

Heavy Vehicle Percentages

		To		
		A - Alexander Lane (S)	B - Oliver Road	C - Alexander Lane (N)
From	A - Alexander Lane (S)	0	1	0
	B - Oliver Road	2	0	78
	C - Alexander Lane (N)	3	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-AC	0.47	16.22	0.9	C	199	299
C-AB	0.01	6.61	0.0	A	8	12
C-A					120	180
A-B					156	234
A-C					131	197

Main Results for each time segment

17:00 - 17:15

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	199	50	421	0.473	196	0.0	0.9	15.741	C
C-AB	8	2	553	0.015	8	0.0	0.0	6.608	A
C-A	120	30			120				
A-B	156	39			156				
A-C	131	33			131				

17:15 - 17:30

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	199	50	421	0.473	199	0.9	0.9	16.203	C
C-AB	8	2	553	0.015	8	0.0	0.0	6.608	A
C-A	120	30			120				
A-B	156	39			156				
A-C	131	33			131				

17:30 - 17:45

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	199	50	421	0.473	199	0.9	0.9	16.211	C
C-AB	8	2	553	0.015	8	0.0	0.0	6.608	A
C-A	120	30			120				
A-B	156	39			156				
A-C	131	33			131				

17:45 - 18:00

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	199	50	421	0.473	199	0.9	0.9	16.214	C
C-AB	8	2	553	0.015	8	0.0	0.0	6.610	A
C-A	120	30			120				
A-B	156	39			156				
A-C	131	33			131				

18:00 - 18:15

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	199	50	421	0.473	199	0.9	0.9	16.216	C
C-AB	8	2	553	0.015	8	0.0	0.0	6.608	A
C-A	120	30			120				
A-B	156	39			156				
A-C	131	33			131				

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-AC	199	50	421	0.473	199	0.9	0.9	16.216	C
C-AB	8	2	553	0.015	8	0.0	0.0	6.610	A
C-A	120	30			120				
A-B	156	39			156				
A-C	131	33			131				

2028 Base, AM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Profile Type	D3 - 2028 Base, AM	The DIRECT profile type is intended to be used for demand that varies over time. You are using it with the 'Use O-D data' option, but your O-D data does not vary over time. Are you sure this is correct?

Junction Network

Junctions

Junction	Name	Junction type	Major road direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	Alexander Ln_Oliver Rd Priority Junction	T-Junction	Two-way		5.57	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 period length (min)	Time segment length (min)	Run automatically
D3	2028 Base	AM	DIRECT	07:30	09:00	90	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	Scaling Factor (%)
A - Alexander Lane (S)		DIRECT	✓	100.000
B - Oliver Road		DIRECT	✓	100.000
C - Alexander Lane (N)		DIRECT	✓	100.000

Origin-Destination Data

Demand (Veh/hr)

		To		
		A - Alexander Lane (S)	B - Oliver Road	C - Alexander Lane (N)
From	A - Alexander Lane (S)	0	198	114
	B - Oliver Road	211	0	13
	C - Alexander Lane (N)	181	16	0

Vehicle Mix

Heavy Vehicle Percentages

		To		
		A - Alexander Lane (S)	B - Oliver Road	C - Alexander Lane (N)
From	A - Alexander Lane (S)	0	1	2
	B - Oliver Road	1	0	0
	C - Alexander Lane (N)	2	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-AC	0.53	17.82	1.1	C	224	336
C-AB	0.03	6.75	0.0	A	16	24
C-A					181	271
A-B					198	297
A-C					114	171

Main Results for each time segment

07:30 - 07:45

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	224	56	426	0.526	220	0.0	1.1	17.128	C
C-AB	16	4	550	0.029	16	0.0	0.0	6.744	A
C-A	181	45			181				
A-B	198	50			198				
A-C	114	29			114				

07:45 - 08:00

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	224	56	426	0.526	224	1.1	1.1	17.800	C
C-AB	16	4	550	0.029	16	0.0	0.0	6.749	A
C-A	181	45			181				
A-B	198	50			198				
A-C	114	29			114				

08:00 - 08:15

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	224	56	426	0.526	224	1.1	1.1	17.814	C
C-AB	16	4	550	0.029	16	0.0	0.0	6.749	A
C-A	181	45			181				
A-B	198	50			198				
A-C	114	29			114				

08:15 - 08:30

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	224	56	426	0.526	224	1.1	1.1	17.819	C
C-AB	16	4	550	0.029	16	0.0	0.0	6.749	A
C-A	181	45			181				
A-B	198	50			198				
A-C	114	29			114				

08:30 - 08:45

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	224	56	426	0.526	224	1.1	1.1	17.821	C
C-AB	16	4	550	0.029	16	0.0	0.0	6.746	A
C-A	181	45			181				
A-B	198	50			198				
A-C	114	29			114				

08:45 - 09:00

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	224	56	426	0.526	224	1.1	1.1	17.823	C
C-AB	16	4	550	0.029	16	0.0	0.0	6.746	A
C-A	181	45			181				
A-B	198	50			198				
A-C	114	29			114				

2028 Base, PM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Profile Type	D4 - 2028 Base, PM	The DIRECT profile type is intended to be used for demand that varies over time. You are using it with the 'Use O-D data' option, but your O-D data does not vary over time. Are you sure this is correct?

Junction Network

Junctions

Junction	Name	Junction type	Major road direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	Alexander Ln_Oliver Rd Priority Junction	T-Junction	Two-way		5.48	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time period length (min)	Time segment length (min)	Run automatically
D4	2028 Base	PM	DIRECT	17:00	18:30	90	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	Scaling Factor (%)
A - Alexander Lane (S)		DIRECT	✓	100.000
B - Oliver Road		DIRECT	✓	100.000
C - Alexander Lane (N)		DIRECT	✓	100.000

Origin-Destination Data

Demand (Veh/hr)

		To		
		A - Alexander Lane (S)	B - Oliver Road	C - Alexander Lane (N)
From	A - Alexander Lane (S)	0	156	131
	B - Oliver Road	190	0	9
	C - Alexander Lane (N)	120	8	0

Vehicle Mix

Heavy Vehicle Percentages

		To		
		A - Alexander Lane (S)	B - Oliver Road	C - Alexander Lane (N)
From	A - Alexander Lane (S)	0	1	0
	B - Oliver Road	2	0	78
	C - Alexander Lane (N)	3	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-AC	0.47	16.22	0.9	C	199	299
C-AB	0.01	6.61	0.0	A	8	12
C-A					120	180
A-B					156	234
A-C					131	197

Main Results for each time segment

17:00 - 17:15

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	199	50	421	0.473	196	0.0	0.9	15.741	C
C-AB	8	2	553	0.015	8	0.0	0.0	6.608	A
C-A	120	30			120				
A-B	156	39			156				
A-C	131	33			131				

17:15 - 17:30

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	199	50	421	0.473	199	0.9	0.9	16.203	C
C-AB	8	2	553	0.015	8	0.0	0.0	6.608	A
C-A	120	30			120				
A-B	156	39			156				
A-C	131	33			131				

17:30 - 17:45

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	199	50	421	0.473	199	0.9	0.9	16.211	C
C-AB	8	2	553	0.015	8	0.0	0.0	6.608	A
C-A	120	30			120				
A-B	156	39			156				
A-C	131	33			131				

17:45 - 18:00

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	199	50	421	0.473	199	0.9	0.9	16.214	C
C-AB	8	2	553	0.015	8	0.0	0.0	6.610	A
C-A	120	30			120				
A-B	156	39			156				
A-C	131	33			131				

18:00 - 18:15

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	199	50	421	0.473	199	0.9	0.9	16.216	C
C-AB	8	2	553	0.015	8	0.0	0.0	6.608	A
C-A	120	30			120				
A-B	156	39			156				
A-C	131	33			131				

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-AC	199	50	421	0.473	199	0.9	0.9	16.216	C
C-AB	8	2	553	0.015	8	0.0	0.0	6.610	A
C-A	120	30			120				
A-B	156	39			156				
A-C	131	33			131				

2028 Base + Dev, AM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Profile Type	D5 - 2028 Base + Dev, AM	The DIRECT profile type is intended to be used for demand that varies over time. You are using it with the 'Use O-D data' option, but your O-D data does not vary over time. Are you sure this is correct?

Junction Network

Junctions

Junction	Name	Junction type	Major road direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	Alexander Ln_Oliver Rd Priority Junction	T-Junction	Two-way		6.98	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 period length (min)	Time segment length (min)	Run automatically
D5	2028 Base + Dev	AM	DIRECT	07:30	09:00	90	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	Scaling Factor (%)
A - Alexander Lane (S)		DIRECT	✓	100.000
B - Oliver Road		DIRECT	✓	100.000
C - Alexander Lane (N)		DIRECT	✓	100.000

Origin-Destination Data

Demand (Veh/hr)

		To		
		A - Alexander Lane (S)	B - Oliver Road	C - Alexander Lane (N)
From	A - Alexander Lane (S)	0	217	158
	B - Oliver Road	241	0	13
	C - Alexander Lane (N)	214	16	0

Vehicle Mix

Heavy Vehicle Percentages

		To		
		A - Alexander Lane (S)	B - Oliver Road	C - Alexander Lane (N)
From	A - Alexander Lane (S)	0	1	1
	B - Oliver Road	1	0	0
	C - Alexander Lane (N)	2	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-AC	0.62	23.24	1.6	C	254	381
C-AB	0.03	6.93	0.0	A	16	24
C-A					214	321
A-B					217	326
A-C					158	237

Main Results for each time segment

07:30 - 07:45

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	254	63	409	0.621	248	0.0	1.5	21.634	C
C-AB	16	4	536	0.030	16	0.0	0.0	6.923	A
C-A	214	53			214				
A-B	217	54			217				
A-C	158	40			158				

07:45 - 08:00

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	254	63	409	0.621	254	1.5	1.6	23.160	C
C-AB	16	4	536	0.030	16	0.0	0.0	6.926	A
C-A	214	53			214				
A-B	217	54			217				
A-C	158	40			158				

08:00 - 08:15

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	254	63	409	0.621	254	1.6	1.6	23.212	C
C-AB	16	4	536	0.030	16	0.0	0.0	6.926	A
C-A	214	53			214				
A-B	217	54			217				
A-C	158	40			158				

08:15 - 08:30

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	254	63	409	0.621	254	1.6	1.6	23.230	C
C-AB	16	4	536	0.030	16	0.0	0.0	6.926	A
C-A	214	53			214				
A-B	217	54			217				
A-C	158	40			158				

08:30 - 08:45

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	254	63	409	0.621	254	1.6	1.6	23.239	C
C-AB	16	4	536	0.030	16	0.0	0.0	6.926	A
C-A	214	53			214				
A-B	217	54			217				
A-C	158	40			158				

08:45 - 09:00

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	254	63	409	0.621	254	1.6	1.6	23.244	C
C-AB	16	4	536	0.030	16	0.0	0.0	6.926	A
C-A	214	53			214				
A-B	217	54			217				
A-C	158	40			158				

2028 Base + Dev, PM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Profile Type	D6 - 2028 Base + Dev, PM	The DIRECT profile type is intended to be used for demand that varies over time. You are using it with the 'Use O-D data' option, but your O-D data does not vary over time. Are you sure this is correct?

Junction Network

Junctions

Junction	Name	Junction type	Major road direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	Alexander Ln_Oliver Rd Priority Junction	T-Junction	Two-way		6.34	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 period length (min)	Time segment length (min)	Run automatically
D6	2028 Base + Dev	PM	DIRECT	17:00	18:30	90	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	Scaling Factor (%)
A - Alexander Lane (S)		DIRECT	✓	100.000
B - Oliver Road		DIRECT	✓	100.000
C - Alexander Lane (N)		DIRECT	✓	100.000

Origin-Destination Data

Demand (Veh/hr)

		To		
		A - Alexander Lane (S)	B - Oliver Road	C - Alexander Lane (N)
From	A - Alexander Lane (S)	0	177	128
	B - Oliver Road	211	0	9
	C - Alexander Lane (N)	111	8	0

Vehicle Mix

Heavy Vehicle Percentages

		To		
		A - Alexander Lane (S)	B - Oliver Road	C - Alexander Lane (N)
From	A - Alexander Lane (S)	0	1	1
	B - Oliver Road	2	0	78
	C - Alexander Lane (N)	2	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-AC	0.52	17.87	1.1	C	220	330
C-AB	0.01	6.67	0.0	A	8	12
C-A					111	166
A-B					177	266
A-C					128	192

Main Results for each time segment

17:00 - 17:15

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	220	55	421	0.522	216	0.0	1.0	17.187	C
C-AB	8	2	548	0.015	8	0.0	0.0	6.666	A
C-A	111	28			111				
A-B	177	44			177				
A-C	128	32			128				

17:15 - 17:30

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	220	55	421	0.522	220	1.0	1.1	17.837	C
C-AB	8	2	548	0.015	8	0.0	0.0	6.666	A
C-A	111	28			111				
A-B	177	44			177				
A-C	128	32			128				

17:30 - 17:45

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	220	55	421	0.522	220	1.1	1.1	17.864	C
C-AB	8	2	548	0.015	8	0.0	0.0	6.666	A
C-A	111	28			111				
A-B	177	44			177				
A-C	128	32			128				

17:45 - 18:00

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	220	55	421	0.522	220	1.1	1.1	17.870	C
C-AB	8	2	548	0.015	8	0.0	0.0	6.669	A
C-A	111	28			111				
A-B	177	44			177				
A-C	128	32			128				

18:00 - 18:15

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	220	55	421	0.522	220	1.1	1.1	17.871	C
C-AB	8	2	548	0.015	8	0.0	0.0	6.669	A
C-A	111	28			111				
A-B	177	44			177				
A-C	128	32			128				

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-AC	220	55	421	0.522	220	1.1	1.1	17.873	C
C-AB	8	2	548	0.015	8	0.0	0.0	6.669	A
C-A	111	28			111				
A-B	177	44			177				
A-C	128	32			128				

2028 Base + Comm, AM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Profile Type	D7 - 2028 Base + Comm, AM	The DIRECT profile type is intended to be used for demand that varies over time. You are using it with the 'Use O-D data' option, but your O-D data does not vary over time. Are you sure this is correct?

Junction Network

Junctions

Junction	Name	Junction type	Major road direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	Alexander Ln_Oliver Rd Priority Junction	T-Junction	Two-way		5.78	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time period length (min)	Time segment length (min)	Run automatically
D7	2028 Base + Comm	AM	DIRECT	07:30	09:00	90	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	Scaling Factor (%)
A - Alexander Lane (S)		DIRECT	✓	100.000
B - Oliver Road		DIRECT	✓	100.000
C - Alexander Lane (N)		DIRECT	✓	100.000

Origin-Destination Data

Demand (Veh/hr)

		To		
		A - Alexander Lane (S)	B - Oliver Road	C - Alexander Lane (N)
From	A - Alexander Lane (S)	0	201	115
	B - Oliver Road	216	0	13
	C - Alexander Lane (N)	182	16	0

Vehicle Mix

Heavy Vehicle Percentages

		To		
		A - Alexander Lane (S)	B - Oliver Road	C - Alexander Lane (N)
From	A - Alexander Lane (S)	0	1	2
	B - Oliver Road	1	0	0
	C - Alexander Lane (N)	2	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-AC	0.54	18.35	1.2	C	229	344
C-AB	0.03	6.76	0.0	A	16	24
C-A					182	273
A-B					201	302
A-C					115	173

Main Results for each time segment

07:30 - 07:45

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	229	57	425	0.539	225	0.0	1.1	17.582	C
C-AB	16	4	549	0.029	16	0.0	0.0	6.755	A
C-A	182	45			182				
A-B	201	50			201				
A-C	115	29			115				

07:45 - 08:00

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	229	57	425	0.539	229	1.1	1.1	18.324	C
C-AB	16	4	549	0.029	16	0.0	0.0	6.761	A
C-A	182	45			182				
A-B	201	50			201				
A-C	115	29			115				

08:00 - 08:15

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	229	57	425	0.539	229	1.1	1.2	18.340	C
C-AB	16	4	549	0.029	16	0.0	0.0	6.761	A
C-A	182	45			182				
A-B	201	50			201				
A-C	115	29			115				

08:15 - 08:30

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	229	57	425	0.539	229	1.2	1.2	18.346	C
C-AB	16	4	549	0.029	16	0.0	0.0	6.758	A
C-A	182	45			182				
A-B	201	50			201				
A-C	115	29			115				

08:30 - 08:45

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	229	57	425	0.539	229	1.2	1.2	18.349	C
C-AB	16	4	549	0.029	16	0.0	0.0	6.758	A
C-A	182	45			182				
A-B	201	50			201				
A-C	115	29			115				

08:45 - 09:00

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	229	57	425	0.539	229	1.2	1.2	18.354	C
C-AB	16	4	549	0.029	16	0.0	0.0	6.761	A
C-A	182	45			182				
A-B	201	50			201				
A-C	115	29			115				

2028 Base + Comm, PM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Profile Type	D8 - 2028 Base + Comm, PM	The DIRECT profile type is intended to be used for demand that varies over time. You are using it with the 'Use O-D data' option, but your O-D data does not vary over time. Are you sure this is correct?

Junction Network

Junctions

Junction	Name	Junction type	Major road direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	Alexander Ln_Oliver Rd Priority Junction	T-Junction	Two-way		5.58	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 period length (min)	Time segment length (min)	Run automatically
D8	2028 Base + Comm	PM	DIRECT	17:00	18:30	90	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	Scaling Factor (%)
A - Alexander Lane (S)		DIRECT	✓	100.000
B - Oliver Road		DIRECT	✓	100.000
C - Alexander Lane (N)		DIRECT	✓	100.000

Origin-Destination Data

Demand (Veh/hr)

		To		
		A - Alexander Lane (S)	B - Oliver Road	C - Alexander Lane (N)
From	A - Alexander Lane (S)	0	161	131
	B - Oliver Road	193	0	9
	C - Alexander Lane (N)	120	8	0

Vehicle Mix

Heavy Vehicle Percentages

		To		
		A - Alexander Lane (S)	B - Oliver Road	C - Alexander Lane (N)
From	A - Alexander Lane (S)	0	1	0
	B - Oliver Road	2	0	78
	C - Alexander Lane (N)	3	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-AC	0.48	16.46	0.9	C	202	303
C-AB	0.01	6.63	0.0	A	8	12
C-A					120	180
A-B					161	242
A-C					131	197

Main Results for each time segment

17:00 - 17:15

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	202	51	421	0.480	198	0.0	0.9	15.962	C
C-AB	8	2	552	0.015	8	0.0	0.0	6.622	A
C-A	120	30			120				
A-B	161	40			161				
A-C	131	33			131				

17:15 - 17:30

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	202	51	421	0.480	202	0.9	0.9	16.452	C
C-AB	8	2	552	0.015	8	0.0	0.0	6.622	A
C-A	120	30			120				
A-B	161	40			161				
A-C	131	33			131				

17:30 - 17:45

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	202	51	421	0.480	202	0.9	0.9	16.460	C
C-AB	8	2	552	0.015	8	0.0	0.0	6.622	A
C-A	120	30			120				
A-B	161	40			161				
A-C	131	33			131				

17:45 - 18:00

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	202	51	421	0.480	202	0.9	0.9	16.463	C
C-AB	8	2	552	0.015	8	0.0	0.0	6.625	A
C-A	120	30			120				
A-B	161	40			161				
A-C	131	33			131				

18:00 - 18:15

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	202	51	421	0.480	202	0.9	0.9	16.465	C
C-AB	8	2	552	0.015	8	0.0	0.0	6.625	A
C-A	120	30			120				
A-B	161	40			161				
A-C	131	33			131				

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-AC	202	51	421	0.480	202	0.9	0.9	16.465	C
C-AB	8	2	552	0.015	8	0.0	0.0	6.625	A
C-A	120	30			120				
A-B	161	40			161				
A-C	131	33			131				

2028 Base + Comm + Dev, AM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Profile Type	D9 - 2028 Base + Comm + Dev, AM	The DIRECT profile type is intended to be used for demand that varies over time. You are using it with the 'Use O-D data' option, but your O-D data does not vary over time. Are you sure this is correct?

Junction Network

Junctions

Junction	Name	Junction type	Major road direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	Alexander Ln_Oliver Rd Priority Junction	T-Junction	Two-way		7.30	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 period length (min)	Time segment length (min)	Run automatically
D9	2028 Base + Comm + Dev	AM	DIRECT	07:30	09:00	90	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	Scaling Factor (%)
A - Alexander Lane (S)		DIRECT	✓	100.000
B - Oliver Road		DIRECT	✓	100.000
C - Alexander Lane (N)		DIRECT	✓	100.000

Origin-Destination Data

Demand (Veh/hr)

		To		
		A - Alexander Lane (S)	B - Oliver Road	C - Alexander Lane (N)
From	A - Alexander Lane (S)	0	220	158
	B - Oliver Road	246	0	13
	C - Alexander Lane (N)	216	16	0

Vehicle Mix

Heavy Vehicle Percentages

		To		
		A - Alexander Lane (S)	B - Oliver Road	C - Alexander Lane (N)
From	A - Alexander Lane (S)	0	1	1
	B - Oliver Road	1	0	0
	C - Alexander Lane (N)	2	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-AC	0.63	24.12	1.7	C	259	388
C-AB	0.03	6.94	0.0	A	16	24
C-A					216	324
A-B					220	330
A-C					158	237

Main Results for each time segment

07:30 - 07:45

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	259	65	408	0.635	253	0.0	1.6	22.318	C
C-AB	16	4	535	0.030	16	0.0	0.0	6.932	A
C-A	216	54			216				
A-B	220	55			220				
A-C	158	40			158				

07:45 - 08:00

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	259	65	408	0.635	259	1.6	1.7	24.027	C
C-AB	16	4	535	0.030	16	0.0	0.0	6.935	A
C-A	216	54			216				
A-B	220	55			220				
A-C	158	40			158				

08:00 - 08:15

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	259	65	408	0.635	259	1.7	1.7	24.088	C
C-AB	16	4	535	0.030	16	0.0	0.0	6.937	A
C-A	216	54			216				
A-B	220	55			220				
A-C	158	40			158				

08:15 - 08:30

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	259	65	408	0.635	259	1.7	1.7	24.109	C
C-AB	16	4	535	0.030	16	0.0	0.0	6.937	A
C-A	216	54			216				
A-B	220	55			220				
A-C	158	40			158				

08:30 - 08:45

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	259	65	408	0.635	259	1.7	1.7	24.121	C
C-AB	16	4	535	0.030	16	0.0	0.0	6.935	A
C-A	216	54			216				
A-B	220	55			220				
A-C	158	40			158				

08:45 - 09:00

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	259	65	408	0.635	259	1.7	1.7	24.122	C
C-AB	16	4	535	0.030	16	0.0	0.0	6.935	A
C-A	216	54			216				
A-B	220	55			220				
A-C	158	40			158				

2028 Base + Comm + Dev, PM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Profile Type	D10 - 2028 Base + Comm + Dev, PM	The DIRECT profile type is intended to be used for demand that varies over time. You are using it with the 'Use O-D data' option, but your O-D data does not vary over time. Are you sure this is correct?

Junction Network

Junctions

Junction	Name	Junction type	Major road direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	Alexander Ln_Oliver Rd Priority Junction	T-Junction	Two-way		6.40	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 period length (min)	Time segment length (min)	Run automatically
D10	2028 Base + Comm + Dev	PM	DIRECT	17:00	18:30	90	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	Scaling Factor (%)
A - Alexander Lane (S)		DIRECT	✓	100.000
B - Oliver Road		DIRECT	✓	100.000
C - Alexander Lane (N)		DIRECT	✓	100.000

Origin-Destination Data

Demand (Veh/hr)

		To		
		A - Alexander Lane (S)	B - Oliver Road	C - Alexander Lane (N)
From	A - Alexander Lane (S)	0	182	128
	B - Oliver Road	213	0	9
	C - Alexander Lane (N)	111	8	0

Vehicle Mix

Heavy Vehicle Percentages

		To		
		A - Alexander Lane (S)	B - Oliver Road	C - Alexander Lane (N)
From	A - Alexander Lane (S)	0	1	1
	B - Oliver Road	2	0	78
	C - Alexander Lane (N)	2	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-AC	0.53	18.09	1.1	C	222	333
C-AB	0.01	6.68	0.0	A	8	12
C-A					111	166
A-B					182	273
A-C					128	192

Main Results for each time segment

17:00 - 17:15

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	222	56	421	0.527	218	0.0	1.1	17.373	C
C-AB	8	2	547	0.015	8	0.0	0.0	6.681	A
C-A	111	28			111				
A-B	182	46			182				
A-C	128	32			128				

17:15 - 17:30

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	222	56	421	0.527	222	1.1	1.1	18.065	C
C-AB	8	2	547	0.015	8	0.0	0.0	6.681	A
C-A	111	28			111				
A-B	182	46			182				
A-C	128	32			128				

17:30 - 17:45

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	222	56	421	0.527	222	1.1	1.1	18.080	C
C-AB	8	2	547	0.015	8	0.0	0.0	6.681	A
C-A	111	28			111				
A-B	182	46			182				
A-C	128	32			128				

17:45 - 18:00

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	222	56	421	0.527	222	1.1	1.1	18.086	C
C-AB	8	2	547	0.015	8	0.0	0.0	6.684	A
C-A	111	28			111				
A-B	182	46			182				
A-C	128	32			128				

18:00 - 18:15

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	222	56	421	0.527	222	1.1	1.1	18.087	C
C-AB	8	2	547	0.015	8	0.0	0.0	6.684	A
C-A	111	28			111				
A-B	182	46			182				
A-C	128	32			128				

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-AC	222	56	421	0.527	222	1.1	1.1	18.088	C
C-AB	8	2	547	0.015	8	0.0	0.0	6.681	A
C-A	111	28			111				
A-B	182	46			182				
A-C	128	32			128				

Junctions 9

ARCADY 9 - Roundabout Module

Version: 9.5.2.1013

For sales and distribution information, program advice and maintenance, contact TRL:
+44 (0)1344 379777 software@trl.co.uk www.trlsoftware.co.uk

Filename: A12 Junction 2 V1.j9
Path: X:\Projects\Projects\150000\152080 - Shenfield\MODELLING
Report generation date: 24/08/2023 19:06:09

Summary of junction performance

	AM					PM				
	Set ID	Queue (Veh)	Delay (s)	RFC	LOS	Set ID	Queue (Veh)	Delay (s)	RFC	LOS
	[Lane Simulation] - 2022 Base									
A - A12 (E)	D1	11.4	48.84		E	D2	1.3	7.43		A
B - Chelmsford Road		1.1	4.20		A		1.1	3.57		A
C - A12 (W)		1.2	5.92		A		1.7	7.72		A
D - Roman Road		1.6	5.12		A		0.8	3.41		A
	[Lane Simulation] - 2033 Base									
A - A12 (E)	D5	12.4	51.27		F	D6	1.8	9.05		A
B - Chelmsford Road		1.1	4.12		A		1.9	4.64		A
C - A12 (W)		1.2	6.00		A		2.1	9.05		A
D - Roman Road		1.7	5.14		A		0.9	3.88		A
	[Lane Simulation] - 2028 Base + Committed Development									
A - A12 (E)	D9	19.2	80.98		F	D10	1.8	8.26		A
B - Chelmsford Road		1.3	4.56		A		1.4	3.77		A
C - A12 (W)		1.3	6.15		A		1.5	7.44		A
D - Roman Road		1.7	5.52		A		0.8	3.71		A
	[Lane Simulation] - 2028 Base + Committed + Proposed									
A - A12 (E)	D11	28.9	107.52		F	D12	2.1	9.69		A
B - Chelmsford Road		1.8	5.28		A		1.4	3.94		A
C - A12 (W)		1.4	6.43		A		1.9	7.45		A
D - Roman Road		1.8	5.95		A		1.0	3.98		A
	[Lane Simulation] - 2033 Base + Committed Development									
A - A12 (E)	D13	19.5	81.33		F	D14	1.5	8.45		A
B - Chelmsford Road		1.3	4.57		A		1.1	3.78		A
C - A12 (W)		1.2	6.20		A		1.7	7.51		A
D - Roman Road		1.8	5.80		A		1.2	3.77		A
	[Lane Simulation] - 2033 Base + Proposed Development									
A - A12 (E)	D15	31.0	128.82		F	D16	1.7	8.57		A
B - Chelmsford Road		1.4	4.33		A		1.2	3.77		A
C - A12 (W)		1.4	6.09		A		1.9	7.37		A
D - Roman Road		1.9	5.70		A		0.8	3.88		A
	[Lane Simulation] - 2033 Base + Proposed + Committed									
A - A12 (E)	D17	33.0	130.33		F	D18	2.6	10.37		B
B - Chelmsford Road		1.9	5.36		A		1.5	3.89		A
C - A12 (W)		1.4	6.53		A		2.0	7.67		A
D - Roman Road		2.4	6.26		A		1.2	3.91		A

There are warnings associated with one or more model runs - see the 'Data Errors and Warnings' tables for each Analysis or Demand Set.

Values shown are the highest values encountered over all time segments. Delay is the maximum value of average delay per arriving vehicle. Arm and junction delays are averages for all movements, including movements with zero delay.

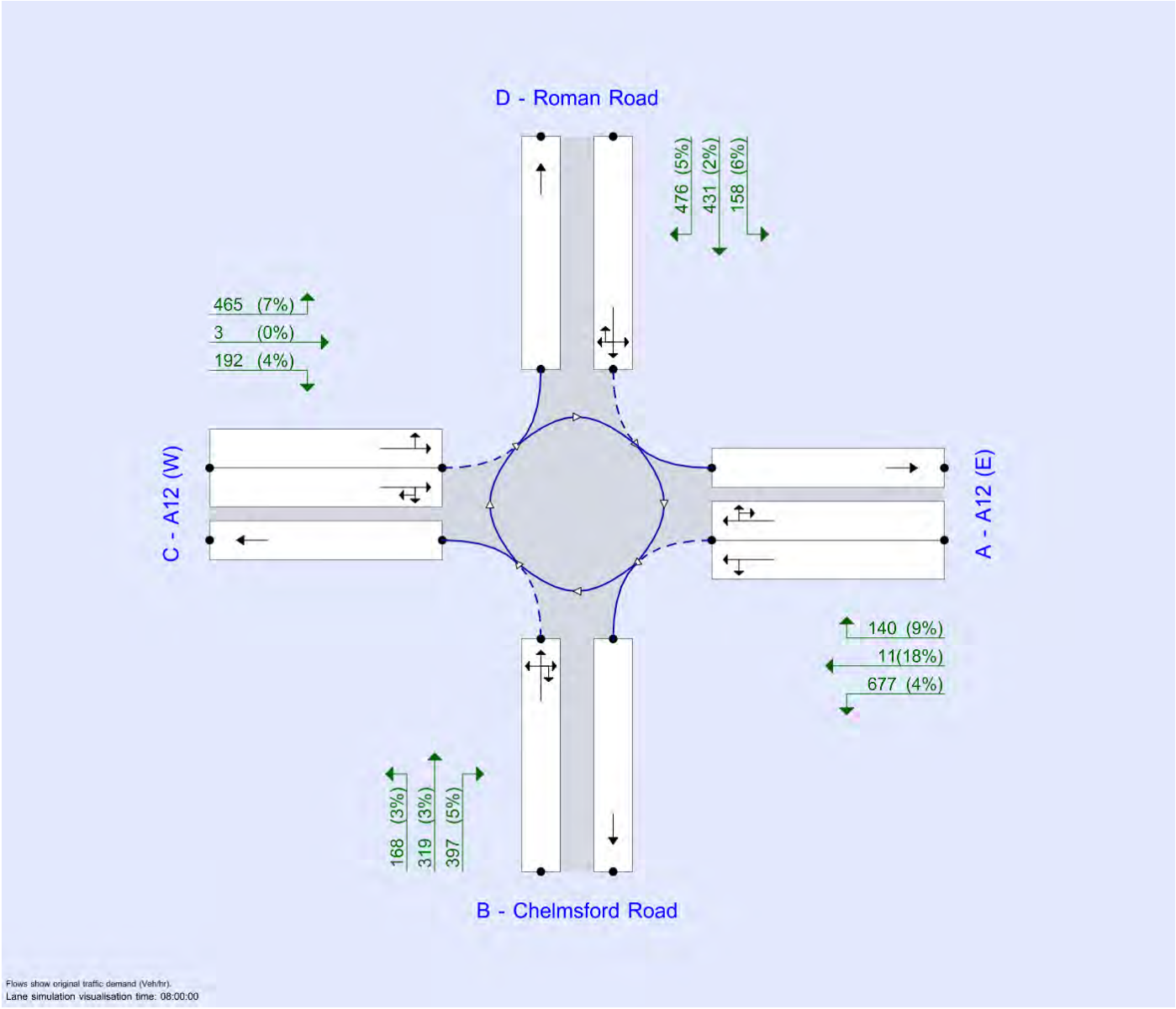
File summary

File Description

Title	
Location	
Site number	
Date	22/07/2022
Version	
Status	(new file)
Identifier	
Client	
Jobnumber	
Enumerator	EUR\George.Magnisalis
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

Lane Simulation options

Criteria type	Stop criteria (%)	Stop criteria time (s)	Stop criteria number of trials	Random seed	Results refresh speed (s)	Individual vehicle animation number of trials	Average animation capture interval (s)	Use quick response	Do flow sampling	Suppress automatic lane creation	Last run random seed	Last run number of trials	Last run time taken (s)
Delay	1.00	100000	100000	-1	3	1	60	✓			836408171	213	44.74

Demand Set Summary

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time period length (min)	Time segment length (min)	Run automatically
D1	2022 Base	AM	DIRECT	08:00	09:30	90	15	✓
D2	2022 Base	PM	DIRECT	17:00	18:30	90	15	✓
D3	2028 Base	AM	DIRECT	08:00	09:30	90	15	
D4	2028 Base	PM	DIRECT	17:00	18:30	90	15	
D5	2033 Base	AM	DIRECT	08:00	09:30	90	15	✓
D6	2033 Base	PM	DIRECT	17:00	18:30	90	15	✓
D7	2028 Base + Proposed Development	AM	DIRECT	08:00	09:30	90	15	
D8	2028 Base + Proposed Development	PM	DIRECT	17:00	18:30	90	15	
D9	2028 Base + Committed Development	AM	DIRECT	08:00	09:30	90	15	✓
D10	2028 Base + Committed Development	PM	DIRECT	17:00	18:30	90	15	✓
D11	2028 Base + Committed + Proposed	AM	DIRECT	08:00	09:30	90	15	✓
D12	2028 Base + Committed + Proposed	PM	DIRECT	17:00	18:30	90	15	✓
D13	2033 Base + Committed Development	AM	DIRECT	08:00	09:30	90	15	✓
D14	2033 Base + Committed Development	PM	DIRECT	17:00	18:30	90	15	✓
D15	2033 Base + Proposed Development	AM	DIRECT	08:00	09:30	90	15	✓
D16	2033 Base + Proposed Development	PM	DIRECT	17:00	18:30	90	15	✓
D17	2033 Base + Proposed + Committed	AM	DIRECT	08:00	09:30	90	15	✓
D18	2033 Base + Proposed + Committed	PM	DIRECT	17:00	18:30	90	15	✓

Analysis Set Details

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

2022 Base, AM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Lane Simulation	A1 - [Lane Simulation]	This analysis set uses Lane Simulation mode. This is provided as an investigative tool and the user should apply judgement when interpreting the results.
Last Run	Lane Simulation	A - A12 (E) - Lane Simulation	Arm A: Queue at end of modelled period is greater than 10 PCU. Delay is likely to have been underestimated.
Warning	Profile Type	D1 - 2022 Base, AM	The DIRECT profile type is intended to be used for demand that varies over time. You are using it with the 'Use O-D data' option, but your O-D data does not vary over time. Are you sure this is correct?

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (s)	Junction LOS
1	Mountnessing Roundabout	Large Roundabout		A, B, C, D	15.61	C

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Arms

Arms

Arm	Name	Description
A	A12 (E)	
B	Chelmsford Road	
C	A12 (W)	
D	Roman Road	

Roundabout Geometry

Arm	V - Approach road half-width (m)	E - Entry width (m)	l' - Effective flare length (m)	R - Entry radius (m)	D - Inscribed circle diameter (m)	PHI - Conflict (entry) angle (deg)	Exit only
A - A12 (E)	6.10	6.60	2.1	47.0	112.0	23.0	
B - Chelmsford Road	3.20	7.20	20.5	17.1	112.0	27.0	
C - A12 (W)	6.70	8.50	16.4	95.9	112.0	7.5	
D - Roman Road	3.40	9.40	11.4	17.8	112.0	37.0	

Large Roundabout Data

Arm	Circulating flow (PCU/hr)	Entry-to-exit separation (m)
A - A12 (E)	1137	88.10
B - Chelmsford Road	665	0.00
C - A12 (W)	897	86.00
D - Roman Road	619	0.00

Slope / Intercept / Capacity

Roundabout Slope and Intercept used in model

Arm	Final slope	Final intercept (PCU/hr)
A - A12 (E)	0.860	2451
B - Chelmsford Road	0.848	2433
C - A12 (W)	1.101	3196
D - Roman Road	0.826	2380

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

Arm Capacity Adjustments

Arm	Type	Reason	Percentage capacity adjustment (%)
A - A12 (E)	Percentage		105.00

Lane Simulation: Arm options

Arm	Lane capacity source	Traffic considering secondary lanes (%)
A - A12 (E)	Evenly split	10.00

B - Chelmsford Road	Evenly split	10.00
C - A12 (W)	Evenly split	10.00
D - Roman Road	Evenly split	10.00

Lanes

Arm	Side	Lane level	Lane	Destination arms	Has limited storage	Storage (PCU)	Has bottleneck	Minimum capacity (PCU/hr)	Maximum capacity (PCU/hr)	Signalised
A - A12 (E)	**Entry**	**1**	**1**	B, C		Infinity		0	99999	
			2	A, C, D		Infinity		0	99999	
	Exit	**1**	**1**			Infinity				
B - Chelmsford Road	**Entry**	**1**	**1**	A, B, C, D		Infinity		0	99999	
	Exit	**1**	**1**			Infinity				
C - A12 (W)	**Entry**	**1**	**1**	A, D		Infinity		0	99999	
			2	A, B, C		Infinity		0	99999	
	Exit	**1**	**1**			Infinity				
D - Roman Road	**Entry**	**1**	**1**	A, B, C, D		Infinity		0	99999	
	Exit	**1**	**1**			Infinity				

Entry Lane slope and intercept

Arm	Side	Lane level	Lane	Final slope	Final intercept (PCU/hr)
A - A12 (E)	**Entry**	**1**	**1**	0.430	1225
			2	0.430	1225
B - Chelmsford Road	**Entry**	**1**	**1**	0.848	2433
C - A12 (W)	**Entry**	**1**	**1**	0.550	1598
			2	0.550	1598
D - Roman Road	**Entry**	**1**	**1**	0.826	2380

Summary of Entry Lane allowed movements

Arm	Lane Level	Lane	Destination arm			
			A12 (E)	Chelmsford Road	A12 (W)	Roman Road
A - A12 (E)	**1**	**1**		✓	✓	
		2	✓		✓	✓
B - Chelmsford Road	**1**	**1**	✓	✓	✓	✓
C - A12 (W)	**1**	**1**	✓			✓
		2	✓	✓	✓	
D - Roman Road	**1**	**1**	✓	✓	✓	✓

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time period length (min)	Time segment length (min)	Run automatically
D1	2022 Base	AM	DIRECT	08:00	09:30	90	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	Scaling Factor (%)
A - A12 (E)		DIRECT	✓	100.000
B - Chelmsford Road		DIRECT	✓	100.000
C - A12 (W)		DIRECT	✓	100.000
D - Roman Road		DIRECT	✓	100.000

Origin-Destination Data

Demand (Veh/hr)

		To			
		A - A12 (E)	B - Chelmsford Road	C - A12 (W)	D - Roman Road
From	A - A12 (E)	1	674	11	139
	B - Chelmsford Road	395	1	167	318
	C - A12 (W)	3	191	1	463
	D - Roman Road	157	429	474	1

Vehicle Mix

Heavy Vehicle Percentages

		To			
		A - A12 (E)	B - Chelmsford Road	C - A12 (W)	D - Roman Road
From	A - A12 (E)	0	4	18	9
	B - Chelmsford Road	5	0	3	3
	C - A12 (W)	0	4	0	7
	D - Roman Road	6	2	5	0

Results

Results Summary for whole modelled period

Arm	Max Delay (s)	Max Queue (Veh)	Max LOS	Average Demand (Veh/hr)	Total Junction Arrivals (Veh)
A - A12 (E)	48.84	11.4	E	823	1235
B - Chelmsford Road	4.20	1.1	A	880	1320
C - A12 (W)	5.92	1.2	A	655	983
D - Roman Road	5.12	1.6	A	1065	1597

Main Results for each time segment

08:00 - 08:15

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Throughput (Veh/hr)	Average throughput (PCU/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
A - A12 (E)	822	206	1093	819	832	553	0.0	9.6	33.553	D
B - Chelmsford Road	878	219	627	877	910	1286	0.0	1.0	3.964	A
C - A12 (W)	645	161	851	648	686	653	0.0	0.9	5.704	A
D - Roman Road	1066	267	581	1065	1101	917	0.0	1.5	4.961	A

08:15 - 08:30

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Throughput (Veh/hr)	Average throughput (PCU/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
A - A12 (E)	828	207	1106	829	865	551	9.6	10.9	45.079	E
B - Chelmsford Road	867	217	639	868	910	1296	1.0	0.8	4.013	A
C - A12 (W)	657	164	854	658	692	653	0.9	0.9	5.817	A
D - Roman Road	1074	268	586	1071	1106	926	1.5	1.6	5.085	A

08:30 - 08:45

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Throughput (Veh/hr)	Average throughput (PCU/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
A - A12 (E)	828	207	1107	836	866	554	10.9	10.6	47.714	E
B - Chelmsford Road	885	221	634	886	910	1310	0.8	1.1	4.049	A
C - A12 (W)	663	166	863	663	695	656	0.9	1.1	5.845	A
D - Roman Road	1066	267	593	1068	1108	933	1.6	1.4	4.926	A

08:45 - 09:00

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Throughput (Veh/hr)	Average throughput (PCU/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
A - A12 (E)	821	205	1106	820	866	550	10.6	10.5	46.037	E
B - Chelmsford Road	884	221	628	882	917	1297	1.1	1.0	4.202	A
C - A12 (W)	654	163	856	651	692	655	1.1	1.1	5.726	A
D - Roman Road	1063	266	592	1064	1104	915	1.4	1.6	5.115	A

09:00 - 09:15

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Throughput (Veh/hr)	Average throughput (PCU/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
A - A12 (E)	821	205	1094	819	865	556	10.5	11.1	48.838	E
B - Chelmsford Road	880	220	618	883	918	1296	1.0	0.8	4.093	A
C - A12 (W)	655	164	862	656	700	639	1.1	1.0	5.916	A
D - Roman Road	1053	263	598	1052	1100	920	1.6	1.4	4.972	A

09:15 - 09:30

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Throughput (Veh/hr)	Average throughput (PCU/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
A - A12 (E)	821	205	1097	818	865	561	11.1	11.6	47.057	E
B - Chelmsford Road	886	221	628	885	922	1288	0.8	1.0	4.122	A
C - A12 (W)	657	164	863	658	701	650	1.0	1.1	5.847	A
D - Roman Road	1066	267	593	1065	1098	928	1.4	1.6	5.058	A

Lane Results

Lane Level notation: Lane Level 1 is always closest to the junction.

Lanes: Main Results for each time segment

08:00 - 08:15

Arm	Side	Lane level	Lane	Destination arms	Total Demand (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Average throughput (PCU/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
A - A12 (E)	Entry	1	1	B, C	672	746	0.901	668	669	0.0	9.3	39.463	E
			2	A, C, D	150	708	0.212	151	163	0.0	0.2	6.761	A
	Exit	1	1		553			553	579	0.0	0.0	0.000	A
B - Chelmsford Road	Entry	1	1	A, B, C, D	878	1797	0.489	877	910	0.0	1.0	3.964	A
	Exit	1	1		1286			1286	1299	0.0	0.0	0.000	A
C - A12 (W)	Entry	1	1	A, D	458	1041	0.440	460	490	0.0	0.8	6.367	A
			2	A, B, C	187	1065	0.175	188	196	0.0	0.1	4.078	A
	Exit	1	1		653			653	683	0.0	0.0	0.000	A
D - Roman Road	Entry	1	1	A, B, C, D	1066	1807	0.590	1065	1101	0.0	1.5	4.961	A
	Exit	1	1		917			917	968	0.0	0.0	0.000	A

08:15 - 08:30

Arm	Side	Lane level	Lane	Destination arms	Total Demand (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Average throughput (PCU/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
A - A12 (E)	Entry	1	1	B, C	672	739	0.909	672	699	9.3	10.6	53.635	F
			2	A, C, D	156	695	0.224	157	166	0.2	0.2	6.628	A
	Exit	1	1		551			551	583	0.0	0.0	0.000	A
B - Chelmsford Road	Entry	1	1	A, B, C, D	867	1784	0.486	868	910	1.0	0.8	4.013	A
	Exit	1	1		1296			1296	1334	0.0	0.0	0.000	A
C - A12 (W)	Entry	1	1	A, D	465	1033	0.450	466	493	0.8	0.7	6.534	A
			2	A, B, C	192	1060	0.181	192	199	0.1	0.2	4.098	A
	Exit	1	1		653			653	683	0.0	0.0	0.000	A
D - Roman Road	Entry	1	1	A, B, C, D	1074	1803	0.596	1071	1106	1.5	1.6	5.085	A
	Exit	1	1		926			926	973	0.0	0.0	0.000	A

08:30 - 08:45

Arm	Side	Lane level	Lane	Destination arms	Total Demand (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Average throughput (PCU/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
A - A12 (E)	Entry	1	1	B, C	672	740	0.908	680	699	10.6	10.3	57.042	F
			2	A, C, D	156	706	0.221	156	167	0.2	0.3	6.696	A
	Exit	1	1		554			554	581	0.0	0.0	0.000	A
B - Chelmsford Road	Entry	1	1	A, B, C, D	885	1793	0.493	886	910	0.8	1.1	4.049	A
	Exit	1	1		1310			1310	1338	0.0	0.0	0.000	A
C - A12 (W)	Entry	1	1	A, D	467	1031	0.453	466	494	0.7	0.9	6.547	A
			2	A, B, C	196	1061	0.185	197	201	0.2	0.2	4.170	A
	Exit	1	1		656			656	686	0.0	0.0	0.000	A
D - Roman Road	Entry	1	1	A, B, C, D	1066	1799	0.593	1068	1108	1.6	1.4	4.926	A
	Exit	1	1		933			933	974	0.0	0.0	0.000	A

08:45 - 09:00

Arm	Side	Lane level	Lane	Destination arms	Total Demand (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Average throughput (PCU/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
A - A12 (E)	Entry	1	1	B, C	671	740	0.907	669	701	10.3	10.3	54.839	F
			2	A, C, D	150	706	0.212	150	164	0.3	0.2	6.526	A
	Exit	1	1		550			550	585	0.0	0.0	0.000	A
B - Chelmsford Road	Entry	1	1	A, B, C, D	884	1797	0.492	882	917	1.1	1.0	4.202	A
	Exit	1	1		1297			1297	1340	0.0	0.0	0.000	A
C - A12 (W)	Entry	1	1	A, D	458	1033	0.443	456	493	0.9	0.9	6.376	A
			2	A, B, C	196	1062	0.185	196	199	0.2	0.3	4.165	A
	Exit	1	1		655			655	681	0.0	0.0	0.000	A
D - Roman Road	Entry	1	1	A, B, C, D	1063	1798	0.591	1064	1104	1.4	1.6	5.115	A
	Exit	1	1		915			915	972	0.0	0.0	0.000	A

09:00 - 09:15

Arm	Side	Lane level	Lane	Destination arms	Total Demand (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Average throughput (PCU/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
A - A12 (E)	Entry	1	1	B, C	673	745	0.902	671	700	10.3	10.9	58.275	F
			2	A, C, D	148	704	0.211	149	166	0.2	0.2	6.624	A
	Exit	1	1		556			556	586	0.0	0.0	0.000	A
B - Chelmsford Road	Entry	1	1	A, B, C, D	880	1814	0.485	883	918	1.0	0.8	4.093	A
	Exit	1	1		1296			1296	1340	0.0	0.0	0.000	A
C - A12 (W)	Entry	1	1	A, D	458	1030	0.445	460	496	0.9	0.8	6.614	A
			2	A, B, C	197	1060	0.186	196	204	0.3	0.2	4.263	A
	Exit	1	1		639			639	680	0.0	0.0	0.000	A
D - Roman Road	Entry	1	1	A, B, C, D	1053	1798	0.585	1052	1100	1.6	1.4	4.972	A
	Exit	1	1		920			920	978	0.0	0.0	0.000	A

09:15 - 09:30

Arm	Side	Lane level	Lane	Destination arms	Total Demand (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Average throughput (PCU/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
A - A12 (E)	Entry	1	1	B, C	667	741	0.898	665	698	10.9	11.3	56.508	F
			2	A, C, D	154	705	0.219	153	167	0.2	0.3	6.728	A
	Exit	1	1		561			561	589	0.0	0.0	0.000	A
B - Chelmsford Road	Entry	1	1	A, B, C, D	886	1790	0.495	885	922	0.8	1.0	4.122	A
	Exit	1	1		1288			1288	1333	0.0	0.0	0.000	A
C - A12 (W)	Entry	1	1	A, D	463	1027	0.451	464	499	0.8	0.8	6.489	A
			2	A, B, C	194	1054	0.184	194	202	0.2	0.3	4.316	A
	Exit	1	1		650			650	679	0.0	0.0	0.000	A
D - Roman Road	Entry	1	1	A, B, C, D	1066	1797	0.594	1065	1098	1.4	1.6	5.058	A
	Exit	1	1		928			928	985	0.0	0.0	0.000	A

2022 Base, PM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Lane Simulation	A1 - [Lane Simulation]	This analysis set uses Lane Simulation mode. This is provided as an investigative tool and the user should apply judgement when interpreting the results.
Warning	Profile Type	D2 - 2022 Base, PM	The DIRECT profile type is intended to be used for demand that varies over time. You are using it with the 'Use O-D data' option, but your O-D data does not vary over time. Are you sure this is correct?

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (s)	Junction LOS
1	Mountnessing Roundabout	Large Roundabout		A, B, C, D	5.34	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Arms

Arms

[same as above]

Roundabout Geometry

[same as above]

Large Roundabout Data

Arm	Circulating flow (PCU/hr)	Entry-to-exit separation (m)
A - A12 (E)	756	88.10
B - Chelmsford Road	501	0.00
C - A12 (W)	960	86.00
D - Roman Road	669	0.00

Slope / Intercept / Capacity

[same as above]

Lane Simulation: Arm options

[same as above]

Lanes

[same as above]

Entry Lane slope and intercept

[same as above]

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time period length (min)	Time segment length (min)	Run automatically
D2	2022 Base	PM	DIRECT	17:00	18:30	90	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	Scaling Factor (%)
A - A12 (E)		DIRECT	✓	100.000
B - Chelmsford Road		DIRECT	✓	100.000
C - A12 (W)		DIRECT	✓	100.000
D - Roman Road		DIRECT	✓	100.000

Origin-Destination Data

Demand (Veh/hr)

		To			
		A - A12 (E)	B - Chelmsford Road	C - A12 (W)	D - Roman Road
From	A - A12 (E)	0	490	2	110
	B - Chelmsford Road	477	1	123	360
	C - A12 (W)	2	171	0	563
	D - Roman Road	130	185	379	1

Vehicle Mix

Heavy Vehicle Percentages

		To			
		A - A12 (E)	B - Chelmsford Road	C - A12 (W)	D - Roman Road
From	A - A12 (E)	0	1	0	1
	B - Chelmsford Road	2	0	2	0
	C - A12 (W)	0	5	0	4
	D - Roman Road	2	1	2	0

Results

Results Summary for whole modelled period

Arm	Max Delay (s)	Max Queue (Veh)	Max LOS	Average Demand (Veh/hr)	Total Junction Arrivals (Veh)
A - A12 (E)	7.43	1.3	A	601	901
B - Chelmsford Road	3.57	1.1	A	961	1441
C - A12 (W)	7.72	1.7	A	736	1104
D - Roman Road	3.41	0.8	A	692	1038

Main Results for each time segment

17:00 - 17:15

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Throughput (Veh/hr)	Average throughput (PCU/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
A - A12 (E)	613	153	717	617	609	616	0.0	1.0	7.433	A
B - Chelmsford Road	966	242	480	966	973	854	0.0	1.0	3.439	A
C - A12 (W)	739	185	951	740	770	495	0.0	1.7	7.199	A
D - Roman Road	681	170	652	681	700	1039	0.0	0.6	3.407	A

17:15 - 17:30

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Throughput (Veh/hr)	Average throughput (PCU/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
A - A12 (E)	586	146	736	590	595	605	1.0	1.1	7.099	A
B - Chelmsford Road	963	241	476	965	982	849	1.0	1.0	3.420	A
C - A12 (W)	732	183	945	735	770	497	1.7	1.2	7.400	A
D - Roman Road	686	171	654	687	707	1025	0.6	0.7	3.282	A

17:30 - 17:45

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Throughput (Veh/hr)	Average throughput (PCU/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
A - A12 (E)	607	152	756	607	606	608	1.1	1.1	7.429	A
B - Chelmsford Road	960	240	506	961	974	857	1.0	0.8	3.425	A
C - A12 (W)	754	188	953	749	771	514	1.2	1.6	7.717	A
D - Roman Road	708	177	659	706	710	1044	0.7	0.7	3.375	A

17:45 - 18:00

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Throughput (Veh/hr)	Average throughput (PCU/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
A - A12 (E)	607	152	734	608	607	598	1.1	1.1	7.159	A
B - Chelmsford Road	963	241	490	963	972	852	0.8	0.8	3.476	A
C - A12 (W)	738	185	941	737	770	512	1.6	1.4	7.208	A
D - Roman Road	689	172	646	686	706	1032	0.7	0.7	3.320	A

18:00 - 18:15

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Throughput (Veh/hr)	Average throughput (PCU/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
A - A12 (E)	598	149	748	597	609	601	1.1	1.3	7.345	A
B - Chelmsford Road	943	236	488	945	974	856	0.8	0.9	3.510	A
C - A12 (W)	736	184	936	736	773	498	1.4	1.4	7.286	A
D - Roman Road	703	176	649	700	707	1023	0.7	0.8	3.401	A

18:15 - 18:30

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Throughput (Veh/hr)	Average throughput (PCU/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
A - A12 (E)	595	149	725	595	604	609	1.3	1.1	7.191	A
B - Chelmsford Road	967	242	479	969	982	840	0.9	1.0	3.566	A
C - A12 (W)	718	180	949	720	761	499	1.4	1.2	6.918	A
D - Roman Road	684	171	647	686	699	1021	0.8	0.7	3.253	A

Lane Results

Lane Level notation: Lane Level 1 is always closest to the junction.

Lanes: Main Results for each time segment

17:00 - 17:15

Arm	Side	Lane level	Lane	Destination arms	Total Demand (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Average throughput (PCU/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
A - A12 (E)	Entry	1	1	B, C	503	965	0.521	507	494	0.0	0.9	8.171	A
			2	A, C, D	110	958	0.115	110	114	0.0	0.1	4.228	A
	Exit	1	1		616			616	620	0.0	0.0	0.000	A
B - Chelmsford Road	Entry	1	1	A, B, C, D	966	2020	0.478	966	973	0.0	1.0	3.439	A
	Exit	1	1		854			854	857	0.0	0.0	0.000	A
C - A12 (W)	Entry	1	1	A, D	571	1024	0.558	570	587	0.0	1.5	8.100	A
			2	A, B, C	168	1017	0.165	170	182	0.0	0.2	4.245	A
	Exit	1	1		495			495	513	0.0	0.0	0.000	A
D - Roman Road	Entry	1	1	A, B, C, D	681	1794	0.380	681	700	0.0	0.6	3.407	A
	Exit	1	1		1039			1039	1062	0.0	0.0	0.000	A

17:15 - 17:30

Arm	Side	Lane level	Lane	Destination arms	Total Demand (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Average throughput (PCU/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
A - A12 (E)	Entry	1	1	B, C	483	955	0.506	486	487	0.9	1.0	7.733	A
			2	A, C, D	103	956	0.108	103	108	0.1	0.1	4.239	A
	Exit	1	1		605			605	619	0.0	0.0	0.000	A
B - Chelmsford Road	Entry	1	1	A, B, C, D	963	2020	0.477	965	982	1.0	1.0	3.420	A
	Exit	1	1		849			849	857	0.0	0.0	0.000	A
C - A12 (W)	Entry	1	1	A, D	558	1026	0.543	560	589	1.5	1.0	8.384	A
			2	A, B, C	174	1017	0.172	175	181	0.2	0.2	4.172	A
	Exit	1	1		497			497	516	0.0	0.0	0.000	A
D - Roman Road	Entry	1	1	A, B, C, D	686	1784	0.384	687	707	0.6	0.7	3.282	A
	Exit	1	1		1025			1025	1063	0.0	0.0	0.000	A

17:30 - 17:45

Arm	Side	Lane level	Lane	Destination arms	Total Demand (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Average throughput (PCU/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
A - A12 (E)	Entry	1	1	B, C	490	944	0.519	490	490	1.0	0.9	8.183	A
			2	A, C, D	116	945	0.123	117	116	0.1	0.1	4.240	A
	Exit	1	1		608			608	619	0.0	0.0	0.000	A
B - Chelmsford Road	Entry	1	1	A, B, C, D	960	1996	0.481	961	974	1.0	0.8	3.425	A
	Exit	1	1		857			857	859	0.0	0.0	0.000	A
C - A12 (W)	Entry	1	1	A, D	572	1026	0.558	568	588	1.0	1.4	8.765	A
			2	A, B, C	182	1026	0.178	182	182	0.2	0.2	4.326	A
	Exit	1	1		514			514	517	0.0	0.0	0.000	A
D - Roman Road	Entry	1	1	A, B, C, D	708	1786	0.397	706	710	0.7	0.7	3.375	A
	Exit	1	1		1044			1044	1064	0.0	0.0	0.000	A

17:45 - 18:00

Arm	Side	Lane level	Lane	Destination arms	Total Demand (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Average throughput (PCU/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
A - A12 (E)	Entry	1	1	B, C	504	951	0.530	505	498	0.9	1.0	7.789	A
			2	A, C, D	102	953	0.107	103	109	0.1	0.1	4.281	A
	Exit	1	1		598			598	618	0.0	0.0	0.000	A
B - Chelmsford Road	Entry	1	1	A, B, C, D	963	2008	0.480	963	972	0.8	0.8	3.476	A
	Exit	1	1		852			852	860	0.0	0.0	0.000	A
C - A12 (W)	Entry	1	1	A, D	567	1029	0.551	565	590	1.4	1.2	7.991	A
			2	A, B, C	171	1010	0.169	171	181	0.2	0.2	4.638	A
	Exit	1	1		512			512	518	0.0	0.0	0.000	A
D - Roman Road	Entry	1	1	A, B, C, D	689	1789	0.385	686	706	0.7	0.7	3.320	A
	Exit	1	1		1032			1032	1060	0.0	0.0	0.000	A

18:00 - 18:15

Arm	Side	Lane level	Lane	Destination arms	Total Demand (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Average throughput (PCU/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
A - A12 (E)	Entry	1	1	B, C	486	947	0.513	486	495	1.0	1.2	8.084	A
			2	A, C, D	112	950	0.118	111	114	0.1	0.2	4.127	A
	Exit	1	1		601			601	623	0.0	0.0	0.000	A
B - Chelmsford Road	Entry	1	1	A, B, C, D	943	2012	0.469	945	974	0.8	0.9	3.510	A
	Exit	1	1		856			856	870	0.0	0.0	0.000	A
C - A12 (W)	Entry	1	1	A, D	561	1035	0.542	561	589	1.2	1.2	8.185	A
			2	A, B, C	175	1027	0.170	175	185	0.2	0.2	4.372	A
	Exit	1	1		498			498	511	0.0	0.0	0.000	A
D - Roman Road	Entry	1	1	A, B, C, D	703	1788	0.393	700	707	0.7	0.8	3.401	A
	Exit	1	1		1023			1023	1060	0.0	0.0	0.000	A

18:15 - 18:30

Arm	Side	Lane level	Lane	Destination arms	Total Demand (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Average throughput (PCU/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
A - A12 (E)	Entry	1	1	B, C	490	960	0.510	491	497	1.2	1.0	7.825	A
			2	A, C, D	104	963	0.108	104	107	0.2	0.1	4.270	A
	Exit	1	1		609			609	627	0.0	0.0	0.000	A
B - Chelmsford Road	Entry	1	1	A, B, C, D	967	2020	0.479	969	982	0.9	1.0	3.566	A
	Exit	1	1		840			840	858	0.0	0.0	0.000	A
C - A12 (W)	Entry	1	1	A, D	551	1028	0.536	553	581	1.2	1.0	7.728	A
			2	A, B, C	167	1020	0.164	167	181	0.2	0.1	4.291	A
	Exit	1	1		499			499	512	0.0	0.0	0.000	A
D - Roman Road	Entry	1	1	A, B, C, D	684	1794	0.382	686	699	0.8	0.7	3.253	A
	Exit	1	1		1021			1021	1049	0.0	0.0	0.000	A

2033 Base, AM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Lane Simulation	A1 - [Lane Simulation]	This analysis set uses Lane Simulation mode. This is provided as an investigative tool and the user should apply judgement when interpreting the results.
Last Run	Lane Simulation	A - A12 (E) - Lane Simulation	Arm A: Queue at end of modelled period is greater than 10 PCU. Delay is likely to have been underestimated.
Warning	Profile Type	D5 - 2033 Base, AM	The DIRECT profile type is intended to be used for demand that varies over time. You are using it with the 'Use O-D data' option, but your O-D data does not vary over time. Are you sure this is correct?

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (s)	Junction LOS
1	Mountnessing Roundabout	Large Roundabout		A, B, C, D	16.23	C

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Arms

Arms

[same as above]

Roundabout Geometry

[same as above]

Large Roundabout Data

Arm	Circulating flow (PCU/hr)	Entry-to-exit separation (m)
A - A12 (E)	1142	88.10
B - Chelmsford Road	667	0.00
C - A12 (W)	899	86.00
D - Roman Road	621	0.00

Slope / Intercept / Capacity

[same as above]

Lane Simulation: Arm options

[same as above]

Lanes

[same as above]

Entry Lane slope and intercept

[same as above]

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time period length (min)	Time segment length (min)	Run automatically
D5	2033 Base	AM	DIRECT	08:00	09:30	90	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	Scaling Factor (%)
A - A12 (E)		DIRECT	✓	100.000
B - Chelmsford Road		DIRECT	✓	100.000
C - A12 (W)		DIRECT	✓	100.000
D - Roman Road		DIRECT	✓	100.000

Origin-Destination Data

Demand (Veh/hr)

		To			
		A - A12 (E)	B - Chelmsford Road	C - A12 (W)	D - Roman Road
From	A - A12 (E)	1	677	11	140
	B - Chelmsford Road	397	1	168	319
	C - A12 (W)	3	192	1	465
	D - Roman Road	158	431	476	1

Vehicle Mix

Heavy Vehicle Percentages

		To			
		A - A12 (E)	B - Chelmsford Road	C - A12 (W)	D - Roman Road
From	A - A12 (E)	0	4	18	9
	B - Chelmsford Road	5	0	3	3
	C - A12 (W)	0	4	0	7
	D - Roman Road	6	2	5	0

Results

Results Summary for whole modelled period

Arm	Max Delay (s)	Max Queue (Veh)	Max LOS	Average Demand (Veh/hr)	Total Junction Arrivals (Veh)
A - A12 (E)	51.27	12.4	F	829	1243
B - Chelmsford Road	4.12	1.1	A	884	1326
C - A12 (W)	6.00	1.2	A	660	990
D - Roman Road	5.14	1.7	A	1059	1589

Main Results for each time segment

08:00 - 08:15

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Throughput (Veh/hr)	Average throughput (PCU/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
A - A12 (E)	832	208	1101	815	838	553	0.0	9.7	31.962	D
B - Chelmsford Road	874	219	632	874	913	1285	0.0	1.0	4.013	A
C - A12 (W)	673	168	846	670	705	660	0.0	1.2	5.826	A
D - Roman Road	1063	266	594	1059	1099	922	0.0	1.6	5.084	A

08:15 - 08:30

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Throughput (Veh/hr)	Average throughput (PCU/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
A - A12 (E)	820	205	1085	821	865	570	9.7	10.5	44.288	E
B - Chelmsford Road	898	224	625	900	929	1281	1.0	0.8	4.066	A
C - A12 (W)	659	165	865	659	703	661	1.2	1.1	5.827	A
D - Roman Road	1057	264	601	1054	1097	922	1.6	1.7	5.110	A

08:30 - 08:45

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Throughput (Veh/hr)	Average throughput (PCU/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
A - A12 (E)	832	208	1107	838	874	554	10.5	10.0	46.256	E
B - Chelmsford Road	882	221	638	884	920	1307	0.8	1.0	4.119	A
C - A12 (W)	664	166	860	664	699	661	1.1	1.0	5.825	A
D - Roman Road	1066	266	597	1064	1104	928	1.7	1.7	5.061	A

08:45 - 09:00

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Throughput (Veh/hr)	Average throughput (PCU/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
A - A12 (E)	833	208	1097	829	859	553	10.0	11.4	46.853	E
B - Chelmsford Road	872	218	625	876	920	1302	1.0	0.8	4.038	A
C - A12 (W)	666	166	850	666	701	651	1.0	1.0	5.856	A
D - Roman Road	1062	266	592	1059	1104	924	1.7	1.7	5.074	A

09:00 - 09:15

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Throughput (Veh/hr)	Average throughput (PCU/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
A - A12 (E)	840	210	1083	834	868	557	11.4	12.5	51.274	F
B - Chelmsford Road	889	222	620	889	926	1296	0.8	1.2	4.058	A
C - A12 (W)	649	162	866	649	696	643	1.0	1.0	5.812	A
D - Roman Road	1042	261	594	1046	1106	920	1.7	1.4	5.145	A

09:15 - 09:30

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Throughput (Veh/hr)	Average throughput (PCU/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
A - A12 (E)	822	205	1095	829	876	567	12.5	10.7	48.215	E
B - Chelmsford Road	887	222	628	885	924	1296	1.2	1.1	4.064	A
C - A12 (W)	651	163	854	653	697	659	1.0	1.0	6.003	A
D - Roman Road	1063	266	597	1064	1104	909	1.4	1.5	4.982	A

Lane Results

Lane Level notation: Lane Level 1 is always closest to the junction.

Lanes: Main Results for each time segment

08:00 - 08:15

Arm	Side	Lane level	Lane	Destination arms	Total Demand (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Average throughput (PCU/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
A - A12 (E)	Entry	1	1	B, C	681	742	0.918	665	670	0.0	9.5	37.688	E
			2	A, C, D	151	702	0.216	150	169	0.0	0.3	6.646	A
	Exit	1	1		553			553	584	0.0	0.0	0.000	A
B - Chelmsford Road	Entry	1	1	A, B, C, D	874	1789	0.489	874	913	0.0	1.0	4.013	A
	Exit	1	1		1285			1285	1306	0.0	0.0	0.000	A
C - A12 (W)	Entry	1	1	A, D	469	1037	0.453	467	499	0.0	1.0	6.488	A
			2	A, B, C	204	1064	0.191	203	206	0.0	0.2	4.256	A
	Exit	1	1		660			660	686	0.0	0.0	0.000	A
D - Roman Road	Entry	1	1	A, B, C, D	1063	1793	0.593	1059	1099	0.0	1.6	5.084	A
	Exit	1	1		922			922	979	0.0	0.0	0.000	A

08:15 - 08:30

Arm	Side	Lane level	Lane	Destination arms	Total Demand (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Average throughput (PCU/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
A - A12 (E)	Entry	1	1	B, C	674	748	0.900	676	702	9.5	10.2	52.563	F
			2	A, C, D	146	707	0.206	146	163	0.3	0.3	6.452	A
	Exit	1	1		570			570	591	0.0	0.0	0.000	A
B - Chelmsford Road	Entry	1	1	A, B, C, D	898	1803	0.498	900	929	1.0	0.8	4.066	A
	Exit	1	1		1281			1281	1332	0.0	0.0	0.000	A
C - A12 (W)	Entry	1	1	A, D	470	1028	0.457	468	502	1.0	0.9	6.521	A
			2	A, B, C	190	1060	0.179	191	201	0.2	0.2	4.152	A
	Exit	1	1		661			661	686	0.0	0.0	0.000	A
D - Roman Road	Entry	1	1	A, B, C, D	1057	1788	0.591	1054	1097	1.6	1.7	5.110	A
	Exit	1	1		922			922	984	0.0	0.0	0.000	A

08:30 - 08:45

Arm	Side	Lane level	Lane	Destination arms	Total Demand (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Average throughput (PCU/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
A - A12 (E)	Entry	1	1	B, C	680	738	0.920	686	706	10.2	9.8	55.189	F
			2	A, C, D	152	698	0.217	153	169	0.3	0.2	6.758	A
	Exit	1	1		554			554	587	0.0	0.0	0.000	A
B - Chelmsford Road	Entry	1	1	A, B, C, D	882	1786	0.494	884	920	0.8	1.0	4.119	A
	Exit	1	1		1307			1307	1346	0.0	0.0	0.000	A
C - A12 (W)	Entry	1	1	A, D	469	1031	0.454	469	494	0.9	0.8	6.523	A
			2	A, B, C	196	1051	0.186	196	205	0.2	0.2	4.185	A
	Exit	1	1		661			661	687	0.0	0.0	0.000	A
D - Roman Road	Entry	1	1	A, B, C, D	1066	1791	0.595	1064	1104	1.7	1.7	5.061	A
	Exit	1	1		928			928	976	0.0	0.0	0.000	A

08:45 - 09:00

Arm	Side	Lane level	Lane	Destination arms	Total Demand (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Average throughput (PCU/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
A - A12 (E)	Entry	1	1	B, C	682	744	0.914	678	697	9.8	11.1	55.716	F
			2	A, C, D	151	709	0.213	152	163	0.2	0.3	6.826	A
	Exit	1	1		553			553	586	0.0	0.0	0.000	A
B - Chelmsford Road	Entry	1	1	A, B, C, D	872	1798	0.485	876	920	1.0	0.8	4.038	A
	Exit	1	1		1302			1302	1333	0.0	0.0	0.000	A
C - A12 (W)	Entry	1	1	A, D	468	1035	0.453	469	499	0.8	0.8	6.574	A
			2	A, B, C	197	1063	0.185	197	202	0.2	0.2	4.133	A
	Exit	1	1		651			651	689	0.0	0.0	0.000	A
D - Roman Road	Entry	1	1	A, B, C, D	1062	1793	0.593	1059	1104	1.7	1.7	5.074	A
	Exit	1	1		924			924	976	0.0	0.0	0.000	A

09:00 - 09:15

Arm	Side	Lane level	Lane	Destination arms	Total Demand (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Average throughput (PCU/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
A - A12 (E)	Entry	1	1	B, C	686	750	0.914	679	704	11.1	12.3	61.097	F
			2	A, C, D	154	721	0.213	154	164	0.3	0.2	6.590	A
	Exit	1	1		557			557	590	0.0	0.0	0.000	A
B - Chelmsford Road	Entry	1	1	A, B, C, D	889	1805	0.493	889	926	0.8	1.2	4.058	A
	Exit	1	1		1296			1296	1343	0.0	0.0	0.000	A
C - A12 (W)	Entry	1	1	A, D	456	1028	0.443	456	493	0.8	0.8	6.497	A
			2	A, B, C	193	1053	0.183	192	203	0.2	0.2	4.192	A
	Exit	1	1		643			643	688	0.0	0.0	0.000	A
D - Roman Road	Entry	1	1	A, B, C, D	1042	1795	0.581	1046	1106	1.7	1.4	5.145	A
	Exit	1	1		920			920	974	0.0	0.0	0.000	A

09:15 - 09:30

Arm	Side	Lane level	Lane	Destination arms	Total Demand (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Average throughput (PCU/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
A - A12 (E)	Entry	1	1	B, C	671	747	0.899	677	708	12.3	10.4	57.923	F
			2	A, C, D	150	712	0.211	152	168	0.2	0.2	6.751	A
	Exit	1	1		567			567	591	0.0	0.0	0.000	A
B - Chelmsford Road	Entry	1	1	A, B, C, D	887	1796	0.494	885	924	1.2	1.1	4.064	A
	Exit	1	1		1296			1296	1343	0.0	0.0	0.000	A
C - A12 (W)	Entry	1	1	A, D	458	1028	0.445	459	495	0.8	0.8	6.800	A
			2	A, B, C	193	1069	0.181	193	201	0.2	0.2	4.103	A
	Exit	1	1		659			659	687	0.0	0.0	0.000	A
D - Roman Road	Entry	1	1	A, B, C, D	1063	1794	0.593	1064	1104	1.4	1.5	4.982	A
	Exit	1	1		909			909	980	0.0	0.0	0.000	A

2033 Base, PM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Lane Simulation	A1 - [Lane Simulation]	This analysis set uses Lane Simulation mode. This is provided as an investigative tool and the user should apply judgement when interpreting the results.
Warning	Profile Type	D6 - 2033 Base, PM	The DIRECT profile type is intended to be used for demand that varies over time. You are using it with the 'Use O-D data' option, but your O-D data does not vary over time. Are you sure this is correct?

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (s)	Junction LOS
1	Mountnessing Roundabout	Large Roundabout		A, B, C, D	6.42	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Arms

Arms

[same as above]

Roundabout Geometry

[same as above]

Large Roundabout Data

Arm	Circulating flow (PCU/hr)	Entry-to-exit separation (m)
A - A12 (E)	760	88.10
B - Chelmsford Road	504	0.00
C - A12 (W)	965	86.00
D - Roman Road	672	0.00

Slope / Intercept / Capacity

[same as above]

Lane Simulation: Arm options

[same as above]

Lanes

[same as above]

Entry Lane slope and intercept

[same as above]

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time period length (min)	Time segment length (min)	Run automatically
D6	2033 Base	PM	DIRECT	17:00	18:30	90	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	Scaling Factor (%)
A - A12 (E)		DIRECT	✓	100.000
B - Chelmsford Road		DIRECT	✓	100.000
C - A12 (W)		DIRECT	✓	100.000
D - Roman Road		DIRECT	✓	100.000

Origin-Destination Data

Demand (Veh/hr)

		To			
		A - A12 (E)	B - Chelmsford Road	C - A12 (W)	D - Roman Road
From	A - A12 (E)	0	492	2	111
	B - Chelmsford Road	479	1	124	362
	C - A12 (W)	2	172	0	566
	D - Roman Road	131	186	381	1

Vehicle Mix

Heavy Vehicle Percentages

		To			
		A - A12 (E)	B - Chelmsford Road	C - A12 (W)	D - Roman Road
From	A - A12 (E)	0	9	2	3
	B - Chelmsford Road	20	0	9	0
	C - A12 (W)	1	2	0	8
	D - Roman Road	1	0	7	0

Results

Results Summary for whole modelled period

Arm	Max Delay (s)	Max Queue (Veh)	Max LOS	Average Demand (Veh/hr)	Total Junction Arrivals (Veh)
A - A12 (E)	9.05	1.8	A	598	897
B - Chelmsford Road	4.64	1.9	A	958	1437
C - A12 (W)	9.05	2.1	A	738	1107
D - Roman Road	3.88	0.9	A	706	1059

Main Results for each time segment

17:00 - 17:15

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Throughput (Veh/hr)	Average throughput (PCU/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
A - A12 (E)	589	147	740	591	648	621	0.0	1.7	8.878	A
B - Chelmsford Road	959	240	504	957	1066	827	0.0	1.1	4.366	A
C - A12 (W)	731	183	953	730	782	508	0.0	2.1	8.469	A
D - Roman Road	712	178	649	712	734	1034	0.0	0.7	3.838	A

17:15 - 17:30

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Throughput (Veh/hr)	Average throughput (PCU/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
A - A12 (E)	607	152	744	607	657	606	1.7	1.6	8.865	A
B - Chelmsford Road	965	241	499	973	1076	852	1.1	0.9	4.537	A
C - A12 (W)	740	185	963	742	783	509	2.1	1.7	8.722	A
D - Roman Road	700	175	652	699	731	1053	0.7	0.7	3.759	A

17:30 - 17:45

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Throughput (Veh/hr)	Average throughput (PCU/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
A - A12 (E)	601	150	760	601	647	610	1.6	1.3	8.820	A
B - Chelmsford Road	960	240	498	957	1070	863	0.9	1.5	4.590	A
C - A12 (W)	741	185	947	743	775	508	1.7	1.8	8.390	A
D - Roman Road	710	178	661	709	738	1030	0.7	0.9	3.884	A

17:45 - 18:00

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Throughput (Veh/hr)	Average throughput (PCU/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
A - A12 (E)	594	149	751	590	653	606	1.3	1.7	8.991	A
B - Chelmsford Road	959	240	499	958	1082	842	1.5	1.3	4.564	A
C - A12 (W)	750	187	943	750	795	513	1.8	1.9	9.045	A
D - Roman Road	702	175	649	708	725	1045	0.9	0.4	3.718	A

18:00 - 18:15

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Throughput (Veh/hr)	Average throughput (PCU/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
A - A12 (E)	609	152	749	607	656	608	1.7	1.6	9.053	A
B - Chelmsford Road	955	239	508	949	1079	849	1.3	1.6	4.637	A
C - A12 (W)	739	185	944	737	789	513	1.9	1.7	9.010	A
D - Roman Road	713	178	643	715	727	1038	0.4	0.7	3.739	A

18:15 - 18:30

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Throughput (Veh/hr)	Average throughput (PCU/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
A - A12 (E)	589	147	750	593	650	596	1.6	1.5	8.686	A
B - Chelmsford Road	953	238	499	943	1058	843	1.6	1.8	4.229	A
C - A12 (W)	731	183	937	731	784	505	1.7	1.7	8.974	A
D - Roman Road	700	175	647	700	731	1021	0.7	0.7	3.662	A

Lane Results

Lane Level notation: Lane Level 1 is always closest to the junction.

Lanes: Main Results for each time segment

17:00 - 17:15

Arm	Side	Lane level	Lane	Destination arms	Total Demand (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Average throughput (PCU/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
A - A12 (E)	Entry	1	1	B, C	475	874	0.543	476	530	0.0	1.6	9.898	A
			2	A, C, D	114	925	0.123	116	118	0.0	0.1	4.473	A
	Exit	1	1		621			621	715	0.0	0.0	0.000	A
B - Chelmsford Road	Entry	1	1	A, B, C, D	959	1807	0.530	957	1066	0.0	1.1	4.366	A
	Exit	1	1		827			827	891	0.0	0.0	0.000	A
C - A12 (W)	Entry	1	1	A, D	565	947	0.596	564	607	0.0	1.9	9.690	A
			2	A, B, C	165	1003	0.165	166	175	0.0	0.2	4.425	A
	Exit	1	1		508			508	543	0.0	0.0	0.000	A
D - Roman Road	Entry	1	1	A, B, C, D	712	1687	0.422	712	734	0.0	0.7	3.838	A
	Exit	1	1		1034			1034	1081	0.0	0.0	0.000	A

17:15 - 17:30

Arm	Side	Lane level	Lane	Destination arms	Total Demand (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Average throughput (PCU/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
A - A12 (E)	Entry	1	1	B, C	494	876	0.564	495	541	1.6	1.4	9.886	A
			2	A, C, D	113	925	0.122	112	116	0.1	0.2	4.411	A
	Exit	1	1		606			606	707	0.0	0.0	0.000	A
B - Chelmsford Road	Entry	1	1	A, B, C, D	965	1805	0.534	973	1076	1.1	0.9	4.537	A
	Exit	1	1		852			852	907	0.0	0.0	0.000	A
C - A12 (W)	Entry	1	1	A, D	569	939	0.605	569	607	1.9	1.5	10.043	B
			2	A, B, C	171	995	0.172	173	176	0.2	0.1	4.433	A
	Exit	1	1		509			509	546	0.0	0.0	0.000	A
D - Roman Road	Entry	1	1	A, B, C, D	700	1686	0.415	699	731	0.7	0.7	3.759	A
	Exit	1	1		1053			1053	1088	0.0	0.0	0.000	A

17:30 - 17:45

Arm	Side	Lane level	Lane	Destination arms	Total Demand (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Average throughput (PCU/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
A - A12 (E)	Entry	1	1	B, C	490	865	0.566	491	533	1.4	1.1	9.791	A
			2	A, C, D	110	909	0.122	110	114	0.2	0.1	4.524	A
	Exit	1	1		610			610	708	0.0	0.0	0.000	A
B - Chelmsford Road	Entry	1	1	A, B, C, D	960	1796	0.533	957	1070	0.9	1.5	4.590	A
	Exit	1	1		863			863	896	0.0	0.0	0.000	A
C - A12 (W)	Entry	1	1	A, D	565	944	0.597	566	599	1.5	1.6	9.602	A
			2	A, B, C	177	1003	0.176	177	177	0.1	0.2	4.513	A
	Exit	1	1		508			508	555	0.0	0.0	0.000	A
D - Roman Road	Entry	1	1	A, B, C, D	710	1674	0.424	709	738	0.7	0.9	3.884	A
	Exit	1	1		1030			1030	1071	0.0	0.0	0.000	A

17:45 - 18:00

Arm	Side	Lane level	Lane	Destination arms	Total Demand (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Average throughput (PCU/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
A - A12 (E)	Entry	1	1	B, C	481	873	0.551	477	536	1.1	1.5	10.031	B
			2	A, C, D	113	933	0.122	113	117	0.1	0.2	4.482	A
	Exit	1	1		606			606	707	0.0	0.0	0.000	A
B - Chelmsford Road	Entry	1	1	A, B, C, D	959	1818	0.527	958	1082	1.5	1.3	4.564	A
	Exit	1	1		842			842	899	0.0	0.0	0.000	A
C - A12 (W)	Entry	1	1	A, D	572	954	0.599	572	616	1.6	1.7	10.454	B
			2	A, B, C	178	1010	0.176	178	179	0.2	0.2	4.461	A
	Exit	1	1		513			513	549	0.0	0.0	0.000	A
D - Roman Road	Entry	1	1	A, B, C, D	702	1703	0.412	708	725	0.9	0.4	3.718	A
	Exit	1	1		1045			1045	1100	0.0	0.0	0.000	A

18:00 - 18:15

Arm	Side	Lane level	Lane	Destination arms	Total Demand (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Average throughput (PCU/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
A - A12 (E)	Entry	1	1	B, C	494	872	0.566	491	536	1.5	1.5	10.195	B
			2	A, C, D	115	924	0.124	116	120	0.2	0.1	4.218	A
	Exit	1	1		608			608	710	0.0	0.0	0.000	A
B - Chelmsford Road	Entry	1	1	A, B, C, D	955	1794	0.532	949	1079	1.3	1.6	4.637	A
	Exit	1	1		849			849	901	0.0	0.0	0.000	A
C - A12 (W)	Entry	1	1	A, D	566	946	0.598	564	609	1.7	1.5	10.444	B
			2	A, B, C	172	1003	0.172	173	180	0.2	0.2	4.425	A
	Exit	1	1		513			513	545	0.0	0.0	0.000	A
D - Roman Road	Entry	1	1	A, B, C, D	713	1692	0.422	715	727	0.4	0.7	3.739	A
	Exit	1	1		1038			1038	1096	0.0	0.0	0.000	A

18:15 - 18:30

Arm	Side	Lane level	Lane	Destination arms	Total Demand (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Average throughput (PCU/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
A - A12 (E)	Entry	1	1	B, C	476	872	0.546	480	532	1.5	1.3	9.681	A
			2	A, C, D	113	919	0.123	113	117	0.1	0.1	4.456	A
	Exit	1	1		596			596	700	0.0	0.0	0.000	A
B - Chelmsford Road	Entry	1	1	A, B, C, D	953	1809	0.527	943	1058	1.6	1.8	4.229	A
	Exit	1	1		843			843	902	0.0	0.0	0.000	A
C - A12 (W)	Entry	1	1	A, D	557	952	0.585	557	605	1.5	1.5	10.388	B
			2	A, B, C	174	1014	0.172	173	179	0.2	0.2	4.457	A
	Exit	1	1		505			505	542	0.0	0.0	0.000	A
D - Roman Road	Entry	1	1	A, B, C, D	700	1692	0.414	700	731	0.7	0.7	3.662	A
	Exit	1	1		1021			1021	1079	0.0	0.0	0.000	A

2028 Base + Committed Development, AM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Lane Simulation	A1 - [Lane Simulation]	This analysis set uses Lane Simulation mode. This is provided as an investigative tool and the user should apply judgement when interpreting the results.
Last Run	Lane Simulation	A - A12 (E) - Lane Simulation	Arm A: Queue at end of modelled period is greater than 10 PCU. Delay is likely to have been underestimated.
Warning	Profile Type	D9 - 2028 Base + Committed Development, AM	The DIRECT profile type is intended to be used for demand that varies over time. You are using it with the 'Use O-D data' option, but your O-D data does not vary over time. Are you sure this is correct?

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (s)	Junction LOS
1	Mountnessing Roundabout	Large Roundabout		A, B, C, D	23.06	C

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Arms

Arms

[same as above]

Roundabout Geometry

[same as above]

Large Roundabout Data

Arm	Circulating flow (PCU/hr)	Entry-to-exit separation (m)
A - A12 (E)	1142	88.10
B - Chelmsford Road	667	0.00
C - A12 (W)	899	86.00
D - Roman Road	621	0.00

Slope / Intercept / Capacity

[same as above]

Lane Simulation: Arm options

[same as above]

Lanes

[same as above]

Entry Lane slope and intercept

[same as above]

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time period length (min)	Time segment length (min)	Run automatically
D9	2028 Base + Committed Development	AM	DIRECT	08:00	09:30	90	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	Scaling Factor (%)
A - A12 (E)		DIRECT	✓	100.000
B - Chelmsford Road		DIRECT	✓	100.000
C - A12 (W)		DIRECT	✓	100.000
D - Roman Road		DIRECT	✓	100.000

Origin-Destination Data

Demand (Veh/hr)

		To			
		A - A12 (E)	B - Chelmsford Road	C - A12 (W)	D - Roman Road
From	A - A12 (E)	1	686	11	139
	B - Chelmsford Road	416	1	227	343
	C - A12 (W)	3	226	1	463
	D - Roman Road	157	444	474	1

Vehicle Mix

Heavy Vehicle Percentages

		To			
		A - A12 (E)	B - Chelmsford Road	C - A12 (W)	D - Roman Road
From	A - A12 (E)	0	4	18	9
	B - Chelmsford Road	5	0	2	3
	C - A12 (W)	0	4	0	7
	D - Roman Road	6	2	5	0

Results

Results Summary for whole modelled period

Arm	Max Delay (s)	Max Queue (Veh)	Max LOS	Average Demand (Veh/hr)	Total Junction Arrivals (Veh)
A - A12 (E)	80.98	19.2	F	835	1253
B - Chelmsford Road	4.56	1.3	A	984	1476
C - A12 (W)	6.15	1.3	A	690	1034
D - Roman Road	5.52	1.7	A	1077	1615

Main Results for each time segment

08:00 - 08:15

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Throughput (Veh/hr)	Average throughput (PCU/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
A - A12 (E)	850	213	1144	819	833	572	0.0	12.2	37.424	E
B - Chelmsford Road	984	246	620	985	1013	1343	0.0	1.1	4.397	A
C - A12 (W)	694	173	901	690	729	704	0.0	1.2	6.011	A
D - Roman Road	1074	269	645	1071	1113	947	0.0	1.6	5.504	A

08:15 - 08:30

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Throughput (Veh/hr)	Average throughput (PCU/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
A - A12 (E)	830	207	1138	833	869	577	12.2	14.5	61.192	F
B - Chelmsford Road	987	247	628	990	1019	1343	1.1	1.1	4.565	A
C - A12 (W)	692	173	900	691	738	718	1.2	1.3	6.139	A
D - Roman Road	1066	267	648	1067	1119	944	1.6	1.6	5.458	A

08:30 - 08:45

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Throughput (Veh/hr)	Average throughput (PCU/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
A - A12 (E)	831	208	1149	836	875	577	14.5	15.9	69.086	F
B - Chelmsford Road	981	245	629	980	1022	1356	1.1	1.3	4.504	A
C - A12 (W)	690	172	887	689	734	723	1.3	1.2	6.147	A
D - Roman Road	1081	270	645	1081	1122	930	1.6	1.5	5.336	A

08:45 - 09:00

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Throughput (Veh/hr)	Average throughput (PCU/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
A - A12 (E)	833	208	1141	829	870	576	15.9	17.7	73.985	F
B - Chelmsford Road	985	246	622	983	1018	1348	1.3	1.3	4.385	A
C - A12 (W)	685	171	895	685	729	710	1.2	1.1	6.150	A
D - Roman Road	1076	269	640	1077	1117	940	1.5	1.6	5.520	A

09:00 - 09:15

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Throughput (Veh/hr)	Average throughput (PCU/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
A - A12 (E)	838	209	1150	829	869	579	17.7	19.4	80.978	F
B - Chelmsford Road	980	245	631	979	1021	1347	1.3	1.2	4.558	A
C - A12 (W)	688	172	901	686	735	709	1.1	1.2	6.069	A
D - Roman Road	1077	269	651	1078	1121	936	1.6	1.6	5.520	A

09:15 - 09:30

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Throughput (Veh/hr)	Average throughput (PCU/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
A - A12 (E)	828	207	1155	828	876	577	19.4	19.1	77.227	F
B - Chelmsford Road	985	246	627	981	1016	1356	1.2	1.3	4.448	A
C - A12 (W)	690	172	898	692	730	710	1.2	1.0	6.026	A
D - Roman Road	1087	272	642	1089	1124	947	1.6	1.5	5.329	A

Lane Results

Lane Level notation: Lane Level 1 is always closest to the junction.

Lanes: Main Results for each time segment

08:00 - 08:15

Arm	Side	Lane level	Lane	Destination arms	Total Demand (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Average throughput (PCU/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
A - A12 (E)	Entry	1	1	B, C	698	720	0.967	667	669	0.0	11.9	44.121	E
			2	A, C, D	152	687	0.222	152	164	0.0	0.3	6.682	A
	Exit	1	1		572			572	602	0.0	0.0	0.000	A
B - Chelmsford Road	Entry	1	1	A, B, C, D	984	1814	0.543	985	1013	0.0	1.1	4.397	A
	Exit	1	1		1343			1343	1354	0.0	0.0	0.000	A
C - A12 (W)	Entry	1	1	A, D	462	1010	0.458	459	491	0.0	1.0	6.757	A
			2	A, B, C	231	1035	0.223	231	238	0.0	0.3	4.502	A
	Exit	1	1		704			704	739	0.0	0.0	0.000	A
D - Roman Road	Entry	1	1	A, B, C, D	1074	1755	0.612	1071	1113	0.0	1.6	5.504	A
	Exit	1	1		947			947	992	0.0	0.0	0.000	A

08:15 - 08:30

Arm	Side	Lane level	Lane	Destination arms	Total Demand (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Average throughput (PCU/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
A - A12 (E)	Entry	1	1	B, C	677	725	0.935	680	702	11.9	14.1	73.295	F
			2	A, C, D	153	687	0.223	153	167	0.3	0.3	6.824	A
	Exit	1	1		577			577	606	0.0	0.0	0.000	A
B - Chelmsford Road	Entry	1	1	A, B, C, D	987	1803	0.548	990	1019	1.1	1.1	4.565	A
	Exit	1	1		1343			1343	1392	0.0	0.0	0.000	A
C - A12 (W)	Entry	1	1	A, D	465	1012	0.460	465	498	1.0	1.0	6.934	A
			2	A, B, C	227	1036	0.219	227	240	0.3	0.3	4.530	A
	Exit	1	1		718			718	750	0.0	0.0	0.000	A
D - Roman Road	Entry	1	1	A, B, C, D	1066	1749	0.610	1067	1119	1.6	1.6	5.458	A
	Exit	1	1		944			944	998	0.0	0.0	0.000	A

08:30 - 08:45

Arm	Side	Lane level	Lane	Destination arms	Total Demand (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Average throughput (PCU/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
A - A12 (E)	Entry	1	1	B, C	682	721	0.944	687	709	14.1	15.7	82.794	F
			2	A, C, D	149	684	0.218	150	166	0.3	0.3	6.686	A
	Exit	1	1		577			577	608	0.0	0.0	0.000	A
B - Chelmsford Road	Entry	1	1	A, B, C, D	981	1808	0.543	980	1022	1.1	1.3	4.504	A
	Exit	1	1		1356			1356	1399	0.0	0.0	0.000	A
C - A12 (W)	Entry	1	1	A, D	461	1012	0.455	459	496	1.0	1.0	6.925	A
			2	A, B, C	229	1047	0.218	230	238	0.3	0.2	4.573	A
	Exit	1	1		723			723	748	0.0	0.0	0.000	A
D - Roman Road	Entry	1	1	A, B, C, D	1081	1757	0.615	1081	1122	1.6	1.5	5.336	A
	Exit	1	1		930			930	997	0.0	0.0	0.000	A

08:45 - 09:00

Arm	Side	Lane level	Lane	Destination arms	Total Demand (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Average throughput (PCU/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
A - A12 (E)	Entry	1	1	B, C	683	727	0.943	679	708	15.7	17.4	88.338	F
			2	A, C, D	149	686	0.218	150	162	0.3	0.3	6.996	A
	Exit	1	1		576			576	608	0.0	0.0	0.000	A
B - Chelmsford Road	Entry	1	1	A, B, C, D	985	1811	0.544	983	1018	1.3	1.3	4.385	A
	Exit	1	1		1348			1348	1392	0.0	0.0	0.000	A
C - A12 (W)	Entry	1	1	A, D	457	1010	0.453	458	496	1.0	0.8	6.985	A
			2	A, B, C	228	1040	0.219	227	233	0.2	0.3	4.438	A
	Exit	1	1		710			710	738	0.0	0.0	0.000	A
D - Roman Road	Entry	1	1	A, B, C, D	1076	1758	0.612	1077	1117	1.5	1.6	5.520	A
	Exit	1	1		940			940	997	0.0	0.0	0.000	A

09:00 - 09:15

Arm	Side	Lane level	Lane	Destination arms	Total Demand (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Average throughput (PCU/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
A - A12 (E)	Entry	1	1	B, C	685	721	0.949	676	704	17.4	19.1	97.365	F
			2	A, C, D	153	682	0.223	153	165	0.3	0.2	6.768	A
	Exit	1	1		579			579	608	0.0	0.0	0.000	A
B - Chelmsford Road	Entry	1	1	A, B, C, D	980	1802	0.544	979	1021	1.3	1.2	4.558	A
	Exit	1	1		1347			1347	1396	0.0	0.0	0.000	A
C - A12 (W)	Entry	1	1	A, D	457	1009	0.453	456	493	0.8	0.9	6.841	A
			2	A, B, C	230	1042	0.221	230	242	0.3	0.2	4.537	A
	Exit	1	1		709			709	747	0.0	0.0	0.000	A
D - Roman Road	Entry	1	1	A, B, C, D	1077	1754	0.614	1078	1121	1.6	1.6	5.520	A
	Exit	1	1		936			936	994	0.0	0.0	0.000	A

09:15 - 09:30

Arm	Side	Lane level	Lane	Destination arms	Total Demand (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Average throughput (PCU/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
A - A12 (E)	Entry	1	1	B, C	678	717	0.947	678	714	19.1	18.8	93.376	F
			2	A, C, D	150	685	0.218	150	162	0.2	0.3	6.653	A
	Exit	1	1		577			577	601	0.0	0.0	0.000	A
B - Chelmsford Road	Entry	1	1	A, B, C, D	985	1803	0.546	981	1016	1.2	1.3	4.448	A
	Exit	1	1		1356			1356	1403	0.0	0.0	0.000	A
C - A12 (W)	Entry	1	1	A, D	461	1009	0.457	464	494	0.9	0.7	6.821	A
			2	A, B, C	228	1046	0.219	228	235	0.2	0.3	4.409	A
	Exit	1	1		710			710	746	0.0	0.0	0.000	A
D - Roman Road	Entry	1	1	A, B, C, D	1087	1758	0.618	1089	1124	1.6	1.5	5.329	A
	Exit	1	1		947			947	996	0.0	0.0	0.000	A

2028 Base + Committed Development, PM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Lane Simulation	A1 - [Lane Simulation]	This analysis set uses Lane Simulation mode. This is provided as an investigative tool and the user should apply judgement when interpreting the results.
Warning	Profile Type	D10 - 2028 Base + Committed Development, PM	The DIRECT profile type is intended to be used for demand that varies over time. You are using it with the 'Use O-D data' option, but your O-D data does not vary over time. Are you sure this is correct?

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (s)	Junction LOS
1	Mountnessing Roundabout	Large Roundabout		A, B, C, D	5.57	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Arms

Arms

[same as above]

Roundabout Geometry

[same as above]

Large Roundabout Data

Arm	Circulating flow (PCU/hr)	Entry-to-exit separation (m)
A - A12 (E)	760	88.10
B - Chelmsford Road	504	0.00
C - A12 (W)	965	86.00
D - Roman Road	672	0.00

Slope / Intercept / Capacity

[same as above]

Lane Simulation: Arm options

[same as above]

Lanes

[same as above]

Entry Lane slope and intercept

[same as above]

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time period length (min)	Time segment length (min)	Run automatically
D10	2028 Base + Committed Development	PM	DIRECT	17:00	18:30	90	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	Scaling Factor (%)
A - A12 (E)		DIRECT	✓	100.000
B - Chelmsford Road		DIRECT	✓	100.000
C - A12 (W)		DIRECT	✓	100.000
D - Roman Road		DIRECT	✓	100.000

Origin-Destination Data

Demand (Veh/hr)

		To			
		A - A12 (E)	B - Chelmsford Road	C - A12 (W)	D - Roman Road
From	A - A12 (E)	0	509	2	110
	B - Chelmsford Road	489	1	155	374
	C - A12 (W)	2	225	0	563
	D - Roman Road	130	208	379	1

Vehicle Mix

Heavy Vehicle Percentages

		To			
		A - A12 (E)	B - Chelmsford Road	C - A12 (W)	D - Roman Road
From	A - A12 (E)	0	1	0	1
	B - Chelmsford Road	2	0	1	0
	C - A12 (W)	0	4	0	4
	D - Roman Road	2	1	2	0

Results

Results Summary for whole modelled period

Arm	Max Delay (s)	Max Queue (Veh)	Max LOS	Average Demand (Veh/hr)	Total Junction Arrivals (Veh)
A - A12 (E)	8.26	1.8	A	617	926
B - Chelmsford Road	3.77	1.4	A	1015	1523
C - A12 (W)	7.44	1.5	A	789	1184
D - Roman Road	3.71	0.8	A	715	1073

Main Results for each time segment

17:00 - 17:15

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Throughput (Veh/hr)	Average throughput (PCU/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
A - A12 (E)	611	153	808	610	621	624	0.0	1.3	7.701	A
B - Chelmsford Road	1025	256	488	1022	1038	930	0.0	1.3	3.769	A
C - A12 (W)	788	197	978	791	814	533	0.0	1.4	7.201	A
D - Roman Road	713	178	720	713	728	1049	0.0	0.7	3.571	A

17:15 - 17:30

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Throughput (Veh/hr)	Average throughput (PCU/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
A - A12 (E)	623	156	813	626	630	624	1.3	1.3	8.257	A
B - Chelmsford Road	1025	256	486	1024	1029	953	1.3	1.3	3.555	A
C - A12 (W)	784	196	973	787	831	537	1.4	1.3	6.957	A
D - Roman Road	719	180	718	719	735	1042	0.7	0.7	3.714	A

17:30 - 17:45

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Throughput (Veh/hr)	Average throughput (PCU/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
A - A12 (E)	620	155	816	627	629	625	1.3	1.1	8.103	A
B - Chelmsford Road	1021	255	494	1016	1025	949	1.3	1.4	3.660	A
C - A12 (W)	793	198	972	796	825	538	1.3	1.5	7.305	A
D - Roman Road	717	179	725	716	734	1043	0.7	0.6	3.657	A

17:45 - 18:00

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Throughput (Veh/hr)	Average throughput (PCU/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
A - A12 (E)	609	152	807	602	617	607	1.1	1.8	8.205	A
B - Chelmsford Road	1007	252	485	1006	1033	924	1.4	1.0	3.699	A
C - A12 (W)	788	197	959	792	825	531	1.5	1.3	7.124	A
D - Roman Road	708	177	705	709	728	1046	0.6	0.6	3.560	A

18:00 - 18:15

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Throughput (Veh/hr)	Average throughput (PCU/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
A - A12 (E)	624	156	826	625	628	610	1.8	1.4	8.186	A
B - Chelmsford Road	1014	254	495	1012	1034	956	1.0	1.3	3.660	A
C - A12 (W)	800	200	973	804	823	533	1.3	1.5	7.441	A
D - Roman Road	714	179	719	718	730	1059	0.6	0.6	3.513	A

18:15 - 18:30

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Throughput (Veh/hr)	Average throughput (PCU/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
A - A12 (E)	617	154	806	613	623	609	1.4	1.5	7.819	A
B - Chelmsford Road	1000	250	486	1001	1021	934	1.3	0.9	3.566	A
C - A12 (W)	783	196	946	787	817	540	1.5	1.3	6.987	A
D - Roman Road	720	180	696	719	722	1037	0.6	0.7	3.502	A

Lane Results

Lane Level notation: Lane Level 1 is always closest to the junction.

Lanes: Main Results for each time segment

17:00 - 17:15

Arm	Side	Lane level	Lane	Destination arms	Total Demand (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Average throughput (PCU/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
A - A12 (E)	Entry	1	1	B, C	502	920	0.546	499	508	0.0	1.3	8.427	A
			2	A, C, D	109	920	0.119	110	114	0.0	0.0	4.420	A
	Exit	1	1		624			624	641	0.0	0.0	0.000	A
B - Chelmsford Road	Entry	1	1	A, B, C, D	1025	2014	0.509	1022	1038	0.0	1.3	3.769	A
	Exit	1	1		930			930	951	0.0	0.0	0.000	A
C - A12 (W)	Entry	1	1	A, D	561	1010	0.555	564	580	0.0	1.2	8.144	A
			2	A, B, C	226	1018	0.222	227	234	0.0	0.2	4.863	A
	Exit	1	1		533			533	539	0.0	0.0	0.000	A
D - Roman Road	Entry	1	1	A, B, C, D	713	1737	0.411	713	728	0.0	0.7	3.571	A
	Exit	1	1		1049			1049	1071	0.0	0.0	0.000	A

17:15 - 17:30

Arm	Side	Lane level	Lane	Destination arms	Total Demand (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Average throughput (PCU/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
A - A12 (E)	Entry	1	1	B, C	512	918	0.558	515	520	1.3	1.2	9.074	A
			2	A, C, D	111	917	0.121	111	110	0.0	0.1	4.412	A
	Exit	1	1		624			624	642	0.0	0.0	0.000	A
B - Chelmsford Road	Entry	1	1	A, B, C, D	1025	2018	0.508	1024	1029	1.3	1.3	3.555	A
	Exit	1	1		953			953	972	0.0	0.0	0.000	A
C - A12 (W)	Entry	1	1	A, D	553	1016	0.544	555	589	1.2	1.1	7.884	A
			2	A, B, C	231	1023	0.226	232	242	0.2	0.2	4.712	A
	Exit	1	1		537			537	544	0.0	0.0	0.000	A
D - Roman Road	Entry	1	1	A, B, C, D	719	1743	0.412	719	735	0.7	0.7	3.714	A
	Exit	1	1		1042			1042	1068	0.0	0.0	0.000	A

17:30 - 17:45

Arm	Side	Lane level	Lane	Destination arms	Total Demand (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Average throughput (PCU/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
A - A12 (E)	Entry	1	1	B, C	509	917	0.555	516	516	1.2	0.9	8.868	A
			2	A, C, D	112	916	0.122	111	112	0.1	0.2	4.591	A
	Exit	1	1		625			625	635	0.0	0.0	0.000	A
B - Chelmsford Road	Entry	1	1	A, B, C, D	1021	2008	0.508	1016	1025	1.3	1.4	3.660	A
	Exit	1	1		949			949	963	0.0	0.0	0.000	A
C - A12 (W)	Entry	1	1	A, D	565	1019	0.554	568	588	1.1	1.2	8.352	A
			2	A, B, C	228	1023	0.223	228	236	0.2	0.3	4.698	A
	Exit	1	1		538			538	550	0.0	0.0	0.000	A
D - Roman Road	Entry	1	1	A, B, C, D	717	1732	0.414	716	734	0.7	0.6	3.657	A
	Exit	1	1		1043			1043	1064	0.0	0.0	0.000	A

17:45 - 18:00

Arm	Side	Lane level	Lane	Destination arms	Total Demand (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Average throughput (PCU/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
A - A12 (E)	Entry	1	1	B, C	498	918	0.542	492	506	0.9	1.6	9.051	A
			2	A, C, D	111	918	0.121	110	111	0.2	0.2	4.319	A
	Exit	1	1		607			607	629	0.0	0.0	0.000	A
B - Chelmsford Road	Entry	1	1	A, B, C, D	1007	2016	0.500	1006	1033	1.4	1.0	3.699	A
	Exit	1	1		924			924	954	0.0	0.0	0.000	A
C - A12 (W)	Entry	1	1	A, D	561	1025	0.547	563	585	1.2	1.1	8.071	A
			2	A, B, C	227	1017	0.224	229	240	0.3	0.2	4.799	A
	Exit	1	1		531			531	546	0.0	0.0	0.000	A
D - Roman Road	Entry	1	1	A, B, C, D	708	1742	0.406	709	728	0.6	0.6	3.560	A
	Exit	1	1		1046			1046	1073	0.0	0.0	0.000	A

18:00 - 18:15

Arm	Side	Lane level	Lane	Destination arms	Total Demand (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Average throughput (PCU/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
A - A12 (E)	Entry	1	1	B, C	511	909	0.562	511	515	1.6	1.3	8.972	A
			2	A, C, D	113	907	0.125	114	113	0.2	0.1	4.614	A
	Exit	1	1		610			610	637	0.0	0.0	0.000	A
B - Chelmsford Road	Entry	1	1	A, B, C, D	1014	2006	0.506	1012	1034	1.0	1.3	3.660	A
	Exit	1	1		956			956	966	0.0	0.0	0.000	A
C - A12 (W)	Entry	1	1	A, D	568	1012	0.561	571	585	1.1	1.2	8.615	A
			2	A, B, C	233	1011	0.230	233	238	0.2	0.2	4.552	A
	Exit	1	1		533			533	540	0.0	0.0	0.000	A
D - Roman Road	Entry	1	1	A, B, C, D	714	1734	0.412	718	730	0.6	0.6	3.513	A
	Exit	1	1		1059			1059	1072	0.0	0.0	0.000	A

18:15 - 18:30

Arm	Side	Lane level	Lane	Destination arms	Total Demand (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Average throughput (PCU/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
A - A12 (E)	Entry	1	1	B, C	511	919	0.556	508	514	1.3	1.3	8.513	A
			2	A, C, D	106	921	0.115	106	110	0.1	0.2	4.593	A
	Exit	1	1		609			609	625	0.0	0.0	0.000	A
B - Chelmsford Road	Entry	1	1	A, B, C, D	1000	2020	0.495	1001	1021	1.3	0.9	3.566	A
	Exit	1	1		934			934	951	0.0	0.0	0.000	A
C - A12 (W)	Entry	1	1	A, D	560	1032	0.542	564	586	1.2	1.0	8.044	A
			2	A, B, C	223	1034	0.215	222	231	0.2	0.3	4.326	A
	Exit	1	1		540			540	539	0.0	0.0	0.000	A
D - Roman Road	Entry	1	1	A, B, C, D	720	1755	0.410	719	722	0.6	0.7	3.502	A
	Exit	1	1		1037			1037	1068	0.0	0.0	0.000	A

2028 Base + Committed + Proposed, AM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Lane Simulation	A1 - [Lane Simulation]	This analysis set uses Lane Simulation mode. This is provided as an investigative tool and the user should apply judgement when interpreting the results.
Last Run	Lane Simulation	A - A12 (E) - Lane Simulation	Arm A: Queue at end of modelled period is greater than 10 PCU. Delay is likely to have been underestimated.
Warning	Profile Type	D11 - 2028 Base + Committed + Proposed, AM	The DIRECT profile type is intended to be used for demand that varies over time. You are using it with the 'Use O-D data' option, but your O-D data does not vary over time. Are you sure this is correct?

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (s)	Junction LOS
1	Mountnessing Roundabout	Large Roundabout		A, B, C, D	29.02	D

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Arms

Arms

[same as above]

Roundabout Geometry

[same as above]

Large Roundabout Data

Arm	Circulating flow (PCU/hr)	Entry-to-exit separation (m)
A - A12 (E)	1142	88.10
B - Chelmsford Road	667	0.00
C - A12 (W)	899	86.00
D - Roman Road	621	0.00

Slope / Intercept / Capacity

[same as above]

Lane Simulation: Arm options

[same as above]

Lanes

[same as above]

Entry Lane slope and intercept

[same as above]

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time period length (min)	Time segment length (min)	Run automatically
D11	2028 Base + Committed + Proposed	AM	DIRECT	08:00	09:30	90	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	Scaling Factor (%)
A - A12 (E)		DIRECT	✓	100.000
B - Chelmsford Road		DIRECT	✓	100.000
C - A12 (W)		DIRECT	✓	100.000
D - Roman Road		DIRECT	✓	100.000

Origin-Destination Data

Demand (Veh/hr)

		To			
		A - A12 (E)	B - Chelmsford Road	C - A12 (W)	D - Roman Road
From	A - A12 (E)	1	693	11	139
	B - Chelmsford Road	435	1	283	371
	C - A12 (W)	3	245	1	463
	D - Roman Road	157	457	474	1

Vehicle Mix

Heavy Vehicle Percentages

		To			
		A - A12 (E)	B - Chelmsford Road	C - A12 (W)	D - Roman Road
From	A - A12 (E)	0	4	18	9
	B - Chelmsford Road	5	0	2	3
	C - A12 (W)	0	3	0	7
	D - Roman Road	6	2	5	0

Results

Results Summary for whole modelled period

Arm	Max Delay (s)	Max Queue (Veh)	Max LOS	Average Demand (Veh/hr)	Total Junction Arrivals (Veh)
A - A12 (E)	107.52	28.9	F	847	1270
B - Chelmsford Road	5.28	1.8	A	1092	1638
C - A12 (W)	6.43	1.4	A	709	1064
D - Roman Road	5.95	1.8	A	1088	1632

Main Results for each time segment

08:00 - 08:15

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Throughput (Veh/hr)	Average throughput (PCU/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
A - A12 (E)	849	212	1170	818	835	591	0.0	13.8	42.508	E
B - Chelmsford Road	1083	271	626	1083	1123	1362	0.0	1.6	5.106	A
C - A12 (W)	711	178	944	708	749	765	0.0	1.3	6.260	A
D - Roman Road	1079	270	683	1078	1117	970	0.0	1.5	5.747	A

08:15 - 08:30

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Throughput (Veh/hr)	Average throughput (PCU/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
A - A12 (E)	845	211	1183	829	870	597	13.8	18.3	70.540	F
B - Chelmsford Road	1098	274	629	1094	1132	1383	1.6	1.8	5.203	A
C - A12 (W)	700	175	951	701	748	773	1.3	1.1	6.258	A
D - Roman Road	1085	271	693	1086	1130	959	1.5	1.5	5.696	A

08:30 - 08:45

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Throughput (Veh/hr)	Average throughput (PCU/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
A - A12 (E)	844	211	1187	832	877	601	18.3	21.7	88.004	F
B - Chelmsford Road	1090	273	633	1092	1130	1386	1.8	1.6	5.142	A
C - A12 (W)	710	177	949	709	746	777	1.1	1.3	6.362	A
D - Roman Road	1098	275	687	1100	1134	970	1.5	1.8	5.922	A

08:45 - 09:00

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Throughput (Veh/hr)	Average throughput (PCU/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
A - A12 (E)	842	211	1181	839	883	595	21.7	23.1	97.481	F
B - Chelmsford Road	1102	275	632	1101	1131	1388	1.6	1.5	5.203	A
C - A12 (W)	716	179	956	716	752	777	1.3	1.4	6.434	A
D - Roman Road	1083	271	690	1086	1130	982	1.8	1.8	5.946	A

09:00 - 09:15

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Throughput (Veh/hr)	Average throughput (PCU/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
A - A12 (E)	844	211	1188	829	875	598	23.1	25.8	107.257	F
B - Chelmsford Road	1094	274	630	1095	1122	1387	1.5	1.6	5.134	A
C - A12 (W)	711	178	951	711	748	774	1.4	1.2	6.196	A
D - Roman Road	1093	273	691	1095	1130	971	1.8	1.7	5.871	A

09:15 - 09:30

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Throughput (Veh/hr)	Average throughput (PCU/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
A - A12 (E)	854	213	1181	845	874	598	25.8	29.0	107.524	F
B - Chelmsford Road	1087	272	628	1088	1131	1397	1.6	1.5	5.285	A
C - A12 (W)	710	177	947	712	753	769	1.2	1.1	6.326	A
D - Roman Road	1091	273	688	1091	1135	971	1.7	1.6	5.917	A

Lane Results

Lane Level notation: Lane Level 1 is always closest to the junction.

Lanes: Main Results for each time segment

08:00 - 08:15

Arm	Side	Lane level	Lane	Destination arms	Total Demand (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Average throughput (PCU/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
A - A12 (E)	Entry	1	1	B, C	697	710	0.983	666	670	0.0	13.5	50.274	F
			2	A, C, D	152	674	0.225	152	165	0.0	0.3	6.890	A
	Exit	1	1		591			591	627	0.0	0.0	0.000	A
B - Chelmsford Road	Entry	1	1	A, B, C, D	1083	1806	0.599	1083	1123	0.0	1.6	5.106	A
	Exit	1	1		1362			1362	1386	0.0	0.0	0.000	A
C - A12 (W)	Entry	1	1	A, D	464	986	0.471	462	493	0.0	1.0	7.095	A
			2	A, B, C	247	1022	0.242	247	256	0.0	0.3	4.702	A
	Exit	1	1		765			765	787	0.0	0.0	0.000	A
D - Roman Road	Entry	1	1	A, B, C, D	1079	1719	0.627	1078	1117	0.0	1.5	5.747	A
	Exit	1	1		970			970	1024	0.0	0.0	0.000	A

08:15 - 08:30

Arm	Side	Lane level	Lane	Destination arms	Total Demand (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Average throughput (PCU/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
A - A12 (E)	Entry	1	1	B, C	696	706	0.987	679	706	13.5	18.0	84.156	F
			2	A, C, D	149	672	0.222	150	164	0.3	0.3	7.086	A
	Exit	1	1		597			597	628	0.0	0.0	0.000	A
B - Chelmsford Road	Entry	1	1	A, B, C, D	1098	1799	0.610	1094	1132	1.6	1.8	5.203	A
	Exit	1	1		1383			1383	1425	0.0	0.0	0.000	A
C - A12 (W)	Entry	1	1	A, D	450	978	0.460	451	493	1.0	0.8	7.128	A
			2	A, B, C	249	1015	0.245	250	256	0.3	0.3	4.648	A
	Exit	1	1		773			773	803	0.0	0.0	0.000	A
D - Roman Road	Entry	1	1	A, B, C, D	1085	1714	0.632	1086	1130	1.5	1.5	5.696	A
	Exit	1	1		959			959	1025	0.0	0.0	0.000	A

08:30 - 08:45

Arm	Side	Lane level	Lane	Destination arms	Total Demand (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Average throughput (PCU/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
A - A12 (E)	Entry	1	1	B, C	696	703	0.991	683	712	18.0	21.5	105.347	F
			2	A, C, D	148	662	0.224	149	165	0.3	0.2	7.200	A
	Exit	1	1		601			601	626	0.0	0.0	0.000	A
B - Chelmsford Road	Entry	1	1	A, B, C, D	1090	1803	0.604	1092	1130	1.8	1.6	5.142	A
	Exit	1	1		1386			1386	1431	0.0	0.0	0.000	A
C - A12 (W)	Entry	1	1	A, D	460	980	0.469	459	490	0.8	0.9	7.244	A
			2	A, B, C	250	1019	0.245	250	256	0.3	0.3	4.734	A
	Exit	1	1		777			777	803	0.0	0.0	0.000	A
D - Roman Road	Entry	1	1	A, B, C, D	1098	1721	0.639	1100	1134	1.5	1.8	5.922	A
	Exit	1	1		970			970	1026	0.0	0.0	0.000	A

08:45 - 09:00

Arm	Side	Lane level	Lane	Destination arms	Total Demand (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Average throughput (PCU/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
A - A12 (E)	Entry	1	1	B, C	689	706	0.975	687	715	21.5	22.8	117.423	F
			2	A, C, D	153	665	0.231	153	167	0.2	0.3	7.193	A
	Exit	1	1		595			595	630	0.0	0.0	0.000	A
B - Chelmsford Road	Entry	1	1	A, B, C, D	1102	1796	0.613	1101	1131	1.6	1.5	5.203	A
	Exit	1	1		1388			1388	1432	0.0	0.0	0.000	A
C - A12 (W)	Entry	1	1	A, D	465	980	0.474	465	497	0.9	1.1	7.333	A
			2	A, B, C	251	1016	0.247	251	255	0.3	0.3	4.742	A
	Exit	1	1		777			777	802	0.0	0.0	0.000	A
D - Roman Road	Entry	1	1	A, B, C, D	1083	1717	0.630	1086	1130	1.8	1.8	5.946	A
	Exit	1	1		982			982	1032	0.0	0.0	0.000	A

09:00 - 09:15

Arm	Side	Lane level	Lane	Destination arms	Total Demand (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Average throughput (PCU/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
A - A12 (E)	Entry	1	1	B, C	695	702	0.992	680	711	22.8	25.5	128.816	F
			2	A, C, D	149	672	0.221	149	164	0.3	0.3	6.863	A
	Exit	1	1		598			598	622	0.0	0.0	0.000	A
B - Chelmsford Road	Entry	1	1	A, B, C, D	1094	1798	0.609	1095	1122	1.5	1.6	5.134	A
	Exit	1	1		1387			1387	1428	0.0	0.0	0.000	A
C - A12 (W)	Entry	1	1	A, D	460	984	0.468	461	493	1.1	0.9	7.016	A
			2	A, B, C	251	1020	0.246	250	255	0.3	0.4	4.673	A
	Exit	1	1		774			774	800	0.0	0.0	0.000	A
D - Roman Road	Entry	1	1	A, B, C, D	1093	1714	0.638	1095	1130	1.8	1.7	5.871	A
	Exit	1	1		971			971	1024	0.0	0.0	0.000	A

09:15 - 09:30

Arm	Side	Lane level	Lane	Destination arms	Total Demand (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Average throughput (PCU/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
A - A12 (E)	Entry	1	1	B, C	701	707	0.994	694	709	25.5	28.7	131.738	F
			2	A, C, D	152	675	0.225	151	166	0.3	0.3	6.978	A
	Exit	1	1		598			598	629	0.0	0.0	0.000	A
B - Chelmsford Road	Entry	1	1	A, B, C, D	1087	1804	0.602	1088	1131	1.6	1.5	5.285	A
	Exit	1	1		1397			1397	1430	0.0	0.0	0.000	A
C - A12 (W)	Entry	1	1	A, D	465	986	0.471	467	498	0.9	0.8	7.215	A
			2	A, B, C	244	1024	0.239	245	255	0.4	0.2	4.652	A
	Exit	1	1		769			769	804	0.0	0.0	0.000	A
D - Roman Road	Entry	1	1	A, B, C, D	1091	1719	0.635	1091	1135	1.7	1.6	5.917	A
	Exit	1	1		971			971	1030	0.0	0.0	0.000	A

2028 Base + Committed + Proposed, PM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Lane Simulation	A1 - [Lane Simulation]	This analysis set uses Lane Simulation mode. This is provided as an investigative tool and the user should apply judgement when interpreting the results.
Warning	Profile Type	D12 - 2028 Base + Committed + Proposed, PM	The DIRECT profile type is intended to be used for demand that varies over time. You are using it with the 'Use O-D data' option, but your O-D data does not vary over time. Are you sure this is correct?

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (s)	Junction LOS
1	Mountnessing Roundabout	Large Roundabout		A, B, C, D	5.98	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Arms

Arms

[same as above]

Roundabout Geometry

[same as above]

Large Roundabout Data

Arm	Circulating flow (PCU/hr)	Entry-to-exit separation (m)
A - A12 (E)	760	88.10
B - Chelmsford Road	504	0.00
C - A12 (W)	965	86.00
D - Roman Road	672	0.00

Slope / Intercept / Capacity

[same as above]

Lane Simulation: Arm options

[same as above]

Lanes

[same as above]

Entry Lane slope and intercept

[same as above]

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time period length (min)	Time segment length (min)	Run automatically
D12	2028 Base + Committed + Proposed	PM	DIRECT	17:00	18:30	90	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	Scaling Factor (%)
A - A12 (E)		DIRECT	✓	100.000
B - Chelmsford Road		DIRECT	✓	100.000
C - A12 (W)		DIRECT	✓	100.000
D - Roman Road		DIRECT	✓	100.000

Origin-Destination Data

Demand (Veh/hr)

		To			
		A - A12 (E)	B - Chelmsford Road	C - A12 (W)	D - Roman Road
From	A - A12 (E)	0	527	2	110
	B - Chelmsford Road	496	1	176	384
	C - A12 (W)	2	277	0	563
	D - Roman Road	130	230	379	1

Vehicle Mix

Heavy Vehicle Percentages

		To			
		A - A12 (E)	B - Chelmsford Road	C - A12 (W)	D - Roman Road
From	A - A12 (E)	0	1	0	1
	B - Chelmsford Road	2	0	1	0
	C - A12 (W)	0	3	0	4
	D - Roman Road	2	1	2	0

Results

Results Summary for whole modelled period

Arm	Max Delay (s)	Max Queue (Veh)	Max LOS	Average Demand (Veh/hr)	Total Junction Arrivals (Veh)
A - A12 (E)	9.69	2.1	A	634	951
B - Chelmsford Road	3.94	1.4	A	1057	1586
C - A12 (W)	7.45	1.9	A	847	1271
D - Roman Road	3.98	1.0	A	739	1108

Main Results for each time segment

17:00 - 17:15

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Throughput (Veh/hr)	Average throughput (PCU/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
A - A12 (E)	632	158	874	635	637	630	0.0	1.4	8.979	A
B - Chelmsford Road	1067	267	481	1064	1068	1028	0.0	1.1	3.942	A
C - A12 (W)	837	209	994	835	852	551	0.0	1.8	7.147	A
D - Roman Road	729	182	774	730	767	1055	0.0	1.0	3.821	A

17:15 - 17:30

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Throughput (Veh/hr)	Average throughput (PCU/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
A - A12 (E)	622	156	893	622	636	649	1.4	1.7	9.033	A
B - Chelmsford Road	1081	270	483	1079	1084	1033	1.1	1.4	3.819	A
C - A12 (W)	855	214	1013	860	874	549	1.8	1.8	7.354	A
D - Roman Road	733	183	803	739	752	1070	1.0	0.6	3.808	A

17:30 - 17:45

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Throughput (Veh/hr)	Average throughput (PCU/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
A - A12 (E)	637	159	875	642	654	615	1.7	1.5	9.692	A
B - Chelmsford Road	1036	259	489	1037	1072	1028	1.4	0.9	3.869	A
C - A12 (W)	837	209	981	837	863	545	1.8	1.7	7.255	A
D - Roman Road	730	183	761	729	757	1057	0.6	0.6	3.770	A

17:45 - 18:00

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Throughput (Veh/hr)	Average throughput (PCU/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
A - A12 (E)	656	164	891	658	655	622	1.5	1.8	9.591	A
B - Chelmsford Road	1049	262	497	1051	1068	1051	0.9	1.0	3.828	A
C - A12 (W)	840	210	981	840	875	567	1.7	1.8	7.446	A
D - Roman Road	744	186	764	749	757	1057	0.6	0.6	3.983	A

18:00 - 18:15

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Throughput (Veh/hr)	Average throughput (PCU/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
A - A12 (E)	628	157	899	618	638	615	1.8	2.1	9.187	A
B - Chelmsford Road	1058	264	486	1057	1067	1031	1.0	0.9	3.755	A
C - A12 (W)	857	214	982	851	880	561	1.8	1.8	7.358	A
D - Roman Road	744	186	770	744	754	1062	0.6	0.7	3.734	A

18:15 - 18:30

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Throughput (Veh/hr)	Average throughput (PCU/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
A - A12 (E)	628	157	900	635	633	633	2.1	1.7	9.552	A
B - Chelmsford Road	1051	263	487	1053	1054	1049	0.9	1.2	3.890	A
C - A12 (W)	858	214	988	856	881	552	1.8	1.8	7.183	A
D - Roman Road	754	189	781	752	761	1063	0.7	0.7	3.930	A

Lane Results

Lane Level notation: Lane Level 1 is always closest to the junction.

Lanes: Main Results for each time segment

17:00 - 17:15

Arm	Side	Lane level	Lane	Destination arms	Total Demand (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Average throughput (PCU/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
A - A12 (E)	Entry	1	1	B, C	518	888	0.583	521	523	0.0	1.2	9.856	A
			2	A, C, D	114	888	0.129	113	114	0.0	0.3	4.960	A
	Exit	1	1		630			630	639	0.0	0.0	0.000	A
B - Chelmsford Road	Entry	1	1	A, B, C, D	1067	2015	0.530	1064	1068	0.0	1.1	3.942	A
	Exit	1	1		1028			1028	1044	0.0	0.0	0.000	A
C - A12 (W)	Entry	1	1	A, D	561	1004	0.560	561	566	0.0	1.3	8.266	A
			2	A, B, C	276	1016	0.271	275	286	0.0	0.4	4.945	A
	Exit	1	1		551			551	576	0.0	0.0	0.000	A
D - Roman Road	Entry	1	1	A, B, C, D	729	1690	0.431	730	767	0.0	1.0	3.821	A
	Exit	1	1		1055			1055	1065	0.0	0.0	0.000	A

17:15 - 17:30

Arm	Side	Lane level	Lane	Destination arms	Total Demand (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Average throughput (PCU/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
A - A12 (E)	Entry	1	1	B, C	516	877	0.589	517	525	1.2	1.5	9.964	A
			2	A, C, D	106	880	0.120	106	111	0.3	0.2	4.614	A
	Exit	1	1		649			649	650	0.0	0.0	0.000	A
B - Chelmsford Road	Entry	1	1	A, B, C, D	1081	2024	0.534	1079	1084	1.1	1.4	3.819	A
	Exit	1	1		1033			1033	1051	0.0	0.0	0.000	A
C - A12 (W)	Entry	1	1	A, D	566	995	0.570	571	580	1.3	1.4	8.438	A
			2	A, B, C	289	1005	0.287	289	294	0.4	0.4	5.233	A
	Exit	1	1		549			549	561	0.0	0.0	0.000	A
D - Roman Road	Entry	1	1	A, B, C, D	733	1672	0.438	739	752	1.0	0.6	3.808	A
	Exit	1	1		1070			1070	1084	0.0	0.0	0.000	A

17:30 - 17:45

Arm	Side	Lane level	Lane	Destination arms	Total Demand (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Average throughput (PCU/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
A - A12 (E)	Entry	1	1	B, C	524	885	0.592	529	543	1.5	1.3	10.732	B
			2	A, C, D	113	887	0.127	113	111	0.2	0.2	4.614	A
	Exit	1	1		615			615	638	0.0	0.0	0.000	A
B - Chelmsford Road	Entry	1	1	A, B, C, D	1036	2010	0.516	1037	1072	1.4	0.9	3.869	A
	Exit	1	1		1028			1028	1060	0.0	0.0	0.000	A
C - A12 (W)	Entry	1	1	A, D	558	1009	0.553	559	576	1.4	1.3	8.299	A
			2	A, B, C	278	1025	0.272	278	287	0.4	0.4	5.183	A
	Exit	1	1		545			545	572	0.0	0.0	0.000	A
D - Roman Road	Entry	1	1	A, B, C, D	730	1701	0.429	729	757	0.6	0.6	3.770	A
	Exit	1	1		1057			1057	1077	0.0	0.0	0.000	A

17:45 - 18:00

Arm	Side	Lane level	Lane	Destination arms	Total Demand (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Average throughput (PCU/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
A - A12 (E)	Entry	1	1	B, C	546	878	0.622	547	544	1.3	1.7	10.595	B
			2	A, C, D	110	884	0.125	111	111	0.2	0.2	4.707	A
	Exit	1	1		622			622	642	0.0	0.0	0.000	A
B - Chelmsford Road	Entry	1	1	A, B, C, D	1049	2004	0.524	1051	1068	0.9	1.0	3.828	A
	Exit	1	1		1051			1051	1062	0.0	0.0	0.000	A
C - A12 (W)	Entry	1	1	A, D	571	1007	0.565	572	591	1.3	1.4	8.746	A
			2	A, B, C	270	1020	0.265	268	284	0.4	0.4	4.768	A
	Exit	1	1		567			567	567	0.0	0.0	0.000	A
D - Roman Road	Entry	1	1	A, B, C, D	744	1696	0.439	749	757	0.6	0.6	3.983	A
	Exit	1	1		1057			1057	1084	0.0	0.0	0.000	A

18:00 - 18:15

Arm	Side	Lane level	Lane	Destination arms	Total Demand (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Average throughput (PCU/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
A - A12 (E)	Entry	1	1	B, C	522	875	0.597	515	526	1.7	1.9	10.126	B
			2	A, C, D	105	874	0.120	103	112	0.2	0.2	4.782	A
	Exit	1	1		615			615	634	0.0	0.0	0.000	A
B - Chelmsford Road	Entry	1	1	A, B, C, D	1058	2021	0.524	1057	1067	1.0	0.9	3.755	A
	Exit	1	1		1031			1031	1047	0.0	0.0	0.000	A
C - A12 (W)	Entry	1	1	A, D	573	1008	0.569	567	590	1.4	1.5	8.657	A
			2	A, B, C	284	1019	0.279	284	291	0.4	0.3	4.741	A
	Exit	1	1		561			561	569	0.0	0.0	0.000	A
D - Roman Road	Entry	1	1	A, B, C, D	744	1692	0.440	744	754	0.6	0.7	3.734	A
	Exit	1	1		1062			1062	1089	0.0	0.0	0.000	A

18:15 - 18:30

Arm	Side	Lane level	Lane	Destination arms	Total Demand (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Average throughput (PCU/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
A - A12 (E)	Entry	1	1	B, C	524	874	0.599	528	523	1.9	1.6	10.627	B
			2	A, C, D	105	871	0.120	106	110	0.2	0.1	4.451	A
	Exit	1	1		633			633	630	0.0	0.0	0.000	A
B - Chelmsford Road	Entry	1	1	A, B, C, D	1051	2009	0.523	1053	1054	0.9	1.2	3.890	A
	Exit	1	1		1049			1049	1048	0.0	0.0	0.000	A
C - A12 (W)	Entry	1	1	A, D	578	1007	0.574	577	595	1.5	1.4	8.240	A
			2	A, B, C	280	1012	0.277	279	286	0.3	0.5	5.013	A
	Exit	1	1		552			552	573	0.0	0.0	0.000	A
D - Roman Road	Entry	1	1	A, B, C, D	754	1678	0.449	752	761	0.7	0.7	3.930	A
	Exit	1	1		1063			1063	1079	0.0	0.0	0.000	A

2033 Base + Committed Development, AM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Lane Simulation	A1 - [Lane Simulation]	This analysis set uses Lane Simulation mode. This is provided as an investigative tool and the user should apply judgement when interpreting the results.
Last Run	Lane Simulation	A - A12 (E) - Lane Simulation	Arm A: Queue at end of modelled period is greater than 10 PCU. Delay is likely to have been underestimated.
Warning	Profile Type	D13 - 2033 Base + Committed Development, AM	The DIRECT profile type is intended to be used for demand that varies over time. You are using it with the 'Use O-D data' option, but your O-D data does not vary over time. Are you sure this is correct?

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (s)	Junction LOS
1	Mountnessing Roundabout	Large Roundabout		A, B, C, D	23.23	C

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Arms

Arms

[same as above]

Roundabout Geometry

[same as above]

Large Roundabout Data

Arm	Circulating flow (PCU/hr)	Entry-to-exit separation (m)
A - A12 (E)	1142	88.10
B - Chelmsford Road	667	0.00
C - A12 (W)	899	86.00
D - Roman Road	621	0.00

Slope / Intercept / Capacity

[same as above]

Lane Simulation: Arm options

[same as above]

Lanes

[same as above]

Entry Lane slope and intercept

[same as above]

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time period length (min)	Time segment length (min)	Run automatically
D13	2033 Base + Committed Development	AM	DIRECT	08:00	09:30	90	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	Scaling Factor (%)
A - A12 (E)		DIRECT	✓	100.000
B - Chelmsford Road		DIRECT	✓	100.000
C - A12 (W)		DIRECT	✓	100.000
D - Roman Road		DIRECT	✓	100.000

Origin-Destination Data

Demand (Veh/hr)

		To			
		A - A12 (E)	B - Chelmsford Road	C - A12 (W)	D - Roman Road
From	A - A12 (E)	1	689	11	140
	B - Chelmsford Road	417	1	227	344
	C - A12 (W)	3	226	1	465
	D - Roman Road	158	446	476	1

Vehicle Mix

Heavy Vehicle Percentages

		To			
		A - A12 (E)	B - Chelmsford Road	C - A12 (W)	D - Roman Road
From	A - A12 (E)	0	4	18	9
	B - Chelmsford Road	5	0	2	3
	C - A12 (W)	0	4	0	7
	D - Roman Road	6	2	5	0

Results

Results Summary for whole modelled period

Arm	Max Delay (s)	Max Queue (Veh)	Max LOS	Average Demand (Veh/hr)	Total Junction Arrivals (Veh)
A - A12 (E)	81.33	19.5	F	838	1256
B - Chelmsford Road	4.57	1.3	A	986	1479
C - A12 (W)	6.20	1.2	A	690	1035
D - Roman Road	5.80	1.8	A	1080	1620

Main Results for each time segment

08:00 - 08:15

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Throughput (Veh/hr)	Average throughput (PCU/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
A - A12 (E)	835	209	1154	815	831	588	0.0	11.0	36.901	E
B - Chelmsford Road	987	247	627	987	1024	1342	0.0	1.3	4.556	A
C - A12 (W)	696	174	909	695	734	705	0.0	1.1	6.100	A
D - Roman Road	1080	270	663	1079	1118	942	0.0	1.8	5.804	A

08:15 - 08:30

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Throughput (Veh/hr)	Average throughput (PCU/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
A - A12 (E)	830	208	1142	831	869	584	11.0	13.2	56.045	F
B - Chelmsford Road	991	248	630	992	1029	1343	1.3	1.2	4.511	A
C - A12 (W)	689	172	905	693	734	717	1.1	1.2	6.079	A
D - Roman Road	1078	270	648	1078	1116	949	1.8	1.6	5.601	A

08:30 - 08:45

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Throughput (Veh/hr)	Average throughput (PCU/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
A - A12 (E)	839	210	1154	826	870	577	13.2	16.4	64.968	F
B - Chelmsford Road	985	246	636	986	1019	1343	1.2	1.2	4.512	A
C - A12 (W)	689	172	897	689	736	725	1.2	1.0	6.198	A
D - Roman Road	1083	271	649	1082	1122	937	1.6	1.7	5.553	A

08:45 - 09:00

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Throughput (Veh/hr)	Average throughput (PCU/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
A - A12 (E)	833	208	1158	818	872	574	16.4	17.8	74.420	F
B - Chelmsford Road	993	248	634	991	1030	1342	1.2	1.3	4.511	A
C - A12 (W)	689	172	904	690	735	720	1.0	1.2	6.203	A
D - Roman Road	1091	273	642	1090	1124	952	1.7	1.7	5.672	A

09:00 - 09:15

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Throughput (Veh/hr)	Average throughput (PCU/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
A - A12 (E)	841	210	1142	839	877	576	17.8	19.1	81.335	F
B - Chelmsford Road	982	245	623	981	1025	1358	1.3	1.1	4.568	A
C - A12 (W)	686	172	894	686	730	710	1.2	1.2	5.931	A
D - Roman Road	1068	267	649	1069	1117	931	1.7	1.5	5.509	A

09:15 - 09:30

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Throughput (Veh/hr)	Average throughput (PCU/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
A - A12 (E)	847	212	1147	842	883	581	19.1	19.7	78.320	F
B - Chelmsford Road	976	244	630	977	1021	1359	1.1	1.1	4.562	A
C - A12 (W)	693	173	898	694	740	709	1.2	1.1	6.024	A
D - Roman Road	1082	270	648	1080	1120	944	1.5	1.6	5.467	A

Lane Results

Lane Level notation: Lane Level 1 is always closest to the junction.

Lanes: Main Results for each time segment

08:00 - 08:15

Arm	Side	Lane level	Lane	Destination arms	Total Demand (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Average throughput (PCU/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
A - A12 (E)	Entry	1	1	B, C	687	719	0.955	666	666	0.0	10.7	43.597	E
			2	A, C, D	148	680	0.217	149	166	0.0	0.3	6.810	A
	Exit	1	1		588			588	614	0.0	0.0	0.000	A
B - Chelmsford Road	Entry	1	1	A, B, C, D	987	1798	0.549	987	1024	0.0	1.3	4.556	A
	Exit	1	1		1342			1342	1352	0.0	0.0	0.000	A
C - A12 (W)	Entry	1	1	A, D	465	998	0.466	465	497	0.0	0.8	6.891	A
			2	A, B, C	230	1031	0.224	231	236	0.0	0.3	4.483	A
	Exit	1	1		705			705	738	0.0	0.0	0.000	A
D - Roman Road	Entry	1	1	A, B, C, D	1080	1737	0.622	1079	1118	0.0	1.8	5.804	A
	Exit	1	1		942			942	1003	0.0	0.0	0.000	A

08:15 - 08:30

Arm	Side	Lane level	Lane	Destination arms	Total Demand (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Average throughput (PCU/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
A - A12 (E)	Entry	1	1	B, C	680	724	0.940	681	705	10.7	13.0	66.853	F
			2	A, C, D	150	690	0.219	150	164	0.3	0.2	6.820	A
	Exit	1	1		584			584	611	0.0	0.0	0.000	A
B - Chelmsford Road	Entry	1	1	A, B, C, D	991	1799	0.551	992	1029	1.3	1.2	4.511	A
	Exit	1	1		1343			1343	1387	0.0	0.0	0.000	A
C - A12 (W)	Entry	1	1	A, D	464	1004	0.462	467	499	0.8	1.0	6.823	A
			2	A, B, C	225	1037	0.217	226	235	0.3	0.3	4.545	A
	Exit	1	1		717			717	743	0.0	0.0	0.000	A
D - Roman Road	Entry	1	1	A, B, C, D	1078	1751	0.616	1078	1116	1.8	1.6	5.601	A
	Exit	1	1		949			949	1007	0.0	0.0	0.000	A

08:30 - 08:45

Arm	Side	Lane level	Lane	Destination arms	Total Demand (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Average throughput (PCU/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
A - A12 (E)	Entry	1	1	B, C	687	719	0.956	672	704	13.0	16.2	77.836	F
			2	A, C, D	152	680	0.224	153	166	0.2	0.2	6.835	A
	Exit	1	1		577			577	603	0.0	0.0	0.000	A
B - Chelmsford Road	Entry	1	1	A, B, C, D	985	1797	0.548	986	1019	1.2	1.2	4.512	A
	Exit	1	1		1343			1343	1397	0.0	0.0	0.000	A
C - A12 (W)	Entry	1	1	A, D	462	1015	0.455	461	497	1.0	0.7	7.019	A
			2	A, B, C	227	1046	0.217	227	240	0.3	0.3	4.549	A
	Exit	1	1		725			725	747	0.0	0.0	0.000	A
D - Roman Road	Entry	1	1	A, B, C, D	1083	1751	0.618	1082	1122	1.6	1.7	5.553	A
	Exit	1	1		937			937	1001	0.0	0.0	0.000	A

08:45 - 09:00

Arm	Side	Lane level	Lane	Destination arms	Total Demand (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Average throughput (PCU/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
A - A12 (E)	Entry	1	1	B, C	684	717	0.955	669	707	16.2	17.5	89.293	F
			2	A, C, D	148	679	0.218	148	165	0.2	0.3	6.950	A
	Exit	1	1		574			574	609	0.0	0.0	0.000	A
B - Chelmsford Road	Entry	1	1	A, B, C, D	993	1795	0.554	991	1030	1.2	1.3	4.511	A
	Exit	1	1		1342			1342	1399	0.0	0.0	0.000	A
C - A12 (W)	Entry	1	1	A, D	464	1006	0.461	465	499	0.7	0.9	7.012	A
			2	A, B, C	225	1030	0.218	226	236	0.3	0.3	4.538	A
	Exit	1	1		720			720	747	0.0	0.0	0.000	A
D - Roman Road	Entry	1	1	A, B, C, D	1091	1753	0.622	1090	1124	1.7	1.7	5.672	A
	Exit	1	1		952			952	1006	0.0	0.0	0.000	A

09:00 - 09:15

Arm	Side	Lane level	Lane	Destination arms	Total Demand (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Average throughput (PCU/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
A - A12 (E)	Entry	1	1	B, C	691	723	0.956	690	711	17.5	18.8	97.647	F
			2	A, C, D	150	687	0.218	149	166	0.3	0.3	6.848	A
	Exit	1	1		576			576	606	0.0	0.0	0.000	A
B - Chelmsford Road	Entry	1	1	A, B, C, D	982	1802	0.545	981	1025	1.3	1.1	4.568	A
	Exit	1	1		1358			1358	1396	0.0	0.0	0.000	A
C - A12 (W)	Entry	1	1	A, D	459	1010	0.454	458	494	0.9	1.0	6.637	A
			2	A, B, C	227	1042	0.218	228	237	0.3	0.2	4.498	A
	Exit	1	1		710			710	748	0.0	0.0	0.000	A
D - Roman Road	Entry	1	1	A, B, C, D	1068	1746	0.612	1069	1117	1.7	1.5	5.509	A
	Exit	1	1		931			931	999	0.0	0.0	0.000	A

09:15 - 09:30

Arm	Side	Lane level	Lane	Destination arms	Total Demand (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Average throughput (PCU/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
A - A12 (E)	Entry	1	1	B, C	695	719	0.965	690	716	18.8	19.3	95.166	F
			2	A, C, D	153	684	0.223	151	167	0.3	0.3	6.689	A
	Exit	1	1		581			581	610	0.0	0.0	0.000	A
B - Chelmsford Road	Entry	1	1	A, B, C, D	976	1802	0.542	977	1021	1.1	1.1	4.562	A
	Exit	1	1		1359			1359	1404	0.0	0.0	0.000	A
C - A12 (W)	Entry	1	1	A, D	466	1006	0.464	468	503	1.0	0.9	6.786	A
			2	A, B, C	227	1039	0.218	227	237	0.2	0.3	4.469	A
	Exit	1	1		709			709	742	0.0	0.0	0.000	A
D - Roman Road	Entry	1	1	A, B, C, D	1082	1753	0.617	1080	1120	1.5	1.6	5.467	A
	Exit	1	1		944			944	1009	0.0	0.0	0.000	A

2033 Base + Committed Development, PM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Lane Simulation	A1 - [Lane Simulation]	This analysis set uses Lane Simulation mode. This is provided as an investigative tool and the user should apply judgement when interpreting the results.
Warning	Profile Type	D14 - 2033 Base + Committed Development, PM	The DIRECT profile type is intended to be used for demand that varies over time. You are using it with the 'Use O-D data' option, but your O-D data does not vary over time. Are you sure this is correct?

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (s)	Junction LOS
1	Mountnessing Roundabout	Large Roundabout		A, B, C, D	5.64	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Arms

Arms

[same as above]

Roundabout Geometry

[same as above]

Large Roundabout Data

Arm	Circulating flow (PCU/hr)	Entry-to-exit separation (m)
A - A12 (E)	760	88.10
B - Chelmsford Road	504	0.00
C - A12 (W)	965	86.00
D - Roman Road	672	0.00

Slope / Intercept / Capacity

[same as above]

Lane Simulation: Arm options

[same as above]

Lanes

[same as above]

Entry Lane slope and intercept

[same as above]

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time period length (min)	Time segment length (min)	Run automatically
D14	2033 Base + Committed Development	PM	DIRECT	17:00	18:30	90	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	Scaling Factor (%)
A - A12 (E)		DIRECT	✓	100.000
B - Chelmsford Road		DIRECT	✓	100.000
C - A12 (W)		DIRECT	✓	100.000
D - Roman Road		DIRECT	✓	100.000

Origin-Destination Data

Demand (Veh/hr)

		To			
		A - A12 (E)	B - Chelmsford Road	C - A12 (W)	D - Roman Road
From	A - A12 (E)	0	511	2	111
	B - Chelmsford Road	491	1	155	376
	C - A12 (W)	2	225	0	566
	D - Roman Road	131	209	381	1

Vehicle Mix

Heavy Vehicle Percentages

		To			
		A - A12 (E)	B - Chelmsford Road	C - A12 (W)	D - Roman Road
From	A - A12 (E)	0	1	0	1
	B - Chelmsford Road	2	0	1	0
	C - A12 (W)	0	4	0	4
	D - Roman Road	2	1	2	0

Results

Results Summary for whole modelled period

Arm	Max Delay (s)	Max Queue (Veh)	Max LOS	Average Demand (Veh/hr)	Total Junction Arrivals (Veh)
A - A12 (E)	8.45	1.5	A	618	926
B - Chelmsford Road	3.78	1.1	A	1021	1532
C - A12 (W)	7.51	1.7	A	799	1198
D - Roman Road	3.77	1.2	A	727	1090

Main Results for each time segment

17:00 - 17:15

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Throughput (Veh/hr)	Average throughput (PCU/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
A - A12 (E)	626	157	825	626	629	647	0.0	1.5	8.445	A
B - Chelmsford Road	1027	257	511	1030	1034	940	0.0	1.0	3.706	A
C - A12 (W)	779	195	992	786	816	549	0.0	1.3	7.020	A
D - Roman Road	748	187	726	746	737	1052	0.0	0.8	3.734	A

17:15 - 17:30

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Throughput (Veh/hr)	Average throughput (PCU/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
A - A12 (E)	614	153	825	617	620	615	1.5	1.0	7.825	A
B - Chelmsford Road	1017	254	486	1018	1049	957	1.0	0.9	3.667	A
C - A12 (W)	832	208	971	832	838	533	1.3	1.7	7.250	A
D - Roman Road	717	179	719	720	730	1084	0.8	0.6	3.542	A

17:30 - 17:45

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Throughput (Veh/hr)	Average throughput (PCU/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
A - A12 (E)	608	152	807	617	632	628	1.0	1.4	8.452	A
B - Chelmsford Road	1017	254	474	1017	1035	949	0.9	1.1	3.736	A
C - A12 (W)	803	201	967	806	821	524	1.7	1.7	7.228	A
D - Roman Road	710	177	727	708	731	1046	0.6	0.7	3.719	A

17:45 - 18:00

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Throughput (Veh/hr)	Average throughput (PCU/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
A - A12 (E)	610	153	832	613	636	612	1.4	1.4	7.976	A
B - Chelmsford Road	1024	256	504	1021	1031	942	1.1	1.0	3.776	A
C - A12 (W)	798	199	978	799	824	546	1.7	1.5	7.505	A
D - Roman Road	730	182	716	729	731	1061	0.7	0.8	3.592	A

18:00 - 18:15

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Throughput (Veh/hr)	Average throughput (PCU/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
A - A12 (E)	613	153	814	609	624	646	1.4	1.2	7.594	A
B - Chelmsford Road	1019	255	494	1019	1023	929	1.0	0.9	3.554	A
C - A12 (W)	800	200	988	802	830	524	1.5	1.6	7.095	A
D - Roman Road	730	182	735	724	737	1056	0.8	1.0	3.766	A

18:15 - 18:30

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Throughput (Veh/hr)	Average throughput (PCU/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
A - A12 (E)	635	159	802	640	626	622	1.2	1.3	8.404	A
B - Chelmsford Road	1024	256	484	1021	1027	958	0.9	1.1	3.458	A
C - A12 (W)	783	196	976	784	824	529	1.6	1.5	7.062	A
D - Roman Road	724	181	707	717	748	1052	1.0	1.2	3.724	A

Lane Results

Lane Level notation: Lane Level 1 is always closest to the junction.

Lanes: Main Results for each time segment

17:00 - 17:15

Arm	Side	Lane level	Lane	Destination arms	Total Demand (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Average throughput (PCU/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
A - A12 (E)	Entry	1	1	B, C	514	912	0.563	512	515	0.0	1.4	9.328	A
			2	A, C, D	113	912	0.123	113	114	0.0	0.1	4.437	A
	Exit	1	1		647			647	644	0.0	0.0	0.000	A
B - Chelmsford Road	Entry	1	1	A, B, C, D	1027	1995	0.515	1030	1034	0.0	1.0	3.706	A
	Exit	1	1		940			940	956	0.0	0.0	0.000	A
C - A12 (W)	Entry	1	1	A, D	549	1004	0.547	556	580	0.0	1.0	7.989	A
			2	A, B, C	230	1020	0.226	230	236	0.0	0.2	4.648	A
	Exit	1	1		549			549	544	0.0	0.0	0.000	A
D - Roman Road	Entry	1	1	A, B, C, D	748	1735	0.431	746	737	0.0	0.8	3.734	A
	Exit	1	1		1052			1052	1073	0.0	0.0	0.000	A

17:15 - 17:30

Arm	Side	Lane level	Lane	Destination arms	Total Demand (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Average throughput (PCU/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
A - A12 (E)	Entry	1	1	B, C	509	915	0.557	512	514	1.4	0.9	8.549	A
			2	A, C, D	104	919	0.114	105	106	0.1	0.1	4.340	A
	Exit	1	1		615			615	639	0.0	0.0	0.000	A
B - Chelmsford Road	Entry	1	1	A, B, C, D	1017	2011	0.506	1018	1049	1.0	0.9	3.667	A
	Exit	1	1		957			957	961	0.0	0.0	0.000	A
C - A12 (W)	Entry	1	1	A, D	602	1022	0.590	603	600	1.0	1.4	8.269	A
			2	A, B, C	230	1020	0.226	230	237	0.2	0.3	4.675	A
	Exit	1	1		533			533	550	0.0	0.0	0.000	A
D - Roman Road	Entry	1	1	A, B, C, D	717	1736	0.413	720	730	0.8	0.6	3.542	A
	Exit	1	1		1084			1084	1088	0.0	0.0	0.000	A

17:30 - 17:45

Arm	Side	Lane level	Lane	Destination arms	Total Demand (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Average throughput (PCU/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
A - A12 (E)	Entry	1	1	B, C	509	920	0.553	517	521	0.9	1.3	9.259	A
			2	A, C, D	100	920	0.108	99	110	0.1	0.1	4.628	A
	Exit	1	1		628			628	638	0.0	0.0	0.000	A
B - Chelmsford Road	Entry	1	1	A, B, C, D	1017	2026	0.502	1017	1035	0.9	1.1	3.736	A
	Exit	1	1		949			949	959	0.0	0.0	0.000	A
C - A12 (W)	Entry	1	1	A, D	575	1020	0.563	577	588	1.4	1.5	8.318	A
			2	A, B, C	228	1014	0.224	229	232	0.3	0.2	4.451	A
	Exit	1	1		524			524	549	0.0	0.0	0.000	A
D - Roman Road	Entry	1	1	A, B, C, D	710	1735	0.409	708	731	0.6	0.7	3.719	A
	Exit	1	1		1046			1046	1072	0.0	0.0	0.000	A

17:45 - 18:00

Arm	Side	Lane level	Lane	Destination arms	Total Demand (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Average throughput (PCU/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
A - A12 (E)	Entry	1	1	B, C	497	903	0.550	500	517	1.3	1.2	8.750	A
			2	A, C, D	113	908	0.124	113	119	0.1	0.1	4.622	A
	Exit	1	1		612			612	625	0.0	0.0	0.000	A
B - Chelmsford Road	Entry	1	1	A, B, C, D	1024	1999	0.512	1021	1031	1.1	1.0	3.776	A
	Exit	1	1		942			942	959	0.0	0.0	0.000	A
C - A12 (W)	Entry	1	1	A, D	568	1010	0.562	569	588	1.5	1.4	8.753	A
			2	A, B, C	230	1006	0.229	230	236	0.2	0.2	4.398	A
	Exit	1	1		546			546	552	0.0	0.0	0.000	A
D - Roman Road	Entry	1	1	A, B, C, D	730	1732	0.422	729	731	0.7	0.8	3.592	A
	Exit	1	1		1061			1061	1085	0.0	0.0	0.000	A

18:00 - 18:15

Arm	Side	Lane level	Lane	Destination arms	Total Demand (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Average throughput (PCU/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
A - A12 (E)	Entry	1	1	B, C	500	917	0.545	495	506	1.2	1.1	8.281	A
			2	A, C, D	113	919	0.124	114	119	0.1	0.1	4.662	A
	Exit	1	1		646			646	644	0.0	0.0	0.000	A
B - Chelmsford Road	Entry	1	1	A, B, C, D	1019	2007	0.508	1019	1023	1.0	0.9	3.554	A
	Exit	1	1		929			929	941	0.0	0.0	0.000	A
C - A12 (W)	Entry	1	1	A, D	573	1013	0.565	576	596	1.4	1.4	8.092	A
			2	A, B, C	227	1011	0.224	227	234	0.2	0.2	4.560	A
	Exit	1	1		524			524	545	0.0	0.0	0.000	A
D - Roman Road	Entry	1	1	A, B, C, D	730	1717	0.425	724	737	0.8	1.0	3.766	A
	Exit	1	1		1056			1056	1083	0.0	0.0	0.000	A

18:15 - 18:30

Arm	Side	Lane level	Lane	Destination arms	Total Demand (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Average throughput (PCU/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
A - A12 (E)	Entry	1	1	B, C	527	924	0.571	531	516	1.1	1.1	9.212	A
			2	A, C, D	108	917	0.118	108	110	0.1	0.2	4.616	A
	Exit	1	1		622			622	628	0.0	0.0	0.000	A
B - Chelmsford Road	Entry	1	1	A, B, C, D	1024	2013	0.509	1021	1027	0.9	1.1	3.458	A
	Exit	1	1		958			958	972	0.0	0.0	0.000	A
C - A12 (W)	Entry	1	1	A, D	568	1020	0.556	568	587	1.4	1.2	8.043	A
			2	A, B, C	216	1014	0.213	215	238	0.2	0.3	4.645	A
	Exit	1	1		529			529	551	0.0	0.0	0.000	A
D - Roman Road	Entry	1	1	A, B, C, D	724	1746	0.415	717	748	1.0	1.2	3.724	A
	Exit	1	1		1052			1052	1075	0.0	0.0	0.000	A

2033 Base + Proposed Development, AM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Lane Simulation	A1 - [Lane Simulation]	This analysis set uses Lane Simulation mode. This is provided as an investigative tool and the user should apply judgement when interpreting the results.
Last Run	Lane Simulation	A - A12 (E) - Lane Simulation	Arm A: Queue at end of modelled period is greater than 10 PCU. Delay is likely to have been underestimated.
Warning	Profile Type	D15 - 2033 Base + Proposed Development, AM	The DIRECT profile type is intended to be used for demand that varies over time. You are using it with the 'Use O-D data' option, but your O-D data does not vary over time. Are you sure this is correct?

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (s)	Junction LOS
1	Mountnessing Roundabout	Large Roundabout		A, B, C, D	34.71	D

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Arms

Arms

[same as above]

Roundabout Geometry

[same as above]

Large Roundabout Data

Arm	Circulating flow (PCU/hr)	Entry-to-exit separation (m)
A - A12 (E)	1142	88.10
B - Chelmsford Road	667	0.00
C - A12 (W)	899	86.00
D - Roman Road	621	0.00

Slope / Intercept / Capacity

[same as above]

Lane Simulation: Arm options

[same as above]

Lanes

[same as above]

Entry Lane slope and intercept

[same as above]

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time period length (min)	Time segment length (min)	Run automatically
D15	2033 Base + Proposed Development	AM	DIRECT	08:00	09:30	90	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	Scaling Factor (%)
A - A12 (E)		DIRECT	✓	100.000
B - Chelmsford Road		DIRECT	✓	100.000
C - A12 (W)		DIRECT	✓	100.000
D - Roman Road		DIRECT	✓	100.000

Origin-Destination Data

Demand (Veh/hr)

		To			
		A - A12 (E)	B - Chelmsford Road	C - A12 (W)	D - Roman Road
From	A - A12 (E)	1	695	11	140
	B - Chelmsford Road	404	1	189	330
	C - A12 (W)	3	244	1	465
	D - Roman Road	158	453	476	1

Vehicle Mix

Heavy Vehicle Percentages

		To			
		A - A12 (E)	B - Chelmsford Road	C - A12 (W)	D - Roman Road
From	A - A12 (E)	0	4	18	9
	B - Chelmsford Road	5	0	3	3
	C - A12 (W)	0	4	0	7
	D - Roman Road	6	2	5	0

Results

Results Summary for whole modelled period

Arm	Max Delay (s)	Max Queue (Veh)	Max LOS	Average Demand (Veh/hr)	Total Junction Arrivals (Veh)
A - A12 (E)	128.82	31.0	F	848	1272
B - Chelmsford Road	4.33	1.4	A	929	1394
C - A12 (W)	6.09	1.4	A	713	1069
D - Roman Road	5.70	1.9	A	1091	1636

Main Results for each time segment

08:00 - 08:15

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Throughput (Veh/hr)	Average throughput (PCU/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
A - A12 (E)	844	211	1182	794	825	559	0.0	14.9	44.740	E
B - Chelmsford Road	916	229	627	913	949	1350	0.0	1.2	4.310	A
C - A12 (W)	717	179	856	716	749	684	0.0	1.4	5.882	A
D - Roman Road	1086	271	658	1083	1129	914	0.0	1.8	5.530	A

08:15 - 08:30

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Throughput (Veh/hr)	Average throughput (PCU/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
A - A12 (E)	859	215	1187	822	866	568	14.9	22.1	82.311	F
B - Chelmsford Road	935	234	633	934	956	1375	1.2	1.4	4.218	A
C - A12 (W)	714	178	882	716	768	685	1.4	1.2	6.078	A
D - Roman Road	1098	275	656	1098	1135	942	1.8	1.9	5.691	A

08:30 - 08:45

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Throughput (Veh/hr)	Average throughput (PCU/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
A - A12 (E)	838	210	1159	825	876	566	22.1	25.1	104.075	F
B - Chelmsford Road	937	234	627	937	964	1357	1.4	1.1	4.290	A
C - A12 (W)	710	178	880	711	751	684	1.2	1.1	5.972	A
D - Roman Road	1081	270	647	1077	1132	944	1.9	1.8	5.640	A

08:45 - 09:00

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Throughput (Veh/hr)	Average throughput (PCU/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
A - A12 (E)	851	213	1177	826	883	566	25.1	29.1	117.205	F
B - Chelmsford Road	942	236	639	944	969	1365	1.1	1.0	4.296	A
C - A12 (W)	704	176	893	706	751	690	1.1	1.1	5.849	A
D - Roman Road	1092	273	655	1089	1125	944	1.8	1.9	5.700	A

09:00 - 09:15

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Throughput (Veh/hr)	Average throughput (PCU/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
A - A12 (E)	849	212	1175	855	889	562	29.1	30.4	128.824	F
B - Chelmsford Road	929	232	630	927	965	1400	1.0	1.1	4.335	A
C - A12 (W)	719	180	881	718	756	676	1.1	1.1	5.782	A
D - Roman Road	1084	271	654	1083	1131	945	1.9	1.5	5.417	A

09:15 - 09:30

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Throughput (Veh/hr)	Average throughput (PCU/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
A - A12 (E)	847	212	1175	844	891	569	30.4	31.2	117.137	F
B - Chelmsford Road	916	229	632	918	960	1387	1.1	0.8	4.168	A
C - A12 (W)	713	178	874	711	757	677	1.1	1.4	6.089	A
D - Roman Road	1103	276	647	1097	1128	937	1.5	1.8	5.579	A

Lane Results

Lane Level notation: Lane Level 1 is always closest to the junction.

Lanes: Main Results for each time segment

08:00 - 08:15

Arm	Side	Lane level	Lane	Destination arms	Total Demand (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Average throughput (PCU/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
A - A12 (E)	Entry	1	1	B, C	700	708	0.991	651	666	0.0	14.6	52.637	F
			2	A, C, D	144	670	0.214	142	158	0.0	0.3	6.994	A
	Exit	1	1		559			559	595	0.0	0.0	0.000	A
B - Chelmsford Road	Entry	1	1	A, B, C, D	916	1798	0.509	913	949	0.0	1.2	4.310	A
	Exit	1	1		1350			1350	1377	0.0	0.0	0.000	A
C - A12 (W)	Entry	1	1	A, D	464	1034	0.449	462	494	0.0	1.1	6.641	A
			2	A, B, C	253	1064	0.237	253	254	0.0	0.3	4.450	A
	Exit	1	1		684			684	707	0.0	0.0	0.000	A
D - Roman Road	Entry	1	1	A, B, C, D	1086	1746	0.621	1083	1129	0.0	1.8	5.530	A
	Exit	1	1		914			914	973	0.0	0.0	0.000	A

08:15 - 08:30

Arm	Side	Lane level	Lane	Destination arms	Total Demand (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Average throughput (PCU/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
A - A12 (E)	Entry	1	1	B, C	705	702	1.006	670	698	14.6	21.7	98.712	F
			2	A, C, D	153	661	0.233	151	167	0.3	0.3	7.129	A
	Exit	1	1		568			568	593	0.0	0.0	0.000	A
B - Chelmsford Road	Entry	1	1	A, B, C, D	935	1796	0.521	934	956	1.2	1.4	4.218	A
	Exit	1	1		1375			1375	1421	0.0	0.0	0.000	A
C - A12 (W)	Entry	1	1	A, D	463	1017	0.455	466	509	1.1	0.9	6.841	A
			2	A, B, C	251	1042	0.241	250	260	0.3	0.3	4.629	A
	Exit	1	1		685			685	705	0.0	0.0	0.000	A
D - Roman Road	Entry	1	1	A, B, C, D	1098	1744	0.630	1098	1135	1.8	1.9	5.691	A
	Exit	1	1		942			942	1007	0.0	0.0	0.000	A

08:30 - 08:45

Arm	Side	Lane level	Lane	Destination arms	Total Demand (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Average throughput (PCU/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
A - A12 (E)	Entry	1	1	B, C	683	716	0.953	673	709	21.7	24.7	125.540	F
			2	A, C, D	156	684	0.228	152	167	0.3	0.4	7.324	A
	Exit	1	1		566			566	595	0.0	0.0	0.000	A
B - Chelmsford Road	Entry	1	1	A, B, C, D	937	1804	0.519	937	964	1.4	1.1	4.290	A
	Exit	1	1		1357			1357	1425	0.0	0.0	0.000	A
C - A12 (W)	Entry	1	1	A, D	467	1023	0.456	467	497	0.9	0.8	6.634	A
			2	A, B, C	243	1044	0.233	243	254	0.3	0.3	4.705	A
	Exit	1	1		684			684	710	0.0	0.0	0.000	A
D - Roman Road	Entry	1	1	A, B, C, D	1081	1752	0.617	1077	1132	1.9	1.8	5.640	A
	Exit	1	1		944			944	993	0.0	0.0	0.000	A

08:45 - 09:00

Arm	Side	Lane level	Lane	Destination arms	Total Demand (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Average throughput (PCU/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
A - A12 (E)	Entry	1	1	B, C	698	706	0.986	674	712	24.7	28.8	141.284	F
			2	A, C, D	153	673	0.228	153	170	0.4	0.3	7.206	A
	Exit	1	1		566			566	594	0.0	0.0	0.000	A
B - Chelmsford Road	Entry	1	1	A, B, C, D	942	1785	0.528	944	969	1.1	1.0	4.296	A
	Exit	1	1		1365			1365	1433	0.0	0.0	0.000	A
C - A12 (W)	Entry	1	1	A, D	461	1014	0.455	464	490	0.8	0.6	6.552	A
			2	A, B, C	242	1039	0.233	242	261	0.3	0.4	4.561	A
	Exit	1	1		690			690	711	0.0	0.0	0.000	A
D - Roman Road	Entry	1	1	A, B, C, D	1092	1749	0.625	1089	1125	1.8	1.9	5.700	A
	Exit	1	1		944			944	989	0.0	0.0	0.000	A

09:00 - 09:15

Arm	Side	Lane level	Lane	Destination arms	Total Demand (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Average throughput (PCU/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
A - A12 (E)	Entry	1	1	B, C	696	707	0.984	702	720	28.8	30.1	155.755	F
			2	A, C, D	153	668	0.228	152	169	0.3	0.3	7.037	A
	Exit	1	1		562			562	597	0.0	0.0	0.000	A
B - Chelmsford Road	Entry	1	1	A, B, C, D	929	1796	0.518	927	965	1.0	1.1	4.335	A
	Exit	1	1		1400			1400	1443	0.0	0.0	0.000	A
C - A12 (W)	Entry	1	1	A, D	469	1014	0.463	467	494	0.6	0.9	6.512	A
			2	A, B, C	250	1044	0.239	250	261	0.4	0.2	4.436	A
	Exit	1	1		676			676	707	0.0	0.0	0.000	A
D - Roman Road	Entry	1	1	A, B, C, D	1084	1747	0.620	1083	1131	1.9	1.5	5.417	A
	Exit	1	1		945			945	994	0.0	0.0	0.000	A

09:15 - 09:30

Arm	Side	Lane level	Lane	Destination arms	Total Demand (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Average throughput (PCU/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
A - A12 (E)	Entry	1	1	B, C	695	712	0.976	692	722	30.1	30.9	144.166	F
			2	A, C, D	151	676	0.224	151	169	0.3	0.3	7.086	A
	Exit	1	1		569			569	599	0.0	0.0	0.000	A
B - Chelmsford Road	Entry	1	1	A, B, C, D	916	1789	0.512	918	960	1.1	0.8	4.168	A
	Exit	1	1		1387			1387	1435	0.0	0.0	0.000	A
C - A12 (W)	Entry	1	1	A, D	467	1017	0.459	465	502	0.9	1.0	6.847	A
			2	A, B, C	246	1053	0.234	246	255	0.2	0.3	4.650	A
	Exit	1	1		677			677	706	0.0	0.0	0.000	A
D - Roman Road	Entry	1	1	A, B, C, D	1103	1752	0.630	1097	1128	1.5	1.8	5.579	A
	Exit	1	1		937			937	995	0.0	0.0	0.000	A

2033 Base + Proposed Development, PM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Lane Simulation	A1 - [Lane Simulation]	This analysis set uses Lane Simulation mode. This is provided as an investigative tool and the user should apply judgement when interpreting the results.
Warning	Profile Type	D16 - 2033 Base + Proposed Development, PM	The DIRECT profile type is intended to be used for demand that varies over time. You are using it with the 'Use O-D data' option, but your O-D data does not vary over time. Are you sure this is correct?

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (s)	Junction LOS
1	Mountnessing Roundabout	Large Roundabout		A, B, C, D	5.69	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Arms

Arms

[same as above]

Roundabout Geometry

[same as above]

Large Roundabout Data

Arm	Circulating flow (PCU/hr)	Entry-to-exit separation (m)
A - A12 (E)	760	88.10
B - Chelmsford Road	504	0.00
C - A12 (W)	965	86.00
D - Roman Road	672	0.00

Slope / Intercept / Capacity

[same as above]

Lane Simulation: Arm options

[same as above]

Lanes

[same as above]

Entry Lane slope and intercept

[same as above]

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time period length (min)	Time segment length (min)	Run automatically
D16	2033 Base + Proposed Development	PM	DIRECT	17:00	18:30	90	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	Scaling Factor (%)
A - A12 (E)		DIRECT	✓	100.000
B - Chelmsford Road		DIRECT	✓	100.000
C - A12 (W)		DIRECT	✓	100.000
D - Roman Road		DIRECT	✓	100.000

Origin-Destination Data

Demand (Veh/hr)

		To			
		A - A12 (E)	B - Chelmsford Road	C - A12 (W)	D - Roman Road
From	A - A12 (E)	0	511	2	111
	B - Chelmsford Road	487	1	145	372
	C - A12 (W)	2	224	0	566
	D - Roman Road	131	208	381	1

Vehicle Mix

Heavy Vehicle Percentages

		To			
		A - A12 (E)	B - Chelmsford Road	C - A12 (W)	D - Roman Road
From	A - A12 (E)	0	1	0	1
	B - Chelmsford Road	2	0	1	0
	C - A12 (W)	0	4	0	4
	D - Roman Road	2	1	2	0

Results

Results Summary for whole modelled period

Arm	Max Delay (s)	Max Queue (Veh)	Max LOS	Average Demand (Veh/hr)	Total Junction Arrivals (Veh)
A - A12 (E)	8.57	1.7	A	634	951
B - Chelmsford Road	3.77	1.2	A	993	1490
C - A12 (W)	7.37	1.9	A	805	1207
D - Roman Road	3.88	0.8	A	722	1083

Main Results for each time segment

17:00 - 17:15

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Throughput (Veh/hr)	Average throughput (PCU/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
A - A12 (E)	636	159	806	640	640	627	0.0	1.2	8.030	A
B - Chelmsford Road	1002	250	499	1003	1011	947	0.0	0.8	3.578	A
C - A12 (W)	783	196	969	790	816	533	0.0	1.4	7.373	A
D - Roman Road	726	181	704	730	738	1056	0.0	0.6	3.533	A

17:15 - 17:30

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Throughput (Veh/hr)	Average throughput (PCU/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
A - A12 (E)	618	155	810	618	627	630	1.2	1.4	8.224	A
B - Chelmsford Road	992	248	493	993	1003	936	0.8	0.9	3.583	A
C - A12 (W)	813	203	981	818	836	506	1.4	1.7	7.005	A
D - Roman Road	712	178	728	712	727	1071	0.6	0.6	3.524	A

17:30 - 17:45

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Throughput (Veh/hr)	Average throughput (PCU/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
A - A12 (E)	625	156	820	624	628	616	1.4	1.3	7.718	A
B - Chelmsford Road	993	248	486	992	1015	958	0.9	0.8	3.465	A
C - A12 (W)	804	201	952	810	825	526	1.7	1.5	7.365	A
D - Roman Road	715	179	722	714	715	1039	0.6	0.8	3.531	A

17:45 - 18:00

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Throughput (Veh/hr)	Average throughput (PCU/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
A - A12 (E)	632	158	797	634	632	623	1.3	1.4	8.182	A
B - Chelmsford Road	994	249	486	996	1006	945	0.8	1.2	3.407	A
C - A12 (W)	805	201	972	798	821	510	1.5	1.6	7.001	A
D - Roman Road	707	177	713	706	733	1056	0.8	0.8	3.532	A

18:00 - 18:15

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Throughput (Veh/hr)	Average throughput (PCU/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
A - A12 (E)	655	164	800	652	648	620	1.4	1.7	8.571	A
B - Chelmsford Road	1009	252	497	1007	1012	955	1.2	1.2	3.551	A
C - A12 (W)	809	202	986	802	824	518	1.6	1.8	7.244	A
D - Roman Road	721	180	699	720	741	1089	0.8	0.7	3.558	A

18:15 - 18:30

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Throughput (Veh/hr)	Average throughput (PCU/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
A - A12 (E)	640	160	842	637	646	614	1.7	1.6	8.220	A
B - Chelmsford Road	972	243	509	975	1002	970	1.2	1.1	3.774	A
C - A12 (W)	813	203	946	818	839	539	1.8	1.4	7.184	A
D - Roman Road	749	187	703	753	749	1061	0.7	0.8	3.882	A

Lane Results

Lane Level notation: Lane Level 1 is always closest to the junction.

Lanes: Main Results for each time segment

17:00 - 17:15

Arm	Side	Lane level	Lane	Destination arms	Total Demand (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Average throughput (PCU/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
A - A12 (E)	Entry	1	1	B, C	527	919	0.574	529	524	0.0	1.2	8.815	A
			2	A, C, D	109	917	0.119	110	117	0.0	0.1	4.478	A
	Exit	1	1		627			627	632	0.0	0.0	0.000	A
B - Chelmsford Road	Entry	1	1	A, B, C, D	1002	2003	0.500	1003	1011	0.0	0.8	3.578	A
	Exit	1	1		947			947	961	0.0	0.0	0.000	A
C - A12 (W)	Entry	1	1	A, D	568	1015	0.559	575	588	0.0	1.2	8.449	A
			2	A, B, C	215	1007	0.214	215	228	0.0	0.3	4.582	A
	Exit	1	1		533			533	539	0.0	0.0	0.000	A
D - Roman Road	Entry	1	1	A, B, C, D	726	1751	0.415	730	738	0.0	0.6	3.533	A
	Exit	1	1		1056			1056	1074	0.0	0.0	0.000	A

17:15 - 17:30

Arm	Side	Lane level	Lane	Destination arms	Total Demand (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Average throughput (PCU/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
A - A12 (E)	Entry	1	1	B, C	499	917	0.544	500	513	1.2	1.2	9.014	A
			2	A, C, D	119	922	0.129	119	113	0.1	0.2	4.687	A
	Exit	1	1		630			630	633	0.0	0.0	0.000	A
B - Chelmsford Road	Entry	1	1	A, B, C, D	992	2012	0.493	993	1003	0.8	0.9	3.583	A
	Exit	1	1		936			936	959	0.0	0.0	0.000	A
C - A12 (W)	Entry	1	1	A, D	583	1011	0.578	589	598	1.2	1.3	7.946	A
			2	A, B, C	230	1002	0.229	229	238	0.3	0.4	4.642	A
	Exit	1	1		506			506	526	0.0	0.0	0.000	A
D - Roman Road	Entry	1	1	A, B, C, D	712	1721	0.414	712	727	0.6	0.6	3.524	A
	Exit	1	1		1071			1071	1075	0.0	0.0	0.000	A

17:30 - 17:45

Arm	Side	Lane level	Lane	Destination arms	Total Demand (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Average throughput (PCU/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
A - A12 (E)	Entry	1	1	B, C	515	914	0.563	514	516	1.2	1.2	8.430	A
			2	A, C, D	110	911	0.121	109	111	0.2	0.1	4.408	A
	Exit	1	1		616			616	634	0.0	0.0	0.000	A
B - Chelmsford Road	Entry	1	1	A, B, C, D	993	2015	0.493	992	1015	0.9	0.8	3.465	A
	Exit	1	1		958			958	960	0.0	0.0	0.000	A
C - A12 (W)	Entry	1	1	A, D	571	1030	0.553	576	589	1.3	1.3	8.502	A
			2	A, B, C	234	1029	0.227	234	236	0.4	0.3	4.529	A
	Exit	1	1		526			526	523	0.0	0.0	0.000	A
D - Roman Road	Entry	1	1	A, B, C, D	715	1735	0.412	714	715	0.6	0.8	3.531	A
	Exit	1	1		1039			1039	1066	0.0	0.0	0.000	A

17:45 - 18:00

Arm	Side	Lane level	Lane	Destination arms	Total Demand (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Average throughput (PCU/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
A - A12 (E)	Entry	1	1	B, C	512	922	0.555	515	518	1.2	1.2	9.010	A
			2	A, C, D	120	921	0.130	120	114	0.1	0.2	4.410	A
	Exit	1	1		623			623	643	0.0	0.0	0.000	A
B - Chelmsford Road	Entry	1	1	A, B, C, D	994	2016	0.493	996	1006	0.8	1.2	3.407	A
	Exit	1	1		945			945	961	0.0	0.0	0.000	A
C - A12 (W)	Entry	1	1	A, D	580	1017	0.571	574	590	1.3	1.4	7.908	A
			2	A, B, C	225	1010	0.222	224	231	0.3	0.2	4.694	A
	Exit	1	1		510			510	528	0.0	0.0	0.000	A
D - Roman Road	Entry	1	1	A, B, C, D	707	1734	0.408	706	733	0.8	0.8	3.532	A
	Exit	1	1		1056			1056	1060	0.0	0.0	0.000	A

18:00 - 18:15

Arm	Side	Lane level	Lane	Destination arms	Total Demand (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Average throughput (PCU/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
A - A12 (E)	Entry	1	1	B, C	536	926	0.580	536	533	1.2	1.4	9.426	A
			2	A, C, D	118	925	0.128	116	115	0.2	0.3	4.620	A
	Exit	1	1		620			620	629	0.0	0.0	0.000	A
B - Chelmsford Road	Entry	1	1	A, B, C, D	1009	2008	0.503	1007	1012	1.2	1.2	3.551	A
	Exit	1	1		955			955	972	0.0	0.0	0.000	A
C - A12 (W)	Entry	1	1	A, D	593	1011	0.587	588	595	1.4	1.5	8.321	A
			2	A, B, C	216	1005	0.215	215	229	0.2	0.3	4.439	A
	Exit	1	1		518			518	543	0.0	0.0	0.000	A
D - Roman Road	Entry	1	1	A, B, C, D	721	1750	0.412	720	741	0.8	0.7	3.558	A
	Exit	1	1		1089			1089	1082	0.0	0.0	0.000	A

18:15 - 18:30

Arm	Side	Lane level	Lane	Destination arms	Total Demand (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Average throughput (PCU/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
A - A12 (E)	Entry	1	1	B, C	527	904	0.583	525	531	1.4	1.4	9.005	A
			2	A, C, D	113	906	0.125	113	114	0.3	0.2	4.554	A
	Exit	1	1		614			614	626	0.0	0.0	0.000	A
B - Chelmsford Road	Entry	1	1	A, B, C, D	972	1989	0.488	975	1002	1.2	1.1	3.774	A
	Exit	1	1		970			970	980	0.0	0.0	0.000	A
C - A12 (W)	Entry	1	1	A, D	585	1023	0.572	589	602	1.5	1.1	8.186	A
			2	A, B, C	228	1029	0.221	229	236	0.3	0.3	4.632	A
	Exit	1	1		539			539	549	0.0	0.0	0.000	A
D - Roman Road	Entry	1	1	A, B, C, D	749	1748	0.428	753	749	0.7	0.8	3.882	A
	Exit	1	1		1061			1061	1080	0.0	0.0	0.000	A

2033 Base + Proposed + Committed, AM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Lane Simulation	A1 - [Lane Simulation]	This analysis set uses Lane Simulation mode. This is provided as an investigative tool and the user should apply judgement when interpreting the results.
Last Run	Lane Simulation	A - A12 (E) - Lane Simulation	Arm A: Queue at end of modelled period is greater than 10 PCU. Delay is likely to have been underestimated.
Warning	Profile Type	D17 - 2033 Base + Proposed + Committed, AM	The DIRECT profile type is intended to be used for demand that varies over time. You are using it with the 'Use O-D data' option, but your O-D data does not vary over time. Are you sure this is correct?

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (s)	Junction LOS
1	Mountnessing Roundabout	Large Roundabout		A, B, C, D	34.21	D

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Arms

Arms

[same as above]

Roundabout Geometry

[same as above]

Large Roundabout Data

Arm	Circulating flow (PCU/hr)	Entry-to-exit separation (m)
A - A12 (E)	1142	88.10
B - Chelmsford Road	667	0.00
C - A12 (W)	899	86.00
D - Roman Road	621	0.00

Slope / Intercept / Capacity

[same as above]

Lane Simulation: Arm options

[same as above]

Lanes

[same as above]

Entry Lane slope and intercept

[same as above]

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time period length (min)	Time segment length (min)	Run automatically
D17	2033 Base + Proposed + Committed	AM	DIRECT	08:00	09:30	90	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	Scaling Factor (%)
A - A12 (E)		DIRECT	✓	100.000
B - Chelmsford Road		DIRECT	✓	100.000
C - A12 (W)		DIRECT	✓	100.000
D - Roman Road		DIRECT	✓	100.000

Origin-Destination Data

Demand (Veh/hr)

		To			
		A - A12 (E)	B - Chelmsford Road	C - A12 (W)	D - Roman Road
From	A - A12 (E)	1	695	11	140
	B - Chelmsford Road	437	1	283	372
	C - A12 (W)	3	246	1	465
	D - Roman Road	158	459	476	1

Vehicle Mix

Heavy Vehicle Percentages

		To			
		A - A12 (E)	B - Chelmsford Road	C - A12 (W)	D - Roman Road
From	A - A12 (E)	0	4	18	9
	B - Chelmsford Road	5	0	2	3
	C - A12 (W)	0	3	0	7
	D - Roman Road	6	2	5	0

Results

Results Summary for whole modelled period

Arm	Max Delay (s)	Max Queue (Veh)	Max LOS	Average Demand (Veh/hr)	Total Junction Arrivals (Veh)
A - A12 (E)	130.33	33.0	F	847	1270
B - Chelmsford Road	5.36	1.9	A	1097	1646
C - A12 (W)	6.53	1.4	A	714	1071
D - Roman Road	6.26	2.4	A	1096	1644

Main Results for each time segment

08:00 - 08:15

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Throughput (Veh/hr)	Average throughput (PCU/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
A - A12 (E)	837	209	1193	810	823	604	0.0	14.3	45.542	E
B - Chelmsford Road	1104	276	631	1105	1134	1372	0.0	1.5	5.269	A
C - A12 (W)	726	181	955	724	753	782	0.0	1.4	6.534	A
D - Roman Road	1102	276	692	1105	1137	988	0.0	1.8	5.688	A

08:15 - 08:30

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Throughput (Veh/hr)	Average throughput (PCU/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
A - A12 (E)	848	212	1189	830	868	607	14.3	18.8	73.286	F
B - Chelmsford Road	1104	276	630	1099	1133	1390	1.5	1.9	5.289	A
C - A12 (W)	712	178	955	711	755	773	1.4	1.2	6.391	A
D - Roman Road	1105	276	696	1100	1146	971	1.8	1.9	5.925	A

08:30 - 08:45

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Throughput (Veh/hr)	Average throughput (PCU/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
A - A12 (E)	848	212	1185	828	865	602	18.8	23.5	92.775	F
B - Chelmsford Road	1089	272	632	1088	1133	1381	1.9	1.7	5.355	A
C - A12 (W)	720	180	953	722	757	767	1.2	1.2	6.471	A
D - Roman Road	1090	273	695	1093	1139	980	1.9	1.7	6.261	A

08:45 - 09:00

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Throughput (Veh/hr)	Average throughput (PCU/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
A - A12 (E)	843	211	1178	848	879	595	23.5	26.8	112.394	F
B - Chelmsford Road	1083	271	619	1082	1117	1407	1.7	1.6	5.152	A
C - A12 (W)	697	174	939	699	749	762	1.2	1.0	6.093	A
D - Roman Road	1087	272	682	1092	1131	957	1.7	1.8	5.963	A

09:00 - 09:15

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Throughput (Veh/hr)	Average throughput (PCU/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
A - A12 (E)	847	212	1175	839	871	609	26.8	31.0	130.326	F
B - Chelmsford Road	1106	277	632	1107	1134	1382	1.6	1.4	5.141	A
C - A12 (W)	714	178	963	713	753	777	1.0	1.4	6.361	A
D - Roman Road	1089	272	693	1091	1137	983	1.8	1.7	5.906	A

09:15 - 09:30

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Throughput (Veh/hr)	Average throughput (PCU/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
A - A12 (E)	856	214	1175	850	890	603	31.0	33.2	123.855	F
B - Chelmsford Road	1097	274	632	1094	1127	1393	1.4	1.6	5.061	A
C - A12 (W)	715	179	949	712	759	777	1.4	1.3	6.435	A
D - Roman Road	1100	275	683	1095	1139	978	1.7	2.3	5.997	A

Lane Results

Lane Level notation: Lane Level 1 is always closest to the junction.

Lanes: Main Results for each time segment

08:00 - 08:15

Arm	Side	Lane level	Lane	Destination arms	Total Demand (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Average throughput (PCU/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
A - A12 (E)	Entry	1	1	B, C	686	703	0.976	660	659	0.0	14.0	53.974	F
			2	A, C, D	150	660	0.228	150	164	0.0	0.4	7.001	A
	Exit	1	1		604			604	628	0.0	0.0	0.000	A
B - Chelmsford Road	Entry	1	1	A, B, C, D	1104	1799	0.613	1105	1134	0.0	1.5	5.269	A
	Exit	1	1		1372			1372	1382	0.0	0.0	0.000	A
C - A12 (W)	Entry	1	1	A, D	472	978	0.483	472	496	0.0	1.0	7.503	A
			2	A, B, C	254	1018	0.249	253	257	0.0	0.3	4.727	A
	Exit	1	1		782			782	807	0.0	0.0	0.000	A
D - Roman Road	Entry	1	1	A, B, C, D	1102	1715	0.643	1105	1137	0.0	1.8	5.688	A
	Exit	1	1		988			988	1029	0.0	0.0	0.000	A

08:15 - 08:30

Arm	Side	Lane level	Lane	Destination arms	Total Demand (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Average throughput (PCU/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
A - A12 (E)	Entry	1	1	B, C	697	702	0.991	677	700	14.0	18.5	87.822	F
			2	A, C, D	152	667	0.228	153	167	0.4	0.3	7.262	A
	Exit	1	1		607			607	632	0.0	0.0	0.000	A
B - Chelmsford Road	Entry	1	1	A, B, C, D	1104	1804	0.612	1099	1133	1.5	1.9	5.289	A
	Exit	1	1		1390			1390	1429	0.0	0.0	0.000	A
C - A12 (W)	Entry	1	1	A, D	458	985	0.466	459	498	1.0	0.8	7.310	A
			2	A, B, C	254	1019	0.249	253	257	0.3	0.4	4.679	A
	Exit	1	1		773			773	806	0.0	0.0	0.000	A
D - Roman Road	Entry	1	1	A, B, C, D	1105	1713	0.645	1100	1146	1.8	1.9	5.925	A
	Exit	1	1		971			971	1034	0.0	0.0	0.000	A

08:30 - 08:45

Arm	Side	Lane level	Lane	Destination arms	Total Demand (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Average throughput (PCU/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
A - A12 (E)	Entry	1	1	B, C	696	705	0.990	675	703	18.5	23.2	111.121	F
			2	A, C, D	152	670	0.228	152	162	0.3	0.3	6.971	A
	Exit	1	1		602			602	634	0.0	0.0	0.000	A
B - Chelmsford Road	Entry	1	1	A, B, C, D	1089	1803	0.604	1088	1133	1.9	1.7	5.355	A
	Exit	1	1		1381			1381	1425	0.0	0.0	0.000	A
C - A12 (W)	Entry	1	1	A, D	466	981	0.476	468	500	0.8	0.9	7.374	A
			2	A, B, C	254	1016	0.251	253	258	0.4	0.4	4.781	A
	Exit	1	1		767			767	803	0.0	0.0	0.000	A
D - Roman Road	Entry	1	1	A, B, C, D	1090	1715	0.636	1093	1139	1.9	1.7	6.261	A
	Exit	1	1		980			980	1033	0.0	0.0	0.000	A

08:45 - 09:00

Arm	Side	Lane level	Lane	Destination arms	Total Demand (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Average throughput (PCU/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
A - A12 (E)	Entry	1	1	B, C	695	711	0.980	700	714	23.2	26.6	134.925	F
			2	A, C, D	149	671	0.222	148	165	0.3	0.2	6.944	A
	Exit	1	1		595			595	623	0.0	0.0	0.000	A
B - Chelmsford Road	Entry	1	1	A, B, C, D	1083	1811	0.598	1082	1117	1.7	1.6	5.152	A
	Exit	1	1		1407			1407	1435	0.0	0.0	0.000	A
C - A12 (W)	Entry	1	1	A, D	453	983	0.460	453	493	0.9	0.8	6.864	A
			2	A, B, C	245	1026	0.238	246	256	0.4	0.3	4.668	A
	Exit	1	1		762			762	798	0.0	0.0	0.000	A
D - Roman Road	Entry	1	1	A, B, C, D	1087	1729	0.629	1092	1131	1.7	1.8	5.963	A
	Exit	1	1		957			957	1020	0.0	0.0	0.000	A

09:00 - 09:15

Arm	Side	Lane level	Lane	Destination arms	Total Demand (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Average throughput (PCU/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
A - A12 (E)	Entry	1	1	B, C	693	711	0.974	684	707	26.6	30.7	157.070	F
			2	A, C, D	154	671	0.230	154	164	0.2	0.3	6.885	A
	Exit	1	1		609			609	629	0.0	0.0	0.000	A
B - Chelmsford Road	Entry	1	1	A, B, C, D	1106	1802	0.614	1107	1134	1.6	1.4	5.141	A
	Exit	1	1		1382			1382	1426	0.0	0.0	0.000	A
C - A12 (W)	Entry	1	1	A, D	469	976	0.480	467	498	0.8	1.0	7.207	A
			2	A, B, C	245	1015	0.241	246	255	0.3	0.4	4.778	A
	Exit	1	1		777			777	811	0.0	0.0	0.000	A
D - Roman Road	Entry	1	1	A, B, C, D	1089	1717	0.634	1091	1137	1.8	1.7	5.906	A
	Exit	1	1		983			983	1029	0.0	0.0	0.000	A

09:15 - 09:30

Arm	Side	Lane level	Lane	Destination arms	Total Demand (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Average throughput (PCU/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
A - A12 (E)	Entry	1	1	B, C	703	711	0.988	698	721	30.7	32.9	152.536	F
			2	A, C, D	152	675	0.226	152	169	0.3	0.3	7.160	A
	Exit	1	1		603			603	633	0.0	0.0	0.000	A
B - Chelmsford Road	Entry	1	1	A, B, C, D	1097	1798	0.610	1094	1127	1.4	1.6	5.061	A
	Exit	1	1		1393			1393	1436	0.0	0.0	0.000	A
C - A12 (W)	Entry	1	1	A, D	472	985	0.480	469	505	1.0	1.0	7.368	A
			2	A, B, C	243	1022	0.238	243	255	0.4	0.3	4.660	A
	Exit	1	1		777			777	806	0.0	0.0	0.000	A
D - Roman Road	Entry	1	1	A, B, C, D	1100	1724	0.639	1095	1139	1.7	2.3	5.997	A
	Exit	1	1		978			978	1040	0.0	0.0	0.000	A

2033 Base + Proposed + Committed, PM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Lane Simulation	A1 - [Lane Simulation]	This analysis set uses Lane Simulation mode. This is provided as an investigative tool and the user should apply judgement when interpreting the results.
Warning	Profile Type	D18 - 2033 Base + Proposed + Committed, PM	The DIRECT profile type is intended to be used for demand that varies over time. You are using it with the 'Use O-D data' option, but your O-D data does not vary over time. Are you sure this is correct?

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (s)	Junction LOS
1	Mountnessing Roundabout	Large Roundabout		A, B, C, D	6.14	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Arms

Arms

[same as above]

Roundabout Geometry

[same as above]

Large Roundabout Data

Arm	Circulating flow (PCU/hr)	Entry-to-exit separation (m)
A - A12 (E)	760	88.10
B - Chelmsford Road	504	0.00
C - A12 (W)	965	86.00
D - Roman Road	672	0.00

Slope / Intercept / Capacity

[same as above]

Lane Simulation: Arm options

[same as above]

Lanes

[same as above]

Entry Lane slope and intercept

[same as above]

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time period length (min)	Time segment length (min)	Run automatically
D18	2033 Base + Proposed + Committed	PM	DIRECT	17:00	18:30	90	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	Scaling Factor (%)
A - A12 (E)		DIRECT	✓	100.000
B - Chelmsford Road		DIRECT	✓	100.000
C - A12 (W)		DIRECT	✓	100.000
D - Roman Road		DIRECT	✓	100.000

Origin-Destination Data

Demand (Veh/hr)

		To			
		A - A12 (E)	B - Chelmsford Road	C - A12 (W)	D - Roman Road
From	A - A12 (E)	0	529	2	111
	B - Chelmsford Road	498	1	177	386
	C - A12 (W)	2	278	0	566
	D - Roman Road	131	231	381	1

Vehicle Mix

Heavy Vehicle Percentages

		To			
		A - A12 (E)	B - Chelmsford Road	C - A12 (W)	D - Roman Road
From	A - A12 (E)	0	1	0	1
	B - Chelmsford Road	2	0	1	0
	C - A12 (W)	0	3	0	4
	D - Roman Road	2	1	2	0

Results

Results Summary for whole modelled period

Arm	Max Delay (s)	Max Queue (Veh)	Max LOS	Average Demand (Veh/hr)	Total Junction Arrivals (Veh)
A - A12 (E)	10.37	2.6	B	640	960
B - Chelmsford Road	3.89	1.5	A	1059	1588
C - A12 (W)	7.67	2.0	A	846	1269
D - Roman Road	3.91	1.2	A	740	1110

Main Results for each time segment

17:00 - 17:15

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Throughput (Veh/hr)	Average throughput (PCU/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
A - A12 (E)	624	156	879	625	630	635	0.0	1.6	8.838	A
B - Chelmsford Road	1057	264	489	1057	1091	1014	0.0	1.3	3.877	A
C - A12 (W)	832	208	998	838	863	548	0.0	1.5	7.464	A
D - Roman Road	741	185	774	739	745	1061	0.0	0.7	3.787	A

17:15 - 17:30

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Throughput (Veh/hr)	Average throughput (PCU/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
A - A12 (E)	643	161	879	634	651	624	1.6	2.5	10.369	B
B - Chelmsford Road	1058	264	502	1051	1071	1011	1.3	1.5	3.882	A
C - A12 (W)	846	212	987	848	875	566	1.5	1.8	7.228	A
D - Roman Road	731	183	769	733	759	1065	0.7	0.7	3.910	A

17:30 - 17:45

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Throughput (Veh/hr)	Average throughput (PCU/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
A - A12 (E)	650	162	892	651	652	623	2.5	1.6	9.867	A
B - Chelmsford Road	1043	261	498	1046	1063	1045	1.5	0.8	3.890	A
C - A12 (W)	849	212	980	849	877	564	1.8	2.0	7.512	A
D - Roman Road	753	188	767	748	759	1062	0.7	1.2	3.834	A

17:45 - 18:00

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Throughput (Veh/hr)	Average throughput (PCU/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
A - A12 (E)	626	157	898	623	636	636	1.6	1.8	9.385	A
B - Chelmsford Road	1071	268	496	1069	1073	1025	0.8	1.2	3.781	A
C - A12 (W)	862	216	1010	862	886	555	2.0	1.8	7.470	A
D - Roman Road	746	187	787	747	756	1085	1.2	0.8	3.914	A

18:00 - 18:15

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Throughput (Veh/hr)	Average throughput (PCU/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
A - A12 (E)	656	164	887	659	659	648	1.8	1.6	9.599	A
B - Chelmsford Road	1071	268	486	1072	1085	1060	1.2	1.1	3.865	A
C - A12 (W)	845	211	1006	843	878	552	1.8	1.8	7.673	A
D - Roman Road	732	183	800	735	760	1049	0.8	0.5	3.777	A

18:15 - 18:30

Arm	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Circulating flow (Veh/hr)	Throughput (Veh/hr)	Average throughput (PCU/hr)	Throughput (exit side) (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
A - A12 (E)	638	159	876	637	642	632	1.6	1.8	9.087	A
B - Chelmsford Road	1053	263	490	1059	1070	1023	1.1	0.9	3.757	A
C - A12 (W)	844	211	992	844	876	557	1.8	2.0	7.275	A
D - Roman Road	737	184	772	735	751	1064	0.5	0.9	3.676	A

Lane Results

Lane Level notation: Lane Level 1 is always closest to the junction.

Lanes: Main Results for each time segment

17:00 - 17:15

Arm	Side	Lane level	Lane	Destination arms	Total Demand (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Average throughput (PCU/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
A - A12 (E)	Entry	1	1	B, C	512	883	0.581	514	518	0.0	1.4	9.732	A
			2	A, C, D	112	883	0.127	110	112	0.0	0.2	4.687	A
	Exit	1	1		635			635	653	0.0	0.0	0.000	A
B - Chelmsford Road	Entry	1	1	A, B, C, D	1057	2008	0.527	1057	1091	0.0	1.3	3.877	A
	Exit	1	1		1014			1014	1032	0.0	0.0	0.000	A
C - A12 (W)	Entry	1	1	A, D	566	1002	0.564	572	583	0.0	1.2	8.490	A
			2	A, B, C	266	1012	0.263	266	280	0.0	0.4	5.343	A
	Exit	1	1		548			548	558	0.0	0.0	0.000	A
D - Roman Road	Entry	1	1	A, B, C, D	741	1686	0.439	739	745	0.0	0.7	3.787	A
	Exit	1	1		1061			1061	1086	0.0	0.0	0.000	A

17:15 - 17:30

Arm	Side	Lane level	Lane	Destination arms	Total Demand (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Average throughput (PCU/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
A - A12 (E)	Entry	1	1	B, C	528	886	0.595	520	533	1.4	2.3	11.628	B
			2	A, C, D	116	886	0.130	114	117	0.2	0.3	4.626	A
	Exit	1	1		624			624	640	0.0	0.0	0.000	A
B - Chelmsford Road	Entry	1	1	A, B, C, D	1058	2002	0.528	1051	1071	1.3	1.5	3.882	A
	Exit	1	1		1011			1011	1054	0.0	0.0	0.000	A
C - A12 (W)	Entry	1	1	A, D	570	1010	0.564	571	588	1.2	1.4	8.278	A
			2	A, B, C	276	1021	0.271	277	287	0.4	0.3	5.089	A
	Exit	1	1		566			566	571	0.0	0.0	0.000	A
D - Roman Road	Entry	1	1	A, B, C, D	731	1696	0.431	733	759	0.7	0.7	3.910	A
	Exit	1	1		1065			1065	1090	0.0	0.0	0.000	A

17:30 - 17:45

Arm	Side	Lane level	Lane	Destination arms	Total Demand (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Average throughput (PCU/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
A - A12 (E)	Entry	1	1	B, C	539	878	0.614	539	542	2.3	1.6	10.867	B
			2	A, C, D	111	884	0.125	112	110	0.3	0.1	4.958	A
	Exit	1	1		623			623	640	0.0	0.0	0.000	A
B - Chelmsford Road	Entry	1	1	A, B, C, D	1043	2006	0.520	1046	1063	1.5	0.8	3.890	A
	Exit	1	1		1045			1045	1063	0.0	0.0	0.000	A
C - A12 (W)	Entry	1	1	A, D	575	1015	0.566	573	587	1.4	1.5	8.707	A
			2	A, B, C	274	1019	0.269	276	290	0.3	0.5	5.107	A
	Exit	1	1		564			564	575	0.0	0.0	0.000	A
D - Roman Road	Entry	1	1	A, B, C, D	753	1693	0.445	748	759	0.7	1.2	3.834	A
	Exit	1	1		1062			1062	1073	0.0	0.0	0.000	A

17:45 - 18:00

Arm	Side	Lane level	Lane	Destination arms	Total Demand (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Average throughput (PCU/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
A - A12 (E)	Entry	1	1	B, C	512	874	0.586	509	526	1.6	1.6	10.342	B
			2	A, C, D	114	874	0.131	114	110	0.1	0.2	4.840	A
	Exit	1	1		636			636	634	0.0	0.0	0.000	A
B - Chelmsford Road	Entry	1	1	A, B, C, D	1071	2006	0.534	1069	1073	0.8	1.2	3.781	A
	Exit	1	1		1025			1025	1055	0.0	0.0	0.000	A
C - A12 (W)	Entry	1	1	A, D	578	995	0.581	579	591	1.5	1.3	8.648	A
			2	A, B, C	284	1005	0.283	283	294	0.5	0.5	5.132	A
	Exit	1	1		555			555	564	0.0	0.0	0.000	A
D - Roman Road	Entry	1	1	A, B, C, D	746	1682	0.444	747	756	1.2	0.8	3.914	A
	Exit	1	1		1085			1085	1099	0.0	0.0	0.000	A

18:00 - 18:15

Arm	Side	Lane level	Lane	Destination arms	Total Demand (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Average throughput (PCU/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
A - A12 (E)	Entry	1	1	B, C	543	880	0.618	546	541	1.6	1.5	10.631	B
			2	A, C, D	113	882	0.128	112	117	0.2	0.1	4.853	A
	Exit	1	1		648			648	654	0.0	0.0	0.000	A
B - Chelmsford Road	Entry	1	1	A, B, C, D	1071	2017	0.531	1072	1085	1.2	1.1	3.865	A
	Exit	1	1		1060			1060	1066	0.0	0.0	0.000	A
C - A12 (W)	Entry	1	1	A, D	559	999	0.559	559	590	1.3	1.4	9.048	A
			2	A, B, C	286	1009	0.282	283	288	0.5	0.5	4.879	A
	Exit	1	1		552			552	566	0.0	0.0	0.000	A
D - Roman Road	Entry	1	1	A, B, C, D	732	1673	0.437	735	760	0.8	0.5	3.777	A
	Exit	1	1		1049			1049	1096	0.0	0.0	0.000	A

18:15 - 18:30

Arm	Side	Lane level	Lane	Destination arms	Total Demand (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Average throughput (PCU/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
A - A12 (E)	Entry	1	1	B, C	529	887	0.596	528	527	1.5	1.6	10.031	B
			2	A, C, D	109	886	0.124	109	115	0.1	0.2	4.756	A
	Exit	1	1		632			632	638	0.0	0.0	0.000	A
B - Chelmsford Road	Entry	1	1	A, B, C, D	1053	2013	0.523	1059	1070	1.1	0.9	3.757	A
	Exit	1	1		1023			1023	1040	0.0	0.0	0.000	A
C - A12 (W)	Entry	1	1	A, D	578	1005	0.574	577	589	1.4	1.6	8.339	A
			2	A, B, C	266	1018	0.262	267	287	0.5	0.4	5.106	A
	Exit	1	1		557			557	572	0.0	0.0	0.000	A
D - Roman Road	Entry	1	1	A, B, C, D	737	1697	0.435	735	751	0.5	0.9	3.676	A
	Exit	1	1		1064			1064	1088	0.0	0.0	0.000	A

APPENDIX C

School Site

NEAP

LEAP

Attenuation Basin

Private Drive

Shared Surface

Plaza

Bollards to prevent access from north by motorised traffic

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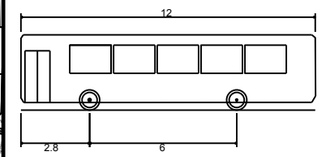
Notes:

1. This is not a construction drawing and is intended for illustrative purposes only.
2. White lining is indicative only.
3. Proposed layout is based on Finc Architects plan :_400K_Shenfield Proposed Site Layout.

Key

Red Line Boundary



'Standard' Rigid Bus

Overall Length	12.000m
Overall Width	2.550m
Overall Body Height	3.069m
Min Body Ground Clearance	0.309m
Track Width	2.350m
Lock to lock time	4.00s
Wall to Wall Turning Radius	10.771m

REV.	DETAILS	DRAWN	CHECKED	DATE
-	-	-	-	-

STATUS:
INFORMATION ONLY

CLIENT:
Croudace Homes Ltd

PROJECT:
Officers Meadow, Shenfield

DRAWING TITLE:
Swept Path Analysis
'Standard' Rigid Bus

SCALES:
1:2000 at A3

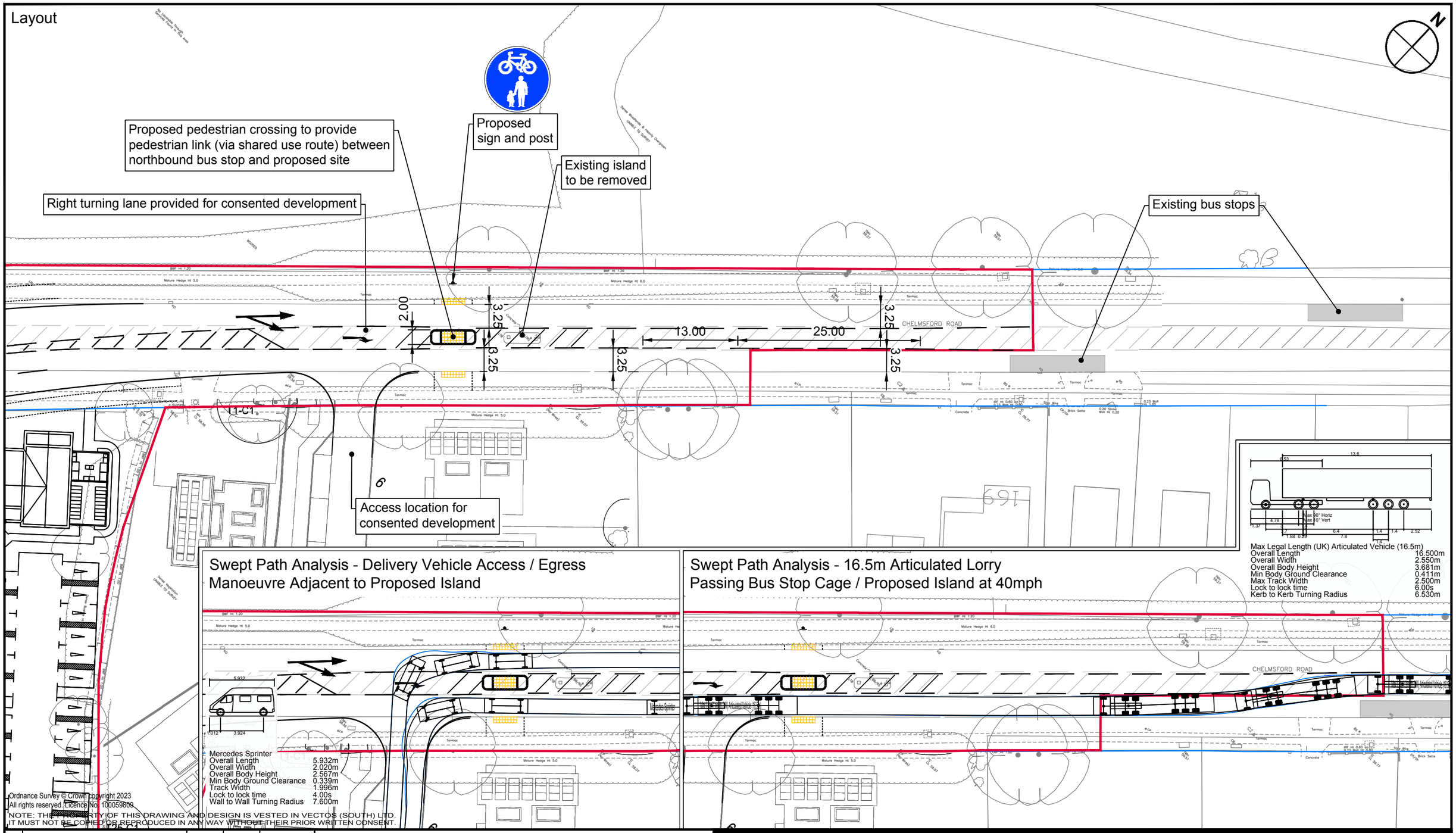
DRAWN:	CHECKED:	DATE:
PP	TF	24.04.2024

SLR

DRAWING NUMBER: 152080/PD23/AT01

REVISION: -

Layout



Max Legal Length (UK) Articulated Vehicle (16.5m)

Overall Length	16.500m
Overall Width	2.550m
Overall Body Height	3.681m
Min Body Ground Clearance	0.411m
Max Track Width	2.500m
Lock to lock time	6.00s
Kerb to Kerb Turning Radius	6.530m

Swept Path Analysis - Delivery Vehicle Access / Egress Manoeuvre Adjacent to Proposed Island

Mercedes Sprinter

Overall Length	5.932m
Overall Width	2.020m
Overall Body Height	2.567m
Min Body Ground Clearance	0.339m
Track Width	1.996m
Lock to lock time	4.00s
Wall to Wall Turning Radius	7.600m

Swept Path Analysis - 16.5m Articulated Lorry Passing Bus Stop Cage / Proposed Island at 40mph

REV.	DETAILS	DRAWN	CHECKED	DATE
A	Two running lane width increased to 3.25m	NS	TF	23.04.2024

INFORMATION ONLY

Notes:
1. This is not a construction drawing and is intended for illustrative purposes only.
2. White lining is indicative only.

Key

- Highway Boundary (Based on Ordnance Survey so minor inconsistencies on Topographical Survey)
- Red Line Boundary

Officers Meadow, Shenfield

Croudace Homes Ltd

Proposed Bus Stops & Pedestrian Crossing Adjacent to Site Access

DRAWN:	CHECKED:	DATE:	SCALES:	DRAWING NUMBER:	REVISION:
JB	MdC	11.12.2023	1:500 at A3	152080/PD19	A

SLR

X:\Projects\150000\152080 - Shenfield\DRAWINGS\152080_PD19_Rev A Prop Bus Stops & Ped Crossing Adjacent to Site Access.dwg

Officers Meadow
Essex County Council Consultation Response

N22/152080
04th June 2024

Introduction

1. Vectos has been appointed by Croudace Homes Ltd, to provide transport and highways advice in relation to the development at Officers Meadows, which forms part of the Land North of Shenfield allocated site within Brentwood Local Plan (2016-2033) as part of Policy R03.

2. The site lies within the administrative boundary of Essex County Council (ECC) and Brentwood Borough Council (BBC).

3. The development description for this full application is as follows:

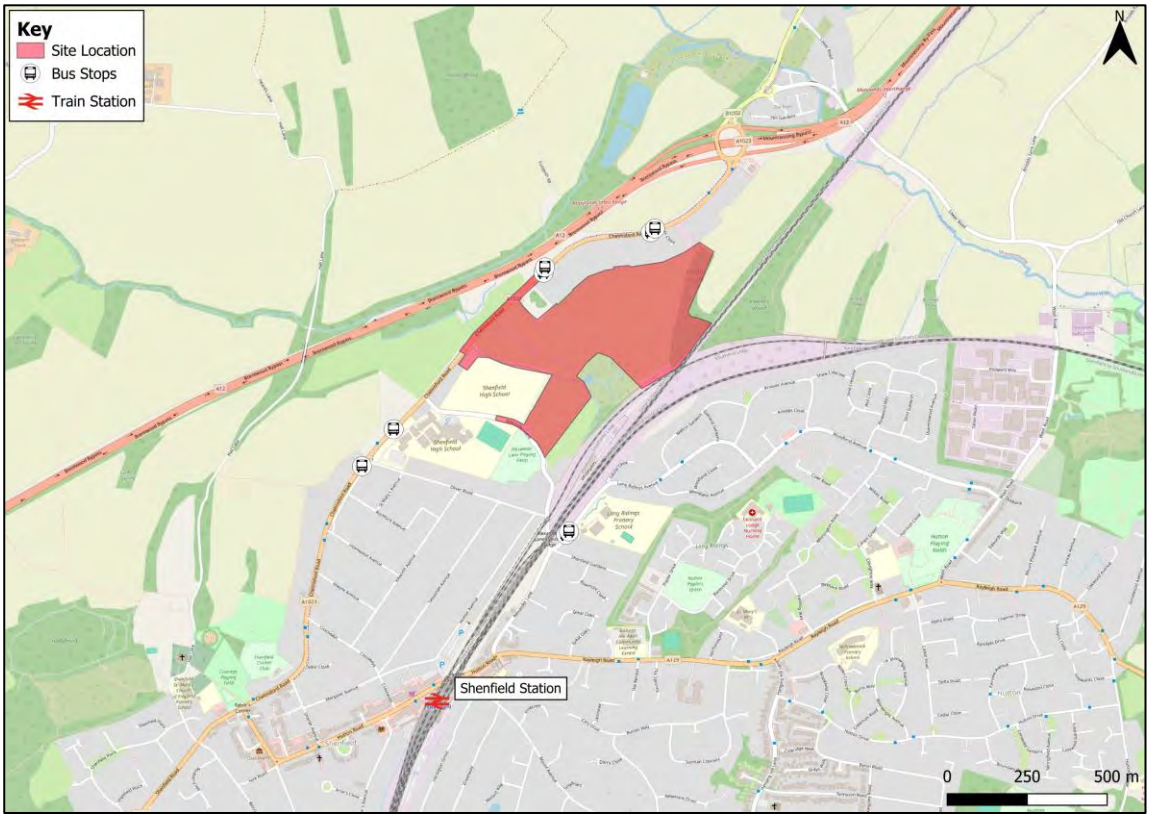
   "Full planning application for 344 units including 35% affordable housing, safeguarded land for a 2FE primary school and early years facility, public open space and associated landscaping, drainage and highways infrastructure."

4. The site location can be found in **Figure 1** below. The site is located to the north of Shenfield town centre and is proposed to have vehicle access from both the A12 Chelmsford Road and Alexander Lane. Pedestrian and cycle access are also provided via these access points. Further pedestrian and cycling accesses are provided via dedicated connections to these two roads and connections to the wider site allocation through the land owned by Stonebond Properties and Redrow Homes.

5. A planning application was submitted setting out the proposals in September 2023 with planning reference 23/01164/FULLPA and 23/01159/OUT. Essex County Council (ECC) Highways provided a previous set of comments on the application, dated 17th April 2024. Vectos responded to these in a technical note on 30th April 2024. A further response was provided on May 16th, 2024, with Vectos submitting a further response on the 23rd of May 2024. Several of the points were resolved through this process. ECC have requested further clarification on a few items considered within this note, dated Monday 3rd June 2024. These clarifications are addressed within this note. The clarifications are provided at **Appendix A** for reference.

6. The comments raised by ECC are provided below in *italics* with Vectos response following it.

Figure 1: Local Site Location



ECC Comments

Comment 1: Traffic Flow Diagrams

7. *"Firstly, it would have been useful if a diagram had been provided with the updated traffic flows. This would allow me to cross-reference the flows used in the junction assessments."*

Vectos Response

8. The traffic flow diagrams for the sensitivity test can be found in **Appendix B**.

Comment 2: Site Access

9. *"The Site Access roundabout model has been altered. The southern arm now has a 4.14m wide approach road half-width, 11.2m effective flare length and 55-degree conflict entry angle. The Transport Assessment showed a 3m wide approach road half width, 83.2m effective flare length and 36-degree conflict entry angle. Why has this been changed? Has the design changed or has this been manually altered for another reason?"*

Vectos Response

10. The measurements included within the sensitivity test have been updated based on CAD measures of the site access proposal. Previously the geometries had been hand measured from a scale drawing. A drawing showing the correct measurements has been included at **Appendix C**.

11. The updated geometries do not impact the results of the assessment within the TA or the sensitivity test. We have included modelling outputs for both the assessment undertaken in the TA and the sensitivity test at **Appendix D** for reference.

Comment 3: A1023 Chelmsford Road / Oliver Road

12. *"Less of a concern, but the Chelmsford Road / Oliver Road junction table appears mislabelled. Regardless, the table does not correspond with the junction output files. It seems that there has been an error in the traffic flow inputs. I hope and trust that figures in the table are correct. If so, there should be no issue."*

Vectos Response

13. The modelling results contained within Vectos response note dated 23rd May 2024 are correct. The correct output is appended at **Appendix E** for reference. The previous note included the previous TA results.

Comment 4: A1023 Chelmsford Road / Hutton Road / A1023 Shenfield Road

14. The correct modelling for A1023 Chelmsford Road/Hutton Road/A1023 Shenfield Road is provided in **Table 2** below. The full modelling output is appended at **Appendix F** for reference. The previous note included the previous TA results.

Table 2 - A1023 Chelmsford Road / Hutton Road / A1023 Shenfield Road Junction Modelling Results

Arm	TA AM		Sensitivity AM	
	Q (pcu)	DoS	Q (pcu)	DoS
2028 Base				
A1023 Shenfield Road	17	74.2	17	74.2
Chelmsford Road	13	74.2	13	74.2
Hutton Road	7	74.2	7	74.2
2028 Base + Proposed Development				
A1023 Shenfield Road	19	78.1	20	81.3
Chelmsford Road	17	79.2	15	81.0
Hutton Road	8	76.0	8	75
2028 Base + Committed Development+ Proposed Development				
A1023 Shenfield Road	19	75.9	21	82.1
Chelmsford Road	15	77.3	15	81.8
Hutton Road	7	76.4	8	77.1

15. The results above show an immaterial increase impact at the junction compared to the results presented within the TA. The conclusions remain the same as in the TA and no further mitigation is required.

Conclusion

16. In conclusion this note addresses a number of clarifications in relation to the response note issued by Vectos on the 23rd of May 2024.

17. All conclusions drawn within the original TA remain valid with there being no material impact on the local highway network.

APPENDIX A

From: [redacted]
Sent: Monday, June 3, 2024 12:08 PM
To: [redacted]
Cc: [redacted]
Subject: Shenfield R03, Croudace - update on Member Briefing / Highways / other matters

Good morning [redacted]

I hope you had a nice weekend. A quick update on various matters, ahead of our meeting this Thursday:

Member Briefing 10/06
I know you spoke with [redacted] about the member briefing next Tuesday. Did you have a chance to discuss with the other developers whether you can all attend as a 'consortium'?

ECC Highways

S278/ contributions
ECC will be happy to take s106 monies for the signals upgrade at the Chelmsford Road / Hutton Road / Shenfield Road junction (T30, amount agreed) and the pedestrian / cycle facilities to link with Shenfield Station (T10, to be agreed). They will expect Croudace to deliver all the works within the red line, which of course Ben already confirmed will be the case.

Route through Alexander Lane playing field
The works to the potential path along the Alexander Lane playing field will be subject to condition, and will most probably not be needed. We will make sure they are specifically linked to Phase 2.

SLR Transport Note

I am pleased that the applicant has now considered more realistic primary school trip numbers. There are one or two issues that I have with the document though;

Firstly, it would have been useful if a diagram had been provided with the updated traffic flows. This would allowed me to cross-reference the flows used in the junction assessments. Regardless, there were a couple of points that I'd like to get clarified in those assessments as follows:

- The Site Access roundabout model has been altered. The southern arm now has a 4.14m wide approach road half-width, 11.2m effective flare length and 55 degree conflict entry angle. The Transport Assessment showed a 3m wide approach road half width, 83.2m effective flare length and 36 degree conflict entry angle. Why has this been changed? Has the design changed or has this been manually altered for another reason?

-

- Less of a concern, but the Chelmsford Road / Oliver Road junction table appears mislabelled. Regardless, the table does not correspond with the junction output files. It seems that there has been an error in the traffic flow inputs. I hope and trust that figures in the table are correct. If so,

there should be no issue.

-
- Chelmsford Road / Hutton Road / Shenfield Road signalised junction; only summary output files have been provided. We would ask that the full results are provided as the results in Table 3 are unchanged from the Transport Assessment. That would suggest the same traffic flows have been used (I can't be sure until I've seen the full results).

I have yet to confirm about the bus stop, but an on-carriageway bus cage is likely to be ok.

Brendan is on leave this week. So, if SLR could provide their response by Friday, he will review it when he is back.

Education
I just chased Education on their final comments on noise, and on the conditions they want to be imposed on application 23/01164/FUL.

Design
Place Services will provide their response tomorrow afternoon. It will be a short response, but it will enable you to finalise the design package and re-submit it. A formal response will follow.

ECC PROW
The ECC PROW team confirmed that they will start looking at your application later in the summer. Brendan advised that this can be dealt with via condition, and since the PROW diversion is part of your Phase 4 development (if I remember correctly), it will not affect commencement of works.

Phasing Plan
Can this be formally submitted, so that we can refer to it in the conditions and committee report?

Pre-commencement Conditions
Subject to ECC Education and [redacted] confirming their requirements, I will be able to send you a draft list of conditions by the end of this week.

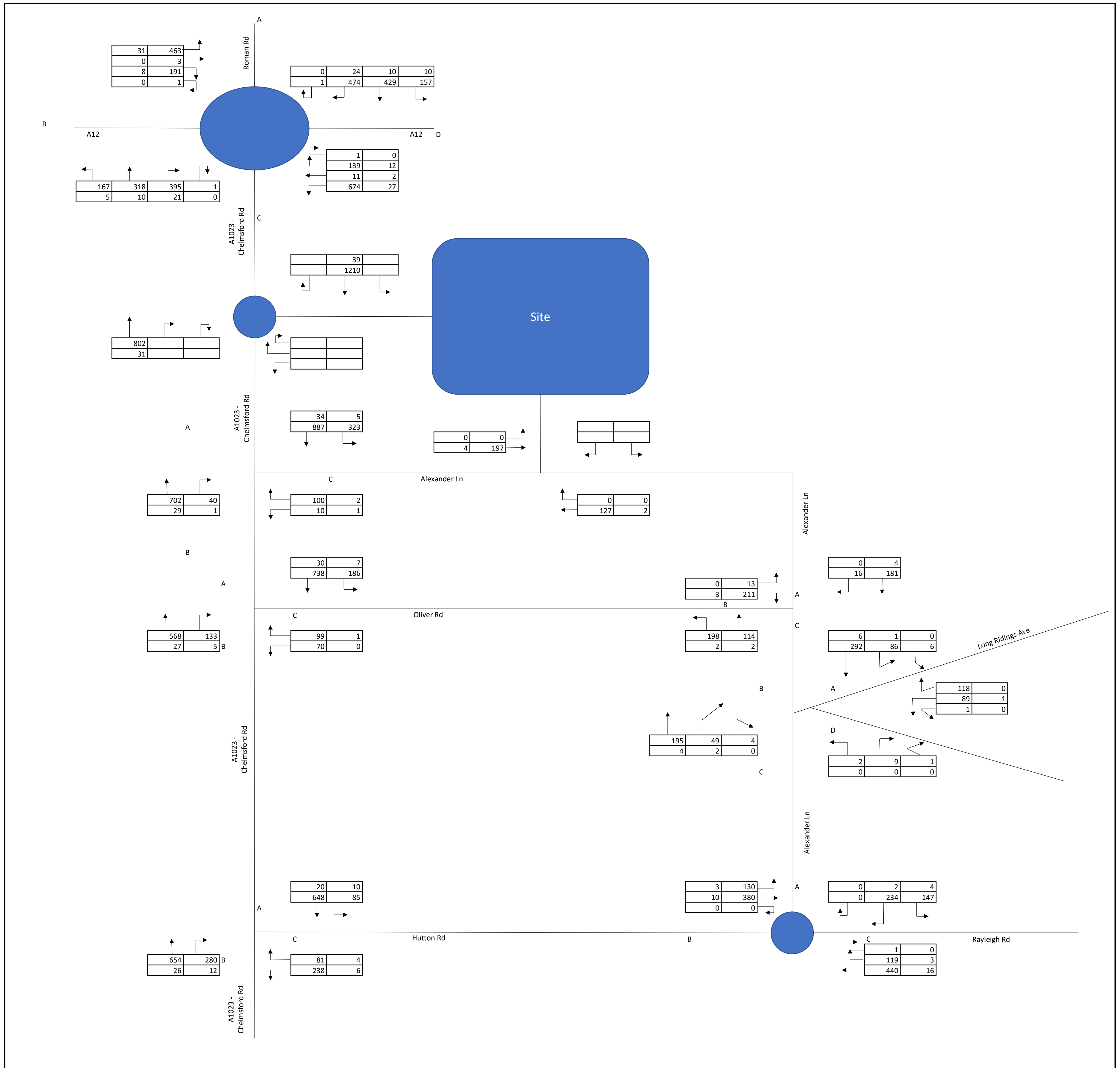
EA
I will emai[redacted] to remind him of how urgently we need their response.

National Highways
When are you expecting to submit your response?

Kind regards
Federica

[redacted]

APPENDIX B



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Project Number: 152080	File Name: SO9-BW-Traffic Flow Diagram-220706			Proect: Shenfield		
Date: 07/07022	Drawn BW	Checked HA	Approved SM	Title 2028 Base AM	Figure	3

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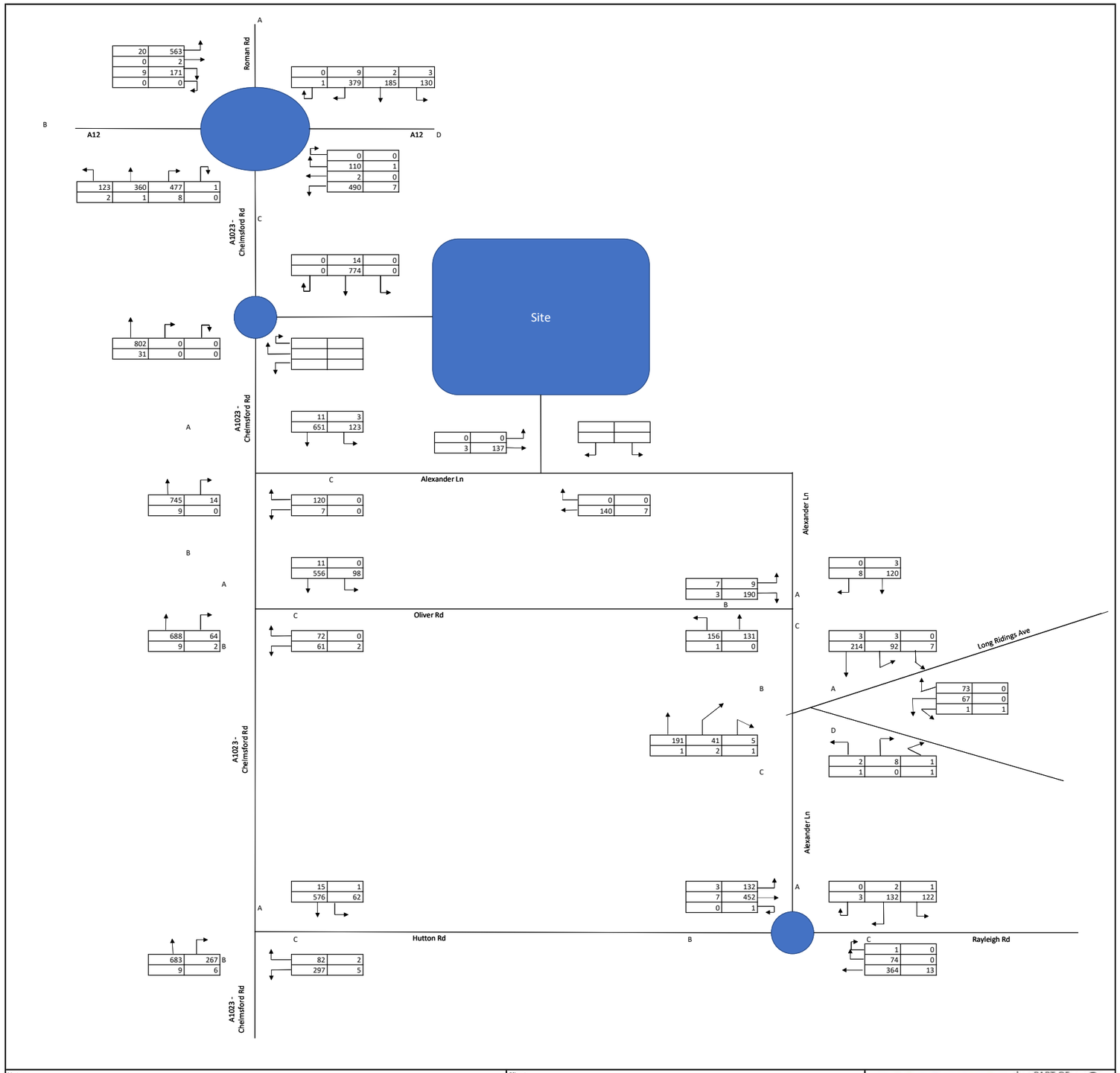

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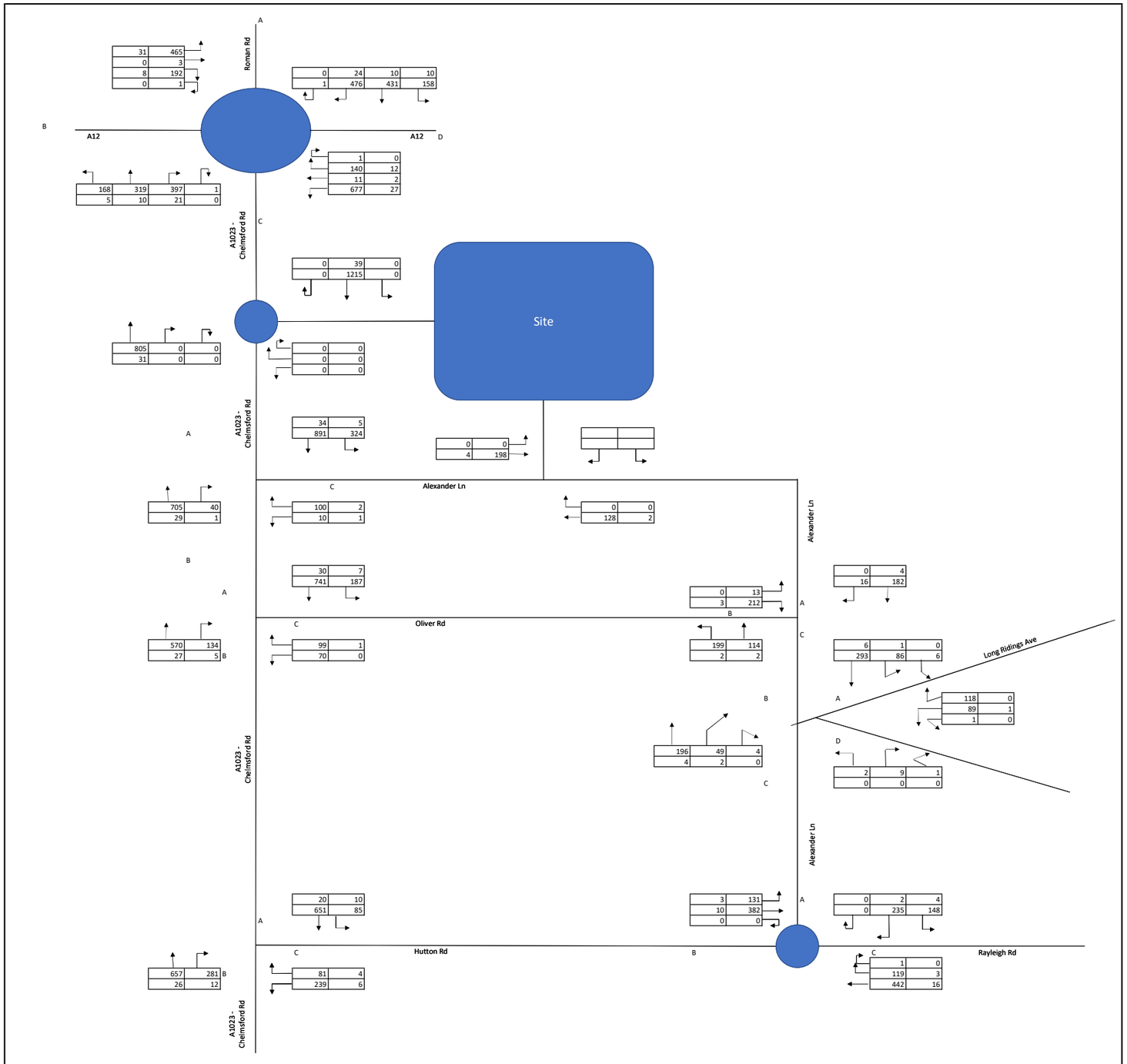

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Date: 07/07022	Drawn BW	Checked HA	Approved SM	Title 2033 Base AM	Figure: 5	

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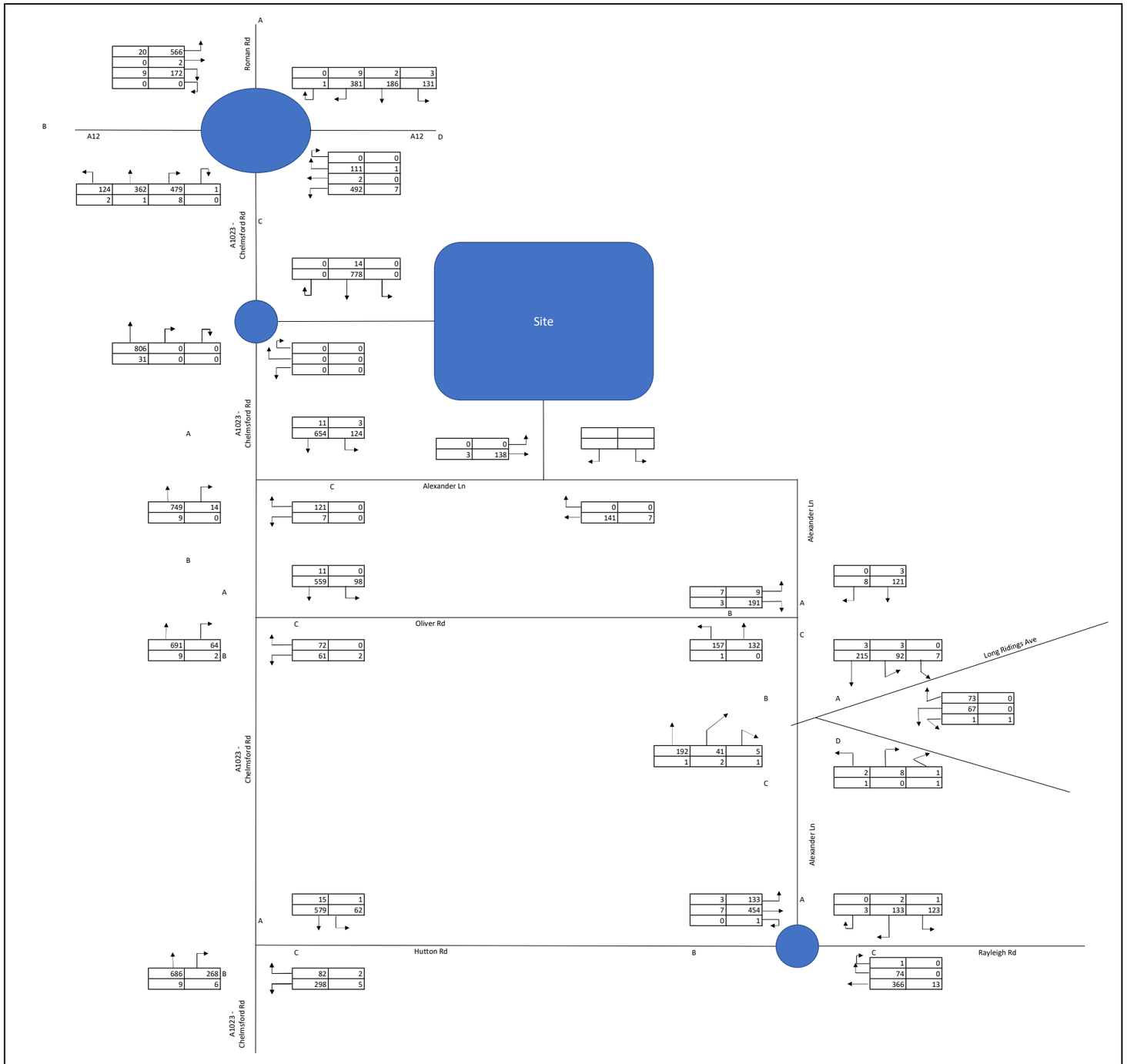

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Date: 07/07022	Drawn BW	Checked HA	Approved SM	Title 2033 Base PM	Figure: 6

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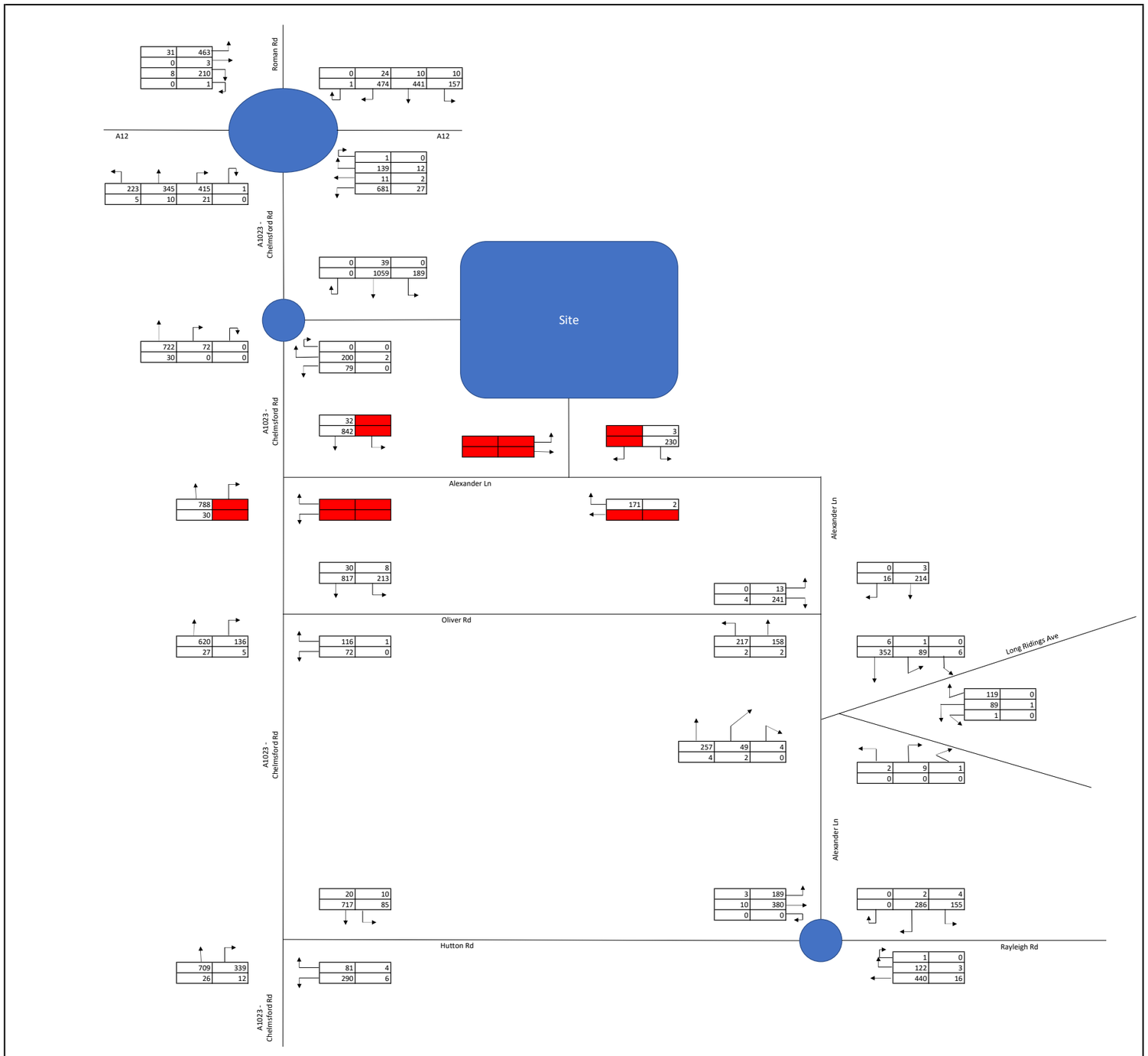

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Date: 04/06/2024	Drawn SGT	Checked HA	Approved MDC	Title 2028 + Development AM	Figure 9

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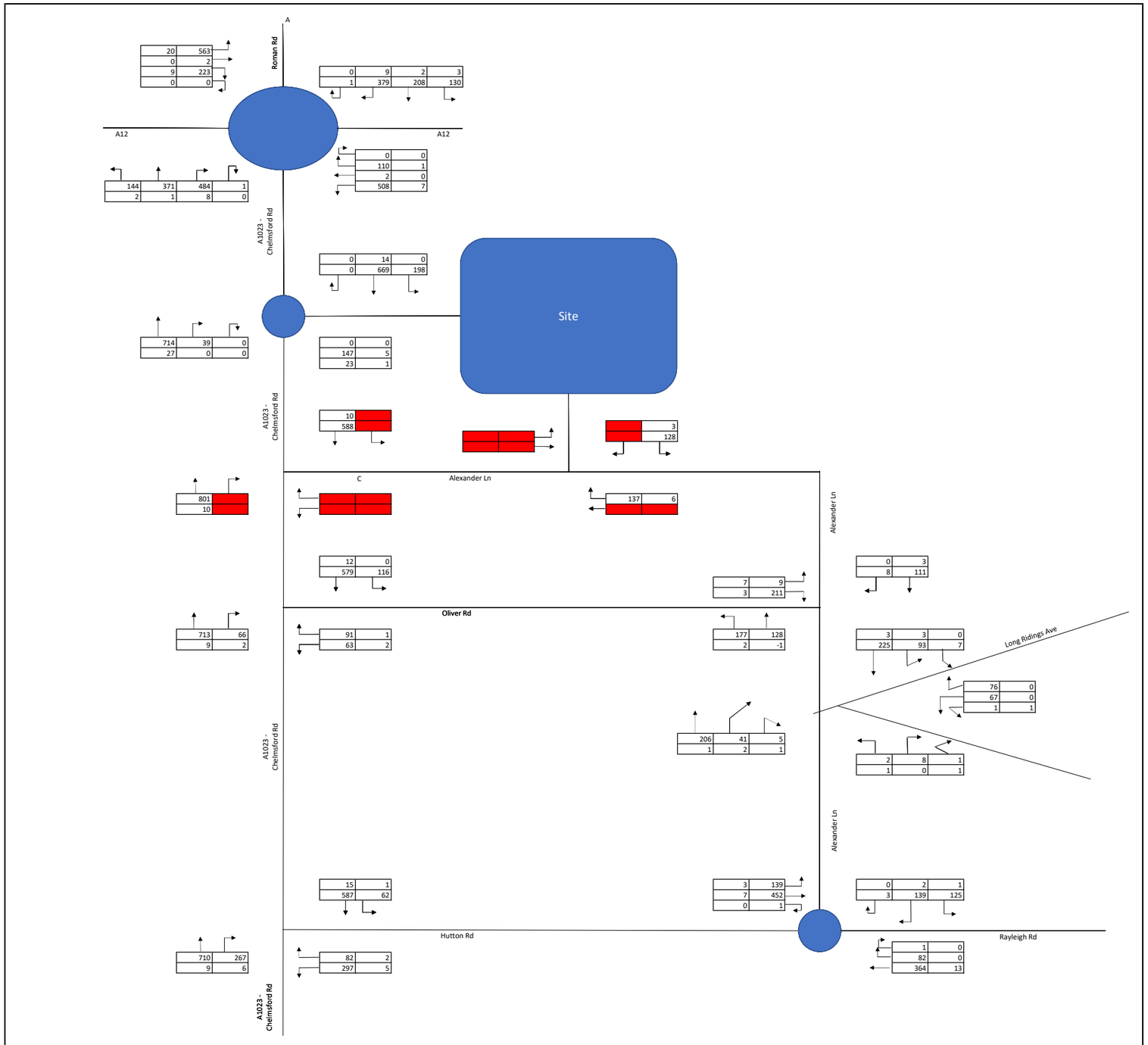

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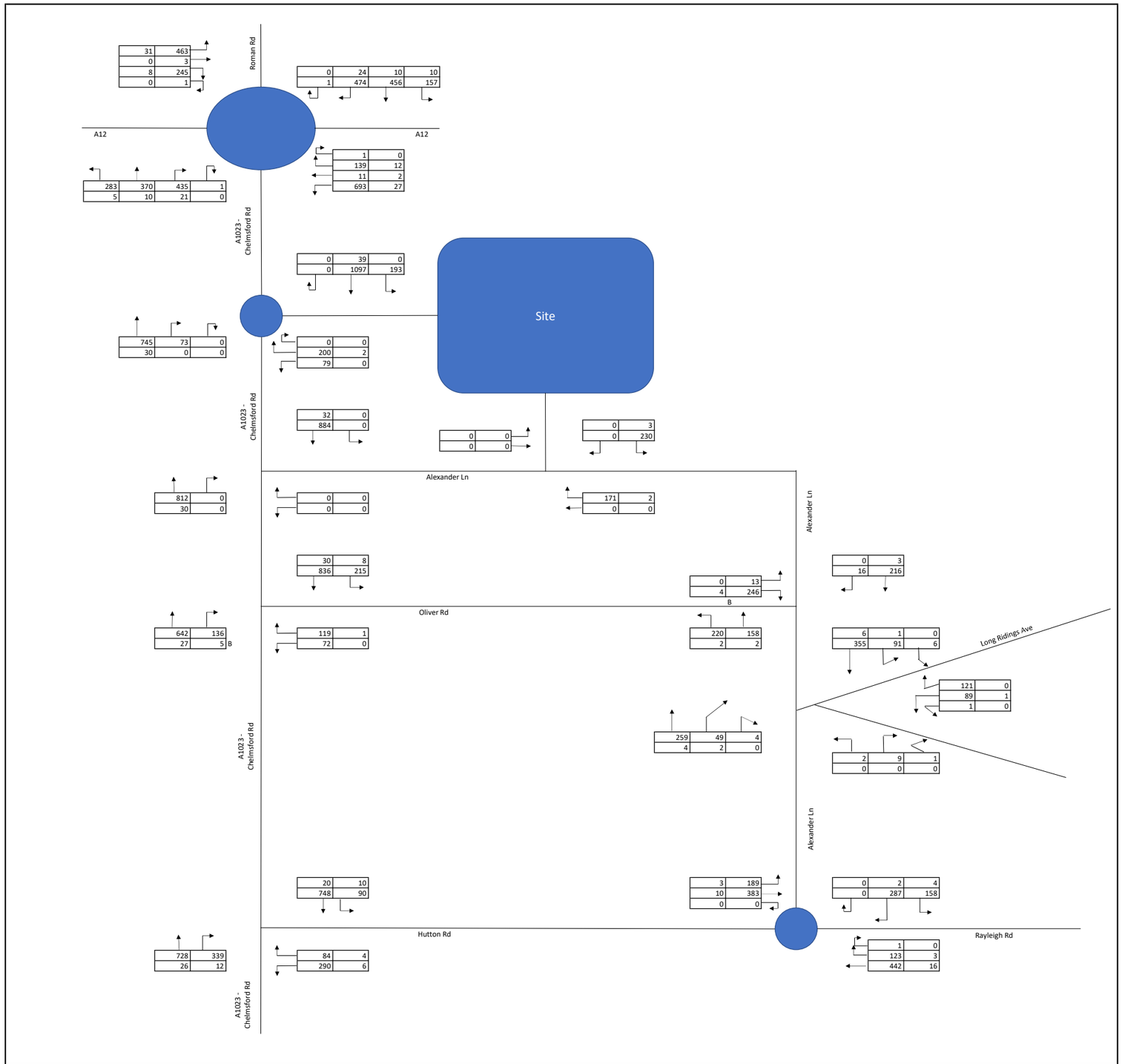

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Date: 04/06/2024	Drawn SGT	Checked HA	Approved MDC	Title 2028 + Committed + Development AM	Figure 13

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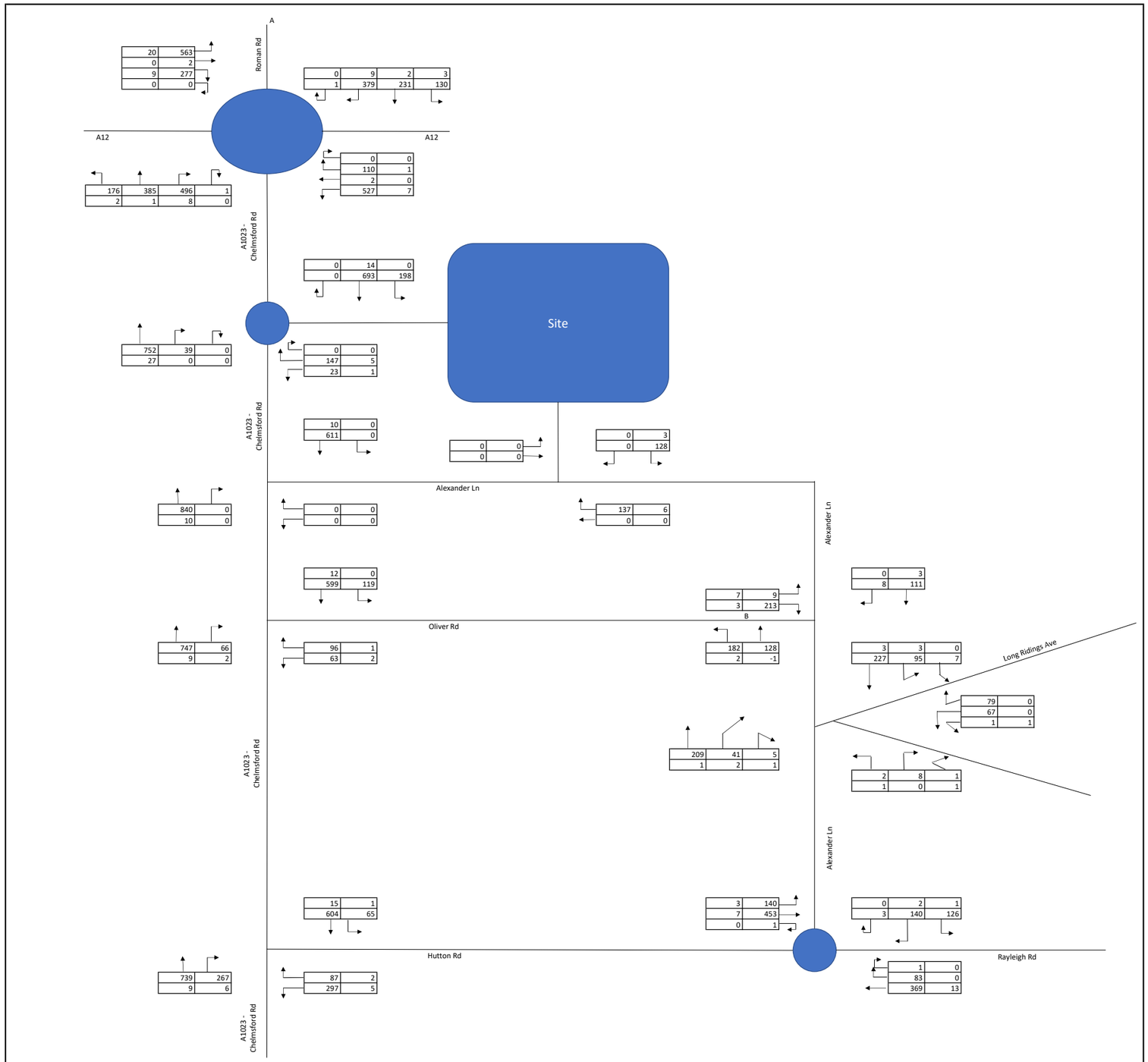

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Date: 04/06/2024	Drawn SGT	Checked HA	Approved MDC	Title 2028 + Committed + Development PM	Figure 14

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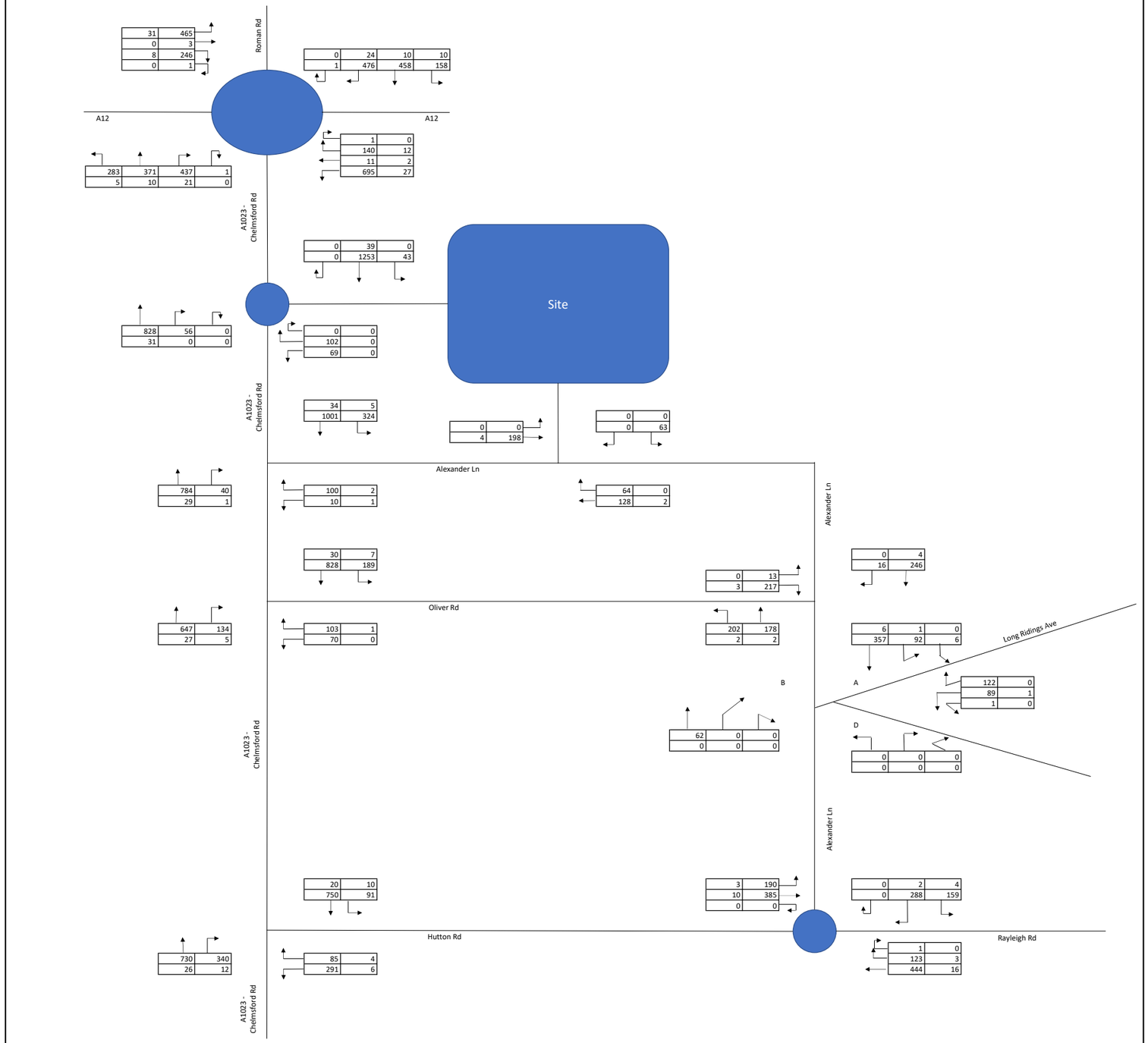

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Date: 04/06/2024	Drawn SGT	Checked HA	Approved MDC	Title 2033 + Development + Committed AM	Figure 17

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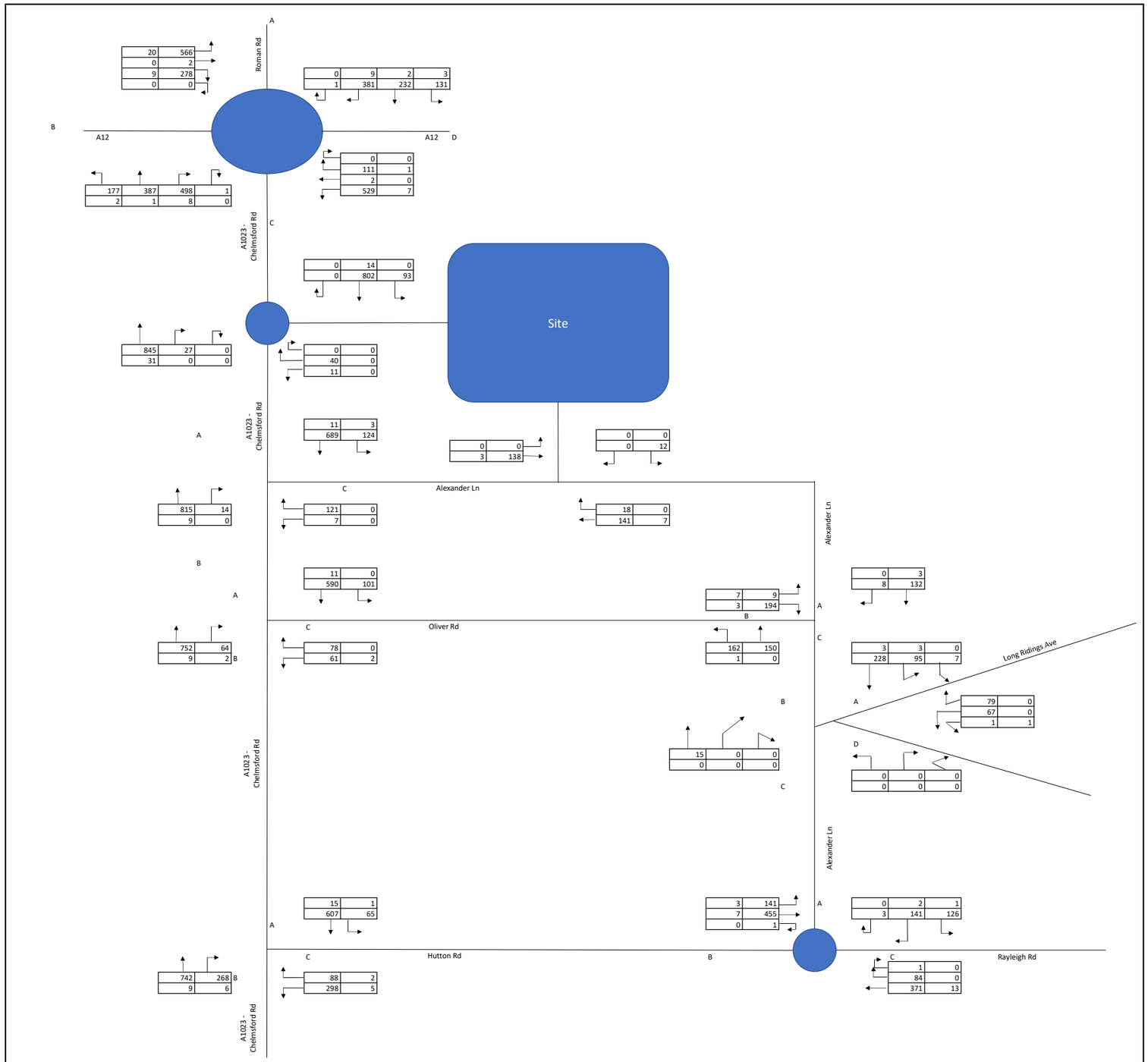
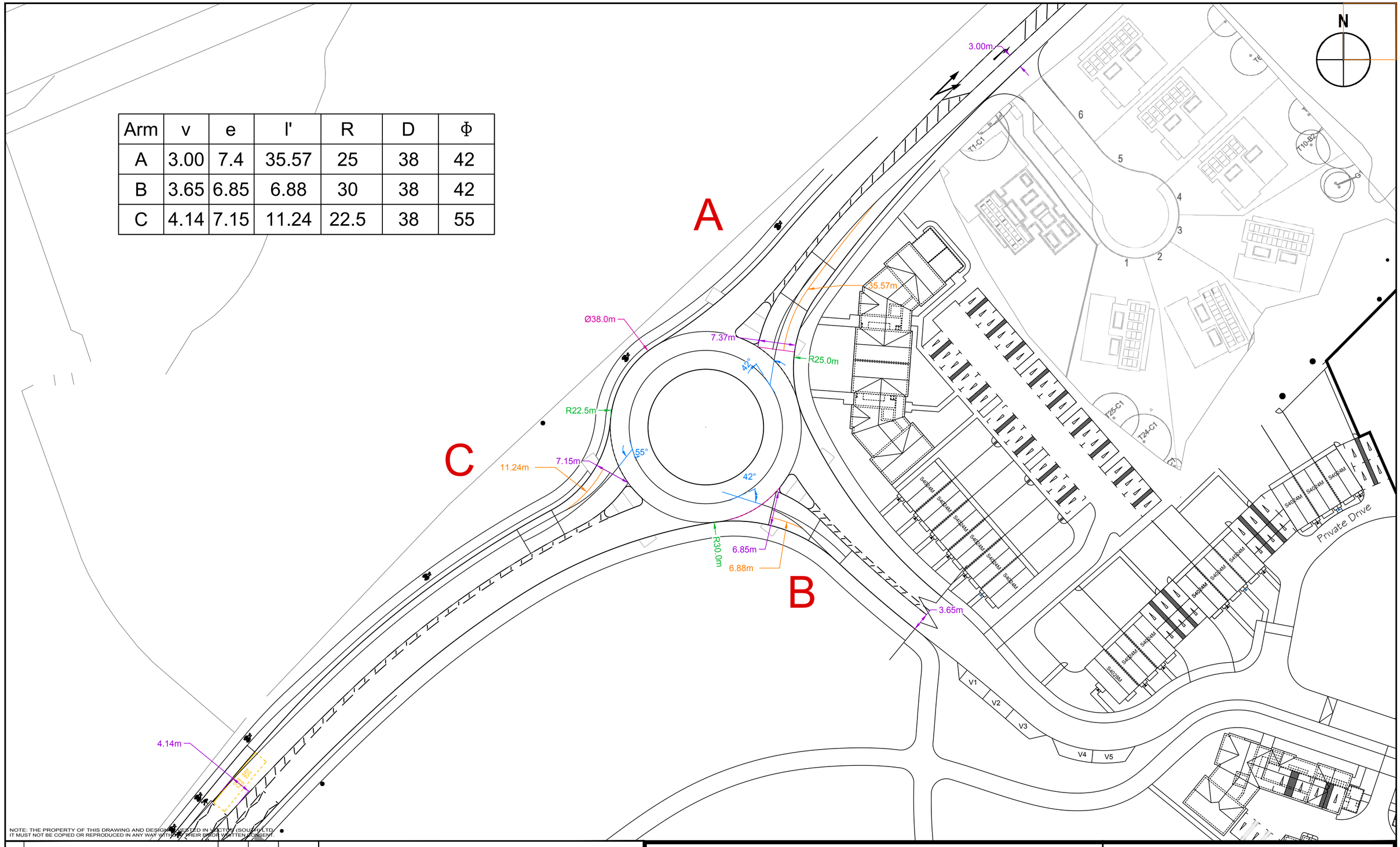


Notes				Client: Croudace	
Project Number: 152080	File Name: SO9-BW-Traffic Flow Diagram-220706			Proect: Shenfield	
Date: 04/06/2024	Drawn SGT	Checked HA	Approved MDC	Title 2033 + Development + Committed PM	Figure 18

vectos. PART OF SLR
WeWork, The Cursitor, 38 Chancery Lane, London, WC2A 1EN
Tel: 020 7580 7373 Email: vectos@vectos.co.uk www.vectos.co.uk

APPENDIX C

Arm	v	e	l'	R	D	Φ
A	3.00	7.4	35.57	25	38	42
B	3.65	6.85	6.88	30	38	42
C	4.14	7.15	11.24	22.5	38	55



REV.	DETAILS	DRAWN	CHECKED	DATE
.	.	.	.	.

STATUS: INFORMATION ONLY

PROJECT: Shenfeld

CLIENT: -

DRAWING TITLE: ARCADY PARAMETERS

DRAWN:	CHECKED:	DATE:	SCALES:
LJ	DR	23.08.23	1:500 @ A2

vectos. | PART OF SLR
3rd Floor, Brew House, Jacob Street , Bristol, BS2 0EQ
t: 0117 203 5240 e: enquiries@vectos.co.uk

DRAWING NUMBER: 152080_ARC01

REVISION: .

APPENDIX D

Junctions 9

ARCADY 9 - Roundabout Module

Filename: Chelmsford Road - Site Access V4 (new geoms).j9
Path: \\slr.local\eu\Offices\UK\London\Vectos\Projects\Projects\150000\152080 - Shenfield\MODELLING
Report generation date: 04/06/2024 17:20:39

Summary of junction performance

	AM					PM				
	Set ID	Queue (Veh)	Delay (s)	RFC	LOS	Set ID	Queue (Veh)	Delay (s)	RFC	LOS
	2028 + Dev									
Arm 1	D1	3.9	10.52	0.80	B	D2	1.2	4.53	0.55	A
Arm 2		0.6	7.87	0.38	A		0.2	4.57	0.19	A
Arm 3		1.5	6.27	0.59	A		1.5	6.10	0.60	A
	2028 + Comm + Dev									
Arm 1	D3	4.7	12.20	0.83	B	D4	1.3	4.69	0.56	A
Arm 2		0.6	8.33	0.39	A		0.2	4.66	0.20	A
Arm 3		1.6	6.59	0.61	A		1.7	6.57	0.63	A

There are warnings associated with one or more model runs - see the 'Data Errors and Warnings' tables for each Analysis or Demand Set.

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

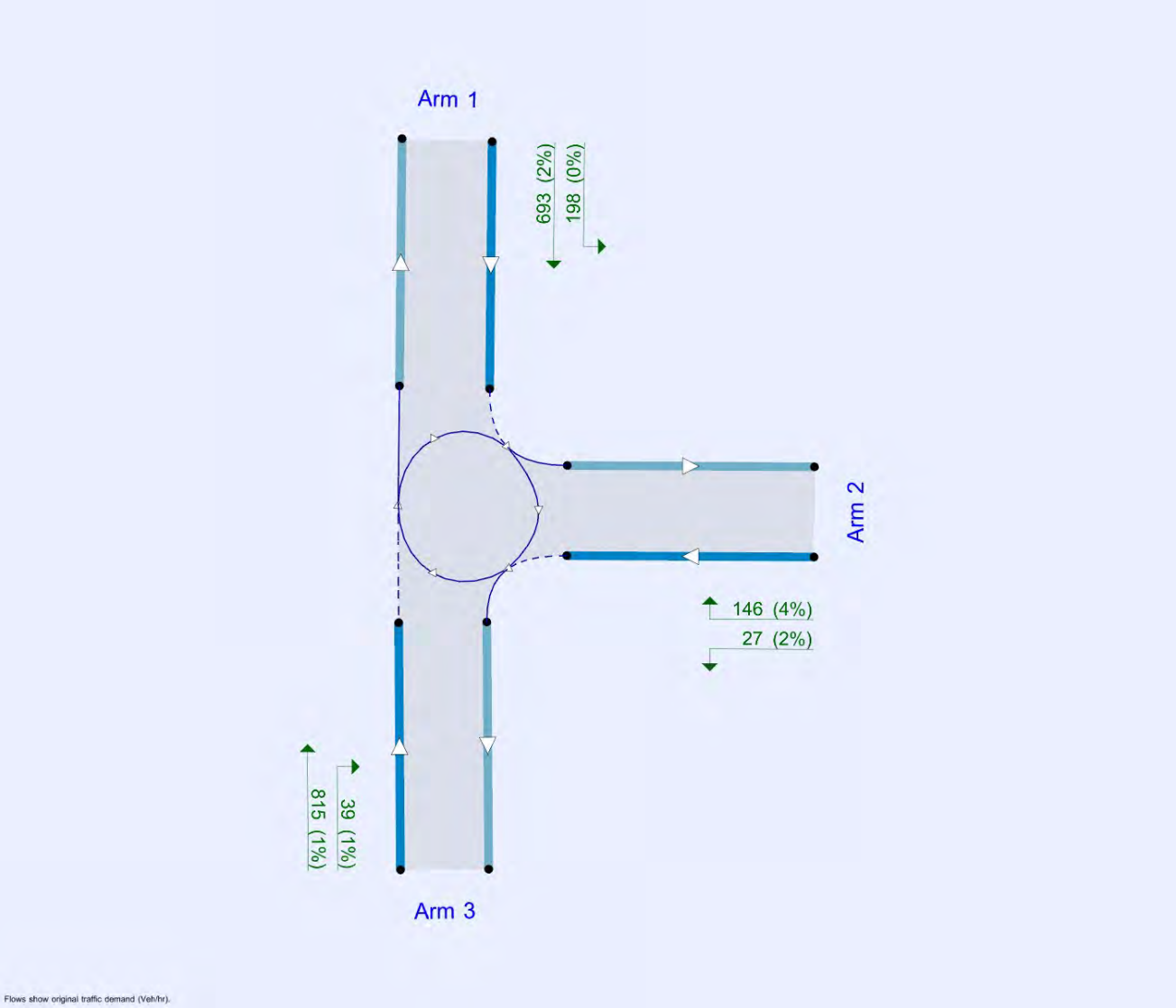
File summary

File Description

Title	
Location	
Site number	
Date	23/08/2023
Version	
Status	(new file)
Identifier	
Client	
Jobnumber	
Enumerator	SLR\Sean.GwynThomas
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

Calculate Queue Percentiles	Calculate residual capacity	RFC Threshold	Average Delay threshold (s)	Queue threshold (PCU)
		0.85	36.00	20.00

Demand Set Summary

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)
D1	2028 + Dev	AM	ONE HOUR	00:00	01:30	15
D2	2028 + Dev	PM	ONE HOUR	00:00	01:30	15
D3	2028 + Comm + Dev	AM	ONE HOUR	00:00	01:30	15
D4	2028 + Comm + Dev	PM	ONE HOUR	00:00	01:30	15

Analysis Set Details

ID	Network flow scaling factor (%)
A1	100.000

2028 + Dev, AM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Geometry	Arm 1 - Roundabout Geometry	Effective flare length is over 30m, which is outside the normal range. Treat capacities with increasing caution.

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (s)	Junction LOS
1	Site Access - Chelsmford Road	Standard Roundabout		1, 2, 3	8.79	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Arms

Arms

Arm	Name	Description
1	Chelmsford Road (North)	
2	Site Access	
3	Chelmsford Road (South)	

Roundabout Geometry

Arm	V - Approach road half-width (m)	E - Entry width (m)	l' - Effective flare length (m)	R - Entry radius (m)	D - Inscribed circle diameter (m)	PHI - Conflict (entry) angle (deg)	Exit only
1	3.00	7.40	35.6	25.0	38.0	42.0	
2	3.65	6.85	6.9	30.0	38.0	42.0	
3	4.14	7.15	11.2	22.5	38.0	55.0	

Slope / Intercept / Capacity

Roundabout Slope and Intercept used in model

Arm	Final slope	Final intercept (PCU/hr)
1	0.658	1805
2	0.590	1458
3	0.602	1604

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

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)
D1	2028 + Dev	AM	ONE HOUR	00:00	01:30	15

Vehicle mix source	PCU Factor for a HV (PCU)
HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Use O-D data	Average Demand (Veh/hr)	Scaling Factor (%)
1		✓	1249	100.000
2		✓	254	100.000
3		✓	764	100.000

Origin-Destination Data

Demand (Veh/hr)

		To		
		1	2	3
From	1	0	190	1059
	2	201	0	53
	3	722	42	0

Vehicle Mix

Heavy Vehicle Percentages

		To		
		1	2	3
From	1	0	0	4
	2	1	0	0
	3	4	1	0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (s)	Max Queue (Veh)	Max LOS
1	0.80	10.52	3.9	B
2	0.38	7.87	0.6	A
3	0.59	6.27	1.5	A

Main Results for each time segment

00:00 - 00:15

Arm	Total Demand (Veh/hr)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	End queue (Veh)	Delay (s)	Unsignalised level of service
1	940	31	1725	0.545	936	1.2	4.532	A
2	191	793	963	0.198	190	0.2	4.650	A
3	575	151	1456	0.395	573	0.6	4.063	A

00:15 - 00:30

Arm	Total Demand (Veh/hr)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	End queue (Veh)	Delay (s)	Unsignalised level of service
1	1123	38	1721	0.652	1120	1.8	5.963	A
2	228	950	868	0.263	228	0.4	5.618	A
3	687	180	1439	0.477	686	0.9	4.774	A

00:30 - 00:45

Arm	Total Demand (Veh/hr)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	End queue (Veh)	Delay (s)	Unsignalised level of service
1	1375	46	1716	0.801	1367	3.8	10.100	B
2	280	1159	741	0.378	279	0.6	7.775	A
3	841	221	1415	0.594	839	1.4	6.223	A

00:45 - 01:00

Arm	Total Demand (Veh/hr)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	End queue (Veh)	Delay (s)	Unsignalised level of service
1	1375	46	1716	0.802	1375	3.9	10.524	B
2	280	1166	737	0.380	280	0.6	7.872	A
3	841	221	1415	0.595	841	1.5	6.275	A

01:00 - 01:15

Arm	Total Demand (Veh/hr)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	End queue (Veh)	Delay (s)	Unsignalised level of service
1	1123	38	1721	0.652	1131	1.9	6.179	A
2	228	959	863	0.265	229	0.4	5.691	A
3	687	181	1438	0.478	689	0.9	4.820	A

01:15 - 01:30

Arm	Total Demand (Veh/hr)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	End queue (Veh)	Delay (s)	Unsignalised level of service
1	940	32	1725	0.545	943	1.2	4.621	A
2	191	800	960	0.199	192	0.3	4.690	A
3	575	152	1456	0.395	576	0.7	4.100	A

2028 + Dev, PM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Geometry	Arm 1 - Roundabout Geometry	Effective flare length is over 30m, which is outside the normal range. Treat capacities with increasing caution.

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (s)	Junction LOS
1	Site Access - Chelsmford Road	Standard Roundabout		1, 2, 3	5.22	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)
D2	2028 + Dev	PM	ONE HOUR	00:00	01:30	15

Vehicle mix source	PCU Factor for a HV (PCU)
HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Use O-D data	Average Demand (Veh/hr)	Scaling Factor (%)
1		✓	867	100.000
2		✓	173	100.000
3		✓	816	100.000

Origin-Destination Data

Demand (Veh/hr)

		To		
		1	2	3
From	1	0	198	669
	2	146	0	27
	3	777	39	0

Vehicle Mix

Heavy Vehicle Percentages

		To		
		1	2	3
From	1	0	0	2
	2	4	0	2
	3	1	1	0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (s)	Max Queue (Veh)	Max LOS
1	0.55	4.53	1.2	A
2	0.19	4.57	0.2	A
3	0.60	6.10	1.5	A

Main Results for each time segment

00:00 - 00:15

Arm	Total Demand (Veh/hr)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	End queue (Veh)	Delay (s)	Unsignalised level of service
1	653	29	1758	0.371	650	0.6	3.243	A
2	130	502	1115	0.117	130	0.1	3.653	A
3	614	109	1520	0.404	612	0.7	3.951	A

00:15 - 00:30

Arm	Total Demand (Veh/hr)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	End queue (Veh)	Delay (s)	Unsignalised level of service
1	779	35	1754	0.444	779	0.8	3.685	A
2	156	601	1057	0.147	155	0.2	3.991	A
3	734	131	1506	0.487	733	0.9	4.644	A

00:30 - 00:45

Arm	Total Demand (Veh/hr)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	End queue (Veh)	Delay (s)	Unsignalised level of service
1	955	43	1749	0.546	953	1.2	4.512	A
2	190	735	979	0.195	190	0.2	4.562	A
3	898	161	1488	0.604	896	1.5	6.057	A

00:45 - 01:00

Arm	Total Demand (Veh/hr)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	End queue (Veh)	Delay (s)	Unsignalised level of service
1	955	43	1749	0.546	955	1.2	4.530	A
2	190	737	978	0.195	190	0.2	4.568	A
3	898	161	1488	0.604	898	1.5	6.104	A

01:00 - 01:15

Arm	Total Demand (Veh/hr)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	End queue (Veh)	Delay (s)	Unsignalised level of service
1	779	35	1754	0.444	781	0.8	3.703	A
2	156	603	1056	0.147	156	0.2	3.999	A
3	734	131	1506	0.487	736	1.0	4.687	A

01:15 - 01:30

Arm	Total Demand (Veh/hr)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	End queue (Veh)	Delay (s)	Unsignalised level of service
1	653	29	1758	0.371	654	0.6	3.263	A
2	130	504	1113	0.117	130	0.1	3.662	A
3	614	110	1520	0.404	615	0.7	3.986	A

2028 + Comm + Dev, AM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Geometry	Arm 1 - Roundabout Geometry	Effective flare length is over 30m, which is outside the normal range. Treat capacities with increasing caution.

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (s)	Junction LOS
1	Site Access - Chelsmford Road	Standard Roundabout		1, 2, 3	9.88	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)
D3	2028 + Comm + Dev	AM	ONE HOUR	00:00	01:30	15

Vehicle mix source	PCU Factor for a HV (PCU)
HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Use O-D data	Average Demand (Veh/hr)	Scaling Factor (%)
1		✓	1291	100.000
2		✓	254	100.000
3		✓	789	100.000

Origin-Destination Data

Demand (Veh/hr)

		To		
		1	2	3
From	1	0	194	1097
	2	201	0	53
	3	745	44	0

Vehicle Mix

Heavy Vehicle Percentages

		To		
		1	2	3
From	1	0	0	4
	2	1	0	0
	3	4	1	0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (s)	Max Queue (Veh)	Max LOS
1	0.83	12.20	4.7	B
2	0.39	8.33	0.6	A
3	0.61	6.59	1.6	A

Main Results for each time segment

00:00 - 00:15

Arm	Total Demand (Veh/hr)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	End queue (Veh)	Delay (s)	Unsignalised level of service
1	972	33	1724	0.564	967	1.3	4.723	A
2	191	822	946	0.202	190	0.3	4.756	A
3	594	151	1456	0.408	591	0.7	4.136	A

00:15 - 00:30

Arm	Total Demand (Veh/hr)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	End queue (Veh)	Delay (s)	Unsignalised level of service
1	1161	39	1720	0.675	1158	2.0	6.366	A
2	228	984	848	0.269	228	0.4	5.805	A
3	709	180	1439	0.493	708	1.0	4.920	A

00:30 - 00:45

Arm	Total Demand (Veh/hr)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	End queue (Veh)	Delay (s)	Unsignalised level of service
1	1421	48	1714	0.829	1411	4.5	11.520	B
2	280	1199	716	0.390	279	0.6	8.205	A
3	869	220	1415	0.614	866	1.6	6.528	A

00:45 - 01:00

Arm	Total Demand (Veh/hr)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	End queue (Veh)	Delay (s)	Unsignalised level of service
1	1421	48	1714	0.829	1421	4.7	12.200	B
2	280	1207	712	0.393	280	0.6	8.334	A
3	869	221	1415	0.614	869	1.6	6.588	A

01:00 - 01:15

Arm	Total Demand (Veh/hr)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	End queue (Veh)	Delay (s)	Unsignalised level of service
1	1161	40	1720	0.675	1171	2.1	6.676	A
2	228	995	841	0.272	229	0.4	5.897	A
3	709	182	1438	0.493	712	1.0	4.973	A

01:15 - 01:30

Arm	Total Demand (Veh/hr)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	End queue (Veh)	Delay (s)	Unsignalised level of service
1	972	33	1724	0.564	975	1.3	4.829	A
2	191	829	942	0.203	192	0.3	4.801	A
3	594	152	1456	0.408	595	0.7	4.189	A

2028 + Comm + Dev, PM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Geometry	Arm 1 - Roundabout Geometry	Effective flare length is over 30m, which is outside the normal range. Treat capacities with increasing caution.

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (s)	Junction LOS
1	Site Access - Chelsmford Road	Standard Roundabout		1, 2, 3	5.52	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)
D4	2028 + Comm + Dev	PM	ONE HOUR	00:00	01:30	15

Vehicle mix source	PCU Factor for a HV (PCU)
HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Use O-D data	Average Demand (Veh/hr)	Scaling Factor (%)
1		✓	891	100.000
2		✓	173	100.000
3		✓	854	100.000

Origin-Destination Data

Demand (Veh/hr)

		To		
		1	2	3
From	1	0	198	693
	2	146	0	27
	3	815	39	0

Vehicle Mix

Heavy Vehicle Percentages

		To		
		1	2	3
From	1	0	0	2
	2	4	0	2
	3	1	1	0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (s)	Max Queue (Veh)	Max LOS
1	0.56	4.69	1.3	A
2	0.20	4.66	0.2	A
3	0.63	6.57	1.7	A

Main Results for each time segment

00:00 - 00:15

Arm	Total Demand (Veh/hr)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	End queue (Veh)	Delay (s)	Unsignalised level of service
1	671	29	1758	0.382	668	0.6	3.297	A
2	130	520	1104	0.118	130	0.1	3.692	A
3	643	109	1520	0.423	640	0.7	4.079	A

00:15 - 00:30

Arm	Total Demand (Veh/hr)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	End queue (Veh)	Delay (s)	Unsignalised level of service
1	801	35	1754	0.457	800	0.8	3.770	A
2	156	622	1045	0.149	155	0.2	4.048	A
3	768	131	1506	0.510	767	1.0	4.857	A

00:30 - 00:45

Arm	Total Demand (Veh/hr)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	End queue (Veh)	Delay (s)	Unsignalised level of service
1	981	43	1749	0.561	979	1.3	4.666	A
2	190	762	964	0.198	190	0.2	4.652	A
3	940	161	1488	0.632	938	1.7	6.507	A

00:45 - 01:00

Arm	Total Demand (Veh/hr)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	End queue (Veh)	Delay (s)	Unsignalised level of service
1	981	43	1749	0.561	981	1.3	4.687	A
2	190	763	963	0.198	190	0.2	4.658	A
3	940	161	1488	0.632	940	1.7	6.568	A

01:00 - 01:15

Arm	Total Demand (Veh/hr)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	End queue (Veh)	Delay (s)	Unsignalised level of service
1	801	35	1754	0.457	803	0.8	3.792	A
2	156	624	1044	0.149	156	0.2	4.055	A
3	768	131	1506	0.510	770	1.1	4.910	A

01:15 - 01:30

Arm	Total Demand (Veh/hr)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	End queue (Veh)	Delay (s)	Unsignalised level of service
1	671	29	1758	0.382	672	0.6	3.319	A
2	130	522	1103	0.118	130	0.1	3.705	A
3	643	110	1520	0.423	644	0.7	4.119	A

Junctions 9

ARCADY 9 - Roundabout Module

Version: 9.5.2.1013

Filename: 20240521 Chelmsford Road - Site Access V3.j9
Path: \\slr.local\eu\Offices\UK\London\Vectos\Projects\Projects\150000\152080 - Shenfield\MODELLING\20240521 - Updated School Sensitvity Assessment
Report generation date: 21/05/2024 16:43:36

Summary of junction performance

	AM				PM			
	Queue (Veh)	Delay (s)	RFC	LOS	Queue (Veh)	Delay (s)	RFC	LOS
	2028 + Dev							
1 - Chelmsford Road (North)	4.2	11.17	0.81	B	1.2	4.53	0.55	A
2 - Site Access	0.7	8.36	0.42	A	0.2	4.55	0.19	A
3 - Chelmsford Road (South)	1.6	6.64	0.62	A	1.3	5.83	0.57	A
	2028 + Comm + Dev							
1 - Chelmsford Road (North)	5.0	13.02	0.84	B	1.3	4.69	0.56	A
2 - Site Access	0.8	8.89	0.43	A	0.2	4.65	0.19	A
3 - Chelmsford Road (South)	1.7	6.96	0.64	A	1.5	6.26	0.60	A

There are warnings associated with one or more model runs - see the 'Data Errors and Warnings' tables for each Analysis or Demand Set.

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

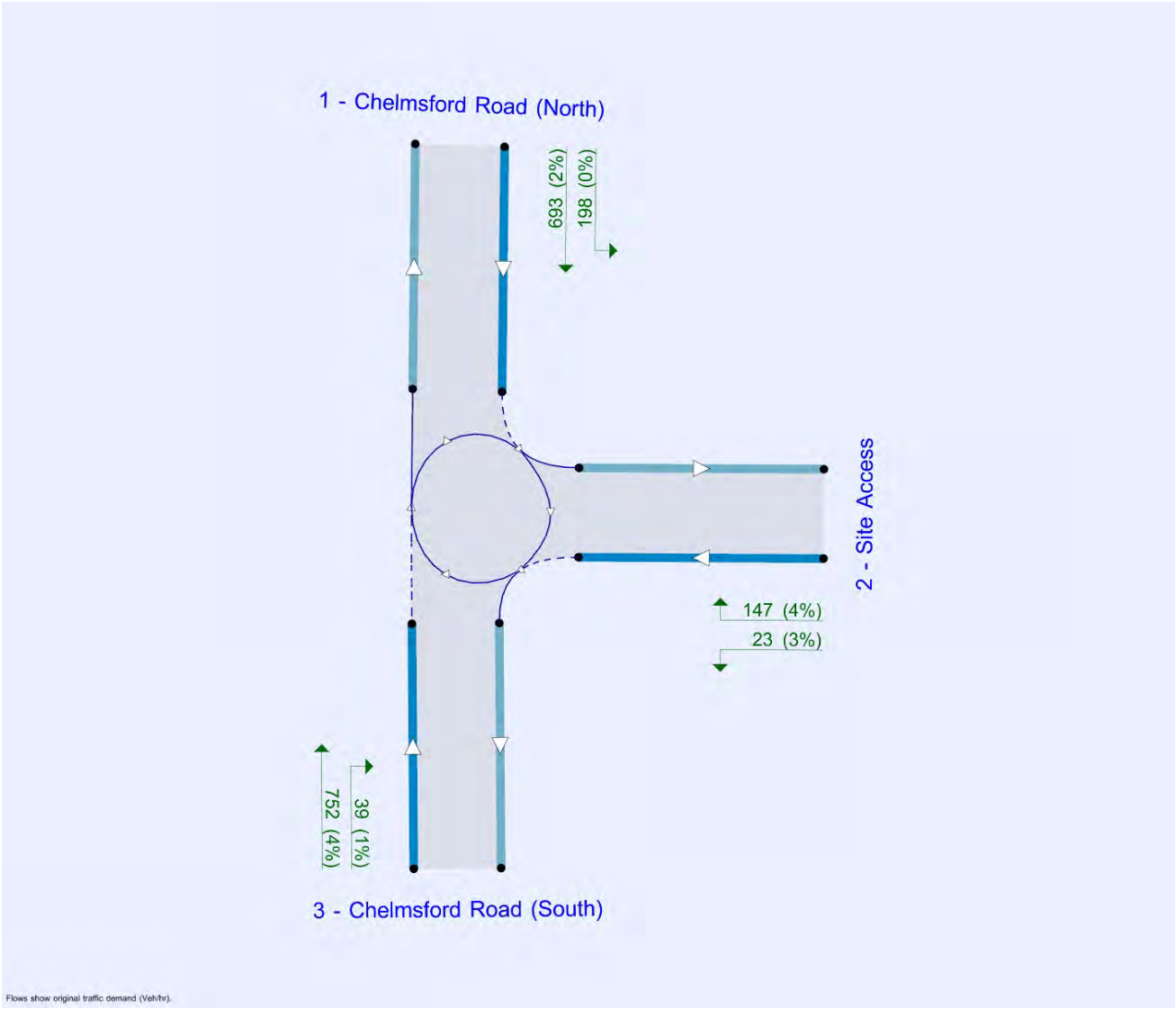
File summary

File Description

Title	
Location	
Site number	
Date	23/08/2023
Version	
Status	(new file)
Identifier	
Client	
Jobnumber	
Enumerator	SLR\Sean.GwynThomas
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

Calculate Queue Percentiles	Calculate residual capacity	RFC Threshold	Average Delay threshold (s)	Queue threshold (PCU)
		0.85	36.00	20.00

Demand Set Summary

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)
D1	2028 + Dev	AM	ONE HOUR	07:45	09:15	15
D2	2028 + Dev	PM	ONE HOUR	16:45	18:15	15
D3	2028 + Comm + Dev	AM	ONE HOUR	07:45	09:15	15
D4	2028 + Comm + Dev	PM	ONE HOUR	16:45	18:15	15

Analysis Set Details

ID	Network flow scaling factor (%)
A1	100.000

2028 + Dev, AM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Geometry	1 - Chelmsford Road (North) - Roundabout Geometry	Effective flare length is over 30m, which is outside the normal range. Treat capacities with increasing caution.

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (s)	Junction LOS
1	Site Access - Chelsmford Road	Standard Roundabout		1, 2, 3	9.28	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Arms

Arms

Arm	Name	Description
1	Chelmsford Road (North)	
2	Site Access	
3	Chelmsford Road (South)	

Roundabout Geometry

Arm	V - Approach road half-width (m)	E - Entry width (m)	l' - Effective flare length (m)	R - Entry radius (m)	D - Inscribed circle diameter (m)	PHI - Conflict (entry) angle (deg)	Exit only
1 - Chelmsford Road (North)	3.00	7.40	35.6	25.0	38.0	42.0	
2 - Site Access	3.65	6.85	6.9	30.0	38.0	42.0	
3 - Chelmsford Road (South)	4.14	7.15	11.2	22.5	38.0	55.0	

Slope / Intercept / Capacity

Roundabout Slope and Intercept used in model

Arm	Final slope	Final intercept (PCU/hr)
1 - Chelmsford Road (North)	0.658	1805
2 - Site Access	0.590	1458
3 - Chelmsford Road (South)	0.602	1603

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

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)
D1	2028 + Dev	AM	ONE HOUR	07:45	09:15	15

Vehicle mix source	PCU Factor for a HV (PCU)
HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Use O-D data	Average Demand (Veh/hr)	Scaling Factor (%)
1 - Chelmsford Road (North)		✓	1248	100.000
2 - Site Access		✓	279	100.000
3 - Chelmsford Road (South)		✓	794	100.000

Origin-Destination Data

Demand (Veh/hr)

		To		
		1 - Chelmsford Road (North)	2 - Site Access	3 - Chelmsford Road (South)
From	1 - Chelmsford Road (North)	0	189	1059
	2 - Site Access	200	0	79
	3 - Chelmsford Road (South)	722	72	0

Vehicle Mix

Heavy Vehicle Percentages

		To		
		1 - Chelmsford Road (North)	2 - Site Access	3 - Chelmsford Road (South)
From	1 - Chelmsford Road (North)	0	0	4
	2 - Site Access	1	0	0
	3 - Chelmsford Road (South)	4	1	0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (s)	Max Queue (Veh)	Max LOS
1 - Chelmsford Road (North)	0.81	11.17	4.2	B
2 - Site Access	0.42	8.36	0.7	A
3 - Chelmsford Road (South)	0.62	6.64	1.6	A

Main Results for each time segment

07:45 - 08:00

Arm	Total Demand (Veh/hr)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	End queue (Veh)	Delay (s)	Unsignalised level of service
1 - Chelmsford Road (North)	940	54	1711	0.549	935	1.2	4.611	A
2 - Site Access	210	793	964	0.218	209	0.3	4.759	A
3 - Chelmsford Road (South)	598	150	1457	0.410	595	0.7	4.160	A

08:00 - 08:15

Arm	Total Demand (Veh/hr)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	End queue (Veh)	Delay (s)	Unsignalised level of service
1 - Chelmsford Road (North)	1122	65	1704	0.658	1119	1.9	6.127	A
2 - Site Access	251	950	869	0.289	250	0.4	5.814	A
3 - Chelmsford Road (South)	714	179	1440	0.496	713	1.0	4.940	A

08:15 - 08:30

Arm	Total Demand (Veh/hr)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	End queue (Veh)	Delay (s)	Unsignalised level of service
1 - Chelmsford Road (North)	1374	79	1695	0.811	1365	4.0	10.663	B
2 - Site Access	307	1159	742	0.414	306	0.7	8.242	A
3 - Chelmsford Road (South)	874	219	1417	0.617	872	1.6	6.575	A

08:30 - 08:45

Arm	Total Demand (Veh/hr)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	End queue (Veh)	Delay (s)	Unsignalised level of service
1 - Chelmsford Road (North)	1374	79	1695	0.811	1374	4.2	11.175	B
2 - Site Access	307	1166	737	0.417	307	0.7	8.365	A
3 - Chelmsford Road (South)	874	220	1416	0.617	874	1.6	6.638	A

08:45 - 09:00

Arm	Total Demand (Veh/hr)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	End queue (Veh)	Delay (s)	Unsignalised level of service
1 - Chelmsford Road (North)	1122	65	1704	0.659	1131	2.0	6.377	A
2 - Site Access	251	959	863	0.291	252	0.4	5.902	A
3 - Chelmsford Road (South)	714	181	1439	0.496	716	1.0	4.995	A

09:00 - 09:15

Arm	Total Demand (Veh/hr)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	End queue (Veh)	Delay (s)	Unsignalised level of service
1 - Chelmsford Road (North)	940	54	1711	0.549	942	1.2	4.704	A
2 - Site Access	210	800	960	0.219	211	0.3	4.806	A
3 - Chelmsford Road (South)	598	151	1457	0.410	599	0.7	4.203	A

2028 + Dev, PM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Geometry	1 - Chelmsford Road (North) - Roundabout Geometry	Effective flare length is over 30m, which is outside the normal range. Treat capacities with increasing caution.

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (s)	Junction LOS
1	Site Access - Chelsmford Road	Standard Roundabout		1, 2, 3	5.09	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)
D2	2028 + Dev	PM	ONE HOUR	16:45	18:15	15

Vehicle mix source	PCU Factor for a HV (PCU)
HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Use O-D data	Average Demand (Veh/hr)	Scaling Factor (%)
1 - Chelmsford Road (North)		✓	867	100.000
2 - Site Access		✓	170	100.000
3 - Chelmsford Road (South)		✓	753	100.000

Origin-Destination Data

Demand (Veh/hr)

		To		
		1 - Chelmsford Road (North)	2 - Site Access	3 - Chelmsford Road (South)
From	1 - Chelmsford Road (North)	0	198	669
	2 - Site Access	147	0	23
	3 - Chelmsford Road (South)	714	39	0

Vehicle Mix

Heavy Vehicle Percentages

		To		
		1 - Chelmsford Road (North)	2 - Site Access	3 - Chelmsford Road (South)
From	1 - Chelmsford Road (North)	0	0	2
	2 - Site Access	4	0	2
	3 - Chelmsford Road (South)	4	1	0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (s)	Max Queue (Veh)	Max LOS
1 - Chelmsford Road (North)	0.55	4.53	1.2	A
2 - Site Access	0.19	4.55	0.2	A
3 - Chelmsford Road (South)	0.57	5.83	1.3	A

Main Results for each time segment

16:45 - 17:00

Arm	Total Demand (Veh/hr)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	End queue (Veh)	Delay (s)	Unsignalised level of service
1 - Chelmsford Road (North)	653	29	1758	0.371	650	0.6	3.243	A
2 - Site Access	128	502	1114	0.115	127	0.1	3.646	A
3 - Chelmsford Road (South)	567	110	1477	0.384	564	0.6	3.934	A

17:00 - 17:15

Arm	Total Demand (Veh/hr)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	End queue (Veh)	Delay (s)	Unsignalised level of service
1 - Chelmsford Road (North)	779	35	1754	0.444	779	0.8	3.685	A
2 - Site Access	153	601	1057	0.145	153	0.2	3.981	A
3 - Chelmsford Road (South)	677	132	1464	0.462	676	0.9	4.563	A

17:15 - 17:30

Arm	Total Demand (Veh/hr)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	End queue (Veh)	Delay (s)	Unsignalised level of service
1 - Chelmsford Road (North)	955	43	1749	0.546	953	1.2	4.512	A
2 - Site Access	187	735	979	0.191	187	0.2	4.545	A
3 - Chelmsford Road (South)	829	162	1446	0.573	827	1.3	5.799	A

17:30 - 17:45

Arm	Total Demand (Veh/hr)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	End queue (Veh)	Delay (s)	Unsignalised level of service
1 - Chelmsford Road (North)	955	43	1749	0.546	955	1.2	4.530	A
2 - Site Access	187	737	978	0.191	187	0.2	4.551	A
3 - Chelmsford Road (South)	829	162	1446	0.573	829	1.3	5.834	A

17:45 - 18:00

Arm	Total Demand (Veh/hr)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	End queue (Veh)	Delay (s)	Unsignalised level of service
1 - Chelmsford Road (North)	779	35	1754	0.444	781	0.8	3.706	A
2 - Site Access	153	603	1056	0.145	153	0.2	3.988	A
3 - Chelmsford Road (South)	677	132	1464	0.462	679	0.9	4.596	A

18:00 - 18:15

Arm	Total Demand (Veh/hr)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	End queue (Veh)	Delay (s)	Unsignalised level of service
1 - Chelmsford Road (North)	653	29	1758	0.371	654	0.6	3.263	A
2 - Site Access	128	504	1113	0.115	128	0.1	3.655	A
3 - Chelmsford Road (South)	567	111	1477	0.384	568	0.6	3.964	A

2028 + Comm + Dev, AM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Geometry	1 - Chelmsford Road (North) - Roundabout Geometry	Effective flare length is over 30m, which is outside the normal range. Treat capacities with increasing caution.

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (s)	Junction LOS
1	Site Access - Chelsmford Road	Standard Roundabout		1, 2, 3	10.46	B

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time segment length (min)
D3	2028 + Comm + Dev	AM	ONE HOUR	07:45	09:15	15

Vehicle mix source	PCU Factor for a HV (PCU)
HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Use O-D data	Average Demand (Veh/hr)	Scaling Factor (%)
1 - Chelmsford Road (North)		✓	1290	100.000
2 - Site Access		✓	279	100.000
3 - Chelmsford Road (South)		✓	818	100.000

Origin-Destination Data

Demand (Veh/hr)

		To		
		1 - Chelmsford Road (North)	2 - Site Access	3 - Chelmsford Road (South)
From	1 - Chelmsford Road (North)	0	193	1097
	2 - Site Access	200	0	79
	3 - Chelmsford Road (South)	745	73	0

Vehicle Mix

Heavy Vehicle Percentages

		To		
		1 - Chelmsford Road (North)	2 - Site Access	3 - Chelmsford Road (South)
From	1 - Chelmsford Road (North)	0	0	4
	2 - Site Access	1	0	0
	3 - Chelmsford Road (South)	4	0	0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (s)	Max Queue (Veh)	Max LOS
1 - Chelmsford Road (North)	0.84	13.02	5.0	B
2 - Site Access	0.43	8.89	0.8	A
3 - Chelmsford Road (South)	0.64	6.96	1.7	A

Main Results for each time segment

07:45 - 08:00

Arm	Total Demand (Veh/hr)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	End queue (Veh)	Delay (s)	Unsignalised level of service
1 - Chelmsford Road (North)	971	55	1710	0.568	966	1.3	4.802	A
2 - Site Access	210	821	947	0.222	209	0.3	4.871	A
3 - Chelmsford Road (South)	616	150	1459	0.422	613	0.7	4.242	A

08:00 - 08:15

Arm	Total Demand (Veh/hr)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	End queue (Veh)	Delay (s)	Unsignalised level of service
1 - Chelmsford Road (North)	1160	66	1704	0.681	1157	2.1	6.542	A
2 - Site Access	251	983	848	0.296	250	0.4	6.014	A
3 - Chelmsford Road (South)	735	179	1441	0.510	734	1.0	5.083	A

08:15 - 08:30

Arm	Total Demand (Veh/hr)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	End queue (Veh)	Delay (s)	Unsignalised level of service
1 - Chelmsford Road (North)	1420	80	1694	0.838	1409	4.8	12.192	B
2 - Site Access	307	1199	717	0.428	306	0.7	8.750	A
3 - Chelmsford Road (South)	901	219	1418	0.635	898	1.7	6.888	A

08:30 - 08:45

Arm	Total Demand (Veh/hr)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	End queue (Veh)	Delay (s)	Unsignalised level of service
1 - Chelmsford Road (North)	1420	80	1694	0.838	1420	5.0	13.018	B
2 - Site Access	307	1207	712	0.431	307	0.8	8.887	A
3 - Chelmsford Road (South)	901	220	1417	0.635	901	1.7	6.962	A

08:45 - 09:00

Arm	Total Demand (Veh/hr)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	End queue (Veh)	Delay (s)	Unsignalised level of service
1 - Chelmsford Road (North)	1160	66	1703	0.681	1171	2.2	6.897	A
2 - Site Access	251	996	841	0.298	252	0.4	6.126	A
3 - Chelmsford Road (South)	735	181	1441	0.510	738	1.1	5.145	A

09:00 - 09:15

Arm	Total Demand (Veh/hr)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	End queue (Veh)	Delay (s)	Unsignalised level of service
1 - Chelmsford Road (North)	971	55	1710	0.568	975	1.3	4.917	A
2 - Site Access	210	829	943	0.223	211	0.3	4.921	A
3 - Chelmsford Road (South)	616	151	1458	0.422	617	0.7	4.287	A

2028 + Comm + Dev, PM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Geometry	1 - Chelmsford Road (North) - Roundabout Geometry	Effective flare length is over 30m, which is outside the normal range. Treat capacities with increasing caution.

Junction Network

Junctions

Junction	Name	Junction type	Use circulating lanes	Arm order	Junction Delay (s)	Junction LOS
1	Site Access - Chelsmford Road	Standard Roundabout		1, 2, 3	5.36	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)
D4	2028 + Comm + Dev	PM	ONE HOUR	16:45	18:15	15

Vehicle mix source	PCU Factor for a HV (PCU)
HV Percentages	2.00

Demand overview (Traffic)

Arm	Linked arm	Use O-D data	Average Demand (Veh/hr)	Scaling Factor (%)
1 - Chelmsford Road (North)		✓	891	100.000
2 - Site Access		✓	170	100.000
3 - Chelmsford Road (South)		✓	791	100.000

Origin-Destination Data

Demand (Veh/hr)

		To		
		1 - Chelmsford Road (North)	2 - Site Access	3 - Chelmsford Road (South)
From	1 - Chelmsford Road (North)	0	198	693
	2 - Site Access	147	0	23
	3 - Chelmsford Road (South)	752	39	0

Vehicle Mix

Heavy Vehicle Percentages

		To		
		1 - Chelmsford Road (North)	2 - Site Access	3 - Chelmsford Road (South)
From	1 - Chelmsford Road (North)	0	0	2
	2 - Site Access	4	0	3
	3 - Chelmsford Road (South)	4	1	0

Results

Results Summary for whole modelled period

Arm	Max RFC	Max Delay (s)	Max Queue (Veh)	Max LOS
1 - Chelmsford Road (North)	0.56	4.69	1.3	A
2 - Site Access	0.19	4.65	0.2	A
3 - Chelmsford Road (South)	0.60	6.26	1.5	A

Main Results for each time segment

16:45 - 17:00

Arm	Total Demand (Veh/hr)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	End queue (Veh)	Delay (s)	Unsignalised level of service
1 - Chelmsford Road (North)	671	29	1758	0.382	668	0.6	3.297	A
2 - Site Access	128	520	1102	0.116	127	0.1	3.690	A
3 - Chelmsford Road (South)	596	110	1477	0.403	593	0.7	4.059	A

17:00 - 17:15

Arm	Total Demand (Veh/hr)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	End queue (Veh)	Delay (s)	Unsignalised level of service
1 - Chelmsford Road (North)	801	35	1754	0.457	800	0.8	3.770	A
2 - Site Access	153	622	1043	0.147	153	0.2	4.043	A
3 - Chelmsford Road (South)	711	132	1464	0.486	710	0.9	4.768	A

17:15 - 17:30

Arm	Total Demand (Veh/hr)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	End queue (Veh)	Delay (s)	Unsignalised level of service
1 - Chelmsford Road (North)	981	43	1749	0.561	979	1.3	4.666	A
2 - Site Access	187	762	962	0.195	187	0.2	4.642	A
3 - Chelmsford Road (South)	871	162	1446	0.602	869	1.5	6.212	A

17:30 - 17:45

Arm	Total Demand (Veh/hr)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	End queue (Veh)	Delay (s)	Unsignalised level of service
1 - Chelmsford Road (North)	981	43	1749	0.561	981	1.3	4.687	A
2 - Site Access	187	763	962	0.195	187	0.2	4.648	A
3 - Chelmsford Road (South)	871	162	1446	0.602	871	1.5	6.260	A

17:45 - 18:00

Arm	Total Demand (Veh/hr)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	End queue (Veh)	Delay (s)	Unsignalised level of service
1 - Chelmsford Road (North)	801	35	1754	0.457	803	0.8	3.789	A
2 - Site Access	153	624	1042	0.147	153	0.2	4.053	A
3 - Chelmsford Road (South)	711	132	1464	0.486	713	1.0	4.811	A

18:00 - 18:15

Arm	Total Demand (Veh/hr)	Circulating flow (Veh/hr)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	End queue (Veh)	Delay (s)	Unsignalised level of service
1 - Chelmsford Road (North)	671	29	1758	0.382	672	0.6	3.316	A
2 - Site Access	128	522	1101	0.116	128	0.1	3.700	A
3 - Chelmsford Road (South)	596	111	1477	0.403	597	0.7	4.095	A

APPENDIX E

Junctions 9

PICADY 9 - Priority Intersection Module

Version: 9.5.2.1013

For sales and distribution information, program advice and maintenance, contact TRL:
+44 (0)1344 379777 software@trl.co.uk www.trlsoftware.co.uk

Filename: 20240521 Chelmsford Road - Oliver Road V1.j9
Path: \\slr.local\eu\Offices\UK\London\Vectos\Projects\Projects\150000\152080 - Shenfield\MODELLING\20240521 - Updated School Sensitvity Assessment
Report generation date: 03/06/2024 14:53:16

Summary of junction performance

	AM					PM				
	Set ID	Queue (Veh)	Delay (s)	RFC	LOS	Set ID	Queue (Veh)	Delay (s)	RFC	LOS
	2022 Base									
Stream B-AC	D1	1.6	34.49	0.62	D	D2	0.6	15.77	0.37	C
Stream C-AB		0.5	12.37	0.31	B		0.1	8.17	0.13	A
	2028 Base									
Stream B-AC	D3	1.6	34.49	0.62	D	D4	0.6	15.77	0.37	C
Stream C-AB		0.5	12.37	0.31	B		0.1	8.17	0.13	A
	2028 Base + Dev									
Stream B-AC	D5	4.1	82.26	0.82	F	D6	0.8	19.91	0.46	C
Stream C-AB		0.5	13.80	0.34	B		0.2	8.42	0.13	A
	2028 Base + Comm									
Stream B-AC	D7	1.9	39.83	0.66	E	D8	0.7	17.27	0.40	C
Stream C-AB		0.5	12.60	0.32	B		0.1	8.28	0.13	A
	2028 Base + Comm + Dev									
Stream B-AC	D9	5.9	116.70	0.87	F	D10	1.0	22.26	0.50	C
Stream C-AB		0.5	14.10	0.35	B		0.2	8.54	0.14	A

There are warnings associated with one or more model runs - see the 'Data Errors and Warnings' tables for each Analysis or Demand Set.

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

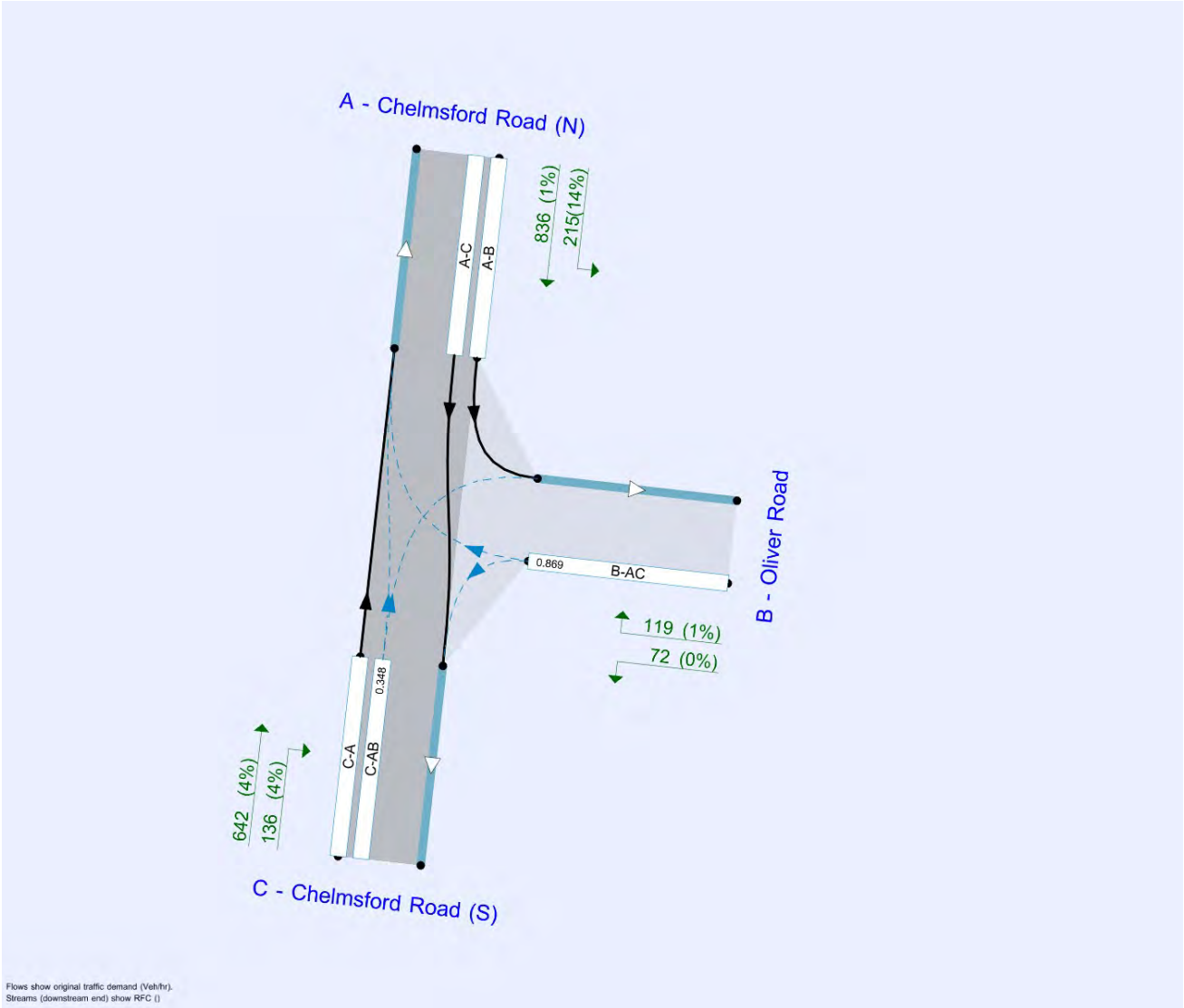
File summary

File Description

Title	
Location	
Site number	
Date	02/02/2023
Version	
Status	(new file)
Identifier	
Client	
Jobnumber	
Enumerator	EUR\George.Magnisalis
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 period length (min)	Time segment length (min)	Run automatically
D1	2022 Base	AM	DIRECT	08:00	09:30	90	15	✓
D2	2022 Base	PM	DIRECT	17:00	18:30	90	15	✓
D3	2028 Base	AM	DIRECT	08:00	09:30	90	15	✓
D4	2028 Base	PM	DIRECT	17:00	18:30	90	15	✓
D5	2028 Base + Dev	AM	DIRECT	08:00	09:30	90	15	✓
D6	2028 Base + Dev	PM	DIRECT	17:00	18:30	90	15	✓
D7	2028 Base + Comm	AM	DIRECT	08:00	09:30	90	15	✓
D8	2028 Base + Comm	PM	DIRECT	17:00	18:30	90	15	✓
D9	2028 Base + Comm + Dev	AM	DIRECT	08:00	09:30	90	15	✓
D10	2028 Base + Comm + Dev	PM	DIRECT	17:00	18:30	90	15	✓

Analysis Set Details

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

2022 Base, AM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Profile Type	D1 - 2022 Base, AM	The DIRECT profile type is intended to be used for demand that varies over time. You are using it with the 'Use O-D data' option, but your O-D data does not vary over time. Are you sure this is correct?

Junction Network

Junctions

Junction	Name	Junction type	Major road direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	Chelmsford Rd_Oliver Rd Priority Junction	T-Junction	Two-way		4.06	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Arms

Arms

Arm	Name	Description	Arm type
A	Chelmsford Road (N)		Major
B	Oliver Road		Minor
C	Chelmsford Road (S)		Major

Major Arm Geometry

Arm	Width of carriageway (m)	Has kerbed central reserve	Has right turn bay	Width for right turn (m)	Visibility for right turn (m)	Blocks?	Blocking queue (PCU)
C - Chelmsford Road (S)	6.35		✓	2.98	117.1	✓	8.00

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

Minor Arm Geometry

Arm	Minor arm type	Lane width (m)	Visibility to left (m)	Visibility to right (m)
B - Oliver Road	One lane	3.86	68	66

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	578	0.104	0.262	0.165	0.375
B-C	723	0.109	0.276	-	-
C-B	696	0.266	0.266	-	-

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 period length (min)	Time segment length (min)	Run automatically
D1	2022 Base	AM	DIRECT	08:00	09:30	90	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	Scaling Factor (%)
A - Chelmsford Road (N)		DIRECT	✓	100.000
B - Oliver Road		DIRECT	✓	100.000
C - Chelmsford Road (S)		DIRECT	✓	100.000

Origin-Destination Data

Demand (Veh/hr)

		To		
		A - Chelmsford Road (N)	B - Oliver Road	C - Chelmsford Road (S)
From	A - Chelmsford Road (N)	0	186	738
	B - Oliver Road	99	0	70
	C - Chelmsford Road (S)	568	133	0

Vehicle Mix

Heavy Vehicle Percentages

		To		
		A - Chelmsford Road (N)	B - Oliver Road	C - Chelmsford Road (S)
From	A - Chelmsford Road (N)	0	16	1
	B - Oliver Road	1	0	0
	C - Chelmsford Road (S)	5	4	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-AC	0.62	34.49	1.6	D	169	253
C-AB	0.31	12.37	0.5	B	133	200
C-A					568	852
A-B					186	279
A-C					738	1107

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-AC	169	42	274	0.617	163	0.0	1.5	31.092	D
C-AB	133	33	424	0.314	131	0.0	0.4	12.222	B
C-A	568	142			568				
A-B	186	47			186				
A-C	738	185			738				

08:15 - 08:30

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	169	42	273	0.619	169	1.5	1.5	34.232	D
C-AB	133	33	424	0.314	133	0.4	0.5	12.367	B
C-A	568	142			568				
A-B	186	47			186				
A-C	738	185			738				

08:30 - 08:45

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	169	42	273	0.619	169	1.5	1.6	34.392	D
C-AB	133	33	424	0.314	133	0.5	0.5	12.369	B
C-A	568	142			568				
A-B	186	47			186				
A-C	738	185			738				

08:45 - 09:00

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	169	42	273	0.619	169	1.6	1.6	34.446	D
C-AB	133	33	424	0.314	133	0.5	0.5	12.369	B
C-A	568	142			568				
A-B	186	47			186				
A-C	738	185			738				

09:00 - 09:15

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	169	42	273	0.619	169	1.6	1.6	34.475	D
C-AB	133	33	424	0.314	133	0.5	0.5	12.369	B
C-A	568	142			568				
A-B	186	47			186				
A-C	738	185			738				

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-AC	169	42	273	0.619	169	1.6	1.6	34.491	D
C-AB	133	33	424	0.314	133	0.5	0.5	12.369	B
C-A	568	142			568				
A-B	186	47			186				
A-C	738	185			738				

2022 Base, PM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Profile Type	D2 - 2022 Base, PM	The DIRECT profile type is intended to be used for demand that varies over time. You are using it with the 'Use O-D data' option, but your O-D data does not vary over time. Are you sure this is correct?

Junction Network

Junctions

Junction	Name	Junction type	Major road direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	Chelmsford Rd_Oliver Rd Priority Junction	T-Junction	Two-way		1.71	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time period length (min)	Time segment length (min)	Run automatically
D2	2022 Base	PM	DIRECT	17:00	18:30	90	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	Scaling Factor (%)
A - Chelmsford Road (N)		DIRECT	✓	100.000
B - Oliver Road		DIRECT	✓	100.000
C - Chelmsford Road (S)		DIRECT	✓	100.000

Origin-Destination Data

Demand (Veh/hr)

		To		
		A - Chelmsford Road (N)	B - Oliver Road	C - Chelmsford Road (S)
From	A - Chelmsford Road (N)	0	98	556
	B - Oliver Road	72	0	61
	C - Chelmsford Road (S)	688	64	0

Vehicle Mix

Heavy Vehicle Percentages

		To		
		A - Chelmsford Road (N)	B - Oliver Road	C - Chelmsford Road (S)
From	A - Chelmsford Road (N)	0	11	0
	B - Oliver Road	0	0	3
	C - Chelmsford Road (S)	1	3	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-AC	0.37	15.77	0.6	C	133	199
C-AB	0.13	8.17	0.1	A	64	96
C-A					688	1032
A-B					98	147
A-C					556	834

Main Results for each time segment

17:00 - 17:15

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	133	33	361	0.368	131	0.0	0.6	15.460	C
C-AB	64	16	505	0.127	63	0.0	0.1	8.151	A
C-A	688	172			688				
A-B	98	25			98				
A-C	556	139			556				

17:15 - 17:30

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	133	33	361	0.368	133	0.6	0.6	15.765	C
C-AB	64	16	505	0.127	64	0.1	0.1	8.171	A
C-A	688	172			688				
A-B	98	25			98				
A-C	556	139			556				

17:30 - 17:45

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	133	33	361	0.368	133	0.6	0.6	15.770	C
C-AB	64	16	505	0.127	64	0.1	0.1	8.171	A
C-A	688	172			688				
A-B	98	25			98				
A-C	556	139			556				

17:45 - 18:00

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	133	33	361	0.368	133	0.6	0.6	15.772	C
C-AB	64	16	505	0.127	64	0.1	0.1	8.171	A
C-A	688	172			688				
A-B	98	25			98				
A-C	556	139			556				

18:00 - 18:15

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	133	33	361	0.368	133	0.6	0.6	15.771	C
C-AB	64	16	505	0.127	64	0.1	0.1	8.171	A
C-A	688	172			688				
A-B	98	25			98				
A-C	556	139			556				

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-AC	133	33	361	0.368	133	0.6	0.6	15.771	C
C-AB	64	16	505	0.127	64	0.1	0.1	8.171	A
C-A	688	172			688				
A-B	98	25			98				
A-C	556	139			556				

2028 Base, AM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Profile Type	D3 - 2028 Base, AM	The DIRECT profile type is intended to be used for demand that varies over time. You are using it with the 'Use O-D data' option, but your O-D data does not vary over time. Are you sure this is correct?

Junction Network

Junctions

Junction	Name	Junction type	Major road direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	Chelmsford Rd_Oliver Rd Priority Junction	T-Junction	Two-way		4.06	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 period length (min)	Time segment length (min)	Run automatically
D3	2028 Base	AM	DIRECT	08:00	09:30	90	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	Scaling Factor (%)
A - Chelmsford Road (N)		DIRECT	✓	100.000
B - Oliver Road		DIRECT	✓	100.000
C - Chelmsford Road (S)		DIRECT	✓	100.000

Origin-Destination Data

Demand (Veh/hr)

		To		
		A - Chelmsford Road (N)	B - Oliver Road	C - Chelmsford Road (S)
From	A - Chelmsford Road (N)	0	186	738
	B - Oliver Road	99	0	70
	C - Chelmsford Road (S)	568	133	0

Vehicle Mix

Heavy Vehicle Percentages

		To		
		A - Chelmsford Road (N)	B - Oliver Road	C - Chelmsford Road (S)
From	A - Chelmsford Road (N)	0	16	1
	B - Oliver Road	1	0	0
	C - Chelmsford Road (S)	5	4	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-AC	0.62	34.49	1.6	D	169	253
C-AB	0.31	12.37	0.5	B	133	200
C-A					568	852
A-B					186	279
A-C					738	1107

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-AC	169	42	274	0.617	163	0.0	1.5	31.092	D
C-AB	133	33	424	0.314	131	0.0	0.4	12.222	B
C-A	568	142			568				
A-B	186	47			186				
A-C	738	185			738				

08:15 - 08:30

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	169	42	273	0.619	169	1.5	1.5	34.232	D
C-AB	133	33	424	0.314	133	0.4	0.5	12.367	B
C-A	568	142			568				
A-B	186	47			186				
A-C	738	185			738				

08:30 - 08:45

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	169	42	273	0.619	169	1.5	1.6	34.392	D
C-AB	133	33	424	0.314	133	0.5	0.5	12.369	B
C-A	568	142			568				
A-B	186	47			186				
A-C	738	185			738				

08:45 - 09:00

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	169	42	273	0.619	169	1.6	1.6	34.446	D
C-AB	133	33	424	0.314	133	0.5	0.5	12.369	B
C-A	568	142			568				
A-B	186	47			186				
A-C	738	185			738				

09:00 - 09:15

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	169	42	273	0.619	169	1.6	1.6	34.475	D
C-AB	133	33	424	0.314	133	0.5	0.5	12.369	B
C-A	568	142			568				
A-B	186	47			186				
A-C	738	185			738				

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-AC	169	42	273	0.619	169	1.6	1.6	34.491	D
C-AB	133	33	424	0.314	133	0.5	0.5	12.369	B
C-A	568	142			568				
A-B	186	47			186				
A-C	738	185			738				

2028 Base, PM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Profile Type	D4 - 2028 Base, PM	The DIRECT profile type is intended to be used for demand that varies over time. You are using it with the 'Use O-D data' option, but your O-D data does not vary over time. Are you sure this is correct?

Junction Network

Junctions

Junction	Name	Junction type	Major road direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	Chelmsford Rd_Oliver Rd Priority Junction	T-Junction	Two-way		1.71	A

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time period length (min)	Time segment length (min)	Run automatically
D4	2028 Base	PM	DIRECT	17:00	18:30	90	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	Scaling Factor (%)
A - Chelmsford Road (N)		DIRECT	✓	100.000
B - Oliver Road		DIRECT	✓	100.000
C - Chelmsford Road (S)		DIRECT	✓	100.000

Origin-Destination Data

Demand (Veh/hr)

		To		
		A - Chelmsford Road (N)	B - Oliver Road	C - Chelmsford Road (S)
From	A - Chelmsford Road (N)	0	98	556
	B - Oliver Road	72	0	61
	C - Chelmsford Road (S)	688	64	0

Vehicle Mix

Heavy Vehicle Percentages

		To		
		A - Chelmsford Road (N)	B - Oliver Road	C - Chelmsford Road (S)
From	A - Chelmsford Road (N)	0	11	0
	B - Oliver Road	0	0	3
	C - Chelmsford Road (S)	1	3	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-AC	0.37	15.77	0.6	C	133	199
C-AB	0.13	8.17	0.1	A	64	96
C-A					688	1032
A-B					98	147
A-C					556	834

Main Results for each time segment

17:00 - 17:15

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	133	33	361	0.368	131	0.0	0.6	15.460	C
C-AB	64	16	505	0.127	63	0.0	0.1	8.151	A
C-A	688	172			688				
A-B	98	25			98				
A-C	556	139			556				

17:15 - 17:30

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	133	33	361	0.368	133	0.6	0.6	15.765	C
C-AB	64	16	505	0.127	64	0.1	0.1	8.171	A
C-A	688	172			688				
A-B	98	25			98				
A-C	556	139			556				

17:30 - 17:45

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	133	33	361	0.368	133	0.6	0.6	15.770	C
C-AB	64	16	505	0.127	64	0.1	0.1	8.171	A
C-A	688	172			688				
A-B	98	25			98				
A-C	556	139			556				

17:45 - 18:00

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	133	33	361	0.368	133	0.6	0.6	15.772	C
C-AB	64	16	505	0.127	64	0.1	0.1	8.171	A
C-A	688	172			688				
A-B	98	25			98				
A-C	556	139			556				

18:00 - 18:15

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	133	33	361	0.368	133	0.6	0.6	15.771	C
C-AB	64	16	505	0.127	64	0.1	0.1	8.171	A
C-A	688	172			688				
A-B	98	25			98				
A-C	556	139			556				

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-AC	133	33	361	0.368	133	0.6	0.6	15.771	C
C-AB	64	16	505	0.127	64	0.1	0.1	8.171	A
C-A	688	172			688				
A-B	98	25			98				
A-C	556	139			556				

2028 Base + Dev, AM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Profile Type	D5 - 2028 Base + Dev, AM	The DIRECT profile type is intended to be used for demand that varies over time. You are using it with the 'Use O-D data' option, but your O-D data does not vary over time. Are you sure this is correct?

Junction Network

Junctions

Junction	Name	Junction type	Major road direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	Chelmsford Rd_Oliver Rd Priority Junction	T-Junction	Two-way		8.57	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 period length (min)	Time segment length (min)	Run automatically
D5	2028 Base + Dev	AM	DIRECT	08:00	09:30	90	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	Scaling Factor (%)
A - Chelmsford Road (N)		DIRECT	✓	100.000
B - Oliver Road		DIRECT	✓	100.000
C - Chelmsford Road (S)		DIRECT	✓	100.000

Origin-Destination Data

Demand (Veh/hr)

		To		
		A - Chelmsford Road (N)	B - Oliver Road	C - Chelmsford Road (S)
From	A - Chelmsford Road (N)	0	213	817
	B - Oliver Road	116	0	72
	C - Chelmsford Road (S)	620	136	0

Vehicle Mix

Heavy Vehicle Percentages

		To		
		A - Chelmsford Road (N)	B - Oliver Road	C - Chelmsford Road (S)
From	A - Chelmsford Road (N)	0	14	1
	B - Oliver Road	1	0	0
	C - Chelmsford Road (S)	4	4	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-AC	0.82	82.26	4.1	F	188	282
C-AB	0.34	13.80	0.5	B	136	204
C-A					620	930
A-B					213	320
A-C					817	1226

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-AC	188	47	231	0.814	175	0.0	3.2	56.300	F
C-AB	136	34	397	0.343	134	0.0	0.5	13.596	B
C-A	620	155			620				
A-B	213	53			213				
A-C	817	204			817				

08:15 - 08:30

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	188	47	230	0.817	186	3.2	3.6	75.569	F
C-AB	136	34	397	0.343	136	0.5	0.5	13.801	B
C-A	620	155			620				
A-B	213	53			213				
A-C	817	204			817				

08:30 - 08:45

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	188	47	230	0.817	187	3.6	3.9	79.057	F
C-AB	136	34	397	0.343	136	0.5	0.5	13.803	B
C-A	620	155			620				
A-B	213	53			213				
A-C	817	204			817				

08:45 - 09:00

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	188	47	230	0.817	187	3.9	4.0	80.684	F
C-AB	136	34	397	0.343	136	0.5	0.5	13.803	B
C-A	620	155			620				
A-B	213	53			213				
A-C	817	204			817				

09:00 - 09:15

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	188	47	230	0.817	188	4.0	4.1	81.635	F
C-AB	136	34	397	0.343	136	0.5	0.5	13.803	B
C-A	620	155			620				
A-B	213	53			213				
A-C	817	204			817				

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-AC	188	47	230	0.817	188	4.1	4.1	82.262	F
C-AB	136	34	397	0.343	136	0.5	0.5	13.803	B
C-A	620	155			620				
A-B	213	53			213				
A-C	817	204			817				

2028 Base + Dev, PM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Profile Type	D6 - 2028 Base + Dev, PM	The DIRECT profile type is intended to be used for demand that varies over time. You are using it with the 'Use O-D data' option, but your O-D data does not vary over time. Are you sure this is correct?

Junction Network

Junctions

Junction	Name	Junction type	Major road direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	Chelmsford Rd_Oliver Rd Priority Junction	T-Junction	Two-way		2.24	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 period length (min)	Time segment length (min)	Run automatically
D6	2028 Base + Dev	PM	DIRECT	17:00	18:30	90	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	Scaling Factor (%)
A - Chelmsford Road (N)		DIRECT	✓	100.000
B - Oliver Road		DIRECT	✓	100.000
C - Chelmsford Road (S)		DIRECT	✓	100.000

Origin-Destination Data

Demand (Veh/hr)

		To		
		A - Chelmsford Road (N)	B - Oliver Road	C - Chelmsford Road (S)
From	A - Chelmsford Road (N)	0	116	579
	B - Oliver Road	91	0	63
	C - Chelmsford Road (S)	713	66	0

Vehicle Mix

Heavy Vehicle Percentages

		To		
		A - Chelmsford Road (N)	B - Oliver Road	C - Chelmsford Road (S)
From	A - Chelmsford Road (N)	0	10	0
	B - Oliver Road	1	0	3
	C - Chelmsford Road (S)	1	3	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-AC	0.46	19.91	0.8	C	154	231
C-AB	0.13	8.42	0.2	A	66	99
C-A					713	1069
A-B					116	174
A-C					579	869

Main Results for each time segment

17:00 - 17:15

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	154	39	335	0.460	151	0.0	0.8	19.221	C
C-AB	66	17	494	0.134	65	0.0	0.2	8.393	A
C-A	713	178			713				
A-B	116	29			116				
A-C	579	145			579				

17:15 - 17:30

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	154	39	335	0.460	154	0.8	0.8	19.886	C
C-AB	66	17	494	0.134	66	0.2	0.2	8.416	A
C-A	713	178			713				
A-B	116	29			116				
A-C	579	145			579				

17:30 - 17:45

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	154	39	335	0.460	154	0.8	0.8	19.900	C
C-AB	66	17	494	0.134	66	0.2	0.2	8.416	A
C-A	713	178			713				
A-B	116	29			116				
A-C	579	145			579				

17:45 - 18:00

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	154	39	335	0.460	154	0.8	0.8	19.906	C
C-AB	66	17	494	0.134	66	0.2	0.2	8.416	A
C-A	713	178			713				
A-B	116	29			116				
A-C	579	145			579				

18:00 - 18:15

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	154	39	335	0.460	154	0.8	0.8	19.908	C
C-AB	66	17	494	0.134	66	0.2	0.2	8.416	A
C-A	713	178			713				
A-B	116	29			116				
A-C	579	145			579				

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-AC	154	39	335	0.460	154	0.8	0.8	19.908	C
C-AB	66	17	494	0.134	66	0.2	0.2	8.416	A
C-A	713	178			713				
A-B	116	29			116				
A-C	579	145			579				

2028 Base + Comm, AM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Profile Type	D7 - 2028 Base + Comm, AM	The DIRECT profile type is intended to be used for demand that varies over time. You are using it with the 'Use O-D data' option, but your O-D data does not vary over time. Are you sure this is correct?

Junction Network

Junctions

Junction	Name	Junction type	Major road direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	Chelmsford Rd_Oliver Rd Priority Junction	T-Junction	Two-way		4.51	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 period length (min)	Time segment length (min)	Run automatically
D7	2028 Base + Comm	AM	DIRECT	08:00	09:30	90	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	Scaling Factor (%)
A - Chelmsford Road (N)		DIRECT	✓	100.000
B - Oliver Road		DIRECT	✓	100.000
C - Chelmsford Road (S)		DIRECT	✓	100.000

Origin-Destination Data

Demand (Veh/hr)

		To		
		A - Chelmsford Road (N)	B - Oliver Road	C - Chelmsford Road (S)
From	A - Chelmsford Road (N)	0	188	756
	B - Oliver Road	102	0	70
	C - Chelmsford Road (S)	590	133	0

Vehicle Mix

Heavy Vehicle Percentages

		To		
		A - Chelmsford Road (N)	B - Oliver Road	C - Chelmsford Road (S)
From	A - Chelmsford Road (N)	0	16	1
	B - Oliver Road	1	0	0
	C - Chelmsford Road (S)	5	4	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-AC	0.66	39.83	1.9	E	172	258
C-AB	0.32	12.60	0.5	B	133	200
C-A					590	885
A-B					188	282
A-C					756	1134

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-AC	172	43	263	0.654	165	0.0	1.7	34.879	D
C-AB	133	33	419	0.318	131	0.0	0.5	12.441	B
C-A	590	147			590				
A-B	188	47			188				
A-C	756	189			756				

08:15 - 08:30

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	172	43	262	0.656	172	1.7	1.8	39.358	E
C-AB	133	33	419	0.318	133	0.5	0.5	12.593	B
C-A	590	147			590				
A-B	188	47			188				
A-C	756	189			756				

08:30 - 08:45

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	172	43	262	0.656	172	1.8	1.8	39.640	E
C-AB	133	33	419	0.318	133	0.5	0.5	12.596	B
C-A	590	147			590				
A-B	188	47			188				
A-C	756	189			756				

08:45 - 09:00

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	172	43	262	0.656	172	1.8	1.8	39.742	E
C-AB	133	33	419	0.318	133	0.5	0.5	12.596	B
C-A	590	147			590				
A-B	188	47			188				
A-C	756	189			756				

09:00 - 09:15

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	172	43	262	0.656	172	1.8	1.9	39.799	E
C-AB	133	33	419	0.318	133	0.5	0.5	12.596	B
C-A	590	147			590				
A-B	188	47			188				
A-C	756	189			756				

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-AC	172	43	262	0.656	172	1.9	1.9	39.829	E
C-AB	133	33	419	0.318	133	0.5	0.5	12.596	B
C-A	590	147			590				
A-B	188	47			188				
A-C	756	189			756				

2028 Base + Comm, PM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Profile Type	D8 - 2028 Base + Comm, PM	The DIRECT profile type is intended to be used for demand that varies over time. You are using it with the 'Use O-D data' option, but your O-D data does not vary over time. Are you sure this is correct?

Junction Network

Junctions

Junction	Name	Junction type	Major road direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	Chelmsford Rd_Oliver Rd Priority Junction	T-Junction	Two-way		1.83	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 period length (min)	Time segment length (min)	Run automatically
D8	2028 Base + Comm	PM	DIRECT	17:00	18:30	90	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	Scaling Factor (%)
A - Chelmsford Road (N)		DIRECT	✓	100.000
B - Oliver Road		DIRECT	✓	100.000
C - Chelmsford Road (S)		DIRECT	✓	100.000

Origin-Destination Data

Demand (Veh/hr)

		To		
		A - Chelmsford Road (N)	B - Oliver Road	C - Chelmsford Road (S)
From	A - Chelmsford Road (N)	0	101	576
	B - Oliver Road	77	0	61
	C - Chelmsford Road (S)	721	64	0

Vehicle Mix

Heavy Vehicle Percentages

		To		
		A - Chelmsford Road (N)	B - Oliver Road	C - Chelmsford Road (S)
From	A - Chelmsford Road (N)	0	11	0
	B - Oliver Road	0	0	3
	C - Chelmsford Road (S)	1	3	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-AC	0.40	17.27	0.7	C	138	207
C-AB	0.13	8.28	0.1	A	64	96
C-A					721	1081
A-B					101	152
A-C					576	864

Main Results for each time segment

17:00 - 17:15

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	138	35	347	0.398	135	0.0	0.6	16.851	C
C-AB	64	16	499	0.128	63	0.0	0.1	8.264	A
C-A	721	180			721				
A-B	101	25			101				
A-C	576	144			576				

17:15 - 17:30

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	138	35	346	0.398	138	0.6	0.7	17.258	C
C-AB	64	16	499	0.128	64	0.1	0.1	8.285	A
C-A	721	180			721				
A-B	101	25			101				
A-C	576	144			576				

17:30 - 17:45

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	138	35	346	0.398	138	0.7	0.7	17.267	C
C-AB	64	16	499	0.128	64	0.1	0.1	8.285	A
C-A	721	180			721				
A-B	101	25			101				
A-C	576	144			576				

17:45 - 18:00

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	138	35	346	0.398	138	0.7	0.7	17.266	C
C-AB	64	16	499	0.128	64	0.1	0.1	8.285	A
C-A	721	180			721				
A-B	101	25			101				
A-C	576	144			576				

18:00 - 18:15

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	138	35	346	0.398	138	0.7	0.7	17.269	C
C-AB	64	16	499	0.128	64	0.1	0.1	8.285	A
C-A	721	180			721				
A-B	101	25			101				
A-C	576	144			576				

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-AC	138	35	346	0.398	138	0.7	0.7	17.268	C
C-AB	64	16	499	0.128	64	0.1	0.1	8.285	A
C-A	721	180			721				
A-B	101	25			101				
A-C	576	144			576				

2028 Base + Comm + Dev, AM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Profile Type	D9 - 2028 Base + Comm + Dev, AM	The DIRECT profile type is intended to be used for demand that varies over time. You are using it with the 'Use O-D data' option, but your O-D data does not vary over time. Are you sure this is correct?

Junction Network

Junctions

Junction	Name	Junction type	Major road direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	Chelmsford Rd_Oliver Rd Priority Junction	T-Junction	Two-way		11.68	B

Junction Network Options

Driving side	Lighting
Left	Normal/unknown

Traffic Demand

Demand Set Details

ID	Scenario name	Time Period name	Traffic profile type	Start time (HH:mm)	Finish time (HH:mm)	Time period length (min)	Time segment length (min)	Run automatically
D9	2028 Base + Comm + Dev	AM	DIRECT	08:00	09:30	90	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	Scaling Factor (%)
A - Chelmsford Road (N)		DIRECT	✓	100.000
B - Oliver Road		DIRECT	✓	100.000
C - Chelmsford Road (S)		DIRECT	✓	100.000

Origin-Destination Data

Demand (Veh/hr)

		To		
		A - Chelmsford Road (N)	B - Oliver Road	C - Chelmsford Road (S)
From	A - Chelmsford Road (N)	0	215	836
	B - Oliver Road	119	0	72
	C - Chelmsford Road (S)	642	136	0

Vehicle Mix

Heavy Vehicle Percentages

		To		
		A - Chelmsford Road (N)	B - Oliver Road	C - Chelmsford Road (S)
From	A - Chelmsford Road (N)	0	14	1
	B - Oliver Road	1	0	0
	C - Chelmsford Road (S)	4	4	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-AC	0.87	116.70	5.9	F	191	287
C-AB	0.35	14.10	0.5	B	136	204
C-A					642	963
A-B					215	323
A-C					836	1254

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-AC	191	48	220	0.869	175	0.0	3.9	67.164	F
C-AB	136	34	391	0.348	134	0.0	0.5	13.879	B
C-A	642	160			642				
A-B	215	54			215				
A-C	836	209			836				

08:15 - 08:30

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	191	48	219	0.872	188	3.9	4.8	98.703	F
C-AB	136	34	391	0.348	136	0.5	0.5	14.096	B
C-A	642	160			642				
A-B	215	54			215				
A-C	836	209			836				

08:30 - 08:45

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	191	48	219	0.872	189	4.8	5.3	107.111	F
C-AB	136	34	391	0.348	136	0.5	0.5	14.099	B
C-A	642	160			642				
A-B	215	54			215				
A-C	836	209			836				

08:45 - 09:00

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	191	48	219	0.873	190	5.3	5.5	111.683	F
C-AB	136	34	391	0.348	136	0.5	0.5	14.099	B
C-A	642	160			642				
A-B	215	54			215				
A-C	836	209			836				

09:00 - 09:15

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	191	48	219	0.873	190	5.5	5.7	114.626	F
C-AB	136	34	391	0.348	136	0.5	0.5	14.099	B
C-A	642	160			642				
A-B	215	54			215				
A-C	836	209			836				

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-AC	191	48	219	0.873	190	5.7	5.9	116.695	F
C-AB	136	34	391	0.348	136	0.5	0.5	14.099	B
C-A	642	160			642				
A-B	215	54			215				
A-C	836	209			836				

2028 Base + Comm + Dev, PM

Data Errors and Warnings

Severity	Area	Item	Description
Warning	Profile Type	D10 - 2028 Base + Comm + Dev, PM	The DIRECT profile type is intended to be used for demand that varies over time. You are using it with the 'Use O-D data' option, but your O-D data does not vary over time. Are you sure this is correct?

Junction Network

Junctions

Junction	Name	Junction type	Major road direction	Use circulating lanes	Junction Delay (s)	Junction LOS
1	Chelmsford Rd_Oliver Rd Priority Junction	T-Junction	Two-way		2.44	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 period length (min)	Time segment length (min)	Run automatically
D10	2028 Base + Comm + Dev	PM	DIRECT	17:00	18:30	90	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	Scaling Factor (%)
A - Chelmsford Road (N)		DIRECT	✓	100.000
B - Oliver Road		DIRECT	✓	100.000
C - Chelmsford Road (S)		DIRECT	✓	100.000

Origin-Destination Data

Demand (Veh/hr)

		To		
		A - Chelmsford Road (N)	B - Oliver Road	C - Chelmsford Road (S)
From	A - Chelmsford Road (N)	0	119	599
	B - Oliver Road	96	0	63
	C - Chelmsford Road (S)	747	66	0

Vehicle Mix

Heavy Vehicle Percentages

		To		
		A - Chelmsford Road (N)	B - Oliver Road	C - Chelmsford Road (S)
From	A - Chelmsford Road (N)	0	10	0
	B - Oliver Road	1	0	3
	C - Chelmsford Road (S)	1	3	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-AC	0.50	22.26	1.0	C	159	239
C-AB	0.14	8.54	0.2	A	66	99
C-A					747	1120
A-B					119	179
A-C					599	899

Main Results for each time segment

17:00 - 17:15

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	159	40	321	0.495	155	0.0	0.9	21.290	C
C-AB	66	17	488	0.135	65	0.0	0.2	8.512	A
C-A	747	187			747				
A-B	119	30			119				
A-C	599	150			599				

17:15 - 17:30

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	159	40	321	0.496	159	0.9	1.0	22.220	C
C-AB	66	17	488	0.135	66	0.2	0.2	8.536	A
C-A	747	187			747				
A-B	119	30			119				
A-C	599	150			599				

17:30 - 17:45

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	159	40	321	0.496	159	1.0	1.0	22.245	C
C-AB	66	17	488	0.135	66	0.2	0.2	8.536	A
C-A	747	187			747				
A-B	119	30			119				
A-C	599	150			599				

17:45 - 18:00

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	159	40	321	0.496	159	1.0	1.0	22.251	C
C-AB	66	17	488	0.135	66	0.2	0.2	8.536	A
C-A	747	187			747				
A-B	119	30			119				
A-C	599	150			599				

18:00 - 18:15

Stream	Total Demand (Veh/hr)	Junction Arrivals (Veh)	Capacity (Veh/hr)	RFC	Throughput (Veh/hr)	Start queue (Veh)	End queue (Veh)	Delay (s)	Unsignalised level of service
B-AC	159	40	321	0.496	159	1.0	1.0	22.256	C
C-AB	66	17	488	0.135	66	0.2	0.2	8.536	A
C-A	747	187			747				
A-B	119	30			119				
A-C	599	150			599				

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-AC	159	40	321	0.496	159	1.0	1.0	22.258	C
C-AB	66	17	488	0.135	66	0.2	0.2	8.536	A
C-A	747	187			747				
A-B	119	30			119				
A-C	599	150			599				

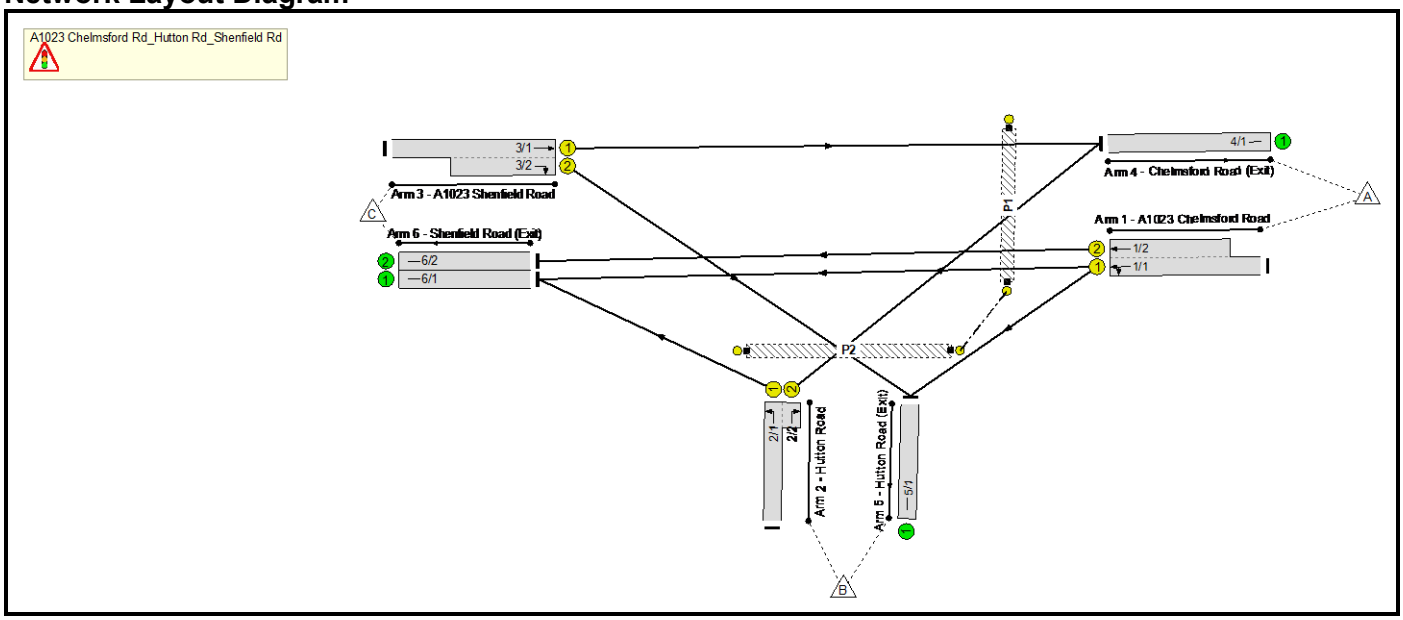
APPENDIX F

Full Input Data And Results

User and Project Details

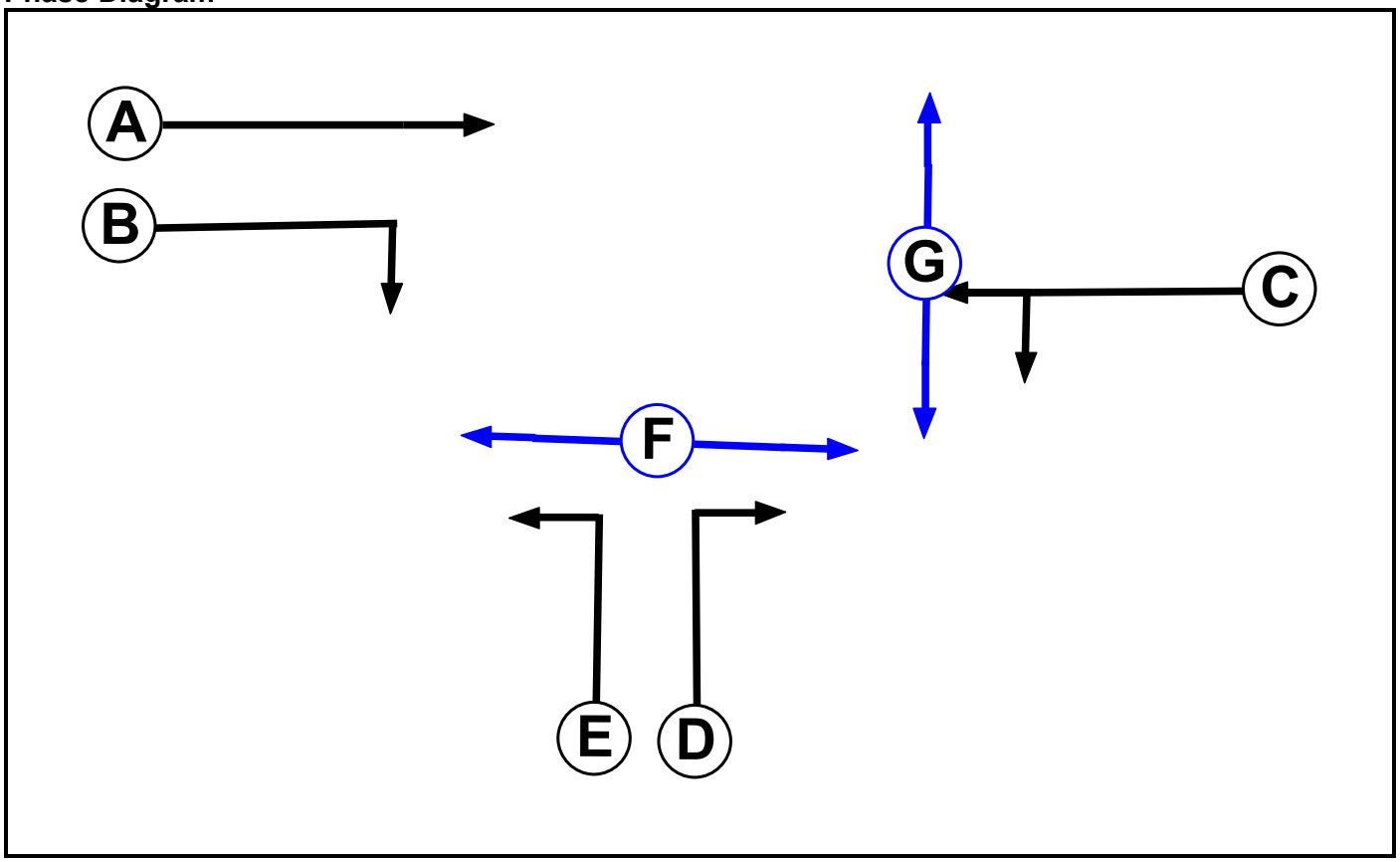
Project:	
Title:	**Shenfield**
Location:	
Additional detail:	
File name:	20240521 152080 - A1023 Chelmsford Rd_Hutton Rd_Shenfield Rd Junction - BS update - V1.lsg3x
Author:	Ben Stone
Company:	SLR
Address:	

Network Layout Diagram



Full Input Data And Results

Phase Diagram



Phase Input Data

Phase Name	Phase Type	Assoc. Phase	Street Min	Cont Min
A	Traffic		7	7
B	Traffic		7	7
C	Traffic		7	7
D	Traffic		7	7
E	Traffic		1	1
F	Pedestrian		12	12
G	Pedestrian		11	11

Full Input Data And Results

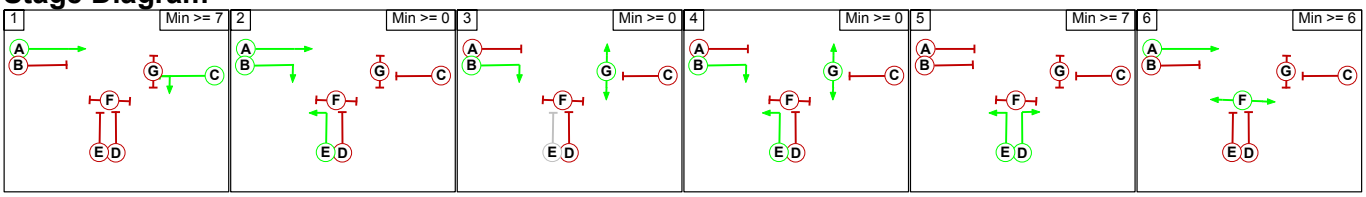
Phase Intergreens Matrix

Terminating Phase	Starting Phase							
		A	B	C	D	E	F	G
	A		-	-	5	-	-	8
	B	-		6	5	-	7	-
	C	-	5		6	6	7	5
	D	5	5	5		-	5	8
	E	-	-	-	-		-	-
	F	-	15	15	15	15		-
	G	13	-	13	13	-	-	

Phases in Stage

Stage No.	Phases in Stage
1	A C
2	A B E
3	B G
4	B E G
5	D E
6	A F

Stage Diagram



Phase Delays

Term. Stage	Start Stage	Phase	Type	Value	Cont value
There are no Phase Delays defined					

Prohibited Stage Change

From Stage	To Stage						
		1	2	3	4	5	6
	1		6	8	8	6	7
	2	6		8	8	5	7
	3	13	13		2	13	13
	4	13	13	0		13	13
	5	5	5	8	8		5
	6	15	15	15	15	15	

Full Input Data And Results

Give-Way Lane Input Data

Junction: A1023 Chelmsford Rd_Hutton Rd_Shenfield Rd
There are no Opposed Lanes in this Junction

Full Input Data And Results

Lane Input Data

Junction: A1023 Chelmsford Rd_Hutton Rd_Shenfield Rd												
Lane	**Lane Type**	**Phases**	**Start Disp.**	**End Disp.**	**Physical Length (PCU)**	**Sat Flow Type**	**Def User Saturation Flow (PCU/Hr)**	**Lane Width (m)**	**Gradient**	**Nearside Lane**	**Turns**	**Turning Radius (m)**
1/1 (A1023 Chelmsford Road)	U	C	2	3	12.0	Geom	-	3.25	0.00	Y	Arm 5 Left	15.00
											Arm 6 Ahead	Inf
1/2 (A1023 Chelmsford Road)	U	C	2	3	12.0	Geom	-	3.25	0.00	N	Arm 6 Ahead	Inf
2/1 (Hutton Road)	U	E	2	3	31.3	Geom	-	3.25	0.00	Y	Arm 6 Left	13.00
2/2 (Hutton Road)	U	D	2	3	2.1	Geom	-	3.25	0.00	N	Arm 4 Right	21.00
3/1 (A1023 Shenfield Road)	U	A	2	3	60.0	Geom	-	3.25	0.00	Y	Arm 4 Ahead	Inf
3/2 (A1023 Shenfield Road)	U	B	2	3	8.7	Geom	-	3.25	0.00	Y	Arm 5 Right	21.00
4/1 (Chelmsford Road (Exit))	U		2	3	60.0	Geom	-	3.25	0.00	Y		
5/1 (Hutton Road (Exit))	U		2	3	31.3	Geom	-	3.25	0.00	Y		
6/1 (Shenfield Road (Exit))	U		2	3	60.0	Geom	-	3.25	0.00	Y		
6/2 (Shenfield Road (Exit))	U		2	3	60.0	Inf	-	-	-	-	-	-

Traffic Flow Groups

Flow Group	Start Time	End Time	Duration	Formula
1: '2022 Base AM Peak'	07:30	08:30	01:00	
2: '2022 Base PM Peak'	17:00	18:00	01:00	
3: '2028 Base AM Peak'	07:30	08:30	01:00	
4: '2028 Base PM Peak'	17:00	18:00	01:00	
5: '2028 Base + Committed AM Peak'	07:30	08:30	01:00	
6: '2028 Base + Committed PM Peak'	17:00	18:00	01:00	
7: '2028 Base + Development AM Peak'	07:30	08:30	01:00	
8: '2028 Base + Development PM Peak'	17:00	18:00	01:00	
9: '2028 Base + Comm + Dev AM Peak'	07:30	08:30	01:00	
10: '2028 Base + Comm + Dev PM Peak'	17:00	18:00	01:00	

Scenario 1: '2022 Base AM Peak' (FG1: '2022 Base AM Peak', Plan 1: 'Network Control Plan 1')

Traffic Flows, Desired

Desired Flow :

		Destination			
		A	B	C	Tot.
Origin	A	0	95	668	763
	B	85	0	244	329
	C	680	292	0	972
	Tot.	765	387	912	2064

Traffic Lane Flows

Lane	Scenario 1: 2022 Base AM Peak
Junction: A1023 Chelmsford Rd_Hutton Rd_Shenfield Rd	
1/1 (with short)	763(In) 326(Out)
1/2 (short)	437
2/1 (with short)	329(In) 244(Out)
2/2 (short)	85
3/1 (with short)	972(In) 680(Out)
3/2 (short)	292
4/1	765
5/1	387
6/1	475
6/2	437

Full Input Data And Results

Lane Saturation Flows

Junction: A1023 Chelmsford Rd_Hutton Rd_Shenfield Rd								
Lane	**Lane Width (m)**	**Gradient**	**Nearside Lane**	**Allowed Turns**	**Turning Radius (m)**	**Turning Prop.**	**Sat Flow (PCU/Hr)**	**Flared Sat Flow (PCU/Hr)**
1/1 (A1023 Chelmsford Road)	3.25	0.00	Y	Arm 5 Left	15.00	29.1 %	1885	1885
				Arm 6 Ahead	Inf	70.9 %		
1/2 (A1023 Chelmsford Road)	3.25	0.00	N	Arm 6 Ahead	Inf	100.0 %	2080	2080
2/1 (Hutton Road)	3.25	0.00	Y	Arm 6 Left	13.00	100.0 %	1739	1739
2/2 (Hutton Road)	3.25	0.00	N	Arm 4 Right	21.00	100.0 %	1941	1941
3/1 (A1023 Shenfield Road)	3.25	0.00	Y	Arm 4 Ahead	Inf	100.0 %	1940	1940
3/2 (A1023 Shenfield Road)	3.25	0.00	Y	Arm 5 Right	21.00	100.0 %	1811	1811
4/1 (Chelmsford Road (Exit))	3.25	0.00	Y				1940	1940
5/1 (Hutton Road (Exit))	3.25	0.00	Y				1940	1940
6/1 (Shenfield Road (Exit))	3.25	0.00	Y				1940	1940
6/2 (Shenfield Road (Exit) Lane 2)	Infinite Saturation Flow						Inf	Inf

Scenario 2: '2022 Base PM Peak' (FG2: '2022 Base PM Peak', Plan 1: 'Network Control Plan 1')

Traffic Flows, Desired

Desired Flow :

		Destination			
		A	B	C	Tot.
Origin	A	0	63	591	654
	B	84	0	302	386
	C	692	273	0	965
	Tot.	776	336	893	2005

Full Input Data And Results

Traffic Lane Flows

Lane	Scenario 2: 2022 Base PM Peak
Junction: A1023 Chelmsford Rd_Hutton Rd_Shenfield Rd	
1/1 (with short)	654(In) 305(Out)
1/2 (short)	349
2/1 (with short)	386(In) 302(Out)
2/2 (short)	84
3/1 (with short)	965(In) 692(Out)
3/2 (short)	273
4/1	776
5/1	336
6/1	544
6/2	349

Lane Saturation Flows

Junction: A1023 Chelmsford Rd_Hutton Rd_Shenfield Rd								
Lane	**Lane Width (m)**	**Gradient**	**Nearside Lane**	**Allowed Turns**	**Turning Radius (m)**	**Turning Prop.**	**Sat Flow (PCU/Hr)**	**Flared Sat Flow (PCU/Hr)**
1/1 (A1023 Chelmsford Road)	3.25	0.00	Y	Arm 5 Left Arm 6 Ahead	15.00 Inf	20.7 % 79.3 %	1901	1901
1/2 (A1023 Chelmsford Road)	3.25	0.00	N	Arm 6 Ahead	Inf	100.0 %	2080	2080
2/1 (Hutton Road)	3.25	0.00	Y	Arm 6 Left	13.00	100.0 %	1739	1739
2/2 (Hutton Road)	3.25	0.00	N	Arm 4 Right	21.00	100.0 %	1941	1941
3/1 (A1023 Shenfield Road)	3.25	0.00	Y	Arm 4 Ahead	Inf	100.0 %	1940	1940
3/2 (A1023 Shenfield Road)	3.25	0.00	Y	Arm 5 Right	21.00	100.0 %	1811	1811
4/1 (Chelmsford Road (Exit))	3.25	0.00	Y				1940	1940
5/1 (Hutton Road (Exit))	3.25	0.00	Y				1940	1940
6/1 (Shenfield Road (Exit))	3.25	0.00	Y				1940	1940
6/2 (Shenfield Road (Exit) Lane 2)	Infinite Saturation Flow						Inf	Inf

Full Input Data And Results

Scenario 3: '2028 Base AM Peak' (FG3: '2028 Base AM Peak', Plan 1: 'Network Control Plan 1')

Traffic Flows, Desired

Desired Flow :

		Destination			
		A	B	C	Tot.
Origin	A	0	95	668	763
	B	85	0	244	329
	C	680	292	0	972
	Tot.	765	387	912	2064

Traffic Lane Flows

Lane	Scenario 3: 2028 Base AM Peak
Junction: A1023 Chelmsford Rd_Hutton Rd_Shenfield Rd	
1/1 (with short)	763(In) 326(Out)
1/2 (short)	437
2/1 (with short)	329(In) 244(Out)
2/2 (short)	85
3/1 (with short)	972(In) 680(Out)
3/2 (short)	292
4/1	765
5/1	387
6/1	475
6/2	437

Full Input Data And Results

Lane Saturation Flows

Junction: A1023 Chelmsford Rd_Hutton Rd_Shenfield Rd								
Lane	**Lane Width (m)**	**Gradient**	**Nearside Lane**	**Allowed Turns**	**Turning Radius (m)**	**Turning Prop.**	**Sat Flow (PCU/Hr)**	**Flared Sat Flow (PCU/Hr)**
1/1 (A1023 Chelmsford Road)	3.25	0.00	Y	Arm 5 Left	15.00	29.1 %	1885	1885
				Arm 6 Ahead	Inf	70.9 %		
1/2 (A1023 Chelmsford Road)	3.25	0.00	N	Arm 6 Ahead	Inf	100.0 %	2080	2080
2/1 (Hutton Road)	3.25	0.00	Y	Arm 6 Left	13.00	100.0 %	1739	1739
2/2 (Hutton Road)	3.25	0.00	N	Arm 4 Right	21.00	100.0 %	1941	1941
3/1 (A1023 Shenfield Road)	3.25	0.00	Y	Arm 4 Ahead	Inf	100.0 %	1940	1940
3/2 (A1023 Shenfield Road)	3.25	0.00	Y	Arm 5 Right	21.00	100.0 %	1811	1811
4/1 (Chelmsford Road (Exit))	3.25	0.00	Y				1940	1940
5/1 (Hutton Road (Exit))	3.25	0.00	Y				1940	1940
6/1 (Shenfield Road (Exit))	3.25	0.00	Y				1940	1940
6/2 (Shenfield Road (Exit) Lane 2)	Infinite Saturation Flow						Inf	Inf

Scenario 4: '2028 Base PM Peak' (FG4: '2028 Base PM Peak', Plan 1: 'Network Control Plan 1')

Traffic Flows, Desired

Desired Flow :

		Destination			
		A	B	C	Tot.
Origin	A	0	63	591	654
	B	84	0	302	386
	C	692	273	0	965
	Tot.	776	336	893	2005

Full Input Data And Results

Traffic Lane Flows

Lane	Scenario 4: 2028 Base PM Peak
Junction: A1023 Chelmsford Rd_Hutton Rd_Shenfield Rd	
1/1 (with short)	654(In) 299(Out)
1/2 (short)	355
2/1 (with short)	386(In) 302(Out)
2/2 (short)	84
3/1 (with short)	965(In) 692(Out)
3/2 (short)	273
4/1	776
5/1	336
6/1	538
6/2	355

Lane Saturation Flows

Junction: A1023 Chelmsford Rd_Hutton Rd_Shenfield Rd								
Lane	**Lane Width (m)**	**Gradient**	**Nearside Lane**	**Allowed Turns**	**Turning Radius (m)**	**Turning Prop.**	**Sat Flow (PCU/Hr)**	**Flared Sat Flow (PCU/Hr)**
1/1 (A1023 Chelmsford Road)	3.25	0.00	Y	Arm 5 Left Arm 6 Ahead	15.00 Inf	21.1 % 78.9 %	1900	1900
1/2 (A1023 Chelmsford Road)	3.25	0.00	N	Arm 6 Ahead	Inf	100.0 %	2080	2080
2/1 (Hutton Road)	3.25	0.00	Y	Arm 6 Left	13.00	100.0 %	1739	1739
2/2 (Hutton Road)	3.25	0.00	N	Arm 4 Right	21.00	100.0 %	1941	1941
3/1 (A1023 Shenfield Road)	3.25	0.00	Y	Arm 4 Ahead	Inf	100.0 %	1940	1940
3/2 (A1023 Shenfield Road)	3.25	0.00	Y	Arm 5 Right	21.00	100.0 %	1811	1811
4/1 (Chelmsford Road (Exit))	3.25	0.00	Y				1940	1940
5/1 (Hutton Road (Exit))	3.25	0.00	Y				1940	1940
6/1 (Shenfield Road (Exit))	3.25	0.00	Y				1940	1940
6/2 (Shenfield Road (Exit) Lane 2)	Infinite Saturation Flow						Inf	Inf

Full Input Data And Results

Scenario 5: '2028 Base + Committed AM Peak' (FG5: '2028 Base + Committed AM Peak', Plan 1: 'Network Control Plan 1')

Traffic Flows, Desired

Desired Flow :

		Destination			
		A	B	C	Tot.
Origin	A	0	100	694	794
	B	88	0	244	332
	C	697	292	0	989
	Tot.	785	392	938	2115

Traffic Lane Flows

Lane	Scenario 5: 2028 Base + Committed AM Peak
Junction: A1023 Chelmsford Rd_Hutton Rd_Shenfield Rd	
1/1 (with short)	794(In) 346(Out)
1/2 (short)	448
2/1 (with short)	332(In) 244(Out)
2/2 (short)	88
3/1 (with short)	989(In) 697(Out)
3/2 (short)	292
4/1	785
5/1	392
6/1	490
6/2	448

Full Input Data And Results

Lane Saturation Flows

Junction: A1023 Chelmsford Rd_Hutton Rd_Shenfield Rd								
Lane	**Lane Width (m)**	**Gradient**	**Nearside Lane**	**Allowed Turns**	**Turning Radius (m)**	**Turning Prop.**	**Sat Flow (PCU/Hr)**	**Flared Sat Flow (PCU/Hr)**
1/1 (A1023 Chelmsford Road)	3.25	0.00	Y	Arm 5 Left	15.00	28.9 %	1886	1886
				Arm 6 Ahead	Inf	71.1 %		
1/2 (A1023 Chelmsford Road)	3.25	0.00	N	Arm 6 Ahead	Inf	100.0 %	2080	2080
2/1 (Hutton Road)	3.25	0.00	Y	Arm 6 Left	13.00	100.0 %	1739	1739
2/2 (Hutton Road)	3.25	0.00	N	Arm 4 Right	21.00	100.0 %	1941	1941
3/1 (A1023 Shenfield Road)	3.25	0.00	Y	Arm 4 Ahead	Inf	100.0 %	1940	1940
3/2 (A1023 Shenfield Road)	3.25	0.00	Y	Arm 5 Right	21.00	100.0 %	1811	1811
4/1 (Chelmsford Road (Exit))	3.25	0.00	Y				1940	1940
5/1 (Hutton Road (Exit))	3.25	0.00	Y				1940	1940
6/1 (Shenfield Road (Exit))	3.25	0.00	Y				1940	1940
6/2 (Shenfield Road (Exit) Lane 2)	Infinite Saturation Flow						Inf	Inf

Scenario 6: '2028 Base + Committed PM Peak' (FG6: '2028 Base + Committed PM Peak', Plan 1: 'Network Control Plan 1')

Traffic Flows, Desired

Desired Flow :

		Destination			
		A	B	C	Tot.
Origin	A	0	66	607	673
	B	89	0	302	391
	C	719	273	0	992
	Tot.	808	339	909	2056

Full Input Data And Results

Traffic Lane Flows

Lane	Scenario 6: 2028 Base + Committed PM Peak
Junction: A1023 Chelmsford Rd_Hutton Rd_Shenfield Rd	
1/1 (with short)	673(In) 313(Out)
1/2 (short)	360
2/1 (with short)	391(In) 302(Out)
2/2 (short)	89
3/1 (with short)	992(In) 719(Out)
3/2 (short)	273
4/1	808
5/1	339
6/1	549
6/2	360

Lane Saturation Flows

Junction: A1023 Chelmsford Rd_Hutton Rd_Shenfield Rd								
Lane	**Lane Width (m)**	**Gradient**	**Nearside Lane**	**Allowed Turns**	**Turning Radius (m)**	**Turning Prop.**	**Sat Flow (PCU/Hr)**	**Flared Sat Flow (PCU/Hr)**
1/1 (A1023 Chelmsford Road)	3.25	0.00	Y	Arm 5 Left	15.00	21.1 %	1900	1900
				Arm 6 Ahead	Inf	78.9 %		
1/2 (A1023 Chelmsford Road)	3.25	0.00	N	Arm 6 Ahead	Inf	100.0 %	2080	2080
2/1 (Hutton Road)	3.25	0.00	Y	Arm 6 Left	13.00	100.0 %	1739	1739
2/2 (Hutton Road)	3.25	0.00	N	Arm 4 Right	21.00	100.0 %	1941	1941
3/1 (A1023 Shenfield Road)	3.25	0.00	Y	Arm 4 Ahead	Inf	100.0 %	1940	1940
3/2 (A1023 Shenfield Road)	3.25	0.00	Y	Arm 5 Right	21.00	100.0 %	1811	1811
4/1 (Chelmsford Road (Exit))	3.25	0.00	Y				1940	1940
5/1 (Hutton Road (Exit))	3.25	0.00	Y				1940	1940
6/1 (Shenfield Road (Exit))	3.25	0.00	Y				1940	1940
6/2 (Shenfield Road (Exit) Lane 2)	Infinite Saturation Flow						Inf	Inf

Full Input Data And Results

Scenario 7: '2028 Base + Development AM Peak' (FG7: '2028 Base + Development AM Peak', Plan 1: 'Network Control Plan 1')

Traffic Flows, Desired

Desired Flow :

		Destination			
		A	B	C	Tot.
Origin	A	0	85	716	801
	B	81	0	289	370
	C	709	339	0	1048
	Tot.	790	424	1005	2219

Traffic Lane Flows

Lane	Scenario 7: 2028 Base + Development AM Peak
Junction: A1023 Chelmsford Rd_Hutton Rd_Shenfield Rd	
1/1 (with short)	801(In) 352(Out)
1/2 (short)	449
2/1 (with short)	370(In) 289(Out)
2/2 (short)	81
3/1 (with short)	1048(In) 709(Out)
3/2 (short)	339
4/1	790
5/1	424
6/1	556
6/2	449

Full Input Data And Results

Lane Saturation Flows

Junction: A1023 Chelmsford Rd_Hutton Rd_Shenfield Rd								
Lane	**Lane Width (m)**	**Gradient**	**Nearside Lane**	**Allowed Turns**	**Turning Radius (m)**	**Turning Prop.**	**Sat Flow (PCU/Hr)**	**Flared Sat Flow (PCU/Hr)**
1/1 (A1023 Chelmsford Road)	3.25	0.00	Y	Arm 5 Left	15.00	24.1 %	1894	1894
				Arm 6 Ahead	Inf	75.9 %		
1/2 (A1023 Chelmsford Road)	3.25	0.00	N	Arm 6 Ahead	Inf	100.0 %	2080	2080
2/1 (Hutton Road)	3.25	0.00	Y	Arm 6 Left	13.00	100.0 %	1739	1739
2/2 (Hutton Road)	3.25	0.00	N	Arm 4 Right	21.00	100.0 %	1941	1941
3/1 (A1023 Shenfield Road)	3.25	0.00	Y	Arm 4 Ahead	Inf	100.0 %	1940	1940
3/2 (A1023 Shenfield Road)	3.25	0.00	Y	Arm 5 Right	21.00	100.0 %	1811	1811
4/1 (Chelmsford Road (Exit))	3.25	0.00	Y				1940	1940
5/1 (Hutton Road (Exit))	3.25	0.00	Y				1940	1940
6/1 (Shenfield Road (Exit))	3.25	0.00	Y				1940	1940
6/2 (Shenfield Road (Exit) Lane 2)	Infinite Saturation Flow						Inf	Inf

Scenario 8: '2028 Base + Development PM Peak' (FG8: '2028 Base + Development PM Peak', Plan 1: 'Network Control Plan 1')

Traffic Flows, Desired

Desired Flow :

		Destination			
		A	B	C	Tot.
Origin	A	0	62	587	649
	B	82	0	297	379
	C	710	267	0	977
	Tot.	792	329	884	2005

Full Input Data And Results

Traffic Lane Flows

Lane	Scenario 8: 2028 Base + Development PM Peak
Junction: A1023 Chelmsford Rd_Hutton Rd_Shenfield Rd	
1/1 (with short)	649(In) 283(Out)
1/2 (short)	366
2/1 (with short)	379(In) 297(Out)
2/2 (short)	82
3/1 (with short)	977(In) 710(Out)
3/2 (short)	267
4/1	792
5/1	329
6/1	518
6/2	366

Lane Saturation Flows

Junction: A1023 Chelmsford Rd_Hutton Rd_Shenfield Rd								
Lane	**Lane Width (m)**	**Gradient**	**Nearside Lane**	**Allowed Turns**	**Turning Radius (m)**	**Turning Prop.**	**Sat Flow (PCU/Hr)**	**Flared Sat Flow (PCU/Hr)**
1/1 (A1023 Chelmsford Road)	3.25	0.00	Y	Arm 5 Left	15.00	21.9 %	1898	1898
				Arm 6 Ahead	Inf	78.1 %		
1/2 (A1023 Chelmsford Road)	3.25	0.00	N	Arm 6 Ahead	Inf	100.0 %	2080	2080
2/1 (Hutton Road)	3.25	0.00	Y	Arm 6 Left	13.00	100.0 %	1739	1739
2/2 (Hutton Road)	3.25	0.00	N	Arm 4 Right	21.00	100.0 %	1941	1941
3/1 (A1023 Shenfield Road)	3.25	0.00	Y	Arm 4 Ahead	Inf	100.0 %	1940	1940
3/2 (A1023 Shenfield Road)	3.25	0.00	Y	Arm 5 Right	21.00	100.0 %	1811	1811
4/1 (Chelmsford Road (Exit))	3.25	0.00	Y				1940	1940
5/1 (Hutton Road (Exit))	3.25	0.00	Y				1940	1940
6/1 (Shenfield Road (Exit))	3.25	0.00	Y				1940	1940
6/2 (Shenfield Road (Exit) Lane 2)	Infinite Saturation Flow						Inf	Inf

Full Input Data And Results

Scenario 9: '2028 Base + Comm + Dev AM Peak' (FG9: '2028 Base + Comm + Dev AM Peak', Plan 1: 'Network Control Plan 1')

Traffic Flows, Desired

Desired Flow :

		Destination			
		A	B	C	Tot.
Origin	A	0	90	747	837
	B	84	0	289	373
	C	727	339	0	1066
	Tot.	811	429	1036	2276

Traffic Lane Flows

Lane	Scenario 9: 2028 Base + Comm + Dev AM Peak
Junction: A1023 Chelmsford Rd_Hutton Rd_Shenfield Rd	
1/1 (with short)	837(In) 379(Out)
1/2 (short)	458
2/1 (with short)	373(In) 289(Out)
2/2 (short)	84
3/1 (with short)	1066(In) 727(Out)
3/2 (short)	339
4/1	811
5/1	429
6/1	578
6/2	458

Full Input Data And Results

Lane Saturation Flows

Junction: A1023 Chelmsford Rd_Hutton Rd_Shenfield Rd								
Lane	**Lane Width (m)**	**Gradient**	**Nearside Lane**	**Allowed Turns**	**Turning Radius (m)**	**Turning Prop.**	**Sat Flow (PCU/Hr)**	**Flared Sat Flow (PCU/Hr)**
1/1 (A1023 Chelmsford Road)	3.25	0.00	Y	Arm 5 Left	15.00	23.7 %	1895	1895
				Arm 6 Ahead	Inf	76.3 %		
1/2 (A1023 Chelmsford Road)	3.25	0.00	N	Arm 6 Ahead	Inf	100.0 %	2080	2080
2/1 (Hutton Road)	3.25	0.00	Y	Arm 6 Left	13.00	100.0 %	1739	1739
2/2 (Hutton Road)	3.25	0.00	N	Arm 4 Right	21.00	100.0 %	1941	1941
3/1 (A1023 Shenfield Road)	3.25	0.00	Y	Arm 4 Ahead	Inf	100.0 %	1940	1940
3/2 (A1023 Shenfield Road)	3.25	0.00	Y	Arm 5 Right	21.00	100.0 %	1811	1811
4/1 (Chelmsford Road (Exit))	3.25	0.00	Y				1940	1940
5/1 (Hutton Road (Exit))	3.25	0.00	Y				1940	1940
6/1 (Shenfield Road (Exit))	3.25	0.00	Y				1940	1940
6/2 (Shenfield Road (Exit) Lane 2)	Infinite Saturation Flow						Inf	Inf

Scenario 10: '2028 Base + Comm + Dev PM Peak' (FG10: '2028 Base + Comm + Dev PM Peak', Plan 1: 'Network Control Plan 1')

Traffic Flows, Desired

Desired Flow :

		Destination			
		A	B	C	Tot.
Origin	A	0	64	604	668
	B	87	0	297	384
	C	738	267	0	1005
	Tot.	825	331	901	2057

Full Input Data And Results

Traffic Lane Flows

Lane	Scenario 10: 2028 Base + Comm + Dev PM Peak
Junction: A1023 Chelmsford Rd_Hutton Rd_Shenfield Rd	
1/1 (with short)	668(In) 311(Out)
1/2 (short)	357
2/1 (with short)	384(In) 297(Out)
2/2 (short)	87
3/1 (with short)	1005(In) 738(Out)
3/2 (short)	267
4/1	825
5/1	331
6/1	544
6/2	357

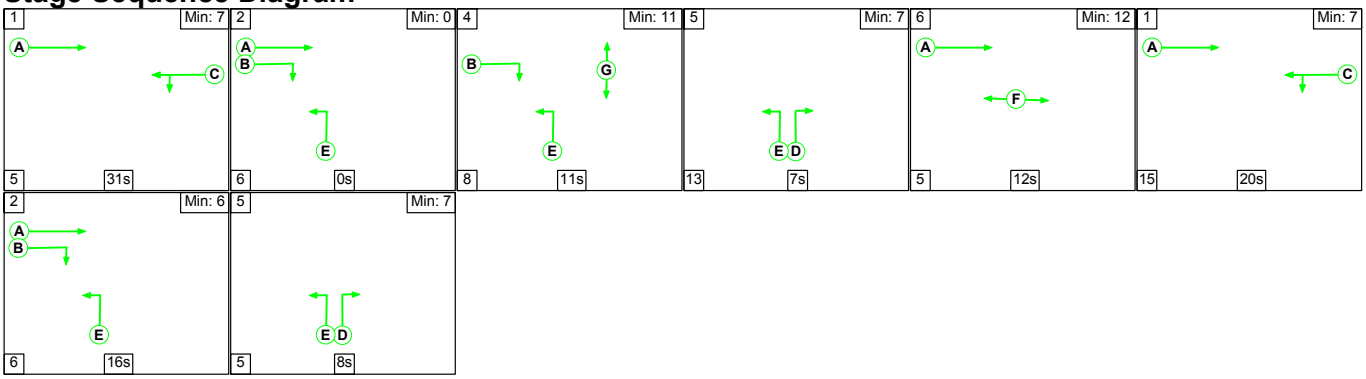
Lane Saturation Flows

Junction: A1023 Chelmsford Rd_Hutton Rd_Shenfield Rd								
Lane	**Lane Width (m)**	**Gradient**	**Nearside Lane**	**Allowed Turns**	**Turning Radius (m)**	**Turning Prop.**	**Sat Flow (PCU/Hr)**	**Flared Sat Flow (PCU/Hr)**
1/1 (A1023 Chelmsford Road)	3.25	0.00	Y	Arm 5 Left	15.00	20.6 %	1901	1901
				Arm 6 Ahead	Inf	79.4 %		
1/2 (A1023 Chelmsford Road)	3.25	0.00	N	Arm 6 Ahead	Inf	100.0 %	2080	2080
2/1 (Hutton Road)	3.25	0.00	Y	Arm 6 Left	13.00	100.0 %	1739	1739
2/2 (Hutton Road)	3.25	0.00	N	Arm 4 Right	21.00	100.0 %	1941	1941
3/1 (A1023 Shenfield Road)	3.25	0.00	Y	Arm 4 Ahead	Inf	100.0 %	1940	1940
3/2 (A1023 Shenfield Road)	3.25	0.00	Y	Arm 5 Right	21.00	100.0 %	1811	1811
4/1 (Chelmsford Road (Exit))	3.25	0.00	Y				1940	1940
5/1 (Hutton Road (Exit))	3.25	0.00	Y				1940	1940
6/1 (Shenfield Road (Exit))	3.25	0.00	Y				1940	1940
6/2 (Shenfield Road (Exit) Lane 2)	Infinite Saturation Flow						Inf	Inf

Full Input Data And Results

Scenario 1: '2022 Base AM Peak' (FG1: '2022 Base AM Peak', Plan 1: 'Network Control Plan 1')

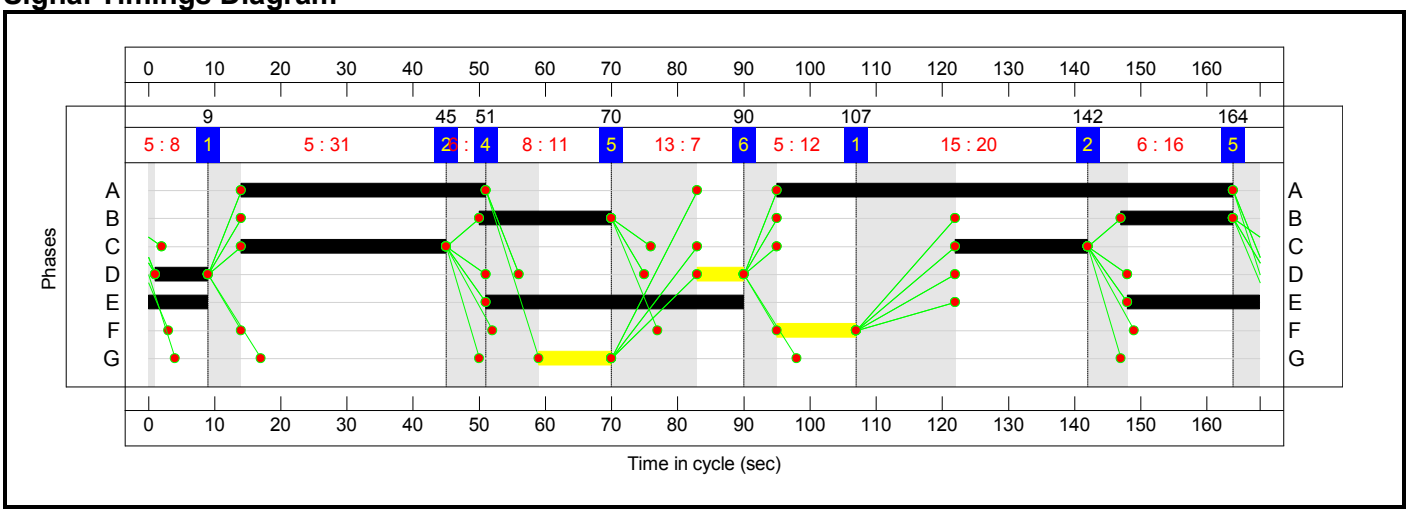
Stage Sequence Diagram



Stage Timings

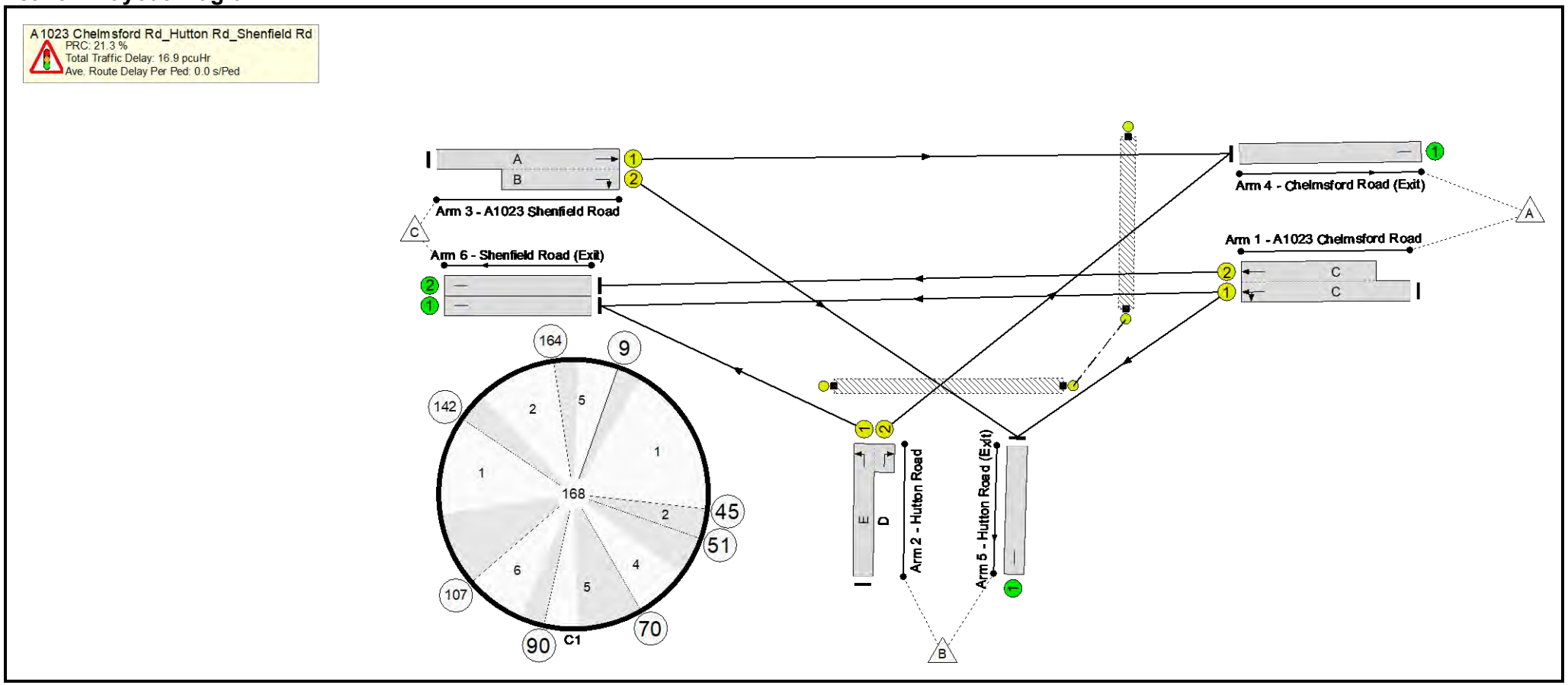
Stage	1	2	4	5	6	1	2	5
Duration	31	0	11	7	12	20	16	8
Change Point	9	45	51	70	90	107	142	164

Signal Timings Diagram



Full Input Data And Results

Network Layout Diagram



Full Input Data And Results

Network Results

Item	Lane Description	Lane Type	Controller Stream	Position In Filtered Route	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)
Network: Shenfield	-	-	**N/A**	-	-		-	-	-	-	-	-	**74.2%**
A1023 Chelmsford Rd_Hutton Rd_Shenfield Rd	-	-	**N/A**	-	-		-	-	-	-	-	-	**74.2%**
1/1+1/2	A1023 Chelmsford Road Left Ahead	U	N/A	N/A	C		2	51	-	763	1885:2080	439+589	74.2 : 74.2%
2/1+2/2	Hutton Road Right Left	U	N/A	N/A	E D		2	68:15	-	329	1739:1941	329+115	74.2 : 74.2%
3/1+3/2	A1023 Shenfield Road Ahead Right	U	N/A	N/A	A B		2	106:37	-	972	1940:1811	917+394	74.2 : 74.2%
4/1	Chelmsford Road (Exit)	U	N/A	N/A	-		-	-	-	765	1940	1940	39.4%
5/1	Hutton Road (Exit)	U	N/A	N/A	-		-	-	-	387	1940	1940	19.9%
6/1	Shenfield Road (Exit)	U	N/A	N/A	-		-	-	-	475	1940	1940	24.5%
6/2	Shenfield Road (Exit)	U	N/A	N/A	-		-	-	-	437	Inf	Inf	0.0%
Ped Link: P1	Chelmsford Road	-	N/A	-	G		1	11	-	0	-	0	0.0%
Ped Link: P2	Hutton Road	-	N/A	-	F		1	12	-	0	-	0	0.0%

Full Input Data And Results

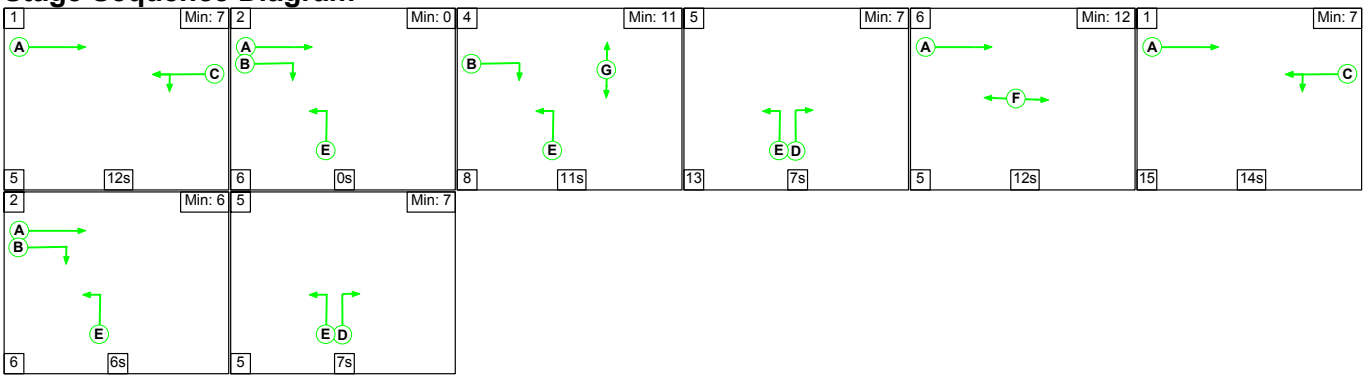
Item	Arriving (pcu)	Leaving (pcu)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Uniform Delay (pcuHr)	Rand + Oversat Delay (pcuHr)	Storage Area Uniform Delay (pcuHr)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Max. Back of Uniform Queue (pcu)	Rand + Oversat Queue (pcu)	Mean Max Queue (pcu)
Network: Shenfield	**-**	**-**	**0**	**0**	**0**	**12.1**	**4.9**	**0.0**	**16.9**	**-**	**-**	**-**	**-**
A1023 Chelmsford Rd_Hutton Rd_Shenfield Rd	**-**	**-**	**0**	**0**	**0**	**12.1**	**4.9**	**0.0**	**16.9**	**-**	**-**	**-**	**-**
1/1+1/2	763	763	-	-	-	5.7	1.4	-	7.1	33.7	11.7	1.4	13.1
2/1+2/2	329	329	-	-	-	2.0	1.4	-	3.4	37.3	5.4	1.4	6.8
3/1+3/2	972	972	-	-	-	4.4	1.4	-	5.8	21.4	15.4	1.4	16.9
4/1	765	765	-	-	-	0.0	0.3	-	0.3	1.5	0.0	0.3	0.3
5/1	387	387	-	-	-	0.0	0.1	-	0.1	1.2	0.0	0.1	0.1
6/1	475	475	-	-	-	0.0	0.2	-	0.2	1.2	0.0	0.2	0.2
6/2	437	437	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
Ped Link: P1	0	0	-	-	-	-	-	-	-	-	-	-	-
Ped Link: P2	0	0	-	-	-	-	-	-	-	-	-	-	-

C1 PRC for Signalled Lanes (%): 21.3 Total Delay for Signalled Lanes (pcuHr): 16.33 Cycle Time (s): 168
PRC Over All Lanes (%): 21.3 Total Delay Over All Lanes(pcuHr): 16.94

Full Input Data And Results

Scenario 2: '2022 Base PM Peak' (FG2: '2022 Base PM Peak', Plan 1: 'Network Control Plan 1')

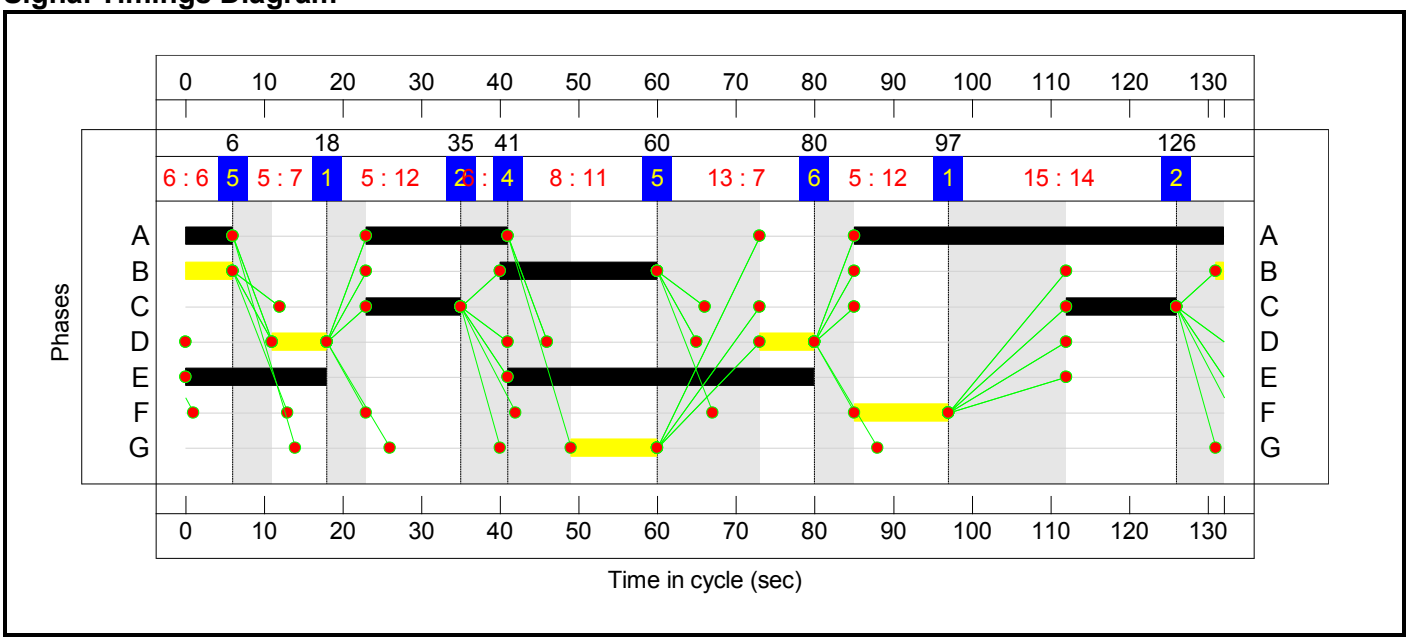
Stage Sequence Diagram



Stage Timings

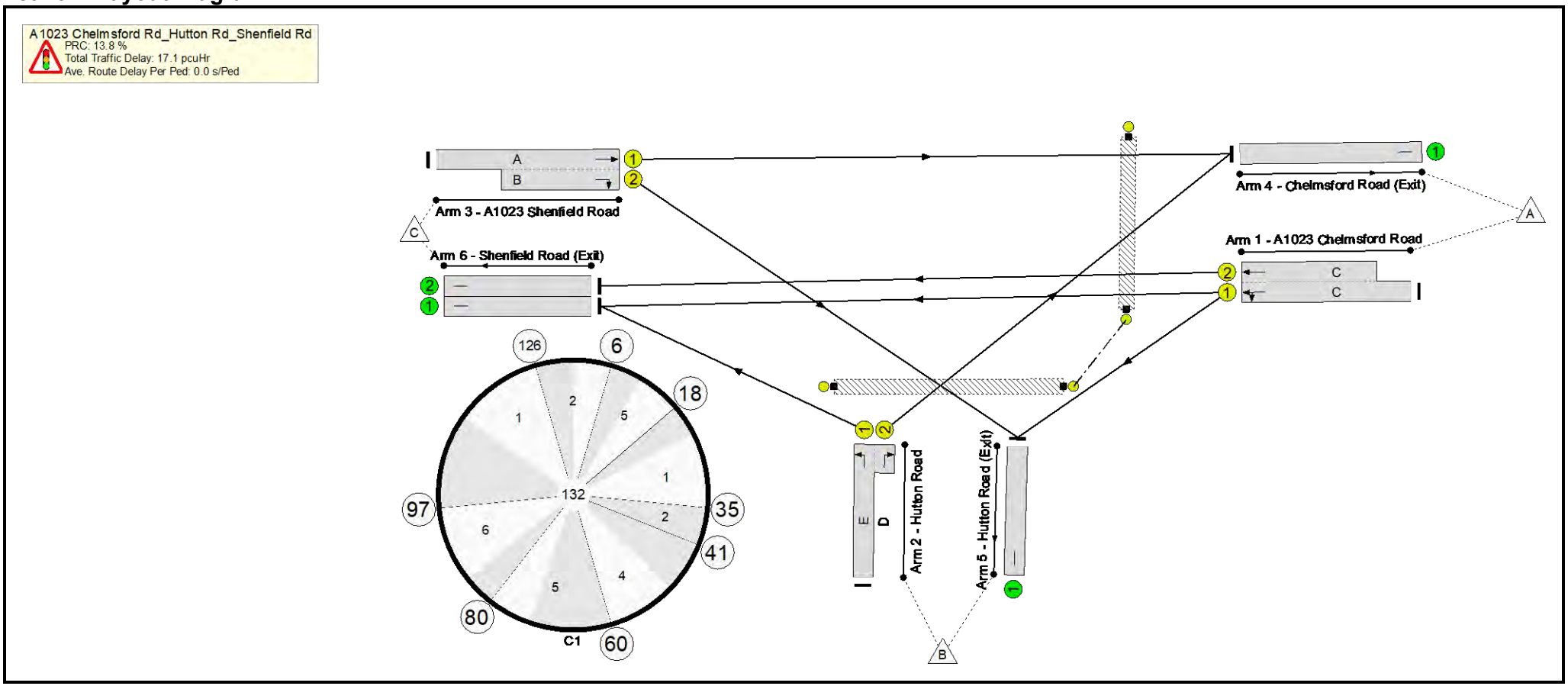
Stage	1	2	4	5	6	1	2	5
Duration	12	0	11	7	12	14	6	7
Change Point	18	35	41	60	80	97	126	6

Signal Timings Diagram



Full Input Data And Results

Network Layout Diagram



Full Input Data And Results

Network Results

Item	Lane Description	Lane Type	Controller Stream	Position In Filtered Route	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)
Network: Shenfield	-	-	**N/A**	-	-		-	-	-	-	-	-	**79.1%**
A1023 Chelmsford Rd_Hutton Rd_Shenfield Rd	-	-	**N/A**	-	-		-	-	-	-	-	-	**79.1%**
1/1+1/2	A1023 Chelmsford Road Left Ahead	U	N/A	N/A	C		2	26	-	654	1901:2080	403+441	75.6 : 79.1%
2/1+2/2	Hutton Road Right Left	U	N/A	N/A	E D		2	57:14	-	386	1739:1941	462+129	65.3 : 65.3%
3/1+3/2	A1023 Shenfield Road Ahead Right	U	N/A	N/A	A B		2	71:27	-	965	1940:1811	906+357	76.4 : 76.4%
4/1	Chelmsford Road (Exit)	U	N/A	N/A	-		-	-	-	776	1940	1940	40.0%
5/1	Hutton Road (Exit)	U	N/A	N/A	-		-	-	-	336	1940	1940	17.3%
6/1	Shenfield Road (Exit)	U	N/A	N/A	-		-	-	-	544	1940	1940	28.0%
6/2	Shenfield Road (Exit)	U	N/A	N/A	-		-	-	-	349	Inf	Inf	0.0%
Ped Link: P1	Chelmsford Road	-	N/A	-	G		1	11	-	0	-	0	0.0%
Ped Link: P2	Hutton Road	-	N/A	-	F		1	12	-	0	-	0	0.0%

Full Input Data And Results

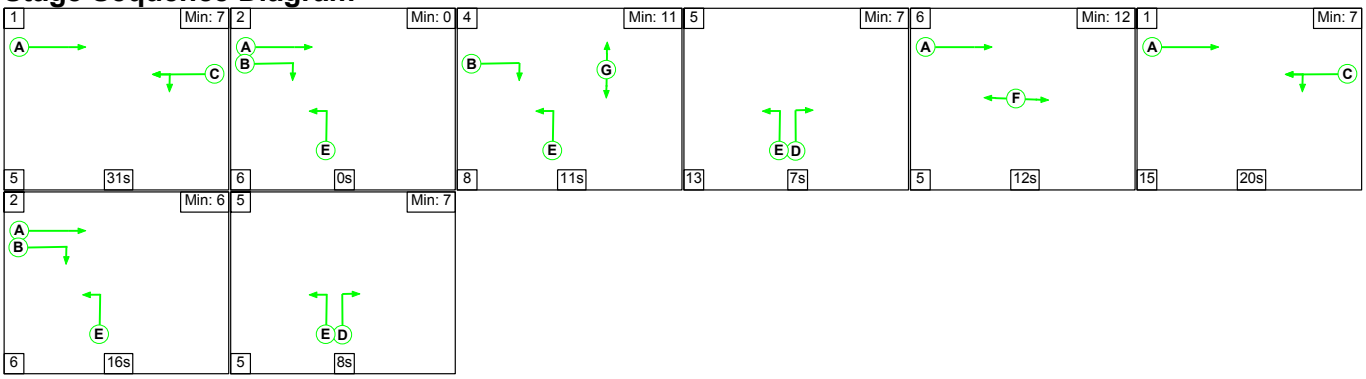
Item	Arriving (pcu)	Leaving (pcu)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Uniform Delay (pcuHr)	Rand + Oversat Delay (pcuHr)	Storage Area Uniform Delay (pcuHr)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Max. Back of Uniform Queue (pcu)	Rand + Oversat Queue (pcu)	Mean Max Queue (pcu)
Network: Shenfield	**-**	**-**	**0**	**0**	**0**	**12.3**	**4.9**	**0.0**	**17.1**	**-**	**-**	**-**	**-**
A1023 Chelmsford Rd_Hutton Rd_Shenfield Rd	**-**	**-**	**0**	**0**	**0**	**12.3**	**4.9**	**0.0**	**17.1**	**-**	**-**	**-**	**-**
1/1+1/2	654	654	-	-	-	5.4	1.7	-	7.1	39.2	8.8	1.7	10.5
2/1+2/2	386	386	-	-	-	1.8	0.9	-	2.8	25.7	6.2	0.9	7.1
3/1+3/2	965	965	-	-	-	5.0	1.6	-	6.6	24.7	15.9	1.6	17.5
4/1	776	776	-	-	-	0.0	0.3	-	0.3	1.5	0.0	0.3	0.3
5/1	336	336	-	-	-	0.0	0.1	-	0.1	1.1	0.0	0.1	0.1
6/1	544	544	-	-	-	0.0	0.2	-	0.2	1.3	0.0	0.2	0.2
6/2	349	349	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
Ped Link: P1	0	0	-	-	-	-	-	-	-	-	-	-	-
Ped Link: P2	0	0	-	-	-	-	-	-	-	-	-	-	-

C1 PRC for Signalled Lanes (%): 13.8 Total Delay for Signalled Lanes (pcuHr): 16.50 Cycle Time (s): 132
PRC Over All Lanes (%): 13.8 Total Delay Over All Lanes(pcuHr): 17.13

Full Input Data And Results

Scenario 3: '2028 Base AM Peak' (FG3: '2028 Base AM Peak', Plan 1: 'Network Control Plan 1')

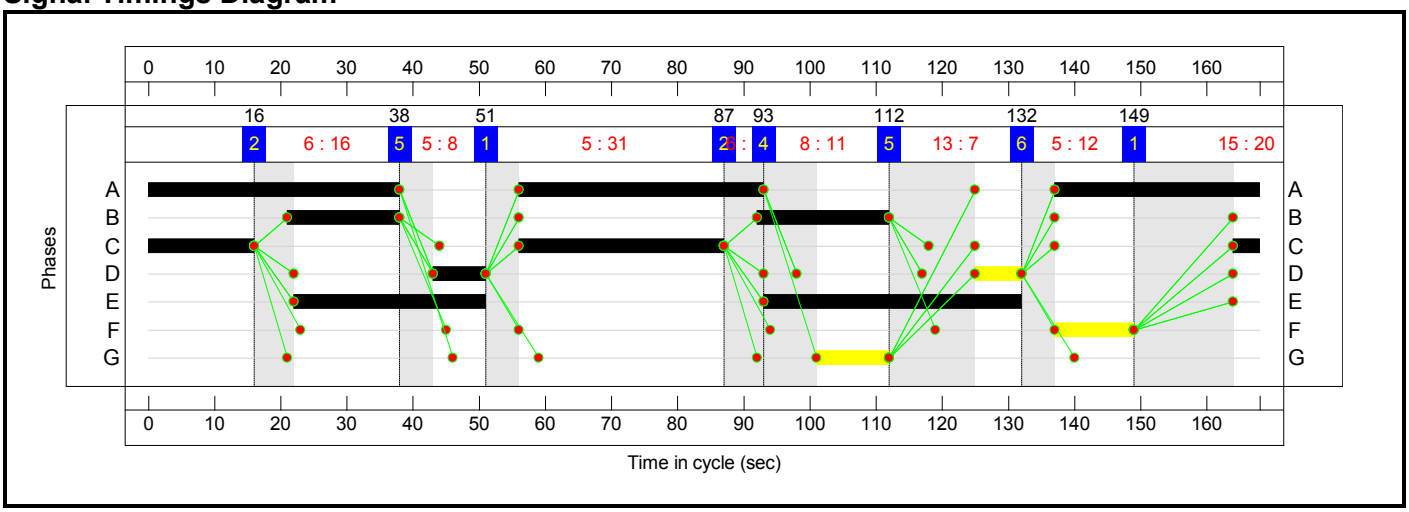
Stage Sequence Diagram



Stage Timings

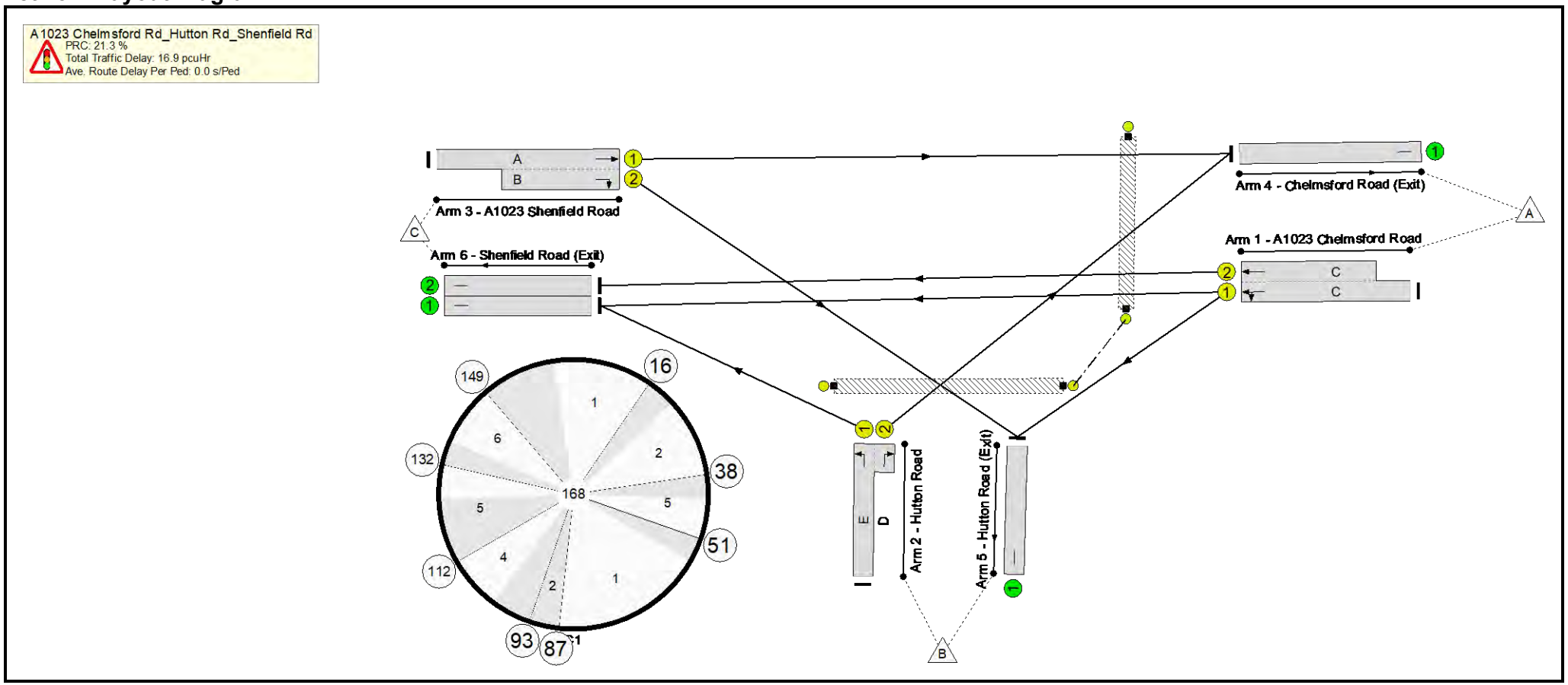
Stage	1	2	4	5	6	1	2	5
Duration	31	0	11	7	12	20	16	8
Change Point	51	87	93	112	132	149	16	38

Signal Timings Diagram



Full Input Data And Results

Network Layout Diagram



Full Input Data And Results

Network Results

Item	Lane Description	Lane Type	Controller Stream	Position In Filtered Route	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)
Network: Shenfield	-	-	**N/A**	-	-		-	-	-	-	-	-	**74.2%**
A1023 Chelmsford Rd_Hutton Rd_Shenfield Rd	-	-	**N/A**	-	-		-	-	-	-	-	-	**74.2%**
1/1+1/2	A1023 Chelmsford Road Left Ahead	U	N/A	N/A	C		2	51	-	763	1885:2080	439+589	74.2 : 74.2%
2/1+2/2	Hutton Road Right Left	U	N/A	N/A	E D		2	68:15	-	329	1739:1941	329+115	74.2 : 74.2%
3/1+3/2	A1023 Shenfield Road Ahead Right	U	N/A	N/A	A B		2	106:37	-	972	1940:1811	917+394	74.2 : 74.2%
4/1	Chelmsford Road (Exit)	U	N/A	N/A	-		-	-	-	765	1940	1940	39.4%
5/1	Hutton Road (Exit)	U	N/A	N/A	-		-	-	-	387	1940	1940	19.9%
6/1	Shenfield Road (Exit)	U	N/A	N/A	-		-	-	-	475	1940	1940	24.5%
6/2	Shenfield Road (Exit)	U	N/A	N/A	-		-	-	-	437	Inf	Inf	0.0%
Ped Link: P1	Chelmsford Road	-	N/A	-	G		1	11	-	0	-	0	0.0%
Ped Link: P2	Hutton Road	-	N/A	-	F		1	12	-	0	-	0	0.0%

Full Input Data And Results

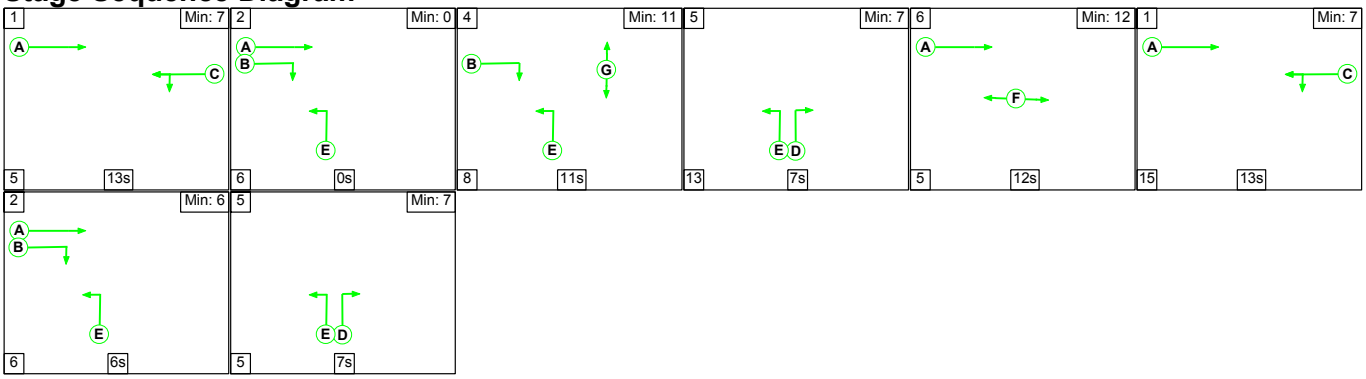
Item	Arriving (pcu)	Leaving (pcu)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Uniform Delay (pcuHr)	Rand + Oversat Delay (pcuHr)	Storage Area Uniform Delay (pcuHr)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Max. Back of Uniform Queue (pcu)	Rand + Oversat Queue (pcu)	Mean Max Queue (pcu)
Network: Shenfield	**-**	**-**	**0**	**0**	**0**	**12.1**	**4.9**	**0.0**	**16.9**	**-**	**-**	**-**	**-**
A1023 Chelmsford Rd_Hutton Rd_Shenfield Rd	**-**	**-**	**0**	**0**	**0**	**12.1**	**4.9**	**0.0**	**16.9**	**-**	**-**	**-**	**-**
1/1+1/2	763	763	-	-	-	5.7	1.4	-	7.1	33.7	11.7	1.4	13.1
2/1+2/2	329	329	-	-	-	2.0	1.4	-	3.4	37.3	5.4	1.4	6.8
3/1+3/2	972	972	-	-	-	4.4	1.4	-	5.8	21.4	15.4	1.4	16.9
4/1	765	765	-	-	-	0.0	0.3	-	0.3	1.5	0.0	0.3	0.3
5/1	387	387	-	-	-	0.0	0.1	-	0.1	1.2	0.0	0.1	0.1
6/1	475	475	-	-	-	0.0	0.2	-	0.2	1.2	0.0	0.2	0.2
6/2	437	437	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
Ped Link: P1	0	0	-	-	-	-	-	-	-	-	-	-	-
Ped Link: P2	0	0	-	-	-	-	-	-	-	-	-	-	-

C1 PRC for Signalled Lanes (%): 21.3 Total Delay for Signalled Lanes (pcuHr): 16.33 Cycle Time (s): 168
PRC Over All Lanes (%): 21.3 Total Delay Over All Lanes(pcuHr): 16.94

Full Input Data And Results

Scenario 4: '2028 Base PM Peak' (FG4: '2028 Base PM Peak', Plan 1: 'Network Control Plan 1')

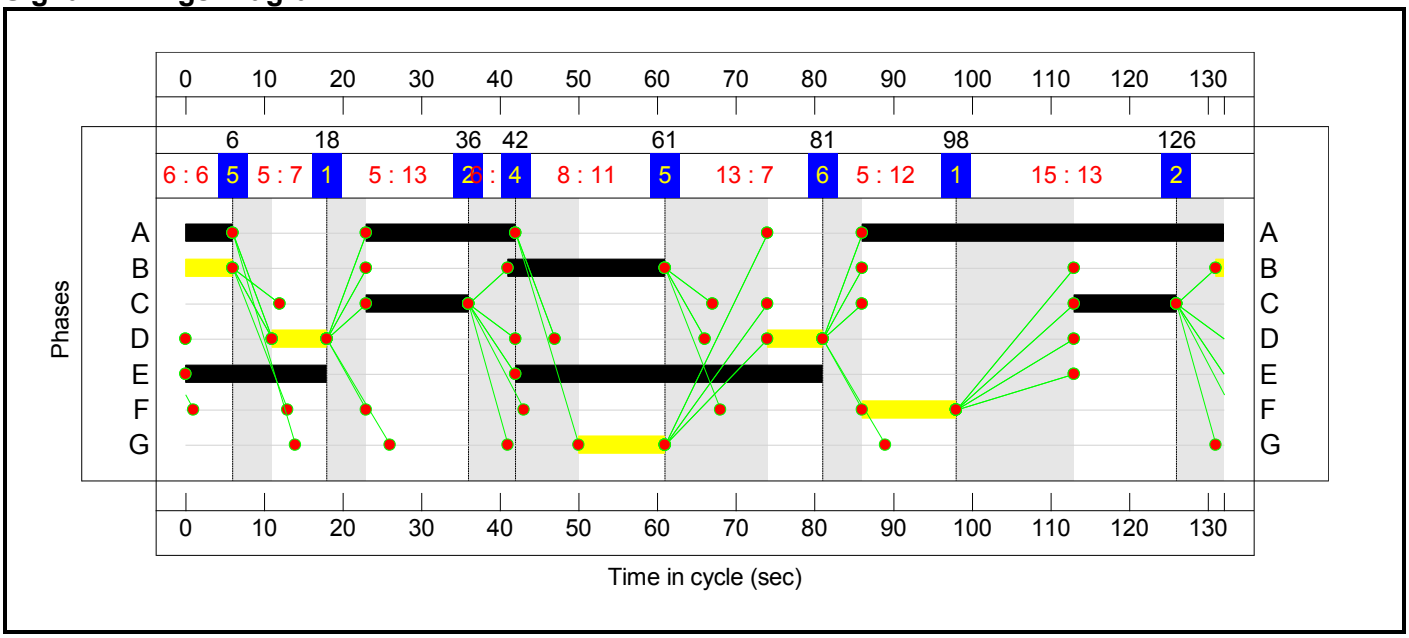
Stage Sequence Diagram



Stage Timings

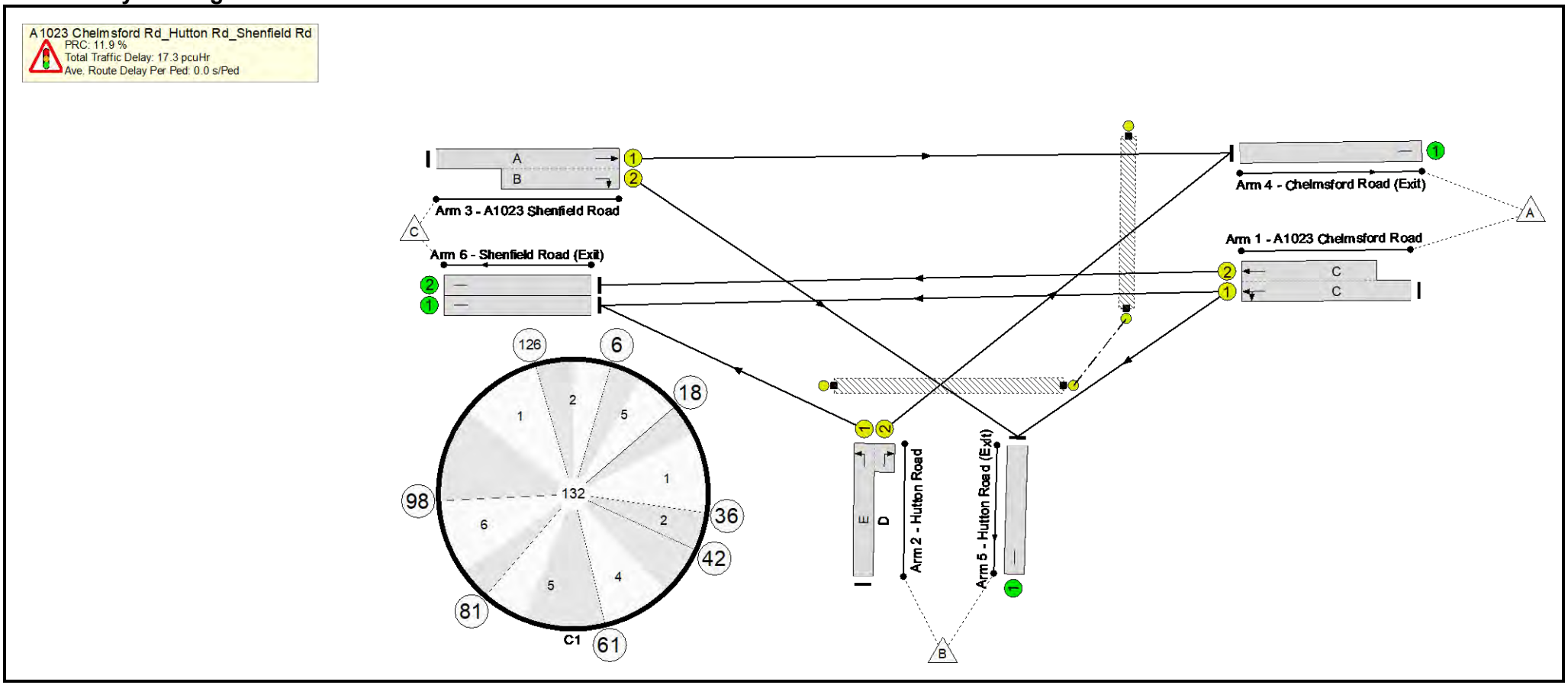
Stage	1	2	4	5	6	1	2	5
Duration	13	0	11	7	12	13	6	7
Change Point	18	36	42	61	81	98	126	6

Signal Timings Diagram



Full Input Data And Results

Network Layout Diagram



Full Input Data And Results

Network Results

Item	Lane Description	Lane Type	Controller Stream	Position In Filtered Route	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)
Network: Shenfield	-	-	**N/A**	-	-		-	-	-	-	-	-	**80.5%**
A1023 Chelmsford Rd_Hutton Rd_Shenfield Rd	-	-	**N/A**	-	-		-	-	-	-	-	-	**80.5%**
1/1+1/2	A1023 Chelmsford Road Left Ahead	U	N/A	N/A	C		2	26	-	654	1900:2080	403+441	74.2 : 80.5%
2/1+2/2	Hutton Road Right Left	U	N/A	N/A	E D		2	57:14	-	386	1739:1941	462+129	65.3 : 65.3%
3/1+3/2	A1023 Shenfield Road Ahead Right	U	N/A	N/A	A B		2	71:27	-	965	1940:1811	906+357	76.4 : 76.4%
4/1	Chelmsford Road (Exit)	U	N/A	N/A	-		-	-	-	776	1940	1940	40.0%
5/1	Hutton Road (Exit)	U	N/A	N/A	-		-	-	-	336	1940	1940	17.3%
6/1	Shenfield Road (Exit)	U	N/A	N/A	-		-	-	-	538	1940	1940	27.7%
6/2	Shenfield Road (Exit)	U	N/A	N/A	-		-	-	-	355	Inf	Inf	0.0%
Ped Link: P1	Chelmsford Road	-	N/A	-	G		1	11	-	0	-	0	0.0%
Ped Link: P2	Hutton Road	-	N/A	-	F		1	12	-	0	-	0	0.0%

Full Input Data And Results

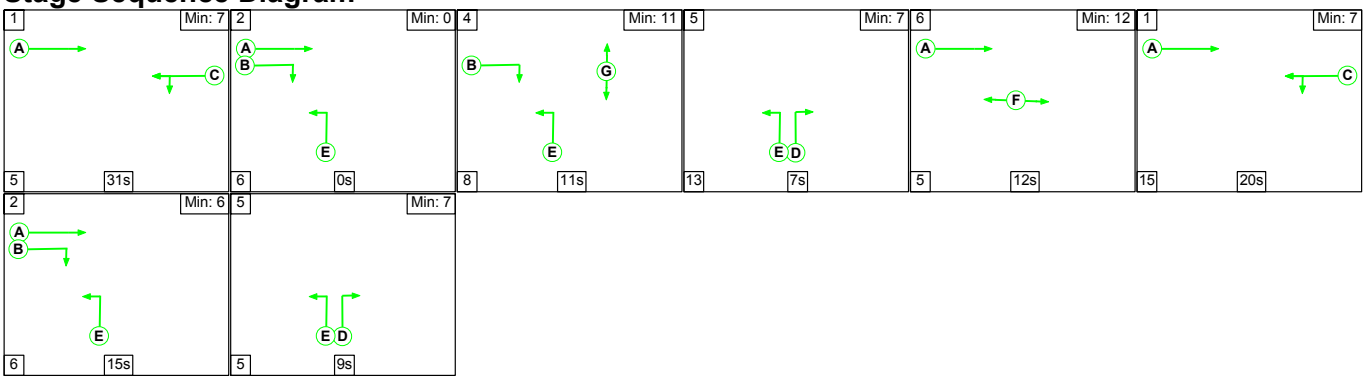
Item	Arriving (pcu)	Leaving (pcu)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Uniform Delay (pcuHr)	Rand + Oversat Delay (pcuHr)	Storage Area Uniform Delay (pcuHr)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Max. Back of Uniform Queue (pcu)	Rand + Oversat Queue (pcu)	Mean Max Queue (pcu)
Network: Shenfield	**-**	**-**	**0**	**0**	**0**	**12.4**	**4.9**	**0.0**	**17.3**	**-**	**-**	**-**	**-**
A1023 Chelmsford Rd_Hutton Rd_Shenfield Rd	**-**	**-**	**0**	**0**	**0**	**12.4**	**4.9**	**0.0**	**17.3**	**-**	**-**	**-**	**-**
1/1+1/2	654	654	-	-	-	5.6	1.7	-	7.3	40.3	8.9	1.7	10.6
2/1+2/2	386	386	-	-	-	1.8	0.9	-	2.7	25.5	6.1	0.9	7.0
3/1+3/2	965	965	-	-	-	5.0	1.6	-	6.6	24.6	15.9	1.6	17.5
4/1	776	776	-	-	-	0.0	0.3	-	0.3	1.5	0.0	0.3	0.3
5/1	336	336	-	-	-	0.0	0.1	-	0.1	1.1	0.0	0.1	0.1
6/1	538	538	-	-	-	0.0	0.2	-	0.2	1.3	0.0	0.2	0.2
6/2	355	355	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
Ped Link: P1	0	0	-	-	-	-	-	-	-	-	-	-	-
Ped Link: P2	0	0	-	-	-	-	-	-	-	-	-	-	-

C1 PRC for Signalled Lanes (%): 11.9 Total Delay for Signalled Lanes (pcuHr): 16.63 Cycle Time (s): 132
PRC Over All Lanes (%): 11.9 Total Delay Over All Lanes(pcuHr): 17.26

Full Input Data And Results

Scenario 5: '2028 Base + Committed AM Peak' (FG5: '2028 Base + Committed AM Peak', Plan 1: 'Network Control Plan 1')

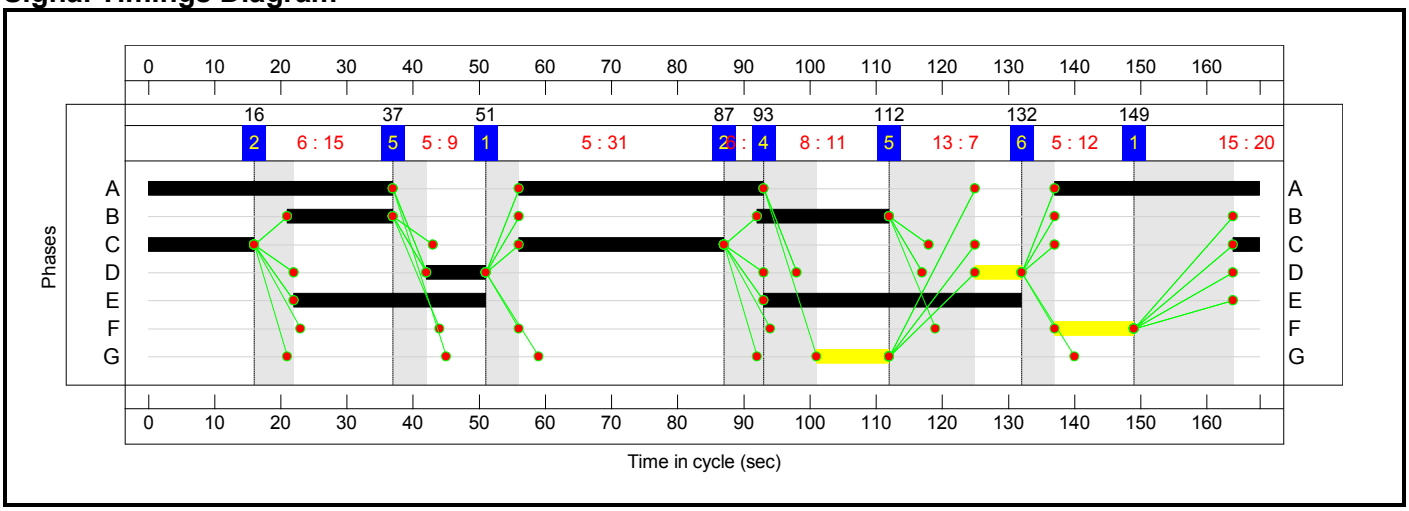
Stage Sequence Diagram



Stage Timings

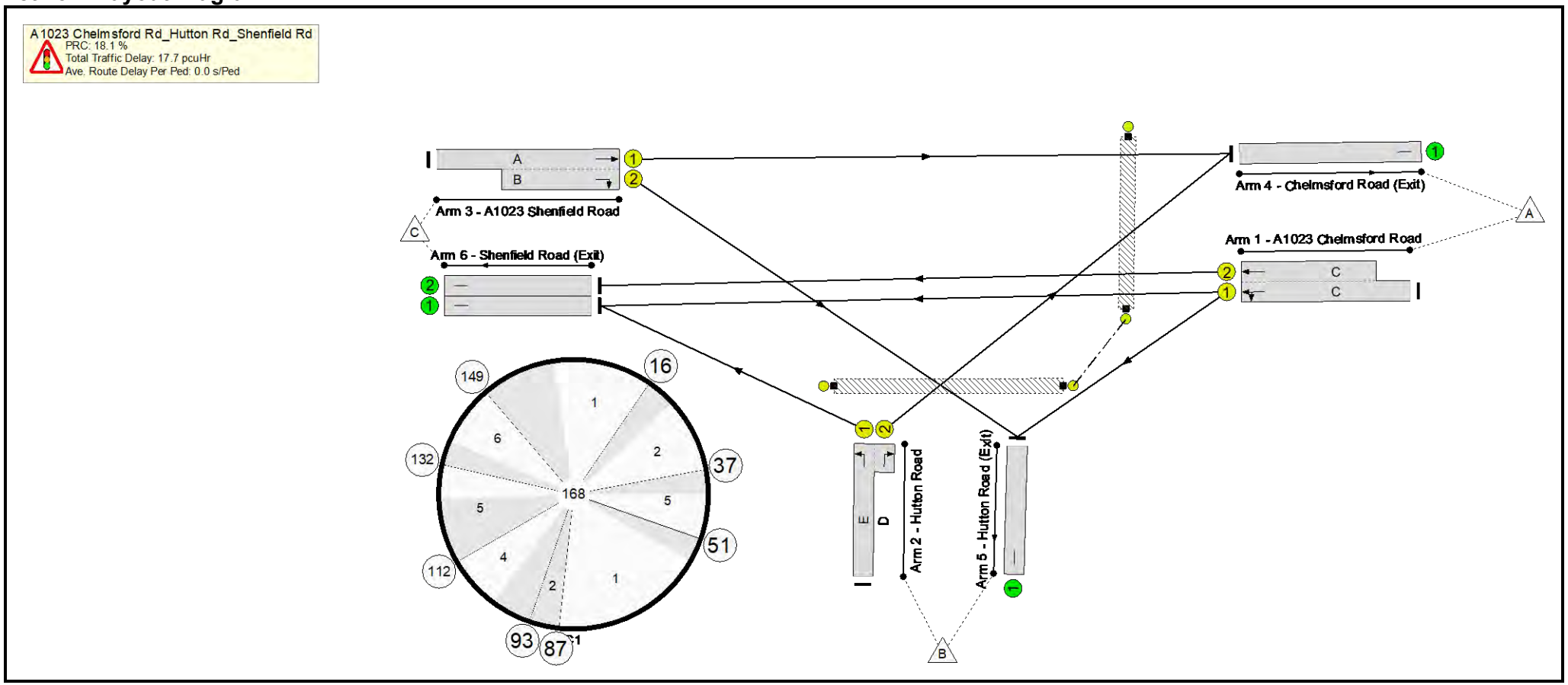
Stage	1	2	4	5	6	1	2	5
Duration	31	0	11	7	12	20	15	9
Change Point	51	87	93	112	132	149	16	37

Signal Timings Diagram



Full Input Data And Results

Network Layout Diagram



Full Input Data And Results

Network Results

Item	Lane Description	Lane Type	Controller Stream	Position In Filtered Route	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)
Network: Shenfield	-	-	**N/A**	-	-		-	-	-	-	-	-	**76.2%**
A1023 Chelmsford Rd_Hutton Rd_Shenfield Rd	-	-	**N/A**	-	-		-	-	-	-	-	-	**76.2%**
1/1+1/2	A1023 Chelmsford Road Left Ahead	U	N/A	N/A	C		2	51	-	794	1886:2080	454+588	76.2 : 76.2%
2/1+2/2	Hutton Road Right Left	U	N/A	N/A	E D		2	68:16	-	332	1739:1941	327+118	74.5 : 74.5%
3/1+3/2	A1023 Shenfield Road Ahead Right	U	N/A	N/A	A B		2	105:36	-	989	1940:1811	919+385	75.8 : 75.8%
4/1	Chelmsford Road (Exit)	U	N/A	N/A	-		-	-	-	785	1940	1940	40.5%
5/1	Hutton Road (Exit)	U	N/A	N/A	-		-	-	-	392	1940	1940	20.2%
6/1	Shenfield Road (Exit)	U	N/A	N/A	-		-	-	-	490	1940	1940	25.3%
6/2	Shenfield Road (Exit)	U	N/A	N/A	-		-	-	-	448	Inf	Inf	0.0%
Ped Link: P1	Chelmsford Road	-	N/A	-	G		1	11	-	0	-	0	0.0%
Ped Link: P2	Hutton Road	-	N/A	-	F		1	12	-	0	-	0	0.0%

Full Input Data And Results

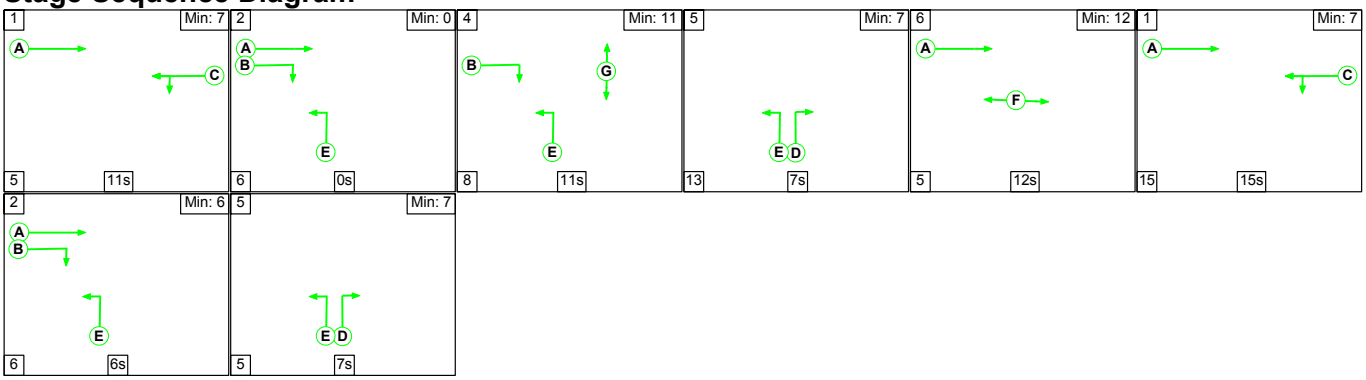
Item	Arriving (pcu)	Leaving (pcu)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Uniform Delay (pcuHr)	Rand + Oversat Delay (pcuHr)	Storage Area Uniform Delay (pcuHr)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Max. Back of Uniform Queue (pcu)	Rand + Oversat Queue (pcu)	Mean Max Queue (pcu)
Network: Shenfield	**-**	**-**	**0**	**0**	**0**	**12.5**	**5.2**	**0.0**	**17.7**	**-**	**-**	**-**	**-**
A1023 Chelmsford Rd_Hutton Rd_Shenfield Rd	**-**	**-**	**0**	**0**	**0**	**12.5**	**5.2**	**0.0**	**17.7**	**-**	**-**	**-**	**-**
1/1+1/2	794	794	-	-	-	6.0	1.6	-	7.6	34.4	12.2	1.6	13.8
2/1+2/2	332	332	-	-	-	2.0	1.4	-	3.5	37.4	5.4	1.4	6.8
3/1+3/2	989	989	-	-	-	4.5	1.6	-	6.1	22.0	16.4	1.6	18.0
4/1	785	785	-	-	-	0.0	0.3	-	0.3	1.6	0.0	0.3	0.3
5/1	392	392	-	-	-	0.0	0.1	-	0.1	1.2	0.0	0.1	0.1
6/1	490	490	-	-	-	0.0	0.2	-	0.2	1.2	0.0	0.2	0.2
6/2	448	448	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
Ped Link: P1	0	0	-	-	-	-	-	-	-	-	-	-	-
Ped Link: P2	0	0	-	-	-	-	-	-	-	-	-	-	-

C1 PRC for Signalled Lanes (%): 18.1 Total Delay for Signalled Lanes (pcuHr): 17.11 Cycle Time (s): 168
PRC Over All Lanes (%): 18.1 Total Delay Over All Lanes(pcuHr): 17.74

Full Input Data And Results

Scenario 6: '2028 Base + Committed PM Peak' (FG6: '2028 Base + Committed PM Peak', Plan 1: 'Network Control Plan 1')

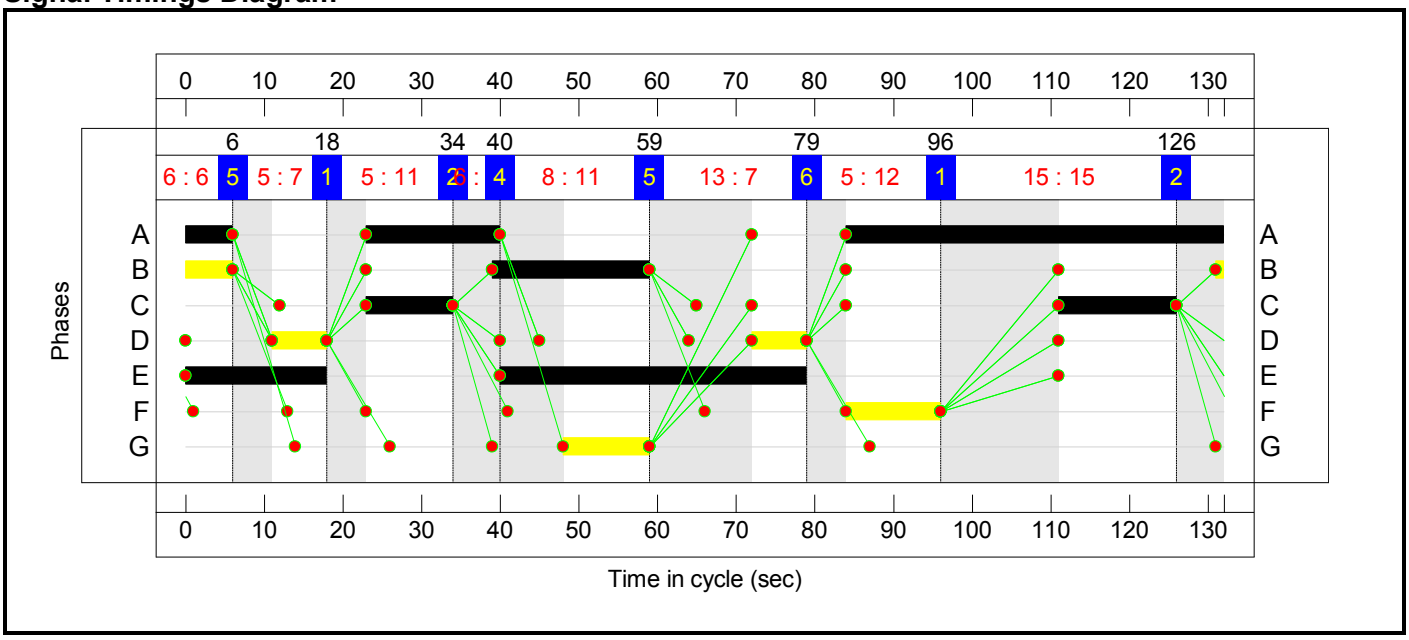
Stage Sequence Diagram



Stage Timings

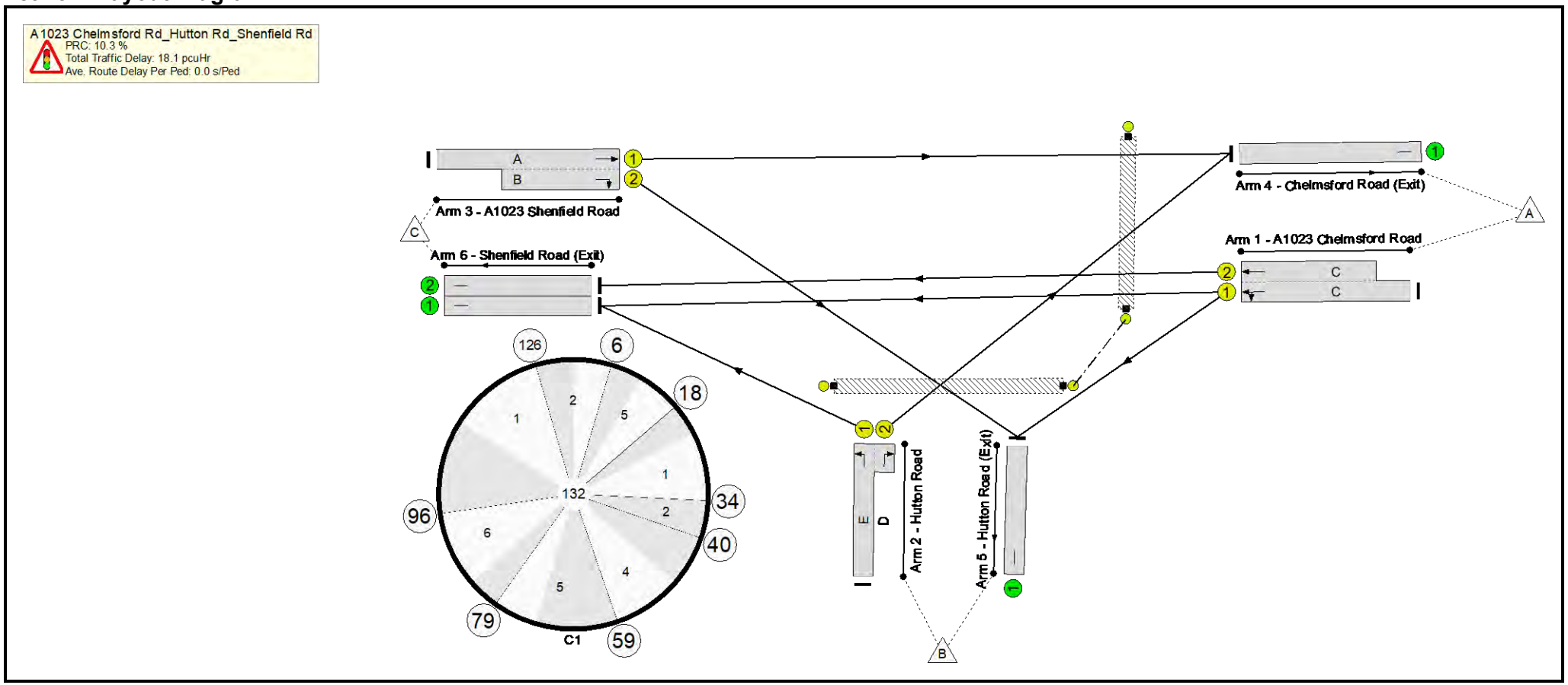
Stage	1	2	4	5	6	1	2	5
Duration	11	0	11	7	12	15	6	7
Change Point	18	34	40	59	79	96	126	6

Signal Timings Diagram



Full Input Data And Results

Network Layout Diagram



Full Input Data And Results

Network Results

Item	Lane Description	Lane Type	Controller Stream	Position In Filtered Route	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)
Network: Shenfield	-	-	**N/A**	-	-		-	-	-	-	-	-	**81.6%**
A1023 Chelmsford Rd_Hutton Rd_Shenfield Rd	-	-	**N/A**	-	-		-	-	-	-	-	-	**81.6%**
1/1+1/2	A1023 Chelmsford Road Left Ahead	U	N/A	N/A	C		2	26	-	673	1900:2080	403+441	77.7 : 81.6%
2/1+2/2	Hutton Road Right Left	U	N/A	N/A	E D		2	57:14	-	391	1739:1941	448+132	67.4 : 67.4%
3/1+3/2	A1023 Shenfield Road Ahead Right	U	N/A	N/A	A B		2	71:27	-	992	1940:1811	911+346	78.9 : 78.9%
4/1	Chelmsford Road (Exit)	U	N/A	N/A	-		-	-	-	808	1940	1940	41.6%
5/1	Hutton Road (Exit)	U	N/A	N/A	-		-	-	-	339	1940	1940	17.5%
6/1	Shenfield Road (Exit)	U	N/A	N/A	-		-	-	-	549	1940	1940	28.3%
6/2	Shenfield Road (Exit)	U	N/A	N/A	-		-	-	-	360	Inf	Inf	0.0%
Ped Link: P1	Chelmsford Road	-	N/A	-	G		1	11	-	0	-	0	0.0%
Ped Link: P2	Hutton Road	-	N/A	-	F		1	12	-	0	-	0	0.0%

Full Input Data And Results

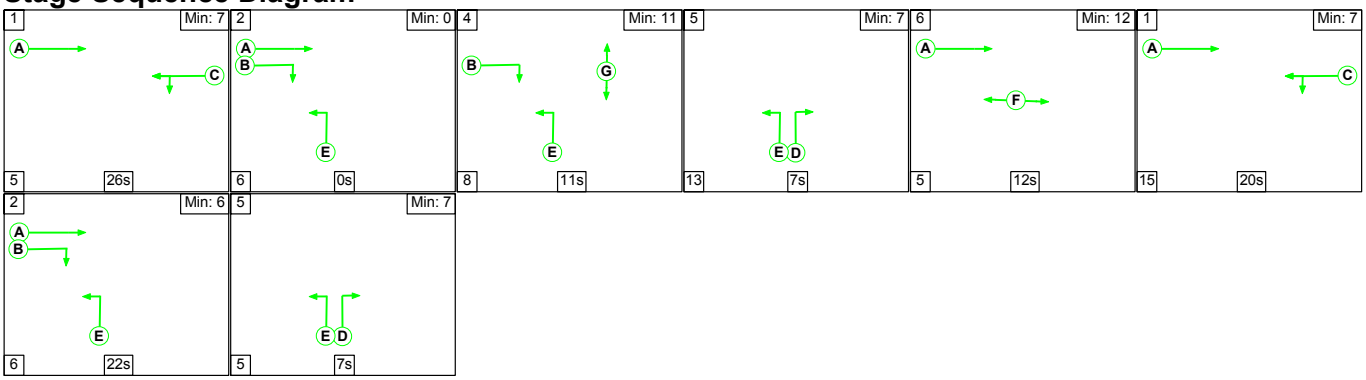
Item	Arriving (pcu)	Leaving (pcu)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Uniform Delay (pcuHr)	Rand + Oversat Delay (pcuHr)	Storage Area Uniform Delay (pcuHr)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Max. Back of Uniform Queue (pcu)	Rand + Oversat Queue (pcu)	Mean Max Queue (pcu)
Network: Shenfield	**-**	**-**	**0**	**0**	**0**	**12.7**	**5.5**	**0.0**	**18.1**	**-**	**-**	**-**	**-**
A1023 Chelmsford Rd_Hutton Rd_Shenfield Rd	**-**	**-**	**0**	**0**	**0**	**12.7**	**5.5**	**0.0**	**18.1**	**-**	**-**	**-**	**-**
1/1+1/2	673	673	-	-	-	5.6	1.9	-	7.5	40.2	9.1	1.9	11.0
2/1+2/2	391	391	-	-	-	1.9	1.0	-	2.9	26.8	6.3	1.0	7.4
3/1+3/2	992	992	-	-	-	5.2	1.8	-	7.1	25.6	17.4	1.8	19.2
4/1	808	808	-	-	-	0.0	0.4	-	0.4	1.6	0.0	0.4	0.4
5/1	339	339	-	-	-	0.0	0.1	-	0.1	1.1	0.0	0.1	0.1
6/1	549	549	-	-	-	0.0	0.2	-	0.2	1.3	0.0	0.2	0.2
6/2	360	360	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
Ped Link: P1	0	0	-	-	-	-	-	-	-	-	-	-	-
Ped Link: P2	0	0	-	-	-	-	-	-	-	-	-	-	-

C1 PRC for Signalled Lanes (%): 10.3 Total Delay for Signalled Lanes (pcuHr): 17.49 Cycle Time (s): 132
PRC Over All Lanes (%): 10.3 Total Delay Over All Lanes(pcuHr): 18.15

Full Input Data And Results

Scenario 7: '2028 Base + Development AM Peak' (FG7: '2028 Base + Development AM Peak', Plan 1: 'Network Control Plan 1')

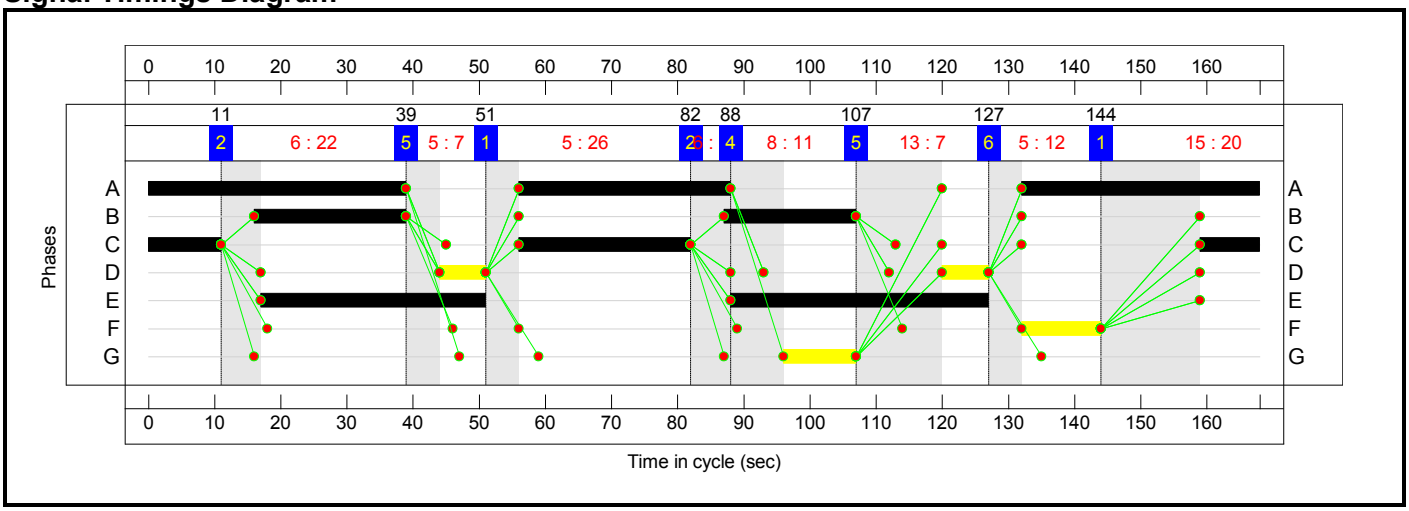
Stage Sequence Diagram



Stage Timings

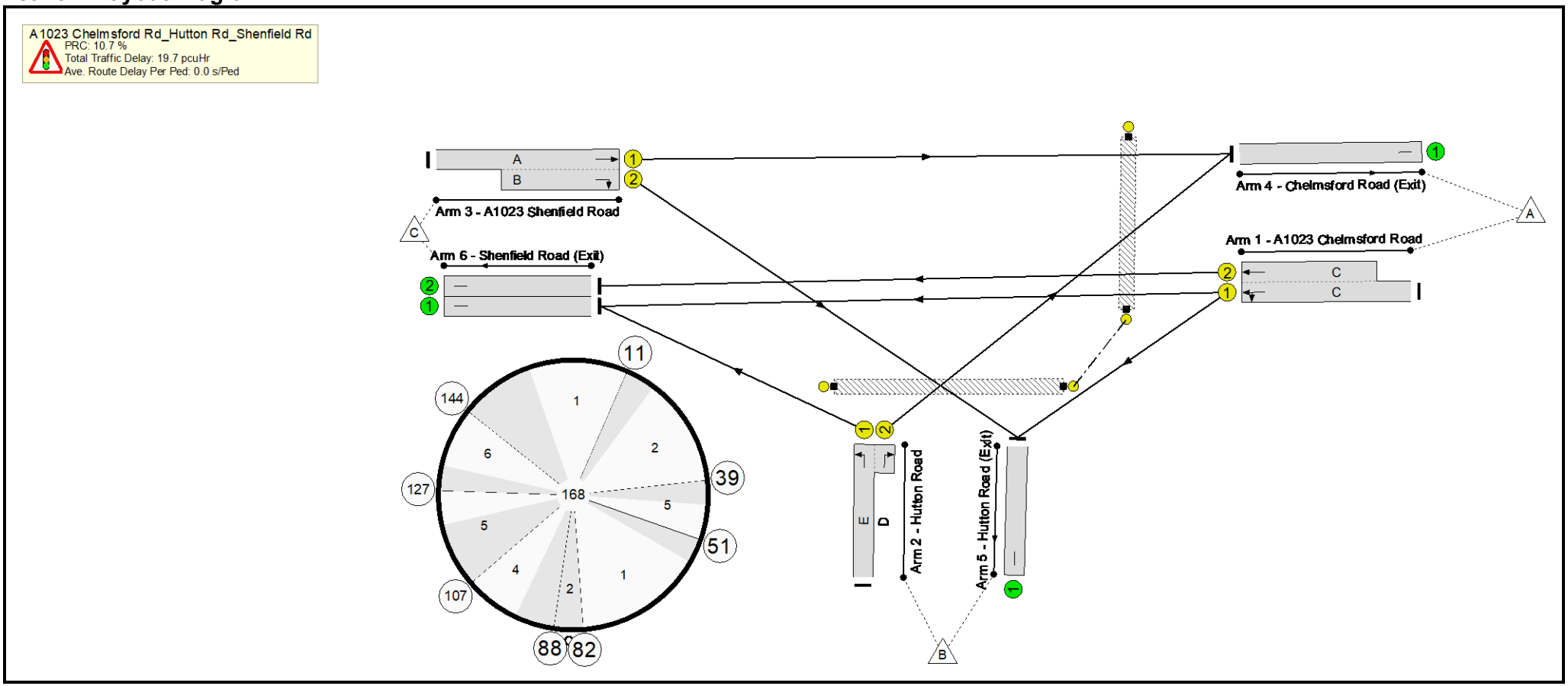
Stage	1	2	4	5	6	1	2	5
Duration	26	0	11	7	12	20	22	7
Change Point	51	82	88	107	127	144	11	39

Signal Timings Diagram



Full Input Data And Results

Network Layout Diagram



Full Input Data And Results

Network Results

Item	Lane Description	Lane Type	Controller Stream	Position In Filtered Route	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)
Network: Shenfield	-	-	**N/A**	-	-		-	-	-	-	-	-	**81.3%**
A1023 Chelmsford Rd_Hutton Rd_Shenfield Rd	-	-	**N/A**	-	-		-	-	-	-	-	-	**81.3%**
1/1+1/2	A1023 Chelmsford Road Left Ahead	U	N/A	N/A	C		2	46	-	801	1894:2080	434+554	81.0 : 81.0%
2/1+2/2	Hutton Road Right Left	U	N/A	N/A	E D		2	73:14	-	370	1739:1941	387+108	74.7 : 74.7%
3/1+3/2	A1023 Shenfield Road Ahead Right	U	N/A	N/A	A B		2	107:43	-	1048	1940:1811	872+417	81.3 : 81.3%
4/1	Chelmsford Road (Exit)	U	N/A	N/A	-		-	-	-	790	1940	1940	40.7%
5/1	Hutton Road (Exit)	U	N/A	N/A	-		-	-	-	424	1940	1940	21.9%
6/1	Shenfield Road (Exit)	U	N/A	N/A	-		-	-	-	556	1940	1940	28.7%
6/2	Shenfield Road (Exit)	U	N/A	N/A	-		-	-	-	449	Inf	Inf	0.0%
Ped Link: P1	Chelmsford Road	-	N/A	-	G		1	11	-	0	-	0	0.0%
Ped Link: P2	Hutton Road	-	N/A	-	F		1	12	-	0	-	0	0.0%

Full Input Data And Results

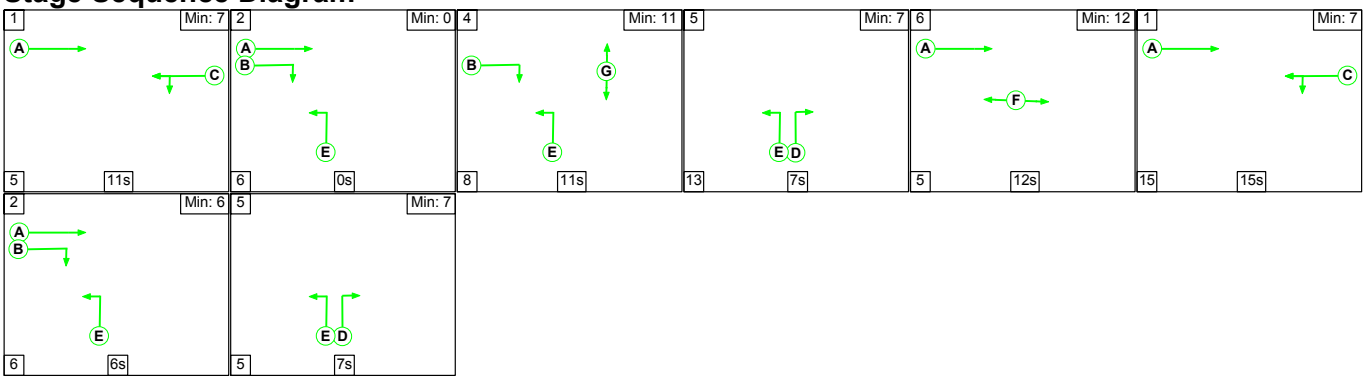
Item	Arriving (pcu)	Leaving (pcu)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Uniform Delay (pcuHr)	Rand + Oversat Delay (pcuHr)	Storage Area Uniform Delay (pcuHr)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Max. Back of Uniform Queue (pcu)	Rand + Oversat Queue (pcu)	Mean Max Queue (pcu)
Network: Shenfield	**-**	**-**	**0**	**0**	**0**	**13.3**	**6.3**	**0.0**	**19.7**	**-**	**-**	**-**	**-**
A1023 Chelmsford Rd_Hutton Rd_Shenfield Rd	**-**	**-**	**0**	**0**	**0**	**13.3**	**6.3**	**0.0**	**19.7**	**-**	**-**	**-**	**-**
1/1+1/2	801	801	-	-	-	6.4	2.1	-	8.5	38.3	12.4	2.1	14.5
2/1+2/2	370	370	-	-	-	2.1	1.4	-	3.6	34.8	6.6	1.4	8.0
3/1+3/2	1048	1048	-	-	-	4.8	2.1	-	6.9	23.7	18.0	2.1	20.1
4/1	790	790	-	-	-	0.0	0.3	-	0.3	1.6	0.0	0.3	0.3
5/1	424	424	-	-	-	0.0	0.1	-	0.1	1.2	0.0	0.1	0.1
6/1	556	556	-	-	-	0.0	0.2	-	0.2	1.3	0.0	0.2	0.2
6/2	449	449	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
Ped Link: P1	0	0	-	-	-	-	-	-	-	-	-	-	-
Ped Link: P2	0	0	-	-	-	-	-	-	-	-	-	-	-

C1 PRC for Signalled Lanes (%): 10.7 Total Delay for Signalled Lanes (pcuHr): 19.00 Cycle Time (s): 168
PRC Over All Lanes (%): 10.7 Total Delay Over All Lanes(pcuHr): 19.68

Full Input Data And Results

Scenario 8: '2028 Base + Development PM Peak' (FG8: '2028 Base + Development PM Peak', Plan 1: 'Network Control Plan 1')

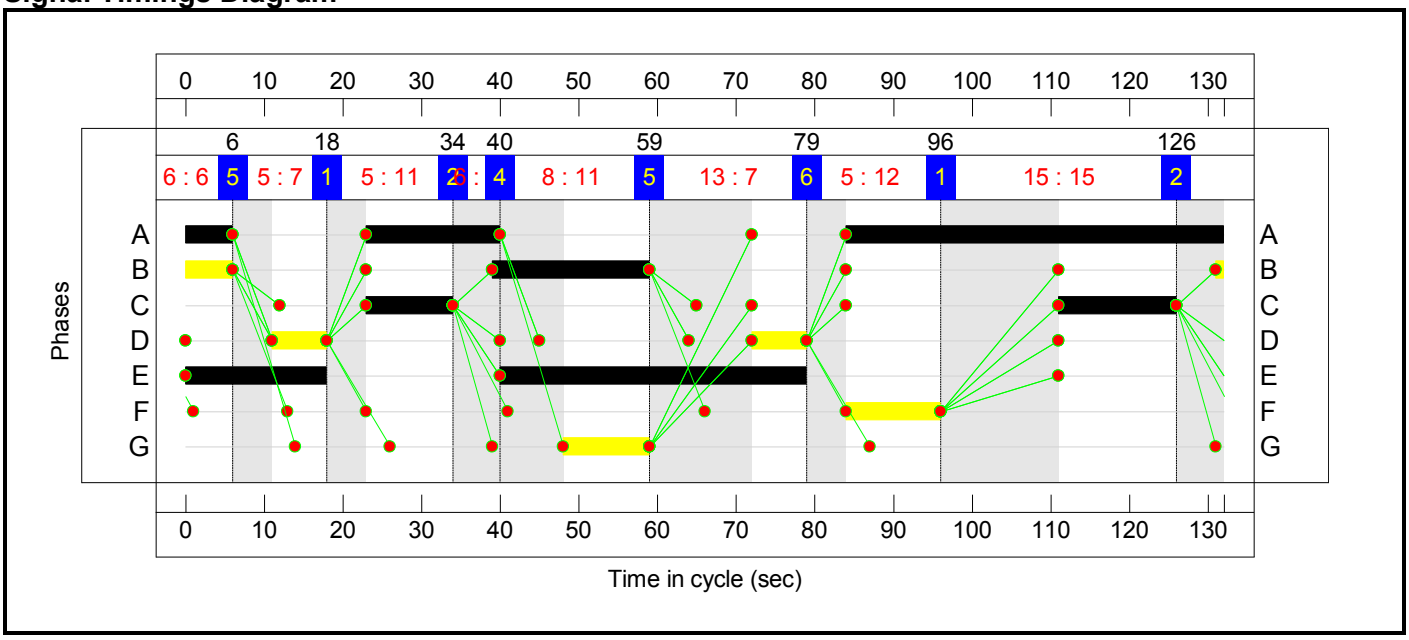
Stage Sequence Diagram



Stage Timings

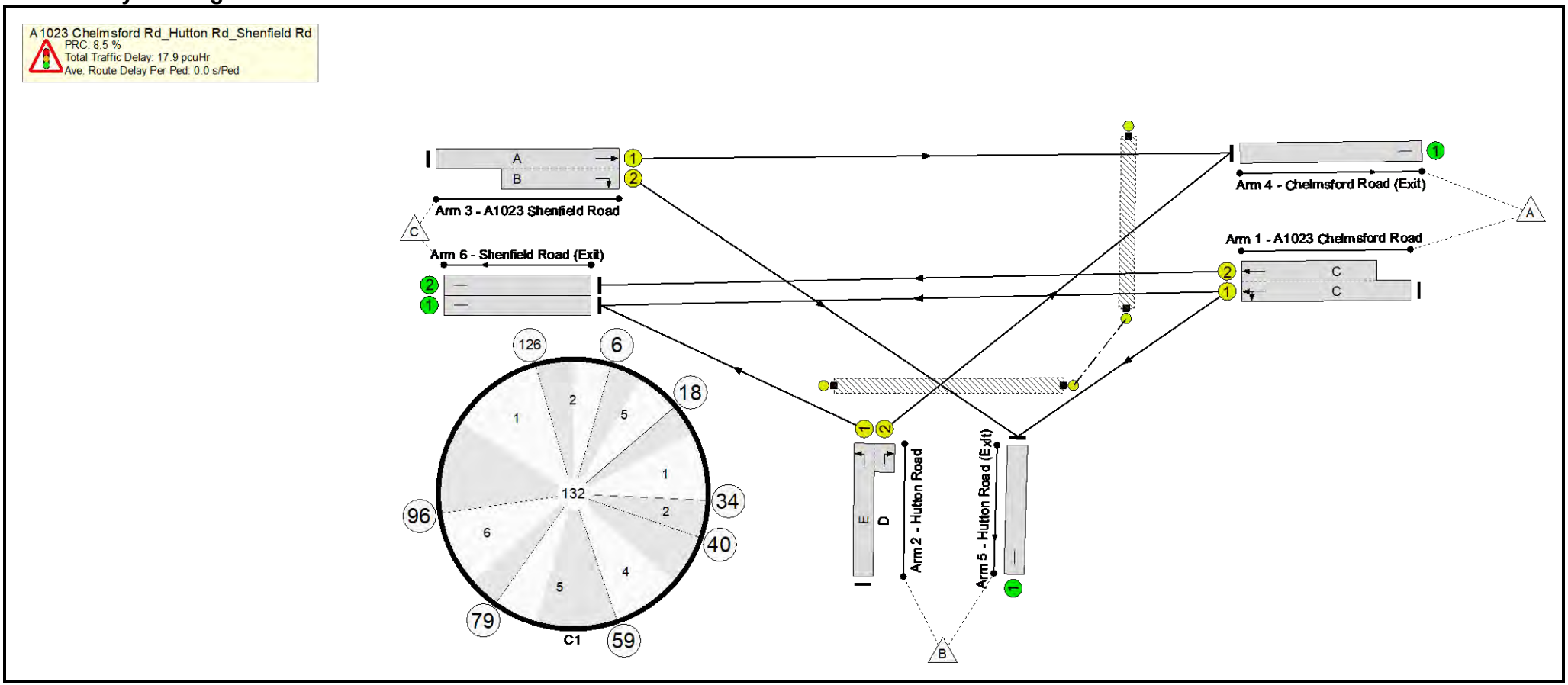
Stage	1	2	4	5	6	1	2	5
Duration	11	0	11	7	12	15	6	7
Change Point	18	34	40	59	79	96	126	6

Signal Timings Diagram



Full Input Data And Results

Network Layout Diagram



Full Input Data And Results

Network Results

Item	Lane Description	Lane Type	Controller Stream	Position In Filtered Route	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)
Network: Shenfield	-	-	**N/A**	-	-		-	-	-	-	-	-	**83.0%**
A1023 Chelmsford Rd_Hutton Rd_Shenfield Rd	-	-	**N/A**	-	-		-	-	-	-	-	-	**83.0%**
1/1+1/2	A1023 Chelmsford Road Left Ahead	U	N/A	N/A	C		2	26	-	649	1898:2080	341+441	83.0 : 83.0%
2/1+2/2	Hutton Road Right Left	U	N/A	N/A	E D		2	57:14	-	379	1739:1941	464+128	64.0 : 64.0%
3/1+3/2	A1023 Shenfield Road Ahead Right	U	N/A	N/A	A B		2	71:27	-	977	1940:1811	912+343	77.9 : 77.9%
4/1	Chelmsford Road (Exit)	U	N/A	N/A	-		-	-	-	792	1940	1940	40.8%
5/1	Hutton Road (Exit)	U	N/A	N/A	-		-	-	-	329	1940	1940	17.0%
6/1	Shenfield Road (Exit)	U	N/A	N/A	-		-	-	-	518	1940	1940	26.7%
6/2	Shenfield Road (Exit)	U	N/A	N/A	-		-	-	-	366	Inf	Inf	0.0%
Ped Link: P1	Chelmsford Road	-	N/A	-	G		1	11	-	0	-	0	0.0%
Ped Link: P2	Hutton Road	-	N/A	-	F		1	12	-	0	-	0	0.0%

Full Input Data And Results

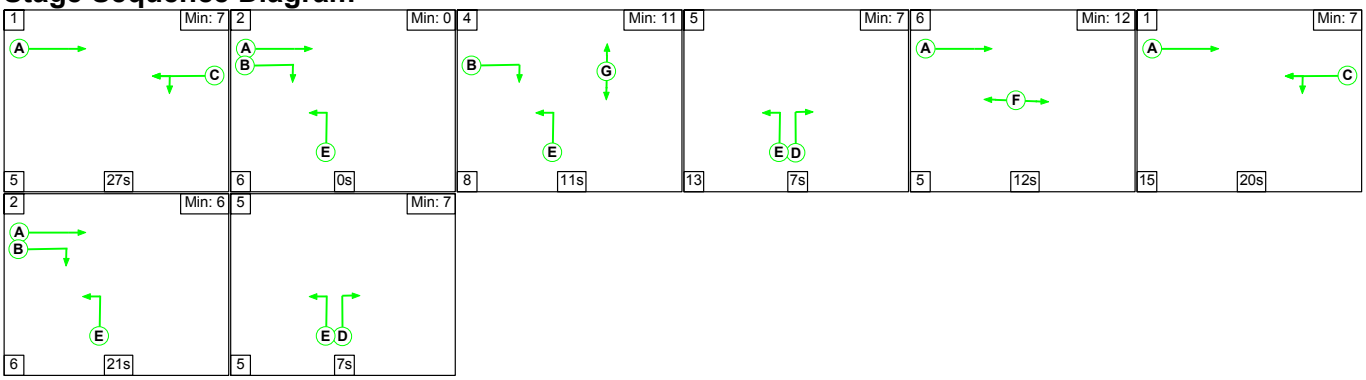
Item	Arriving (pcu)	Leaving (pcu)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Uniform Delay (pcuHr)	Rand + Oversat Delay (pcuHr)	Storage Area Uniform Delay (pcuHr)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Max. Back of Uniform Queue (pcu)	Rand + Oversat Queue (pcu)	Mean Max Queue (pcu)
Network: Shenfield	**-**	**-**	**0**	**0**	**0**	**12.3**	**5.6**	**0.0**	**17.9**	**-**	**-**	**-**	**-**
A1023 Chelmsford Rd_Hutton Rd_Shenfield Rd	**-**	**-**	**0**	**0**	**0**	**12.3**	**5.6**	**0.0**	**17.9**	**-**	**-**	**-**	**-**
1/1+1/2	649	649	-	-	-	5.4	2.4	-	7.7	42.9	9.4	2.4	11.7
2/1+2/2	379	379	-	-	-	1.8	0.9	-	2.7	25.6	6.2	0.9	7.0
3/1+3/2	977	977	-	-	-	5.1	1.7	-	6.8	25.0	16.5	1.7	18.3
4/1	792	792	-	-	-	0.0	0.3	-	0.3	1.6	0.0	0.3	0.3
5/1	329	329	-	-	-	0.0	0.1	-	0.1	1.1	0.0	0.1	0.1
6/1	518	518	-	-	-	0.0	0.2	-	0.2	1.3	0.0	0.2	0.2
6/2	366	366	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
Ped Link: P1	0	0	-	-	-	-	-	-	-	-	-	-	-
Ped Link: P2	0	0	-	-	-	-	-	-	-	-	-	-	-

C1 PRC for Signalled Lanes (%): 8.5 Total Delay for Signalled Lanes (pcuHr): 17.23 Cycle Time (s): 132
PRC Over All Lanes (%): 8.5 Total Delay Over All Lanes(pcuHr): 17.86

Full Input Data And Results

Scenario 9: '2028 Base + Comm + Dev AM Peak' (FG9: '2028 Base + Comm + Dev AM Peak', Plan 1: 'Network Control Plan 1')

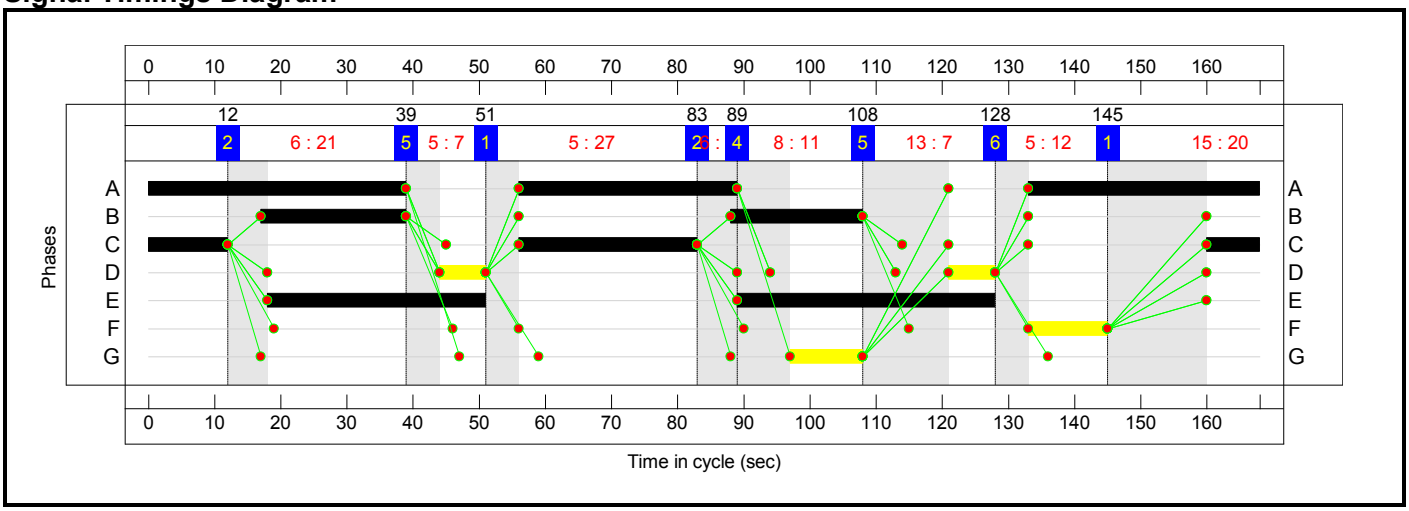
Stage Sequence Diagram



Stage Timings

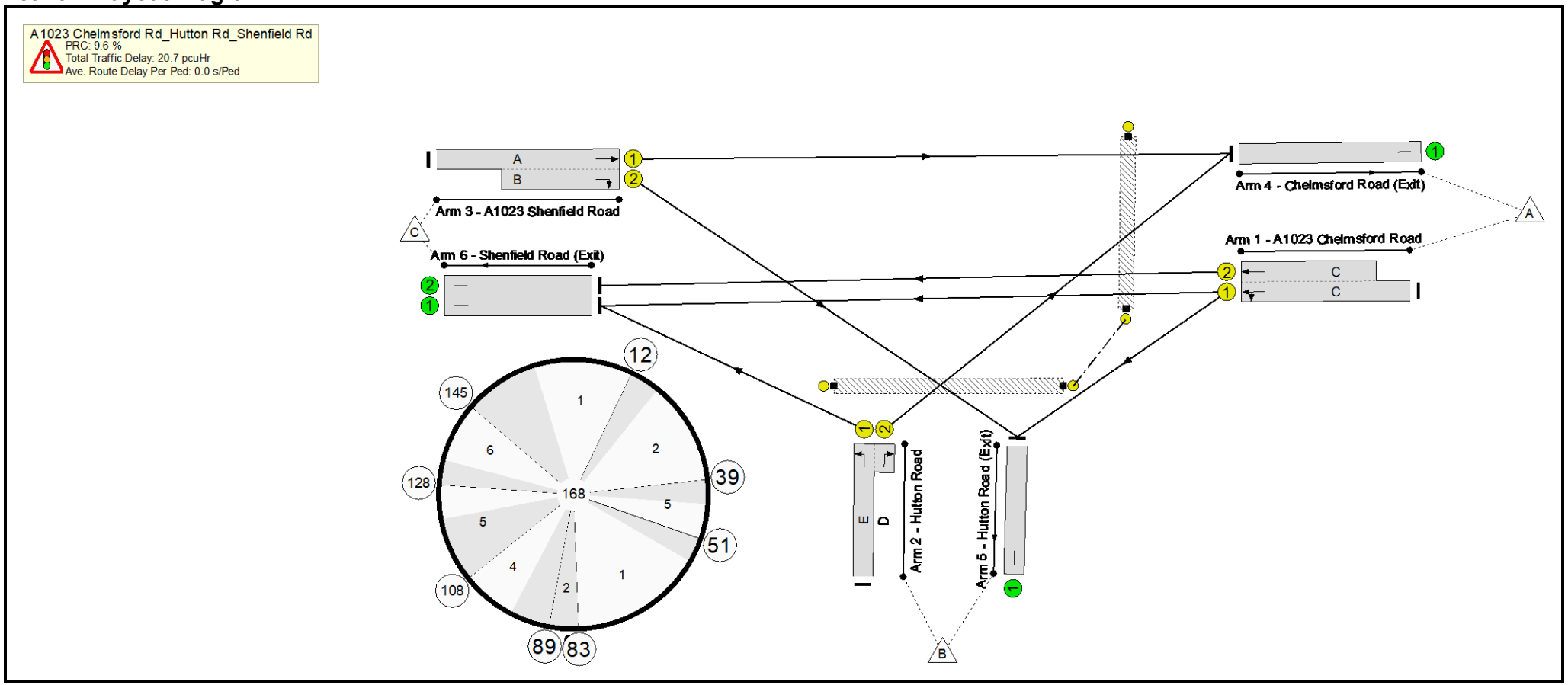
Stage	1	2	4	5	6	1	2	5
Duration	27	0	11	7	12	20	21	7
Change Point	51	83	89	108	128	145	12	39

Signal Timings Diagram



Full Input Data And Results

Network Layout Diagram



Full Input Data And Results

Network Results

Item	Lane Description	Lane Type	Controller Stream	Position In Filtered Route	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)
Network: Shenfield	-	-	**N/A**	-	-		-	-	-	-	-	-	**82.1%**
A1023 Chelmsford Rd_Hutton Rd_Shenfield Rd	-	-	**N/A**	-	-		-	-	-	-	-	-	**82.1%**
1/1+1/2	A1023 Chelmsford Road Left Ahead	U	N/A	N/A	C		2	47	-	837	1895:2080	463+560	81.8 : 81.8%
2/1+2/2	Hutton Road Right Left	U	N/A	N/A	E D		2	72:14	-	373	1739:1941	375+109	77.1 : 77.1%
3/1+3/2	A1023 Shenfield Road Ahead Right	U	N/A	N/A	A B		2	107:42	-	1066	1940:1811	885+413	82.1 : 82.1%
4/1	Chelmsford Road (Exit)	U	N/A	N/A	-		-	-	-	811	1940	1940	41.8%
5/1	Hutton Road (Exit)	U	N/A	N/A	-		-	-	-	429	1940	1940	22.1%
6/1	Shenfield Road (Exit)	U	N/A	N/A	-		-	-	-	578	1940	1940	29.8%
6/2	Shenfield Road (Exit)	U	N/A	N/A	-		-	-	-	458	Inf	Inf	0.0%
Ped Link: P1	Chelmsford Road	-	N/A	-	G		1	11	-	0	-	0	0.0%
Ped Link: P2	Hutton Road	-	N/A	-	F		1	12	-	0	-	0	0.0%

Full Input Data And Results

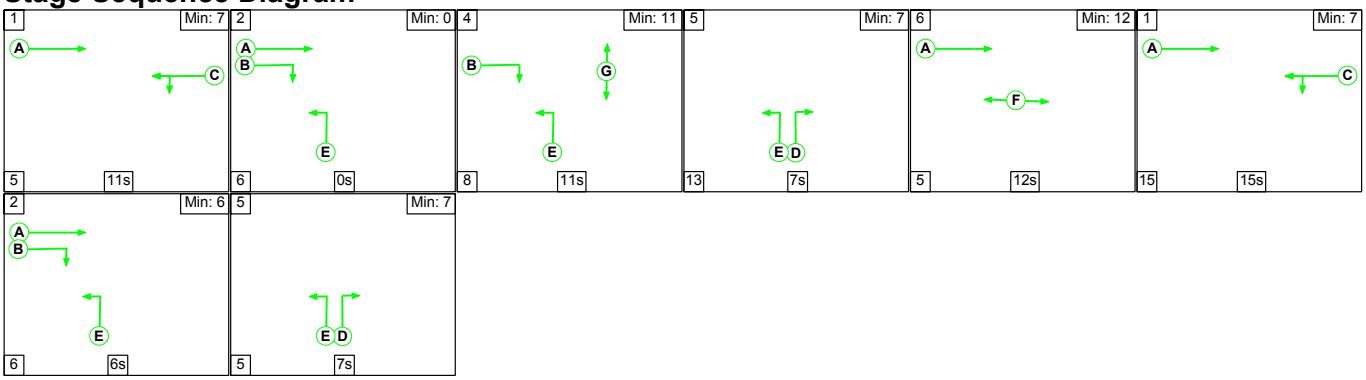
Item	Arriving (pcu)	Leaving (pcu)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Uniform Delay (pcuHr)	Rand + Oversat Delay (pcuHr)	Storage Area Uniform Delay (pcuHr)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Max. Back of Uniform Queue (pcu)	Rand + Oversat Queue (pcu)	Mean Max Queue (pcu)
Network: Shenfield	**-**	**-**	**0**	**0**	**0**	**13.9**	**6.8**	**0.0**	**20.7**	**-**	**-**	**-**	**-**
A1023 Chelmsford Rd_Hutton Rd_Shenfield Rd	**-**	**-**	**0**	**0**	**0**	**13.9**	**6.8**	**0.0**	**20.7**	**-**	**-**	**-**	**-**
1/1+1/2	837	837	-	-	-	6.8	2.2	-	9.0	38.8	12.9	2.2	15.1
2/1+2/2	373	373	-	-	-	2.2	1.6	-	3.8	36.9	6.6	1.6	8.3
3/1+3/2	1066	1066	-	-	-	4.9	2.3	-	7.1	24.1	19.0	2.3	21.3
4/1	811	811	-	-	-	0.0	0.4	-	0.4	1.6	0.0	0.4	0.4
5/1	429	429	-	-	-	0.0	0.1	-	0.1	1.2	0.0	0.1	0.1
6/1	578	578	-	-	-	0.0	0.2	-	0.2	1.3	0.0	0.2	0.2
6/2	458	458	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
Ped Link: P1	0	0	-	-	-	-	-	-	-	-	-	-	-
Ped Link: P2	0	0	-	-	-	-	-	-	-	-	-	-	-

C1 PRC for Signalled Lanes (%): 9.6 Total Delay for Signalled Lanes (pcuHr): 19.99 Cycle Time (s): 168
PRC Over All Lanes (%): 9.6 Total Delay Over All Lanes(pcuHr): 20.70

Full Input Data And Results

Scenario 10: '2028 Base + Comm + Dev PM Peak' (FG10: '2028 Base + Comm + Dev PM Peak', Plan 1: 'Network Control Plan 1')

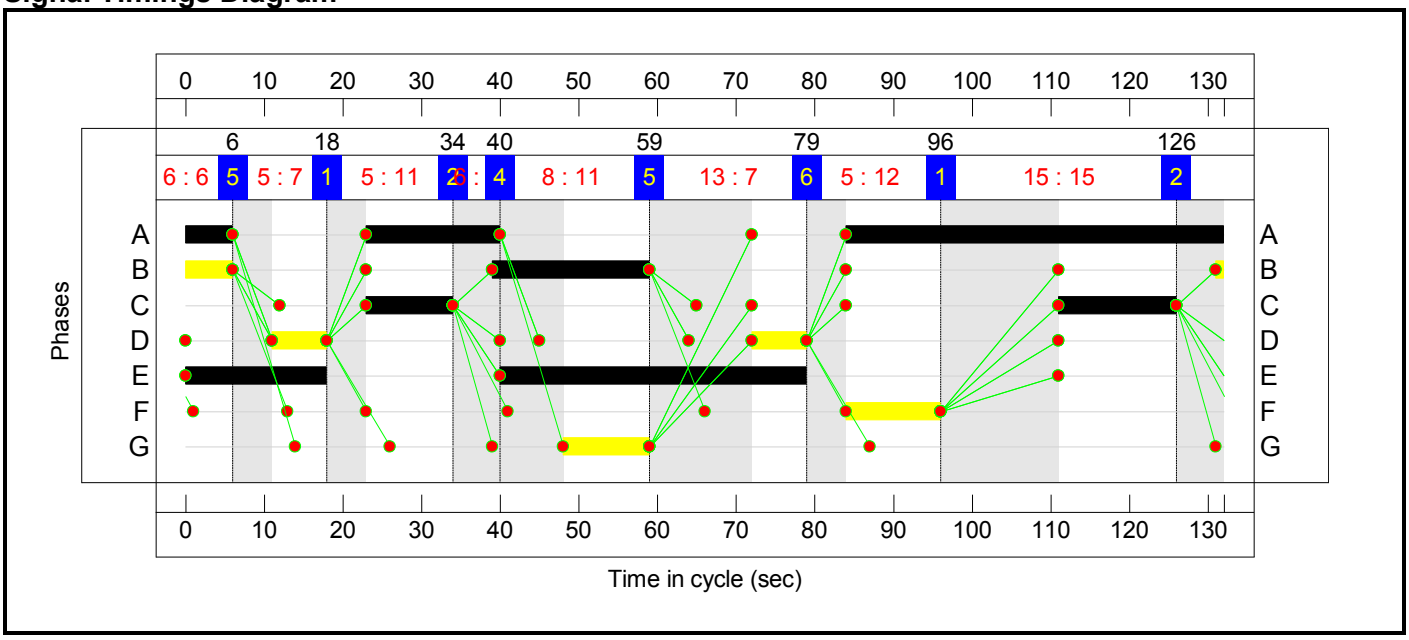
Stage Sequence Diagram



Stage Timings

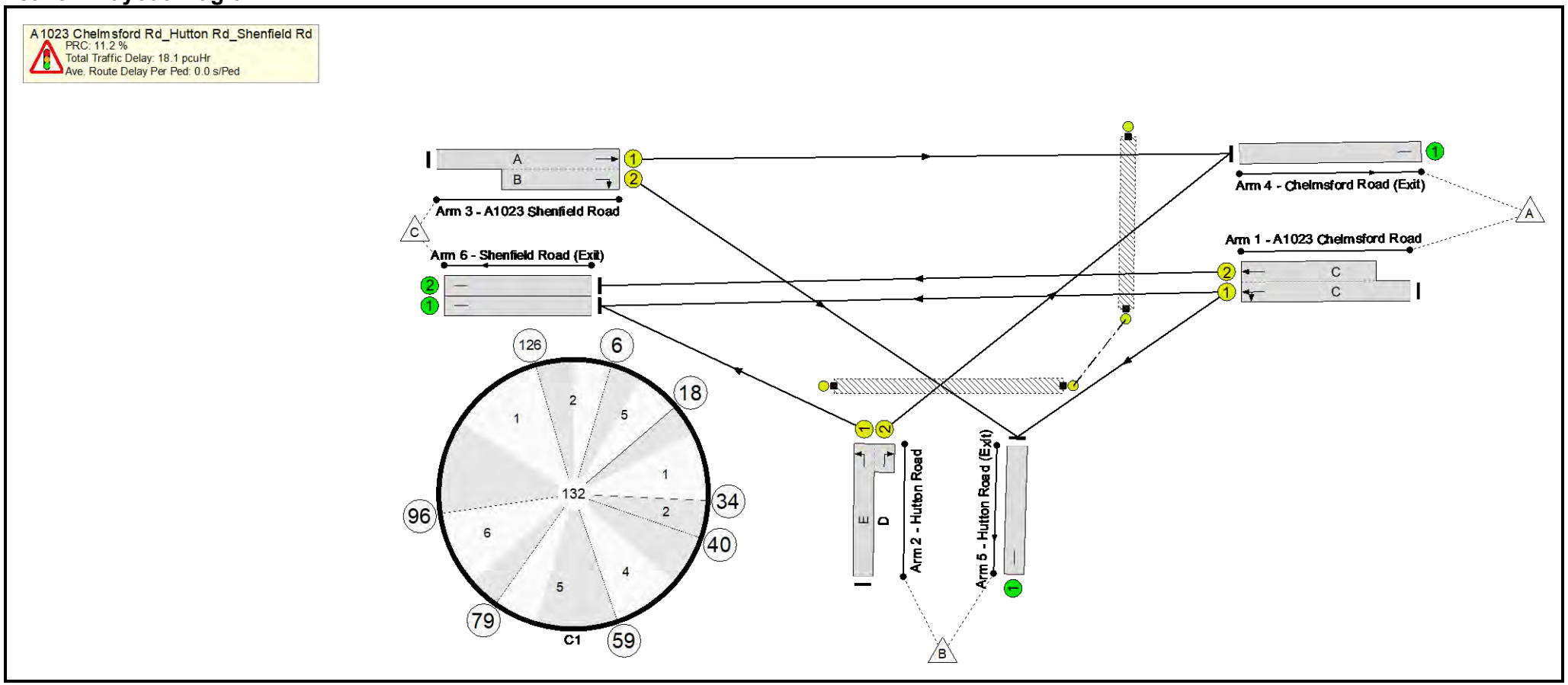
Stage	1	2	4	5	6	1	2	5
Duration	11	0	11	7	12	15	6	7
Change Point	18	34	40	59	79	96	126	6

Signal Timings Diagram



Full Input Data And Results

Network Layout Diagram



Full Input Data And Results

Network Results

Item	Lane Description	Lane Type	Controller Stream	Position In Filtered Route	Full Phase	Arrow Phase	Num Greens	Total Green (s)	Arrow Green (s)	Demand Flow (pcu)	Sat Flow (pcu/Hr)	Capacity (pcu)	Deg Sat (%)
Network: Shenfield	-	-	**N/A**	-	-		-	-	-	-	-	-	**80.9%**
A1023 Chelmsford Rd_Hutton Rd_Shenfield Rd	-	-	**N/A**	-	-		-	-	-	-	-	-	**80.9%**
1/1+1/2	A1023 Chelmsford Road Left Ahead	U	N/A	N/A	C		2	26	-	668	1901:2080	403+441	77.1 : 80.9%
2/1+2/2	Hutton Road Right Left	U	N/A	N/A	E D		2	57:14	-	384	1739:1941	450+132	66.0 : 66.0%
3/1+3/2	A1023 Shenfield Road Ahead Right	U	N/A	N/A	A B		2	71:27	-	1005	1940:1811	917+332	80.5 : 80.5%
4/1	Chelmsford Road (Exit)	U	N/A	N/A	-		-	-	-	825	1940	1940	42.5%
5/1	Hutton Road (Exit)	U	N/A	N/A	-		-	-	-	331	1940	1940	17.1%
6/1	Shenfield Road (Exit)	U	N/A	N/A	-		-	-	-	544	1940	1940	28.0%
6/2	Shenfield Road (Exit)	U	N/A	N/A	-		-	-	-	357	Inf	Inf	0.0%
Ped Link: P1	Chelmsford Road	-	N/A	-	G		1	11	-	0	-	0	0.0%
Ped Link: P2	Hutton Road	-	N/A	-	F		1	12	-	0	-	0	0.0%

Full Input Data And Results

Item	Arriving (pcu)	Leaving (pcu)	Turners In Gaps (pcu)	Turners When Unopposed (pcu)	Turners In Intergreen (pcu)	Uniform Delay (pcuHr)	Rand + Oversat Delay (pcuHr)	Storage Area Uniform Delay (pcuHr)	Total Delay (pcuHr)	Av. Delay Per PCU (s/pcu)	Max. Back of Uniform Queue (pcu)	Rand + Oversat Queue (pcu)	Mean Max Queue (pcu)
Network: Shenfield	**-**	**-**	**0**	**0**	**0**	**12.6**	**5.5**	**0.0**	**18.1**	**-**	**-**	**-**	**-**
A1023 Chelmsford Rd_Hutton Rd_Shenfield Rd	**-**	**-**	**0**	**0**	**0**	**12.6**	**5.5**	**0.0**	**18.1**	**-**	**-**	**-**	**-**
1/1+1/2	668	668	-	-	-	5.5	1.9	-	7.4	39.9	9.0	1.9	10.9
2/1+2/2	384	384	-	-	-	1.9	1.0	-	2.8	26.4	6.2	1.0	7.2
3/1+3/2	1005	1005	-	-	-	5.2	2.0	-	7.3	26.1	18.1	2.0	20.1
4/1	825	825	-	-	-	0.0	0.4	-	0.4	1.6	0.0	0.4	0.4
5/1	331	331	-	-	-	0.0	0.1	-	0.1	1.1	0.0	0.1	0.1
6/1	544	544	-	-	-	0.0	0.2	-	0.2	1.3	0.0	0.2	0.2
6/2	357	357	-	-	-	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
Ped Link: P1	0	0	-	-	-	-	-	-	-	-	-	-	-
Ped Link: P2	0	0	-	-	-	-	-	-	-	-	-	-	-

C1 PRC for Signalled Lanes (%): 11.2 Total Delay for Signalled Lanes (pcuHr): 17.48 Cycle Time (s): 132
PRC Over All Lanes (%): 11.2 Total Delay Over All Lanes(pcuHr): 18.15

Brentwood Borough Council

By email only

Date: 1st November 2023

FAO Kathryn Williams

Application Reference: 23/01164/FUL
Site: Land North Of Shenfield Alexander Lane Shenfield Essex
Proposal: Hybrid planning application for 344 units including 35% affordable housing, safeguarded land for a 2FE primary school and early years facility, public open space and associated landscaping, drainage and highways infrastructure.
Sport England Reference: PA/23/E/BRN/66026

Thank you for consulting Sport England on the above application.

Sport England's Position

An **objection** is made to the proposals for community sports facility provision to meet the needs of the proposed development in its current form due to the lack of confirmed proposals. This position would be reviewed if it was proposed that appropriate financial contributions would be made towards off-site indoor and outdoor sports facility provision, secured through a planning obligation or CIL, as set out in this response.

Sport England – Non Statutory Role and Policy

The Government, within their Planning Practice Guidance (Open Space, Sports and Recreation Facilities Section) advises Local Planning Authorities to consult Sport England on a wide range of applications. https://www.gov.uk/guidance/open-space-sports-and-recreation-facilities-public-rights-of-way-and-local-green-space. This application falls within the scope of the above guidance as it relates to a development of more than 300 dwellings.

Sport England assesses this type of application in line with its planning objectives and with the National Planning Policy Framework (NPPF). Sport England's planning objectives are to PROTECT existing facilities, ENHANCE the quality, accessibility and management of existing facilities, and to PROVIDE new facilities to meet demand. Sport England's Planning for Sport guidance can be found here: https://www.sportengland.org/facilities-and-planning/planning-for-sport/planning-for-sport-guidance/

The Proposal and Assessment against Sport England's Objectives and the NPPF

Community Sports Facility Provision

Introduction

The proposal is a hybrid planning application for a residential led development of 344 dwellings on part of the Land North of Shenfield allocated in Policy R03 in the adopted Brentwood Local Plan. The population of the proposed development is estimated to be around 826 if a typical residential occupancy of 2.4 persons per dwelling is applied. This additional population will generate additional demand for sports facilities. If this demand is not adequately met then it may place additional pressure on existing sports facilities, thereby creating or exacerbating deficiencies in facility provision. In accordance with the NPPF, Sport England seeks to ensure that the development meets any new community sports facility needs arising as a result of the development.

The development makes provision for a range of open space including amenity green space, children's play and natural/semi-natural space but there would not be any formal outdoor sports facilities proposed within the development. In this context, I would wish to make the following comments on the community sports provision aspects of the planning application.

Evidence Base and Policy Context

The evidence base for community sport and local planning policy context can be summarised as follows:

- The adopted Brentwood Local Plan (2011-2031) includes policy NE05 which includes a requirement for development to maximise opportunities to incorporate new publicly accessible, high quality and multi-functional open space and/or where appropriate, enhance existing provision that will serve the new and existing community through high quality sport, play and recreational amenities. The policy goes on to advise that the amount and type of provision will be determined according to the Council's identified needs as set out in its Playing Pitch Strategy. The Council is currently preparing a Planning Obligations SPD that will provide detailed guidance on the approach to sports provision in new development to support the implementation of policy NE05. The SPD may be adopted before this application is determined;
- Brentwood Borough Council's Playing Pitch Strategy and Built Sports Facility Strategy https://www.brentwood.gov.uk/-/leisure-strategy collectively provide a robust evidence base for community outdoor and indoor sports facilities in Brentwood Borough and both strategies identify a range of existing and future deficiencies in facility provision and the strategies

accounted for the projected population growth arising from allocations in the Local Plan when assessing future facility needs.

In view of the local planning policy and evidence base context, it is considered that in accordance with Government policy in paragraph 98 of the NPPF, a robust local basis exists for justifying the provision of outdoor and indoor community sports facility provision to be made by this development proposal.

Formal Sports Provision

No on-site proposals are made for dedicated outdoor sports facility provision with the focus being on open space provision for informal recreation and children's play. No reference is made in the Planning Statement to making off-site provision for community sports facility provision that would be secured through a planning obligation.

As recommended in the Council's Playing Pitch Strategy, Sport England's Playing Pitch Calculator for calculating the demand generated for playing pitches and estimating financial contributions and this is the current industry standard approach used by most local authorities for calculating playing pitch provision in new development. Team data from the latest update of Brentwood Borough Council's Playing Pitch Strategy is applied to the Playing Pitch Calculator which can then assess the demand generated in playing pitch equivalents (and the associated capital costs of delivery) by the population generated in a new residential development. I have used the calculator for estimating the demand generated by the estimated population of the development (826) and I append an EXCEL spreadsheet which provides the full data. The spreadsheet (see Output tab) sets out the demand generated for adult football pitches, youth football pitches, mini soccer pitches, rugby union pitches, cricket pitches, artificial sand based grass pitches (hockey) and artificial 3G grass pitches (football training). The spreadsheet also estimates the total demand generated for associated changing room provision to support the use of this pitch demand for each sport. It is apparent from the calculator outputs that the development would not generate sufficient demand to justify on-site playing pitch provision as there would be insufficient demand for any of the pitch types to justify an entire pitch. Furthermore, in practice it would not be desirable from an operational perspective to provide small single pitch sites that are difficult to maintain and less responsive to user needs. A financial contribution being secured towards off-site provision in the Brentwood area would therefore be considered appropriate on this occasion rather than on-site provision as part of the development. Consideration should be given by the Council to using the figures from the Playing Pitch Calculator as a starting point for informing the level of a financial contribution. Advice should be obtained from Brentwood Borough Council on appropriate projects for using the financial contributions.

As indoor sports facilities are strategic facilities that serve large populations and as the population generated by the proposed development in isolation would not be sufficient to justify the provision of a conventional facility on-site (see appended Sports Facility Calculator figures), it is considered that off-site provision in the form of a financial contribution secured through CIL or a planning obligation towards the provision or improvement of off-site facilities would be the most suitable form of provision on this occasion. Sport England's established Sports Facilities Calculator (SFC) https://www.sportengland.org/facilities-and-planning/planning-for-sport/planning-tools-and-guidance/ can help to provide an indication of the likely demand that will be generated by a development for certain facility types. The appended WORD document provides detail of the calculations for a population of 826 people in Brentwood. Consideration should be given by the Council to using the figures from the Sports Facility Calculator for informing the level of a financial contribution if a planning obligation is secured.

Conclusion

If the principle of all formal sports facility provision being made off-site is considered acceptable to the Borough Council, the inclusion of financial contributions towards off-site sports provision would be welcomed. However, as there are no confirmed proposals at this stage for meeting the development's formal outdoor or indoor sports facility needs, an **objection** is made to the planning application in its current form. However, I would be willing to withdraw this objection in due course if it is confirmed that appropriate financial contributions, secured through a planning obligation (in accordance with the Planning Obligations SPD) and/or CIL, will be made towards the provision of indoor and outdoor sports facilities.

Active Design

Sport England, supported by Active Travel England and the Office for Health Improvement and Disparities, has produced 'Active Design' (2023) https://www.sportengland.org/guidance-and-support/facilities-and-planning/design-and-cost-guidance/active-design, a guide to planning new developments that create the right environment to help people get more active. The guidance sets out ten key principles for ensuring new developments incorporate opportunities for people to take part in sport and physical activity. The Active Design principles are aimed at contributing towards the Government's desire for the planning system to promote healthy communities through good urban design which is consistent with section 8 of the NPPF. The guidance is particularly applicable for major new residential developments such as this. It should also be noted that the Essex Design Guide https://www.essexdesignguide.co.uk/ has embedded the Active Design principles into guide.

Advisory comments on how the Active Design principles could be applied to the

proposed development were provided to the Borough Council at the pre-application stage for consideration by the applicant when the plans were being finalised.

If this application is to be presented to a Planning Committee, we would like to be notified in advance of the publication of any committee agendas, report(s) and committee date(s). We would be grateful if you would advise us of the outcome of the application by sending us a copy of the decision notice.

If you would like any further information or advice please contact me.

Yours sincerely,

Roy Warren
Planning Manager

E: roy.warren@sportengland.org
T: 07769 741137

Tracey Balcombe

From: Devcon Team <devcon.team@thameswater.co.uk>
Sent: 19 October 2023 11:15
To: Planning Team, Brentwood Borough Council
Subject: RE: Planning Consultation 23/01164/FUL

Categories: Malik

Good Morning,

Thank you for consulting Thames Water on this planning application. Having reviewed the details, we have no comments to make because this does not fall within Thames Water area.

Kind Regards,

Saira Irshad
Development Database Administrator
Tel: 0203 577 9956
devcon.team@thameswater.co.uk

Maple Lodge STW, Denham Way, Rickmansworth, WD3 9SQ

-----Original Message-----
From: planning@brentwood.gov.uk <planning@brentwood.gov.uk>
Sent: 18 October 2023 10:54
To: Devcon Team <devcon.team@thameswater.co.uk>
Subject: Planning Consultation 23/01164/FUL

Please see attached consultation letter
.

Place Services
Essex County Council
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Essex, CM1 1QH
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Kathryn Williams
Managing Director
Kew Planning on behalf of
Brentwood Borough Council
Brentwood
Essex
CM18 8AY

12/04/2024

Dear Kathryn,

Ref: 23/01164/FUL – Hybrid application for 344no units and outline for safeguarded land for a 2FE Primary School with Early Years, Land North of Chelmsford Road, Shenfield – CROUDACE (R03)

Thank you for re- consulting us on the Hybrid application for the above proposed development.

Our response follows letters written on 16th November 2023 (first consultation- application) and pre-application consultations on 9th March and 26th July 2023.

The architecture of the most prominent character areas is positive, and where house types have been adapted by the architects to be contemporary, these have become exemplary.

- The Primary Street (Boulevard) still lacks an organic flow as recommended by the EQRP.
- The East-West pedestrian connection is a missed opportunity.
- While most of the Primary Street has a uniform building line, there are elements to the south which require review.
- The landscaping of the School Plaza requires further review to allow more space for meeting and flexibility.
- The rear elevations of the apartments lack interest active frontage and appear rather repetitive. We consider this could easily be resolved.
- The standard house types in the less prominent areas need reviewing for quality. Issues include misaligned windows, weatherboard or render only on the upper storey, overly horizontal elevations, and weatherboarding not continuing around the corner.

Subject to the resolving the above issues, we would be prepared to support the scheme.

The following Urban Design comments are based on the current Masterplan, Drawings, Design and Access Statement and other associated documents.

Policy Background

The National Planning Policy Framework Section 12 requires that developments:

- Function well
- Are visually attractive as a result of good architecture, layout and appropriate landscaping.

- Are sympathetic to local character, including the historic built character, while not preventing increased densities.
- Create a strong sense of place through definition of streets and distinctive forms.
- Optimise the potential of the site to create an appropriate amount and mix of development.
- Create places that are safe, inclusive and accessible.
- Are consistent with the principles set out in the National Design Guide.

Locally, the site in question is an allocated site in the Brentwood Local Plan, 2022, under Policy R03 - Land North of Shenfield. The Policy stipulates that development should provide 825 new homes (in total), around 2.1 hectares of land for a co-located primary school and early years and childcare nursery, around 60-bed residential care home or an appropriate mix of specialist accommodation to meet identified needs, in accordance with policy HP04, 5% self-build and custom build across the entire allocation areas, and around 2ha of land for employment purposes which may include light industrial, offices, research and development (within Class E) or other sui generis employment uses which are compatible with the residential development.

The policy also lists a set of development principles which are expected from any planning application submission.

The policy requires development:

a. *To be accompanied by a comprehensive masterplan and phasing strategy to inform detailed proposal as they come forward.*
b. *Be of a design quality and layout that reflects its key gateway location, particularly the land near to junction 12, A12*
c. *Provide vehicular access via Chelmsford Road (A1023) and Alexander Lane;*
d. *Allow, if possible, for the diversion of Alexander Lane to create a quiet lane for pedestrians and cyclists, with the provision for new and improved route through the development site linking to Chelmsford Road;*
e. *Enhance walking, cycling and public transport services with Shenfield station and local services and facilities in the wider area, including Brentwood Town Centre;*
f. *Provide well-connected internal road layouts which allow for good accessibility*
g. *Provide new multi-functional green infrastructure including public open space in accordance with Policies NE02 and NE05;*
h. *Maintain and enhance Public Rights of Way within the site and to the wider area;*
i. *Protect and where appropriate enhance the Local Wildlife Site (Arnold's Wood).*
j. *Provide for appropriate landscaping and buffers along sensitive boundaries adjoining the A12 and railway line.*

And.

k. *Be designed to ensure a coherent functional relationship with the existing development, which should be well integrated into the layout of the overall masterplan.*

Our comments are laid out in the following sections:

Layout & Connectivity

The relevant sections from the NDG are:

- Sections M1 and M2 encourage a connected network of streets for all forms of travel including walking and cycling.
- M3 encourages well considered parking, and servicing which is convenient but does not undermine the streetscape.
- B3 encourages destinations in accessible locations for people to share spaces and come together as a community.
- P1 encourages well located, attractive and high- quality public spaces.

- P2 encourages proposals that produce safe and secure public spaces through the definition of spaces by buildings, active frontages, and natural surveillance.
- U1 encourages developments which promote social inclusivity through removal of potential barriers to and encouraging accessibility.
- The NDG Section N1 encourages the provision of a network of high-quality green open spaces which addresses the wider context, how spaces are connected, contributes to green infrastructure, has well integrated drainage, encourages biodiversity, and has the ability to support a range of activities such as learning and play.

The proposed overall layout remains **largely the same as previously reviewed.** We would therefore refer you back to the previous letter where a number of our comments have not been addressed. In particular, we would raise the following:

- There is a missed opportunity to provide a coherent pedestrian and cycle route connecting with the Redrow parcels as shown on P4 of the DAS.
- The route in practice lacks connectivity:

    - Across the mini roundabout where the north-south cycle route from the southern part of the site it does not appear to connect with the east west route towards the Redrow parcel. We would question why the mini-roundabout is necessary here and whether a crossing can be proposed which connects the shared pedestrian/cycle path on each side of the road at this junction, to ensure cyclists do not have to navigate planted verge.
    - While the diagram on p4 is flowing, there is a difficult to navigate set of right angles across the junction to connect with the cycle path heading east. We note that our suggestion for a more direct route, which takes advantage adjacency to existing and enhanced landscaping and avoids this right angle has not been taken. We regard this as a missed opportunity:

- Such an opportunity could have included an upgraded footpath adjacent to plots 173 and 180 which would have allowed a high-quality landscaped cycle route which is not continuously interrupted by parking crossovers along this section. It would also enhance permeability between plots 241 and 277 where an unnecessarily long diversion would currently need to be taken past plots 284, 185 and 243. The opportunity is also missed to connect a green finger from Arnold's Wood into the heart of the scheme with the associated benefits to biodiversity enhancement.

- Failing this, is it necessary for the cycle footpath to navigate all the way up to plot 95 before abruptly turning south past 149, when a cycle route could easily be incorporated on the other side of the street opposite plots 149 to 162 (and alongside plots 174 to 179)?
- There is final series of 90 degree turns at plot 162 and overall, it is considered that the pedestrian/ cycle route fails to flow in the manner originally envisaged and that this will have an effect on the connection between the parcels and the uptake of active travel.
- While we welcome the vehicular connection between plots 158 to 159 which increases permeability and reduces unnecessary vehicular movement, this has been at the expense of a short section of landscaped footpath.
- It is further considered that the opportunity has not been taken to move plots 131 and 132 to the predominant building line now that the turning head is no longer required. It is considered that a slight shuffling of dwellings would allow parking down the side of these plots while reducing vehicle dominance. As its stands, we remain concerned that the rear garden wall to plot 158 is exposed, reducing the opportunity for active frontage, with associated safety and security concerns and that this short section is overly vehicle dominant.
- Finally, we remain concerned that the plots 173 and 180 are not sufficient to provide active frontage to the path and the tree belt. This was raised at pre-app but has not yet been addressed. We would welcome additional properties along this run to provide a safer and more secure pedestrian experience, and to encourage more active travel.

Character

- NDG section C1 calls for designs which understand and relate well to local built environment character, views, layout, form, scale and appearance.
- C1 encourages development which responds well to local context, landscape character, views inwards and outwards and landform. It therefore encourages design that understands landscape character and how places and developments can sit within the landscape.
- C2 encourages well- designed places which are positively influenced by the history and the heritage of the context.
- I1 encourages buildings which respond well to local character and identity through appreciation of existing built form, height scale, massing and relationships between buildings. This includes the scale and proportions of proposals, façade design, patterns and proportions of fenestration and their details.
- I3 encourages the siting of buildings within the landscape, the arrangement of layout and grain, landscape spaces, movement network, development blocks, scale, form, proportions and materials to create distinct characters and a memorable sense of place.
- Section B encourages the use of height, density and arrangement of buildings to create destinations, increased legibility, and proposals that are proportionate to the spaces they overlook while being sensitive to the existing landscape and built form context.

We have the following comments arranged by character area which offer more detail on our previous letter:

The Western Gateway

- We applaud the character of the western gateway which avoids frontage parking, turns the corner with active frontage, at an appropriate three storey height, provides large generous balconies and individual expression of dwellings with the use of expressed gables.
- The detailing of this has a strong potential with simple robust brickwork detailing, either balconies being recessed into the brickwork or cladding of framing to the balconies.
- We would question the materiality of the balcony frames as they have a potential to be detailed in copper which would add an appropriate height to complement the modulation of scale from two storey to three storey.
- We consider that the profiled brick panel to the gable has potential, and we would welcome a detail on this via a condition.
- However, we consider that there is more opportunity to highlight the entrances which are somewhat underplayed. We would strongly suggest the adoption of a porch/canopy similarly designed to the apartment balcony frames or porches to the houses to add to legibility, signify each entrance, and to provide shelter from the rain.
- We also note the poor quality of active frontage to the rear the apartments which is undermining the security of the carpark will reduce the use of the rear landscaped courtyard.
- The 3D view on p21 of the DAS should be revised accordingly.
- We would recommend more activation of the rear courtyard with the provision of bathroom windows if the bathrooms stay adjacent to the outside wall, or preferably both bedroom widows with one as a balcony (or terrace at the ground floor). It is currently considered that not enough active frontage is present, these elevations lack character, and there is not enough interaction with the courtyard with balconies and terraces.
- Although overlooking of the adjacent planning application ref 22/00453/FUL is a potential issue, it is still considered that there should be a way of activating the eastern end elevation of the apartment block to terminate views from the west along Chelmsford Road.
- For example, the use of a copper clad oriel bay window projecting the first and second floor kitchens out over the bin cycle store with views only to the street and to the court, would avoid any direct views across the adjacent propsoed rear gardens of the houses.
- We note that although the parking is well hidden in a rear parking court, this is not well observed by the terraced housing (plots 19 to 24) and therefore is potentially insecure and may not be fully used, opening up the risk that residents will park in the street.
- One way out of this would be to introduce coach houses to the rear parking court to provide an element of overlooking or to provided key fob operated gated access at the entrance to ensure only those people using parking court are allowed in.

School Plaza Area

- We commend the design of the housing to the west of the school plaza with appropriately generous strongly proportioned windows grouped together on two storeys above a well-defined entrance base with canopies over.
- Equally encouraging is the language of brick expressed gables with profiled brick panels featuring enhanced detailing. Overall, it is considered that this architecture has an appropriate mix of horizontal and vertical.
- Plot 25 is particularly successful in turning the corner between the entrance gateway and plaza with the entrance plenty of active frontage to the former, and enhanced detailing to the latter including a bay window and profiled brick panel to the gable.
- We look forward to the detailing of this gateway in terms of materiality under condition.
- However, three lines of tandem parking between dwellings is not acceptable here, so close to the school, as it undermines the connection of the buildings to the Plaza and give the appearance of being unsafe for children.
- Of particular concern is the parking immediately adjacent to the school boundary.

- It is considered that a minor revision to the dwelling by detaching two of them will resolve this- see below:

- Trees and benches interrupt the space restricting the use of the plaza for socialising by parents and children, and reducing flexibility for other uses such as market stalls.
- Instead, we would prefer an approach where trees and benches are used to define the edges of the space, with the trees naturally also providing shelter to the benches. This would allow an enhanced space in the centre for a flexible use.
- The southern courtyard apartments provide rear courtyard parking appropriately faced up by coach houses to allow active frontage over the landscaped green space. It is considered that this approach adequately disguises the carparking within a perimeter block.
- We would question whether bins stores are an appropriate way of marking the vehicular entrance to this parking courtyard and whether they could be incorporated close to the main entrance replacing one of the cycle stores.
- It would appear that in order to provide enough parking, too much has been sacrificed in terms of ground floor active frontage of block B and we would welcome a rearrangement of the ground floor to add in an apartment running to edge of the courtyard entrance in place of the refuse store and one of the cycle stores, and whether parking bays 34 and 36 could be pulled south to accommodate this.
- The architecture to the front elevation of block B, D &E is well considered an appropriate and we look forward to investigating the detailing through condition.
- However, the rear elevations are too repetitive and need reconsideration. While it is understood that privacy to the coach houses may be an issue, it seems a missed opportunity to present a bathroom window to the rear courtyard of plots 36 and 40, where this space could be used by bedroom 2 and therefore allow for a more generous window. We would therefore recommend swapping the bathroom with bedroom 2 on the first and second floors.
- We would question whether there is sufficient kitchen space in plots 37 &41.
- We also note a clash between the internal and window in bedroom 2. We would therefore question whether a run of three narrow windows is appropriate here or whether a more generous bedroom 1 and a narrower bedroom 2 window in a balanced composition may be more workable.
- Block C appears to have north facing single aspect apartments which will be poorly lit and ventilated and an overly long corridor creating a repetitive courtyard elevation which is not considered up to the standard of the front elevation. A second stair core would allow the

excessive corridor to be eliminated in favour of dual aspect apartments either side of each core increasing the net saleable area and allowing the front and rear elevations to be enlivened.
- The architectural design of public elevations to blocks D&E is strong. We were unable to source the rear courtyard elevations but would question whether larger more generous windows could be added to the living areas of the end apartments of block D to help turn the corners and enliven the rear elevations.

School Carpark Entrance

- We note that the carpark has been shifted over slightly away from the school, which we welcome.
- However, this now sets an overly long route from the access between plots 74 and 76. In addition it is noted that there is only active frontage to one side of the street by coach houses and that the rear gardens to plots 19 to 24 are therefore exposed, leading to the perception of lack of safety and security, and maintenance issues to the rear boundary.
- It is considered that a rearrangement of this area to line both sides of the street with housing or coach houses would make this access much more pleasant.
- We commend the design of the coach houses which by being of a contrasting buff brick with presumably copper clad expressed gabled entrances help signify the carpark entrance and add to legibility. We would recommend the dwellings covering the back gardens to plots 71 to 74 are similarly treated.

Primary Streets (Green Streets)

- Whilst we welcome the banishing of frontage parking and stepped frontage from the main street running east-west, we would request that page 36 of the DAS be updated accordingly. This historic image highlights how far this street has developed as blank sides of dwellings are no longer prominent.
- However, this coherence in building line appears to break down in the southern parcel where frontage parking once again reemerges at plots 336 to 338 – this adds to vehicle dominance, exposes the side elevation of plot 335 and the rear garden wall to plot 339. Overall, it is considered that the building line from plot 325 to 339 lacks coherence and is rather ragged. We would encourage a stronger, more consistent building line here.
- We would also welcome more formality in terms of a more continuous building line across the scheme along the Primary Street to further signify their status at the top of the route hierarchy. This could be achieved through linking cart lodges or even bridging over parking with additional bedrooms- for example consider the diagram at 3.73 of the Essex Design Guide Design Details.
- We remain concerned about the frequency of repetitive vehicle crossovers to the cycle route across the primary streets and question whether some well- observed rear parking courts could be incorporated to help reduce them.

Southern Gateway

- We welcome the well- defined building line, the continuation of that line from the Stonebond Parcel next door, the modulation up in scale form two storeys to three storeys either side of the entrance, framing of the entrance and the definition of both aspects to both corners with active frontage.
- We also welcome the architectural approach which is detailed on elevation H-H as we assume that the DAS requires revision.
- It is considered that the weatherboarded expressed gables are an appropriate reference to the more rural setting, while the backdrop of brickwork indicates that the character changes to a more urban feel within the parcel.
- The stepping up in scale from the rural context appears to be well considered with 2 storeys reflecting the prevailing context and three storeys signifying the entrance to the site.
- The vertical proportions of the generously sized windows are considered appropriate. Parking is kept out of sight through well observed parking courtyard through intelligent use of coach houses.

Northern Gateway

- This is low key and the composition works reasonably well as a street scene but contains houses types which have flaws addressed in the comments below.

House types and Materiality

The relevant sections from the NDG are:

- I1 encourages buildings which respond well to local character and identity through appreciation of existing built form, height scale, massing and relationships between buildings. This includes the scale and proportions of proposals, façade design, patterns and proportions of fenestration and their details.
- I3 encourages the siting of buildings within the landscape, the arrangement of layout and grain, landscape spaces, movement network, development blocks, scale, form, proportions, and materials to create distinct characters and a memorable sense of place.
- Section B encourages the use of height, density, and arrangement of buildings to create destinations, increased legibility, and proposals that are proportionate to the spaces they overlook while being sensitive to the existing landscape and built form context.
- B1 encourages a compact form of development.
- B2 encourages well defined streets with consistent building lines, heights related to street widths, and plenty of active frontage consistent with local character.

There are some remarkably good contemporary house types on this scheme which are clearly adaptions of standard house types which have been greatly improved. This a credit the architects. While it is understood that that there has been a reversion to more standard product in less prominent areas, it is considered that the quality has tailed off considerably. The following issues arise:

- Misalignment of windows to house type variant B2009M- there appears to be no reason why the bedroom window could not be aligned with the living room below and a smaller window added to align with the front door.
- A similar issue appears at S4023M.
- A number of properties appear to have weatherboarding on the top floor and brick on the ground floor, giving an inappropriately horizontal feel. It is considered that weatherboard, while welcome to provide legibility, should be dressed down to a defined brickwork plinth to provide simplicity in the elevations.

- Conversely the S3022M VARIANT 6 can be applauded for adopting the above suggested detail with weatherboarding dressed down to a plinth level, but somewhat inexplicably this stops at the corner, meaning it fails to address it properly. We would suggest the weatherboarding is continued to include the corner expressed gable.
- What happened to the windows on the first-floor side elevation of S4028M Variant 5? This does the side elevation no favours.
- The G4031M has an overly horizontally propositioned windows and a cumbersome brickwork porch which does the composition no favours.
- More generous, taller, squarer windows on the ground floor lighting the living room and the study will help together with less wide, squarer windows to bedrooms 1 and 4.
- Could the front door be pulled back onto the man building line and a lightweight flat roof porch be instead utilised?
- The S3019M has a much better composition to the front elevation and the lessons learnt could be applied to the G4031M. This property also turns the corner well.

Conclusion

In conclusion, the architecture of the most prominent character areas is positive, and where house types have been adapted by the architects to be contemporary, these have become exemplary.

However, there are still a number of remaining issues which we encourage to be resolved:

- The Primary Street (Boulevard) still lacks an organic flow as recommended by the EQRP.
- The East-West pedestrian connection is a missed opportunity.
- While most of the Primary Street has a uniform building line, there are elements to the south which require review.
- We would welcome more continuous building frontage and less vehicle crossovers across the cycle path- we have made suggests as to how to achieve this.
- The landscaping of the School Plaza requires further review to allow more space for meeting and flexibility.
- The rear elevations of the apartments lack interest active frontage and appear rather repetitive. We consider this could easily be resolved.
- The standard house types in the less prominent areas need reviewing for quality. Issues include misaligned windows, weatherboard or render only on the upper storey, overly horizontal elevations, and weatherboarding not continuing around the corner.
- We would appreciate a condition be drafted on materiality.

Subject to the resolving the above issues, we would be prepared to support the scheme.

Should you wish to discuss any of these comments, please do not hesitate to contact us.

Yours Sincerely,

Jason Yates BA (Hons), PgDip, RIBA, RTPI (licentiate)
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Kathryn Williams
Managing Director
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CM18 8AY

22/05/2024

Dear Kathryn,

Ref: 23/01164/FUL – Hybrid application for 344no units and outline for safeguarded land for a 2FE Primary School with Early Years, Land North of Chelmsford Road, Shenfield – CROUDACE (R03)

Thank you for re- consulting us on the Hybrid application for the above proposed development.

Our response follows previous consultation letters written on 12th April and 16th November 2023 and pre-application consultation letters on 9th March and 26th July 2023.

The architecture of the most prominent character areas is positive, and where house types have been adapted by the architects to be contemporary, these have become exemplary.

Subject to the resolving the below issues, we would be prepared to support the scheme.

- Confirmation of secured gated access to overcoming safety and security issues.
- More detail around the school plaza landscaping to provide increased definition.
- Addition of plots to provide active frontage and overlook the path and tree belt between plots 173 and 180.
- Removal of single aspect apartments to block C.
- Confirmation that all windows will be aligned.
- Revision of house type S4028M Variant 5 to introduce active frontage on the first floor and to produce a well-balanced elevation on the gable.
- Revision of housetype G4031M to produce a less dominant porch and full height render or weatherboard.
- Revision of the DAS to bring it up to date.

The following Urban Design comments are based on the current Masterplan, Drawings, Design and Access Statement and other associated documents.

Policy Background

The National Planning Policy Framework Section 12 requires that developments:

- Function well
- Are visually attractive as a result of good architecture, layout and appropriate landscaping.
- Are sympathetic to local character, including the historic built character, while not preventing increased densities.
- Create a strong sense of place through definition of streets and distinctive forms.
- Optimise the potential of the site to create an appropriate amount and mix of development.
- Create places that are safe, inclusive and accessible.
- Are consistent with the principles set out in the National Design Guide.

Locally, the site in question is an allocated site in the Brentwood Local Plan, 2022, under Policy R03 - Land North of Shenfield. The Policy stipulates that development should provide 825 new homes (in total), around 2.1 hectares of land for a co-located primary school and early years and childcare nursery, around 60-bed residential care home or an appropriate mix of specialist accommodation to meet identified needs, in accordance with policy HP04, 5% self-build and custom build across the entire allocation areas, and around 2ha of land for employment purposes which may include light industrial, offices, research and development (within Class E) or other sui generis employment uses which are compatible with the residential development.

The policy also lists a set of development principles which are expected from any planning application submission.

The policy requires development:

a. To be accompanied by a comprehensive masterplan and phasing strategy to inform detailed proposal as they come forward.
b. Be of a design quality and layout that reflects its key gateway location, particularly the land near to junction 12, A12
c. Provide vehicular access via Chelmsford Road (A1023) and Alexander Lane;
d. Allow, if possible, for the diversion of Alexander Lane to create a quiet lane for pedestrians and cyclists, with the provision for new and improved route through the development site linking to Chelmsford Road;
e. Enhance walking, cycling and public transport services with Shenfield station and local services and facilities in the wider area, including Brentwood Town Centre;
f. Provide well-connected internal road layouts which allow for good accessibility
g. Provide new multi-functional green infrastructure including public open space in accordance with Policies NE02 and NE05;
h. Maintain and enhance Public Rights of Way within the site and to the wider area;
i. Protect and where appropriate enhance the Local Wildlife Site (Arnold's Wood).
j. Provide for appropriate landscaping and buffers along sensitive boundaries adjoining the A12 and railway line.

And.

k. Be designed to ensure a coherent functional relationship with the existing development, which should be well integrated into the layout of the overall masterplan.

Our comments are laid out in the following sections:

Layout & Connectivity

The relevant sections from the NDG are:

- Sections M1 and M2 encourage a connected network of streets for all forms of travel including walking and cycling.
- M3 encourages well considered parking, and servicing which is convenient but does not undermine the streetscape.
- B3 encourages destinations in accessible locations for people to share spaces and come together as a community.
- P1 encourages well located, attractive and high- quality public spaces.
- P2 encourages proposals that produce safe and secure public spaces through the definition of spaces by buildings, active frontages, and natural surveillance.
- U1 encourages developments which promote social inclusivity through removal of potential barriers to and encouraging accessibility.
- The NDG Section N1 encourages the provision of a network of high-quality green open spaces which addresses the wider context, how spaces are connected, contributes to green infrastructure, has well integrated drainage, encourages biodiversity, and has the ability to support a range of activities such as learning and play.

There have been some minor alterations to the previously submitted layout with limited improvements.

- Unfortunately, there is a missed opportunity to provide a coherent pedestrian and cycle route connecting with the Redrow parcels as shown on P4 of the DAS which means that cyclists will need to negotiate unfortunate sharp 90 degree corners several locations and the opportunity to resolve this by providing a new route between plots 276 to 277 has been missed.

- However, pedestrian and cycle connectivity is present to the north and the south and therefore it is considered that although not perfect, this arrangement is acceptable in this instance.

- We commend the removal of the need for a turning head by Plots 132-133 and the increase in vehicle and pedestrian connectivity here.

- The discontinuity of the building line and the vehicle dominance of frontage parking by plots 131 to 132 is unfortunate, and there is a missed opportunity to move these lots forward.

However, as it is the only example in this which is away from the more public spine road, on balance it is considered acceptable.

- Finally, we remain concerned that the plots 173 and 180 are not sufficient to provide active frontage to the path and the tree belt. This was raised at pre-app but has not yet been addressed. We would welcome additional properties along this run to provide a safer and more secure pedestrian experience, and to encourage more active travel.

- We cannot accept the current arrangement as it stands as it is considered that it does not lend sufficient active frontage along this boundary and instead presents too much brick garden wall to this footpath which is also enclosed to south by a tree belt. This will lead to a perception of lack of safety and security, discouraging use of this path, and potentially meaning antisocial behaviour in this location and therefore this current layout cannot be supported.

Character

- NDG section C1 calls for designs which understand and relate well to local built environment character, views, layout, form, scale and appearance.
- C1 encourages development which responds well to local context, landscape character, views inwards and outwards and landform. It therefore encourages design that understands landscape character and how places and developments can sit within the landscape.
- C2 encourages well- designed places which are positively influenced by the history and the heritage of the context.
- I1 encourages buildings which respond well to local character and identity through appreciation of existing built form, height scale, massing and relationships between buildings. This includes the scale and proportions of proposals, façade design, patterns and proportions of fenestration and their details.
- I3 encourages the siting of buildings within the landscape, the arrangement of layout and grain, landscape spaces, movement network, development blocks, scale, form, proportions and materials to create distinct characters and a memorable sense of place.
- Section B encourages the use of height, density and arrangement of buildings to create destinations, increased legibility, and proposals that are proportionate to the spaces they overlook while being sensitive to the existing landscape and built form context.

We have the following comments arranged by character area which offer more detail on our previous letter:

The Western Gateway

- We applaud the character of the western gateway which avoids frontage parking, turns the corner with active frontage, at an appropriate three storey height, provides large generous balconies and individual expression of dwellings with the use of expressed gables.
- We note the applicant has revised block A to indicate copper clad framed two storey balconies and highlighted entrances thereby increasing legibility and adding an appropriate height to complement the modulation of scale from two storey to three storey. This is strongly supported.
- Unfortunately there has been no improvement to the poor quality of active frontage to the rear the apartments which is undermining the security of the carpark and the use of the rear landscaped courtyard.
- However, we understand that a key fob operated gate entrance will be added, to ensure that only residents have access, and subject to the provision of this, we consider the issue of safety and security at least to be sufficiently addressed.
- There is a missed opportunity to provide more activation of the rear courtyard with the provision of bathroom windows. It is currently considered that not enough active frontage is present, these elevations lack character, and there is not enough interaction with the courtyard with balconies and terraces.

School Plaza Area

- We commend the design of the housing to the west of the school plaza with: appropriately generous strongly proportioned windows, grouped together on two storeys above a well-defined entrance base with canopies over; brick expressed gables with profiled brick panels featuring enhanced detailing; and the way Plot 25 addresses the corner.
- We look forward to the detailing of this gateway in terms of materiality under condition.
- However, there is a missed opportunity to rearrange these dwellings to avoid three lines of tandem parking between dwellings and parking immediately adjacent to the school boundary as recommended in our previous letter.
- We therefore recommend secure gated access and increased landscaping to attempt to mask this issue.

- We fully support the removal the Tree/ bench feature which previously interrupt the plaza space. This should allow a more flexible space to be better used for socialising by parents and children, and for other uses such as market stalls.
- We require more detail regarding where trees, benches and planters can be used to define the edges of the space, with the trees naturally also providing shelter to the benches. This would allow an enhanced space in the centre for a flexible use. We presume this will follow.
- The southern courtyard apartments provide rear courtyard parking appropriately faced up by coach houses to allow active frontage over the landscaped green space. It is considered that this approach adequately disguises the carparking within a perimeter block.

Blocks B, D &E

- The architecture to the front elevation of block B, D &E is well considered an appropriate and we look forward to investigating the detailing through condition.

- We regard as a missed opportunity not to provide more active frontage to the ground floor of block B. However, the upper floors are do somewhat compensate for this.
- We would question whether there is sufficient kitchen space in plots 37 &41.
- We assume the clash between the internal wall and window in bedroom 2 is now resolved?

- Block C still appears to have north facing, single aspect apartments which will be poorly lit and ventilated and an overly long corridor creating a repetitive courtyard elevation which is not considered up to the standard of the front elevation. A second stair core would allow the excessive corridor to be eliminated in favour of dual aspect apartments either side of each core increasing the net saleable area and allowing the front and rear elevations to be enlivened. As these are affordable apartments, and tenure neutrality must be preserved, we consider that poorly lit and ventilated north facing internal spaces is unacceptable.

School Carpark Entrance

- We note that there is only active frontage to one side of the carpark access road by coach houses and that the rear gardens to plots 71 to 74 are therefore exposed, leading to the perception of lack of safety and security, and maintenance issues to the rear boundary.
- We still consider that a rearrangement of this area to line both sides of the street with shallow plan coach houses would make this access much more pleasant. This would necessitate moving the access street slightly north-east.
- However, as this only a short section of access road, other ways of overcoming this missed

- opportunity could be considered such as increased landscaping to the rear of plots 71 to 74.

Primary Streets (Green Streets)

- It is important that the spine street has a strong and coherent building line to signify its place in the route hierarchy and to add to legibility.
- However, the coherence in building line has still not been resolved in the southern parcel where frontage parking once again reemerges at plots 336 to 338 and the line becomes is rather ragged – this adds to vehicle dominance, exposes the side elevation of plot 335 and the rear garden wall to plot 339.
- Integral garage house types would be welcomed in less prominent parts of the scheme and some swapping of dwelling types is therefore required to resolve this point.
- A strong building line could be achieved through linking cart lodges or even bridging over parking with additional bedrooms- for example consider the diagram at 3.73 of the Essex Design Guide Design Details.
- Although we remain concerned about the frequency of repetitive vehicle crossovers to the cycle route across the primary streets, we do welcome efforts made by the applicant to reduce vehicle dominance by placing parking between dwellings.

Northern Gateway

- Although this is low key, and there is a missed opportunity to provide higher quality architecture here, the composition works reasonably well as a street scene.

House Types and Materiality

The relevant sections from the NDG are:

- I1 encourages buildings which respond well to local character and identity through appreciation of existing built form, height scale, massing and relationships between buildings. This includes the scale and proportions of proposals, façade design, patterns and proportions of fenestration and their details.
- I3 encourages the siting of buildings within the landscape, the arrangement of layout and grain, landscape spaces, movement network, development blocks, scale, form, proportions, and materials to create distinct characters and a memorable sense of place.
- Section B encourages the use of height, density, and arrangement of buildings to create destinations, increased legibility, and proposals that are proportionate to the spaces they overlook while being sensitive to the existing landscape and built form context.
- B1 encourages a compact form of development.
- B2 encourages well defined streets with consistent building lines, heights related to street widths, and plenty of active frontage consistent with local character.

There are some remarkably good contemporary house types on this scheme which are clearly adaptions of standard house types which have been greatly improved. This a credit the architects. While it is understood that that there has been a reversion to more standard product in less prominent areas, it is considered that the quality has tailed off considerably. The following issues arise:

- There are still no windows on the first-floor side elevation of S4028M Variant 5. One solution to this is to provide a single generous window central to the gable on each of the first and second floors and to allow for light into the other rooms using the other aspect. The current elevation is unacceptable.
- Misalignment of windows between floors should be avoided.
- There are still some properties appear to have weatherboarding on the top floor and brick on the ground floor, giving an inappropriately horizontal feel. It is considered that weatherboard, while welcome to provide legibility, should be dressed down to a defined brickwork plinth to provide simplicity in the elevations.
- The G4031M has an overly horizontally propositioned windows and a cumbersome brickwork porch which does the composition no favours. If a more lightweight porch and full height weatherboarding could be used, the proportion of the windows could be overlooked.

Conclusion

In conclusion, there have been some minor improvements since or last letter, particularly to the school plaza and the western gateway.

However the following revisions are still required:

- Confirmation of secured gated access to overcoming safety and security issues.
- More detail around the school plaza landscaping to provide increased definition.
- Addition of plots to provide active frontage and overlook the path and tree belt between plots 173 and 180.
- Removal of single aspect apartments to block C.
- Confirmation that all windows will be aligned.
- Revision of house type S4028M Variant 5 to introduce active frontage on the first floor and to produce a well-balanced elevation on the gable.
- Revision of housetype G4031M to produce a less dominant porch and full height render or weatherboard.
- Revision of the DAS to bring it up to date.

Subject to the resolving the above issues, we would be prepared to support the scheme.

Should you wish to discuss any of these comments, please do not hesitate to contact us.

Yours Sincerely,

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Our Ref: BRW/23/1164 and BRW/23/1159
Your Ref: 23/01164/FUL and 23/01159/OUT

9 February 2024

Dear Ms Abrosini,

Town and Country Planning Act (as amended) RE: 23/1164/FUL and 23/01159/OUT – Strategic Site R03, Officers' Meadows. Land North of Shenfield, Brentwood, Essex

Thank you for reconsulting Essex County Council (ECC) on the above planning applications. ECC provided an initial corporate response on 20 December 2023. Since then, ECC has been engaging with Brentwood Borough Council (BCC) colleagues and the applicant on outstanding matters, including education, employment, flood risk and drainage, minerals and waste, and sustainability, which has led in part to the revision and resubmission of the red line application ECC school site boundary. This response should be read in conjunction with ECC's initial responses.

The nature and scope of ECC's second corporate response to planning applications 23/01164/FUL and 23/01159/OUT addresses the following service areas:

1. **Education, Early Years and Childcare**
2. **Employment and Skills**
3. **Adult Community Learning**
4. **Flood Risk and Drainage**
5. **Minerals and Waste**
6. **Environment and Green Infrastructure**
7. **Climate Change and Planning Unit**

Please note that **ECC Highway comments will be submitted separately,** and this letter should be read in conjunction with the ECC Highways response which will be received by Brentwood Borough Council as part of the current consultation on the proposal.

Summary

ECC welcomes the opportunity to review and provide a second corporate response to the full and outline planning applications for Strategic Site R03 ' Officer's Meadows'. We have considered the application material and identified matters for further consideration, with recommended amendments, where appropriate.

At this stage, ECC continues to raise a **holding objection** to the planning applications, as proposed, based on:

1) Land Compliance – ECC requests that further information on the School Land Compliance Study (LCS) is provided, as it does not contain enough detailed information in its current form.
2) Amendments to the school design.
3) Noise and Mitigation.
4) Flood Risk and Drainage – ECC require more information regarding:
    - the drainage for the school site, in line with our requirements for an outline application.
    - The LLFA's preference is that all run-off should be restricted to the greenfield 1 in 1-year runoff rate (a single rate discharge) during all events up to and including the 1 in 100-year rainfall event with climate change.
    - A more detailed explanation is required for the surcharging in the system for a 1 in 2-year storm.
    - Please provide the half drain down times for S16, S44, S52 and S66 as these are omitted from the current modelling.
    - An updated drainage strategy should be provided.
5) Submission of a Mineral Supply Audit
6) Further Assessment on mitigation measures and/or contributions required to ensure there is no detrimental impact on the nearby Weald Country Park and Thorndon Country Park.
7) Climate Change – Submission of additional Energy Strategies to address Climate and Planning Unit comments.

1.0 Education, Early Years and Childcare

Education Land

In our initial response ECC stated that, the development proposals would result in the need for primary school places commensurate with circa half a standard 2FE Primary School, however it is not possible to construct at such a scale. In considering the planned development at the local planning stage, ECC in consultation with Brentwood Borough Council (BBC) confirmed the need for land to accommodate a new Primary School in this location. In order to ensure compliance with Reg 122, which requires the mitigation measures to be proportional to the impact of the development, ECC would expect the developer of this site to pass 50% of the land to ECC for a nominal fee of £1, in order to meet the needs of this application. ECC would seek to secure the remaining 50% of the land for the Primary School by paying the developer at a rate commensurate with education use value, this is currently c. £100,000 per ha in Essex, but would need to be confirmed in Brentwood. The agreement will set out ECCs standard requirements in relation to securing transfer of school land, including required notices, pre-transfer works, the timings in relation to the transfer, and in this instance the breakdown of the cost per ha.

ECC have had further correspondence with the applicant regarding the Education Land who are of the view that *"to comply with Reg 122, it is only the Croudace development that should be taken into account. Therefore, at 344 dwellings the proposed Croudace development is calculated to yield 82 primary pupils when the proposed mix of the application is applied. This equates to 0.39ha. As such, Croudace will provide this amount of land at a cost of £1 and the rest as potential expansion for the rest of R03 and the other strategic allocations (R04-R019). As a non-Green Belt site surrounded by housing, the land will also need to be notated, in the s106, as having potential for future residential use should the site not be required and taken up by ECC."*

We would like to highlight that it is unclear at 344 dwellings, what the unit mix consists of and how this equates to 82 pupils. Furthermore, this is only based on a 2FE Primary School on 2 ha of land and excludes the Early Years and Childcare Facility and land. ECC wishes to work positively with the applicant, and therefore it is agreed in principle provided that the land is sold as Education use value (as allocated in the Local Plan - Strategic Site R03, Officers' Meadows). Any future land use is a matter for BBC but at this stage it cannot be considered for potential residential use.

Primary School, Early Years and Childcare (EY&C) Land Compliance Study comments

ECC officers have reviewed the Land Compliance Study (LSC) submitted on behalf of the applicant and have concerns that it does not contain enough information in its current form. The Land Compliance Study is a technical document and is required to give a full picture of

the site in its current state and how the applicant is going to ensure it meets the site requirements. Please refer to Section 4 of the ECC Developers Guide 2023 which provides guidance on *'Land Compliance Requirement for New School Sites'* for further information.

In particular items in the LSC such as acoustics, topsoil, foundation, contamination, trees and ecology need to ensure they have been thoroughly investigated and dealt with by the developer and that there are no implications to the school site or construction of the school site.

Primary School, Early Years and Childcare (EY&C) Design comments

ECC has previously provided comments on the safeguarded land for the 2FE Primary School and Early Years and Childcare facility. Further comments on the design are provided below.

Buffer and Loss of School Land

The developer has submitted a revised straightened red line boundary option (drawing ref. 1643.120 Rev B Site Location Plan 2) on the northwest and southwest boundaries of the education site which are needed to avoid surveillance blackspots and reduce maintenance costs (fencing and grass cutting). ECC agree that the revised red line boundary around the school application site is acceptable in principle in order to straighten the boundary and avoid any trees, recognising that the school site area will be reduced by 0.081 ha. On this basis, it would be helpful if the developer can also provide an updated masterplan with the proposed new boundary.

For the purposes of maintenance access to the school, ECC request that the school site has a 2.4 metre high boundary fence around the entire school boundary area, including the provision of gates from the north and south, so the developer can enter the strips of their own land. This needs to work with the tree protection fence and not compromise the school security. The boundary fencing can be captured in the wording of the S106 and will be required to be installed before the land is transferred.

ECC Noise Criteria for School Site

In response to the applicant's comments regarding the noise criteria of ECC for the school, our original comments still stand and are not accepted as they do not meet the requirements. The school building and its location is not a mitigating factor and therefore this obligation is not met and does not meet the requirement for 55db LAeq (30min) across the whole site.

ECC do not build schools as indicatively shown on the current submitted plans. Set features of the masterplan such as the entrance plaza and main vehicular access will be compromised

as a result of the building forms ECC currently advocate. Furthermore, the setbacks shown to properties are unlikely to be delivered as a result, with it likely some form of built form (building or car park) on or near the boundary of at least some of the properties on the through road.

The school site is shown to be surrounded on almost all of its boundaries by residential gardens. Whilst there is no in principle objection to this, there is no landscaping shown on these boundaries, and therefore it is understood that a fence line is proposed. Laying out a pitch as shown on the submitted drawings, adjacent to the boundary with the residential development, may therefore give rise to the need for noise mitigation within the school grounds. To avoid this, it should be shown that the properties lining the school boundary have been assessed, from a worst-case scenario, in terms of noise levels potentially resulting from the school site and use with mitigation incorporated as appropriate (as part of the detailed residential application).

School Entrance Plaza

As proposed, it appears that the school site would be largely hidden and visually screened from the public realm. The success of the one point of interaction, at the plaza, as suggested above, remains uncertain. The rational of potentially seeking to position the plaza by the veteran tree is noted. However, given the school requirements in terms of maintaining a secure line, there is the potential for this rationale to be misplaced as the area and its appeal will be impacted through the siting of what will likely be a large amount of fencing.

Units 71-74 facing out on the plaza is poor, not only in terms of the character of this space but in terms of potential living condition/environment for occupiers of these properties - as effectively what the layout is saying is the whole pupil roll will be walking past these properties twice a day.

The plaza also has no western connectivity, such that unless pupils traverse the RPA of the veteran tree, they will need to cross the main through road to access a pavement to travel to the west. However, putting the acceptability of this aside, there is then no formal crossing further west to navigate back to the northern side of the road.

As previously commented upon, parking spaces directly abutting the school boundary must be avoided, in particular if they back on to the school fence-line such as with plot 33. The private access arrangements for plots 30 to 33 need to be physically controlled to prevent parents using the area for drop off. The installation of gates at the spine road end of the cul-de-sac are needed to control this and should be incorporated into the scheme, otherwise it could be unsafe, particularly for the school children. This forms part of the full/detailed application and therefore the applicant has the flexibility to amend the proposed site layout

design accordingly. It is also unacceptable to have 4 car parking spaces (parking space for plots 32 and 33) directly adjacent to the school site blowing car fumes into the site.

It is recommended that a condition is imposed to both applications requiring that a gate is provided in this location and that the final design must also avoid any vehicles being able to back up to the school boundary or pedestrianised public realm.

Visual Amenity

The applicant is reminded of ECCs comments regarding visual amenity and public safety. This could be enhanced if plots 30 to 33, along with plots 25 to 29, took vehicular access from the rear as part of a redesigned parking court for plots 18 to 24. It is recognised that this part of the proposed layout will need to be revised to accommodate the red line boundary changes to the school site. With this in mind, the changes to the school red line boundary represents an opportunity for the applicant to improve the design and layout of the full planning application. To prevent the loss of further residential units in this area, an alternative or possible option would be to substitute the houses for flats on this part of the detailed scheme.

School and Emergency Access

The road to the proposed school car park/the vehicular access to the site appears to have quite a wide and substantial pavement. This road is however serving just the school and two properties/garages (one for each property either side of the road). ECC questions the rationale for such a large pavement, on the full extent of the road, as there is no suggestion for this to also acting as a secondary pupil entrance. If the pavement was narrowed, this would likely seek to prevent this from becoming a prime parent drop off and collection point.

It is noted that the emergency and grounds maintenance access is not shown on the submitted drawing no. 22.1643.450P 'Proposed Site Layout Plan', and the applicant states the access will be provided between plots 101 and 104. In its current form, this looks like private driveways indicated on the image below. This matter should be discussed further and clarified with Essex Highways. This area must be a secure right of way with no maintenance costs or fees payable for use by the school.

2.0 Employment and Skills

Skills

ECCs initial response stated that we would seek to maximise employment and skills opportunities and recommend the inclusion of a condition or a requirement within the S106 Heads of Terms for the preparation of an Employment and Skills Plan. This Plan would formalise opportunities and ensure that the potential skills and employment opportunities are maximised for local residents.

In response to the applicants comments, ECC requests the inclusion of a condition or a requirement within the S106 Heads of Terms for the preparation of an Employment and Skills Plan as per the Developers' Guide 2023.

3.0 Adult Community Learning

Post 16 Learning

ECC in our initial corporate response did not request any Sixth Form financial provision as part of the current planning applications and therefore, no further action is required.

4.0 Flood Risk and Drainage

Lead Local Flood Authority Position

Having reviewed the applicant's response to Section 6.0 of the Single Response and the associated documents which accompanied the planning application, we wish to issue a **holding objection** to the granting of planning permission based on the following:

- We require more information regarding the drainage for the school site, in line with our requirements for an outline application. It is unclear whether additional attenuation is being provided within the school site. We also require further clarification as to whether the drainage for the school site will connect into the residential drainage network, and the associated flow rates. Please provide a preliminary drainage layout plan, storage calculations, greenfield runoff rate calculations and hydraulic modelling for the school site.
- The LLFA's preference is that all run-off should be restricted to the greenfield 1 in 1-year runoff rate (a single rate discharge) during all events up to and including the 1 in 100-year rainfall event with climate change. If it is shown that restricting to 2 the 1 in 1-year greenfield rate approach is not possible, then discharge rates can be limited to a range of equivalent greenfield discharge rates. However, if this alternative approach is used, then there should also be an inclusion of long-term storage (LTS). Therefore, it must be demonstrated that restricting to the greenfield 1:1 year rate is not feasible for this site. Furthermore, if the long-term storage approach is being used, it must be evidenced what LTS has been incorporated into the drainage design and the associated storage volumes. For more information please see: https://www.essexdesignguide.co.uk/suds/ratesand-storage/greenfield-runoff-rates/
- A more detailed explanation is required for the surcharging in the system for a 1 in 2-year storm. Please detail where the surcharging occurs in relation to the drainage plan, and whether this can be rectified. Sewer network design demonstrating no surcharging for the 1 in 1yr RP is in accordance with design best practice and in the majority of cases can be overcome.
- Please provide the half drain down times for S16, S44, S52 and S66 as these are omitted from the current modelling.

Whilst the below points have been taken on board by the developer, we would expect these accepted changes to be represented in an updated drainage strategy:

- The inclusion of permeable paving on all non-adoptable roads.

- Water butts fitted to all houses.
- Roof drainage to be connected to nearby pervious pavements.
- Updated MADD Factor of 1 (provision of updated hydraulic modelling).

We also have the following **advisory** comments:

- We strongly recommend looking at the Essex Green Infrastructure Strategy to ensure that the proposals are implementing multifunctional green/blue features effectively. The link can be found below. https://www.essex.gov.uk/protecting-environment
- Please note that the Environment Agency updated the peak rainfall climate change allowances on the 10 May 2022. planning application with outline approval are not required to adjust an already approved climate change allowance, however, wherever possible, in cases that do not have a finalised drainage strategy please endeavour to use the updated climate change figures Flood risk assessments: climate change allowances - GOV.UK (www.gov.uk)
- As the site is situated within a Critical Drainage Area (CDA), the LLFA welcomes the incorporation of permeable paving on all non-adoptable roads and that each dwelling will be fitted with a water butt.
- As parts of the site sit within fluvial flood zones 3 and 2, and as the proposed discharge location is to a Main River, the Environment Agency should be notified of the development proposals.
- Flood Alleviation
  As the site is located within a Critical Drainage Area (CDA), the LLFA has previously prepared a Surface Water Management Plan (SWMP) which looks at opportunities to prevent property flooding. The LLFA would welcome discussions with the developer to explore potential options regarding Flood Alleviation, which would provide benefits to the wider community. Therefore it is recommended that the developer liaise directly with the LLFA on this subject. Flood Alleviation Schemes are overseen by the Floods Team, who can be contacted on the following email address: Floods@essex.gov.uk

In the event that more information was supplied by the applicants then ECC may be in a position to withdraw its objection to the proposal once it has considered the additional clarification/details that are required. Any questions raised within this response should be directed to the applicant and the response should be provided to the LLFA for further consideration. If you are minded to approve the application contrary to this advice, we request that you contact us to allow further discussion and/or representations from us.

5.0 Minerals and Waste

In response to the applicant's comments, ECC have requested a Minerals Supply Audit be submitted on the basis of the recycling of construction materials on site. This is a requirement and has been provided by developers on similar sites such as this and should be addressed as a condition.

6.0 Environment and Green Infrastructure

ECC previously recommended that further consideration should be given on mitigation measures and/or contributions required to ensure there is no detrimental impact on the nearby Weald Country Park and Thorndon Country Park. The applicant has provided further comments and in response ECC would like to refer to the Ecological Appraisal dated September 2023 submitted with the planning applications.

The Ecological Appraisal, page 16 paragraph 3.1.3 does identify that Thorndon Country Park SSSI does sit within Natural England's Impact Risk Zone (IRZ), but then states that the IRZ does not apply to residential developments. Having looked at the guidance notes from Natural England on IRZ it does not mention the exemption of residential developments, only those developments with the potential to impact on coastal processes (page 6) and potentially "householder applications or applications in existing settlements/urban areas that do not impact on greenspace, farmland or semi natural habitats or landscape features such as trees, hedges, streams, rural buildings/structures " (Appendix 3, Page 8), but most types of developments are covered by the SSSI IRZ.
https://magic.defra.gov.uk/metadata_for_magic/sssi%20irz%20user%20guidance%20magic.pdf
It was unclear whether Natural England had been consulted on the Ecological Appraisal document. If they have, we are satisfied that the potential indirect impact on Thorndon and Weald Country Parks have been taken into account. However, the ECC GI Team agrees that the development is likely to have a greater impact on Hutton Country Park and Arnold's Wood ancient wood, and that the provision of public open spaces may reduce potential visitors to nearby Country Parks, but to recognise that a small majority may choose to travel 4.5 miles to other Country Parks, which may be more manageable indirect impacts.

The Ecological Appraisal identifies the close proximity of Hutton Country Park, but it does not link the proposals for the provision of public open/green spaces as a measure to potentially balance the possible increase in recreation pressure on Hutton Country Park and Arnold's Woods. These potential impacts have been considered and factored into the design of the

public open/green space to ensure multi-purpose and functional use. Therefore, future residents will probably use these sites more as a result of the management of these areas and accessibility from the development site.

It is noted that the Ecological Appraisal and the Outline Woodland Management Report for Arnold's Wood Ancient Woodland sets out a number of objectives and mitigation measures to inform a future Management Plan to safeguard Arnold's Wood during and after construction. Including a 15-meter buffer, measures to prevent potential runoff and pollution events during construction (e.g., waterborne pollution, air pollution, and dust deposits), and managing increased recreational use through natural barriers to manage access and a natural footpath to reduce soil compaction. The ECC GI Team supports the Outline Woodland Management Plan's objectives. This brings us back to the need to secure these measures through planning conditions as part of the LBMP and CEMP, during and after development, as well as the Planning Condition for the creation of a future Woodland Management Plan for long-term management.

7.0 Climate Change and Planning Unit

ECC welcomes the submission of additional Energy Strategies to address the Climate and Planning Unit initial response.

Conclusion

ECC is a key infrastructure and service provider with statutory responsibilities to ensure that the right infrastructure is delivered in the right place at the right time to support new and existing communities. ECC has carefully considered the information submitted in support of the hybrid and outline planning applications.

Please note that any Highway works/s106 contributions will be sent separately by ECC Highways.

Alongside the requested financial contributions, we are also recommending a number of changes or requesting submission of further information for assessment including but not limited to:

- Land Compliance Study - ECC requests that further information on the School Land Compliance Study (LCS) is provided, as it does not contain enough detailed information in its current form.

- Amendments to the school design.
- Noise and mitigation.
- Supplementary information to address flood risk.
- Further discussions with LLFA to consider options for Flood Alleviation.
- Submission of a Mineral Supply Audit.
- Further Assessment of the impact of the development on Weald and Thorndon Country Parks.
- Submission of additional Energy Strategy Assessments.

At this stage, ECC continues to raise a **holding objection** to the planning applications, as set out above.

I hope the above is of assistance – if you require further information on the contents of this single response, please contact Matthew Thomas (Growth and Development Manager) as detailed below.

Yours sincerely

Matthew Thomas
Growth and Development Manager
Essex County Council
E: growthanddevelopment@essex.gov.uk
W: www.essex.gov.uk

Hello Teresa,

UK Power Networks typically only reply to planning applications when they have an objection or wish to offer advice. As is allowed, where no response is sent , please assume we have nothing to say.

Thanks

Regards

Martin Graham
Business Support
Property and Consents Team at UK Power Networks

Please note that I do not routinely work on Fridays

13.11.23

Comments for Planning Application 23/01164/FUL

Application Summary

Application Number: 23/01164/FUL
Address: Land North Of Shenfield Alexander Lane Shenfield Essex
Proposal: Hybrid planning application for 344 units including 35% affordable housing, safeguarded land for a 2FE primary school and early years facility, public open space and associated landscaping, drainage and highways infrastructure.
Case Officer: Kathryn Williams

Customer Details

Name: Mr Robert West
Address: 229 Chelmsford Road, Shenfield, Brentwood, Essex CM15 8SA

Comment Details

Commenter Type: Neighbour
Stance: Customer objects to the Planning Application
Comment Reasons:
Comment:A lot more work remains to be done on assessing the flood risk in an area already prone to flooding. Building so many houses in such a confined space as planned is an ecological disaster waiting to happen. There also remains more evidence on traffic impacts. The application continues to be unconvincing, especially in the context of other applications in the immediate surrounding area. The application also appears to deviate significantly from the Brentwood Local Plan. The application is clearly not ready for consideration.
My views on this matter are also represented by the Chelmsford Road Area Residents Association.

Comments for Planning Application 23/01164/FUL

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Case Officer: Kathryn Williams

Customer Details

Name: Mrs Alison England
Address: 181 Chelmsford Road, Shenfield, Brentwood, Essex CM15 8SA

Comment Details

Commenter Type: Neighbour
Stance: Customer objects to the Planning Application
Comment Reasons:
Comment:My views are represented by the Chelmsford Road Area Residents Association.
We do not believe that there has been a cohesive approach to consider all of the new developments in this area in order to assess the full impact on the area.

Comments for Planning Application 23/01164/FUL

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Case Officer: Kathryn Williams

Customer Details

Name: Mr Christopher Powell
Address: 253 Chelmsford Road, Shenfield, Brentwood, Essex CM15 8SD

Comment Details

Commenter Type: Neighbour
Stance: Customer objects to the Planning Application
Comment Reasons:
Comment:The latest updates to the original submission do not provide any new proposals to address the main objections raised by residents and other consultees.

This proposal does not take into consideration the neighbouring developments put forward under R03 (North of Shenfield Development). So far there is no evidence that the various developers involved are working together to create a coherent plan that is required to assess the full impact to the local area and the community.

My objections relating to the initial submission still stand and I fully support the comments submitted by the Chelmsford Road Area Residents Association.

In addition to my earlier comments, I would like to add the following:

1. This application does not meet the requirements of a local community which should aim to include sufficient facilities such as shops, cafes, meeting and recreational places, biodiverse and accessible open spaces within reasonable walking distance.
2. The flood mitigation measures within the proposed development are inadequate.

Comments for Planning Application 23/01164/FUL

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Case Officer: Kathryn Williams

Customer Details

Name: Mrs Helen Prent
Address: 9 Rochford Avenue, Shenfield, Essex CM15 8QN

Comment Details

Commenter Type: Neighbour
Stance: Customer objects to the Planning Application
Comment Reasons:
Comment:My views are represented by the Chelmsford Road Area Residents Association.

Comments for Planning Application 23/01164/FUL

Application Summary

Application Number: 23/01164/FUL
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Case Officer: Kathryn Williams

Customer Details

Name: Mr D and Mrs J Barker
Address: 57 Oliver Road, Shenfield, Essex CM15 8PX

Comment Details

Commenter Type: Neighbour
Stance: Customer objects to the Planning Application
Comment Reasons:
Comment:Our views on all planning applications remain the same.

Too many properties and no provision for additional health care for Shenfield.

Comments for Planning Application 23/01164/FUL

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Case Officer: Kathryn Williams

Customer Details

Name: Mr Stephen Soall
Address: 9 Fen Close, Shenfield, Essex CM15 8SB

Comment Details

Commenter Type: Neighbour
Stance: Customer objects to the Planning Application
Comment Reasons:
Comment:My views on this proposal are represented by the submission from the Chelmsford Road Area Residents Association.

Comments for Planning Application 23/01164/FUL

Application Summary

Application Number: 23/01164/FUL
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Case Officer: Kathryn Williams

Customer Details

Name: Mrs Nisha Gandhi
Address: 225 Chelmsford Road, Shenfield, Essex CM15 8SA

Comment Details

Commenter Type: Member of the Public
Stance: Customer objects to the Planning Application
Comment Reasons:
Comment:My views are represented by the Chelmsford Road Area Residents Association.

Comments for Planning Application 23/01164/FUL

Application Summary

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Case Officer: Kathryn Williams

Customer Details

Name: Mrs Tatiana Atalon
Address: 205 Chelmsford Road, Shenfield, Essex CM15 8SA

Comment Details

Commenter Type: Neighbour
Stance: Customer objects to the Planning Application
Comment Reasons:
Comment:Our views are represented by the Chelmsford Road Area Residents Association.

Comments for Planning Application 23/01164/FUL

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Case Officer: Kathryn Williams

Customer Details

Name: Mrs Tatiana Atalon
Address: 205 Chelmsford Road, Shenfield, Essex CM15 8SA

Comment Details

Commenter Type: Neighbour
Stance: Customer objects to the Planning Application
Comment Reasons:
Comment:Our views are represented by the Chelmsford Road Area Residents Association.
We do not believe that there has been a cohesive approach to consider all of the new developments in this area to assess the full impact on the area.

Comments for Planning Application 23/01164/FUL

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Case Officer: Kathryn Williams

Customer Details

Name: Mr David Baker
Address: 179 Chelmsford Road, Shenfield, Brentwood, Essex CM15 8SA

Comment Details

Commenter Type: Neighbour
Stance: Customer objects to the Planning Application
Comment Reasons:
Comment:My views are represented by the Chelmsford Road Area Residents Association.
To deal with each of these building application separately will mean that the community will not receive the care and attention it should be receiving. If all the applications were taken as one at the moment, are we the community getting all the relevant schools, health care, amenities and job employment which a development of this size would get. Equally have each of the proposed new developments taken the other into account when doing traffic surveys, noise pollution, impact on environment etc. My previous objections still stand.

Comments for Planning Application 23/01164/FUL

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Case Officer: Kathryn Williams

Customer Details

Name: Mr Niels Andersen
Address: 231 Chelmsford Road, Shenfield, Brentwood, Essex CM15 8SA

Comment Details

Commenter Type: Neighbour
Stance: Customer objects to the Planning Application
Comment Reasons:
Comment:The original reasons for my objections to the proposed development still stands, as Croudace has not yet published any additional information to address the concerns raised in relation to the original planning application.

From recent comments posted by different statutory consultees, specifically the EA and ECC, in relation to consultation provided to Croudace on addressing different issues I notice that references are made by Croudace to emails and other documents exchanged during the consultation process. As none of this information has yet been published as updates to the previously submitted reports, otherwise requested by the statutory referees, I don't believe the application is ready for assessment yet. And it is certainly not possible to assess and comment on information that is only available as indirect comments via 2nd-hand sources.

The main focus of my original objection relates to the inadequacy of the published Flood Risk and Drainage report and the potential risk posed to adjoining neighbourhoods and the need for a joined-up assessment across the proposed Croudace and Redrow developments. Following the wet weather during winter and early spring it has been evident how drainage from the Fen Close and Chelmsford Road area around the northern corner of the proposed development site depends on sub-surface drainage across the ancient woodland and along the adjoining field.

I would therefore like to emphasis my objection against the proposed density of development and construction of a main surface water retention facility within this part of the development until these concerns have been addressed within an update to the Flood Risk and Drainage report that recognises the hydrology of the part of the development located outside the CDU and the existing

surface water flood risk identified within the map published by the EA with appropriate mitigations.

My general objections are in line with the objections presented by CRARA.

Comments for Planning Application 23/01164/FUL

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Case Officer: Kathryn Williams

Customer Details

Name: Mr Chris Vaughan
Address: 93 Chelmsford Road, Shenfield, Essex CM15 8QP

Comment Details

Commenter Type: Member of the Public
Stance: Customer made comments in support of the Planning Application
Comment Reasons:
Comment:The new submission from Croudace fails to address any of the serious objections from residents and statutory consultees.
I support the detailed submission of the Chelmsford Road Area RA.
Since then the following significant issues need to be added to the list of serious failings in this application.
1. It has moved further away from the Local Plan as the Countryside application has confirmed that the Care Home planned for the back of Officers' Meadow will not be built there.
2. The Care Home was intended to be part of the community benefit delivered alongside the development. Croudace has failed to suggest how it will deliver a community benefit to replace this.
3. Despite the claims of the developers and the planning department that the four applications (of which we have only seen three) for the North Shenfield (RO3) development have to be dealt with separately, the secret deal done between Croudace and Countryside to move the Care Home and, in the process, let Countryside escape from the requirement to provide 2 hectares of employment land, shows that when it suits them co-operation is possible. Such substantial changes to the Local Plan should be subject to full, open public consultation, not dealt with in this fragmented way across multiple applications.
4. The obvious way to address the need to provide greater community benefit is to provide the multi-function community space demanded by the Residents Association, Essex County Council and the NHS.
5. Since the flood risk and drainage assessments were carried out the flooding in Officers' Meadow and Alexander Lane has got worse. The original proposals for flood mitigation did not satisfy the Environment Agency. As the flooding is now more extensive this needs a complete

reassessment.
The failure to provide shops, cafes and community facilities means the whole RO3 development will be soulless and car dependent, failing far short of modern urban planning concepts.

Comments for Planning Application 23/01164/FUL

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Case Officer: Kathryn Williams

Customer Details

Name: Ms Sabina Rashid
Address: 265 Chelmsford Road, Shenfield, Brentwood, Essex CM15 8SD

Comment Details

Commenter Type: Neighbour
Stance: Customer objects to the Planning Application
Comment Reasons:
Comment:Our views are represented by the Chelmsford Road Residents Association. They have detailed the specifics of our objections.

Comments for Planning Application 23/01164/FUL

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Case Officer: Kathryn Williams

Customer Details

Name: Mrs Ruksana Ahad
Address: 171 Chelmsford Road, Shenfield, Brentwood, Essex CM15 8SA

Comment Details

Commenter Type: Neighbour
Stance: Customer objects to the Planning Application
Comment Reasons:
Comment:Our views are represented by the Chelmsford Road Area Residents Association.

Comments for Planning Application 23/01164/FUL

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Case Officer: Kathryn Williams

Customer Details

Name: Ms Elizabeth Jerrard
Address: 231 Chelmsford Road, Shenfield, Brentwood, Essex CM15 8SA

Comment Details

Commenter Type: Neighbour
Stance: Customer objects to the Planning Application
Comment Reasons:
Comment:My views are represented by the Chelmsford Road RA. I also submitted an objection to the original proposals and see no evidence that any of the consultees or neighbours have been addressed in the interim.
Specific areas of concern:
The land is prone to flooding - mitigation measures proposed are not adequate and the EA also has concerns that need to be addressed
The plan deviates significantly from the local development plan
There are no community facilities that one would expect with a development of this nature and taking into consideration the other proposal
This application should be in sync with the other proposals such that there is an holistic approach with in effect the creation of a new community
Traffic proposals cannot be considered in isolation from the other developments - the impact of additional traffic from all the developments is not insignificant.

Chelmsford Road Area Residents' Association

Planning Department
Brentwood Borough Council

10th April 2024

Dear Kathryn,

RE: OBJECTION TO PLANNING APPLICATION - NORTH SHENFIELD (RO3) DEVELOPMENT 23/01164/FUL

We, representing the residents in Chelmsford Road, Alexander Lane, Fen Close, and Oliver Road, have thoroughly reviewed Planning Application 23/01164/FUL. It's important to reiterate that each of the concerns raised below has been previously expressed. However, we believe that more attention must be paid to these issues to adequately address our community's needs and aspirations.

Overview of the Application:

The North Shenfield (RO3) development, outlined in the Local Plan, holds significant implications for infrastructure, traffic, open space accessibility, biodiversity, and well-being. While development presents an opportunity for enhancement, it currently falls short of fostering a sense of community, a concern we've repeatedly voiced. We emphasize the necessity for comprehensive coordination among developers, which has been lacking thus far.

Community Development Concerns:

Our advocacy for 15-minute neighbourhoods within RO3 developments has been previously expressed. However, the absence of essential amenities like shops, cafes, and community facilities persists, raising concerns about resident well-being and community cohesion.

Health and Wellness Considerations:

Our concerns regarding the absence of wellness facilities, such as pharmacies and wellness hubs, have been previously highlighted. We urge developers to commission a joint report addressing broader health and wellness needs, with a commitment to implementing recommendations. The Basildon & Brentwood NHS Alliance has raised similar concerns and highlighted the need for a community facility that can be used on a sessional basis to deliver a range of services from health advice to vaccine clinics.

Traffic and Road Safety Issues:

We've previously raised concerns about the inadequate consideration of cumulative traffic impacts and specific shortcomings in across all the proposals, including road alignments and pedestrian crossings. These concerns require immediate attention to ensure resident safety. Each application assesses the potential impact on traffic separately, failing to reference each other's plans or make any assessment of the overall increase in traffic levels or the inter-action between the entrances to the different development sites.

We also strongly object to the continued inclusion of a road running right through the site, from Alexander Lane to Chelmsford Road. This has the potential to become a rat-run as well as degrading the ecological value of the water meadow that will have to be created to mitigate the flood hazard.

Employment Opportunities:

Our objections to the application's non-compliance with the Local Plan's employment land allocation requirement have been stated before. We emphasize the necessity for developers to clarify their plans to meet these obligations.

Concerns Regarding Care Home Proposal:

We've previously questioned the relocation of the care home from within the development to the Countryside site and its necessity in light of confirmed lack of demand from NHS trusts. Additionally, concerns about the proposed location's exposure to pollution levels have been expressed.

If the Care Home is not required or has to be moved from the site originally identified in the Local Plan then Croudace should be delivering a commensurate community benefit. This is absent from their plans. The obvious way of meeting this requirement would be to provide a multi-use community facility, proposed by this association and supported by Essex County Council.

Ecology and Biodiversity:

We've previously highlighted the application's failure to meet Brentwood Borough Council's biodiversity targets. We reiterate the necessity for increased efforts to enhance biodiversity net gain and propose an independent ecology survey funded collectively by developers.

Flood Risks:

The Environment Agency has already highlighted the inadequacy of the proposed flood mitigation measures and this was based on surveys carried out during a very dry spring/summer period. Since then, large parts of Officers' Meadow have had significant areas covered in surface water, more extensive and for longer than ever before. Alexander Lane has been flooded more often and more severely too. There is a clear need for the flood and drainage surveys to be re-done and the mitigation measures significantly enhanced.

Site Design, Car Parking, and EV Provision:

Previous concerns about site design, including proposed three-story houses and narrow roads, have been communicated. Additionally, the absence of adequate provision for electric vehicle charging points has been noted and requires urgent attention.

In conclusion, our concerns have been voiced in the previous objection letter, it's imperative to address them comprehensively to ensure that the development aligns with our community's needs and aspirations. Neglecting these concerns undermines the policies outlined in the Local Plan and Brentwood Borough Council's objectives.

On behalf of Chelmsford Road Area Residents' Association

Michael Bains – Chair michaelbains55@gmail.com	Elizabeth Jerrard – Vice Chair elizabeth.Jerrard@yahoo.co.uk	Tracey Underwood - Member traceyunders1@yahoo.co.uk
Ruksana Ahad – Secretary r.ahad@btinternet.com	Maurice Roche – Treasurer rochefamily5@sky.com	David Worsfold – Member david.worsfold@Zen.co.uk

-----Original Message-----
From: Ron Turner <ron.turner123@btinternet.com>
Sent: Wednesday, May 1, 2024 10:54 AM
To: Planning Team, Brentwood Borough Council <planning@brentwood.gov.uk>
Subject: Re the Stonebond

Hi
I have tried other Webb sites to show my concerns re the above, they all seem to have failed.

As a resident of Chelmsford Road Shenfield, I endorse the concerns of CRARA re the several developments that are being suggested for this area. This whole matter needs to be re considered. Much of the suggested land is regularly flooded and unsuitable, insufficient entry and exit roads are being suggested. This will mean congestion on already busy roads. The general infrastructure will not cope with this additional housing. I am not against development and new housing. What is proposed to far to much and out of character with the surrounding area.

Sincerely
Ron Turner
81 Chelmsford Road
CM15 8QP

Sent from my iPad

Tracey Balcombe

From: ron.turner123 <ron.turner123@btinternet.com>
Sent: 02 May 2024 13:15
To: Tracey Balcombe
Subject: RE: Re the Stonebond

Thank you for your reply.
My concerns are regarding the proposed developments in Chelmsford road Shenfield. Of which Stonebond has a part.
I understand that a Chelmsford road association. CRARA. Is Making representation re the whole development and in particular recent proposals that Stonebond has submitted.
I endorse the concerns of CRARA.
Sincerely
Ron Turner

Sent from my Galaxy

-------- Original message --------
From: Tracey Balcombe <tracey.balcombe@brentwood.gov.uk>
Date: 02/05/2024 12:46 (GMT+00:00)
To: 'Ron Turner' <ron.turner123@btinternet.com>
Subject: RE: Re the Stonebond

Dear Mr Turner

Thank you for your email.

Could we clarify that this comment is relating to Grange Court, The Limes, Ingatestone? Planning reference 23/01308/FUL?

This is to enable us to put your comment on the correct application.

Kind Regards, Tracey

Tracey Balcombe
Senior Administration Planning
Brentwood Borough Council & Rochford District Council

T: 01277 312500
E: tracey.balcombe@brentwood.gov.uk
www.brentwood.gov.uk | www.rochford.gov.uk

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To: Planning Team, Brentwood Borough Council <planning@brentwood.gov.uk>
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Sincerely
Ron Turner
81 Chelmsford Road
CM15 8QP

Sent from my iPad

Find out more about cost of living support | Brentwood Council<https://www.brentwood.gov.uk/cost-of-living>
Find out more about cost of living support | Rochford Council<https://www.rochford.gov.uk/community-and-people/cost-living>

[Email Footer]

Comments for Planning Application 23/01164/FUL

Application Summary

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Address: Land North Of Shenfield Alexander Lane Shenfield Essex
Proposal: Hybrid planning application for 344 units including 35% affordable housing, safeguarded land for a 2FE primary school and early years facility, public open space and associated landscaping, drainage and highways infrastructure.
Case Officer: Kathryn Williams

Customer Details

Name: Mrs Tracy Underwood
Address: Oak Croft Alexander Lane, Shenfield, Brentwood, Essex CM15 8QE

Comment Details

Commenter Type: Member of the Public
Stance: Customer objects to the Planning Application
Comment Reasons:
Comment:My comments follows on from the Flood Risk Modelling Report.
The report takes data from the 2018 to 2021 surely with the amount of excessive rainfall over the past couple of years, and the amount of flooding that exists in Alexander Lane, should the data not be more up to date? Flooding in Alexander Lane and the Chelmsford Road has been the worst I have ever seen in the 18 years that I have lived here. This can take up to a week to drain. The report does not guarantee that flooding will not take place in the area designated for development even with the extra culverts being put in place to alleviate the rise in flood water. This could impact two major roads, the A12 and the Chelmsford Road. Also people buying houses on this site will they have any rights to claim financial compensation from the developers or council if their properties become flooded due to building on a flood plain?

If a new primary school is built will the developers be helping financing senior schools in the area to develop or expand? Surely these children will need to go somewhere when they leave. Shenfield is already oversubscribed.

Comments for Planning Application 23/01164/FUL

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Case Officer: Kathryn Williams

Customer Details

Name: Miss Sonya Hatter
Address: Reynosa, Heronway, Hutton Brentwood, Essex CM13 2LX

Comment Details

Commenter Type: Member of the Public
Stance: Customer objects to the Planning Application
Comment Reasons:
Comment:I don't support this planning application as this is being built on green belt land . The doctor surgery already over capacity for this area where we have to wait several weeks to receive an appointment.
Also Chelmsford road is extremely busy without anymore traffic and Alexander lane will be too small to take extra traffic to Shenfield.

Mrs Ruksana Ahad
Mr Syed Ahad
171 Chelmsford Road
Shenfield
Essex
CM15 8SA

26th October 2023

Re: Current Planning Application, no: 23/01164/FUL
Address: Land north of Shenfield, Brentwood Essex
Case Officer: Kathryn Williams

Dear Ms Williams

The above planning application has been submitted to Brentwood Borough Council and as a neighbour, I have been notified by the Council to review and make representation. The applicant may have knowingly and recklessly overstated a proportion of their land, without following the lawful procedure as required by the Town and Country planning Act 1990. The applicant has stated intention to encroach into our garden for the purposes of this development and has been served with a legal warning.

With specific regard to Land ownership Certificate the Government guidance for the effective delivery of planning application process states;

> *The planning system entitles anyone to apply for permission to develop any plot of land, irrespective of ownership. However, an applicant is required to notify owners of the land or buildings to which the application relates, as well as any agricultural tenants, in accordance with article 13 of the Town and Country Planning (Development Management Procedure) (England) Order 2015. When making an application, an applicant is required to sign a certificate confirming the ownership of the land to which the application relates and that the relevant notices have been served.*
>
> *A certificate which applicants must complete that provides certain details about the ownership of the application site and confirms that an appropriate notice has been served on any other owners (and agricultural tenants). The forms of notice are in Schedule 2 to the Town and Country Planning (Development Management Procedure (England) (Order) 2015.*
>
> *An application is not valid, and therefore cannot be determined by the local planning authority, unless the relevant certificate has been completed. It is an offence to complete a false or misleading certificate, either knowingly or recklessly, with a maximum fine of up to £5,000.*

The Town and Country Planning Act 1990, Section 65 states:

> *It is an offence to complete a false or misleading certificate, either knowingly or recklessly. A person guilty of an offence under this section shall be liable on summary conviction to a fine not exceeding level 5 on the standard scale (Section 65(7) of the Town and Country Planning Act 1990). The onus is on the applicant/agent to provide the correct information.*
>
> *(6) If any person—*

(a)issues a certificate which purports to comply with any requirement imposed by virtue of this section and contains a statement which he knows to be false or misleading in a material particular; or

(b)recklessly issues a certificate which purports to comply with any such requirement and contains a statement which is false or misleading in a material particular,
he shall be guilty of an offence.

As part of their planning application referenced above, the Applicant has knowingly and/or recklessly made the following false declaration.

> *I have/The applicant has given the requisite notice to everyone else (as listed below) who, on the day 21 days before the date of this application, was the owner* and/or agricultural tenant** of any part of the land or building to which this application relates.*

The law is clear that applicants must produce certification to show whether they are building on land they own or which is in third party ownership in the subsequent section requiring name, address and date appropriate notice served on all persons with a freehold interest or leasehold interest with 7 years to run. The Council must pay attention to which certificate the applicant provides as it must not "entertain" an application with incorrect certification. There is no discretion in that.

We believe the certificate accompanying this application is knowingly false or misleading

Yours Sincerely

R Ahad

Ruksana Ahad

Gary O'Connor
173 Chelmsford Road
Shenfield
Essex
CM15 8SA
Tel: 07866 879386
E mail: gary@stonescreen.com

25th October 2023

Re: Current Planning Application, no: 23/01164/FUL
Address: Land north of Shenfield, Brentwood Essex
Case Officer: Kathryn Williams

Dear Ms Williams

We would like to express our concerns and make representation regarding the above planning application submitted to Brentwood Borough Council.

The applicant has stated intention to encroach into our garden for the purposes of this development and furthermore has trespassed onto private land to place wooden pegs into the ground.

When making a planning application, an applicant is required to sign a certificate confirming the ownership of the land to which the application relates and that the relevant notices have been served. The forms of notice are in Schedule 2 to the Town and Country Planning (Development Management Procedure (England) (Order) 2015. An application is not valid, and therefore cannot be determined by the local planning authority, unless the relevant certificate has been completed.

The applicant has been served a legal notice prohibiting without express permission any such development and any further trespassing onto private property.

Yours Sincerely

G O'Connor

Gary O'Connor

Comments for Planning Application 23/01164/FUL

Application Summary

Application Number: 23/01164/FUL
Address: Land North Of Shenfield Alexander Lane Shenfield Essex
Proposal: Hybrid planning application for 344 units including 35% affordable housing, safeguarded land for a 2FE primary school and early years facility, public open space and associated landscaping, drainage and highways infrastructure.
Case Officer: Kathryn Williams

Customer Details

Name: Mr RICHARD HARRENDENCE
Address: 1 St Marys Avenue, Shenfield, Brentwood, Essex CM15 8PY

Comment Details

Commenter Type: Neighbour
Stance: Customer objects to the Planning Application
Comment Reasons:
Comment:We STRONGLY OBJECT to this huge development, which overall will have a massively detrimental impact on the local area and its residents, as well as changing the character, appeal and charm of Shenfield as a village. Through experience, these types of developments never improve an area and I list below the inevitable negative impacts it will have on Shenfield and the surrounding areas, in no particular order:

This proposal would inevitably lead to over-development, density, the changing of the landscape where other large estates will inevitably follow negatively changing the character of Shenfield to an unrecognisable inner city-type area.

The elimination of nature conservation interests, which will affect the protection of badgers, great crested newts etc.

This huge development will take away green space and access to the outdoors which is important for people's mental and physical health.

There will be an enormous increase in road use, which is already at a stand-still in rush hour on Junction 12 of the A12 and which will consequently have a detrimental impact on the whole area, as well as affecting the quality and condition of the roads.

There will be an increase in pollution from the additional road use, which will consequently have a negative impact on pedestrians and cyclists.

There will be an increase in crime and disorder.

There will be a negative impact on the already strained infrastructure and amenities in the area which will become strained beyond capacity.

Effects on a specially designated area or building - such as green belt.

Devaluation of local properties

We already know that this is a foregone conclusion and that the likes of the residents in the area such as ourselves do not stand a chance in changing anything that has already been planned. You put on over 300 documents (we get only 2000 characters to state out case) knowing that no one has the means to challenge such a development and that this is simply a formality.

Comments for Planning Application 23/01164/FUL

Application Summary

Application Number: 23/01164/FUL
Address: Land North Of Shenfield Alexander Lane Shenfield Essex
Proposal: Hybrid planning application for 344 units including 35% affordable housing, safeguarded land for a 2FE primary school and early years facility, public open space and associated landscaping, drainage and highways infrastructure.
Case Officer: Kathryn Williams

Customer Details

Name: Mr Jonathan Burridge
Address: 173 Chelmsford Road, Shenfield, Brentwood, Essex CM15 8SA

Comment Details

Commenter Type: Neighbour
Stance: Customer made comments neither objecting to or supporting the Planning Application
Comment Reasons:
Comment:I object to the behaviour of the developer, who trespassed on our land by entering our garden from the rear without consent and then proceeded to place stakes in the ground. My elderly brother, with learning disabilities, was troubled by the uninvited and welcomed trespass. The Developers employee was reluctant to leave our property and I considered calling the police to have them removed.

Comments for Planning Application 23/01164/FUL

Application Summary

Application Number: 23/01164/FUL
Address: Land North Of Shenfield Alexander Lane Shenfield Essex
Proposal: Hybrid planning application for 344 units including 35% affordable housing, safeguarded land for a 2FE primary school and early years facility, public open space and associated landscaping, drainage and highways infrastructure.
Case Officer: Kathryn Williams

Customer Details

Name: Mr David Worsfold
Address: 183 Chelmsford Road, Shenfield, Essex CM15 8SA

Comment Details

Commenter Type: Councillor
Stance: Customer objects to the Planning Application
Comment Reasons:
Comment:The application falls short of the requirements of the Local Plan and good development in many regards:
- It fails to provide any community facilities. The so-called "community hub" is a tree. There are no shops, cafes or community buildings. There is nothing in the way of shops etc within a 15 minute walk of North Shenfield which must be the gold standard for all major developments. The nearest community hall is 1.5 miles away. For people living in the centre or far end of the development, the nearest shops and cafes will be a 30 minute walk.
- Health service professionals have identified isolation and loneliness as a key contributor to bad health. This development will exacerbate that problem.
- The Local Plan requires the provision of employment opportunities as part of the RO3 development. There are none in this application. All the developers should be contributing to this. Without shops and cafes, community workshops, spaces for small businesses this will be a soulless development, adding nothing to the local economy.
- There is nothing that will contribute to wellness - no pharmacy, no wellness hub of the sort the health service is asking for.
- Where are the proposals for pedestrian crossings on Chelmsford Road? With a primary school included in the application and a future application to build houses on the opposite side of Chelmsford Road pending this should be addressed now.
- The Local Plan requires enhancement of public rights of way yet there is no mention of the current consideration by Essex Legal Services of the application for formal recognition of the long-established network of footpaths across Officers' Meadow. This is a serious omission.
- As mentioned in my comments on 23/01156/OUT the road across the site is unnecessary and will undermine the requirements to enhance biodiversity.

- There should be only one road from the Croudace and Stonebond sites onto Alexander Lane.
- The ecology surveys are poor and do not mention slowworms or newts

Comments for Planning Application 23/01164/FUL

Application Summary

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Case Officer: Kathryn Williams

Customer Details

Name: Mr Michael Bains
Address: 169 Chelmsford Road, Shenfield, Brentwood, Essex CM15 8SA

Comment Details

Commenter Type: Neighbour
Stance: Customer objects to the Planning Application
Comment Reasons:
Comment:In any planning application, it's important to take into account the behavior of the applicant. Unfortunately, Croudace has displayed a lack of respect for the law during their proposed development. They trespassed onto our property by removing a fence panel from the back of our garden. This was distressing for my elderly mother, who is 89 years old and lives on the property. She was quite startled and scared to see two unfamiliar men wandering around in our garden. We politely asked them to stop trespassing and leave, but they disregarded our request, causing distress. Eventually, the police had to intervene and escort them off the premises.

Comments for Planning Application 23/01164/FUL

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Case Officer: Kathryn Williams

Customer Details

Name: Mrs Janice Soall
Address: 9 Fen Close, Shenfield, Brentwood, Essex CM15 8SB

Comment Details

Commenter Type: Neighbour
Stance: Customer objects to the Planning Application
Comment Reasons:
Comment:Our views are represented by the Chelmsford Road Area Residents Association.

In addition we would like to add our concern regarding the impact this development will have on the already stretched health services in Shenfield, where it can take weeks to obtain a doctor's appointment.

Comments for Planning Application 23/01164/FUL

Application Summary

Application Number: 23/01164/FUL
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Case Officer: Kathryn Williams

Customer Details

Name: Mrs Caroline Lynch
Address: 41 Oliver Road, Shenfield, Brentwood, Essex CM15 8QA

Comment Details

Commenter Type: Member of the Public
Stance: Customer objects to the Planning Application
Comment Reasons:
Comment:I am extremely concerned about this development and fully support the comments and points raised by the Chelmsford Road residents association. Further, I wish to raise my concern as neighbourhood watch coordinator about the levels of crime that will affect the area due to the increase in residential housing. I am also the speedwatch coordinator for Shenfield and I feel that the increase in traffic will have a adverse effect on speeding in Oliver Road, Shenfield Road and Alexander Lane. Traffic will increase and accidents will occur. I am also concerned that this development will put a strain on NHS services in the area especially GP services and services offered at Brentwood Community Hospital. The loss of natural green spaces in this area will impact on all of the residents. This will impact on mental health and emotional well-being.

Comments for Planning Application 23/01164/FUL

Application Summary

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Case Officer: Kathryn Williams

Customer Details

Name: Mrs Linda Marshall
Address: 197 Chelmsford Road, Shenfield, Brentwood, Essex CM15 8SA

Comment Details

Commenter Type: Neighbour
Stance: Customer objects to the Planning Application
Comment Reasons:
Comment:My views are represented by the Chelmsford Road area RA

Comments for Planning Application 23/01164/FUL

Application Summary

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Proposal: Hybrid planning application for 344 units including 35% affordable housing, safeguarded land for a 2FE primary school and early years facility, public open space and associated landscaping, drainage and highways infrastructure.
Case Officer: Kathryn Williams

Customer Details

Name: Mrs Sarah Hughes
Address: 43 Oliver Road, Shenfield, Brentwood, Essex CM15 8QA

Comment Details

Commenter Type: Neighbour
Stance: Customer objects to the Planning Application
Comment Reasons:
Comment:My views are represented by the Chelmsford Road Area Residents Association

Comments for Planning Application 23/01164/FUL

Application Summary

Application Number: 23/01164/FUL
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Case Officer: Kathryn Williams

Customer Details

Name: Mrs Mary Roche
Address: Farm Cottage, Alexander Lane, Shenfield Brentwood, Essex CM15 8QE

Comment Details

Commenter Type: Member of the Public
Stance: Customer objects to the Planning Application
Comment Reasons:
Comment:My objections:

Increased Traffic on Alexander Lane

This will become a rat run, with hugely increased traffic into Alexander Lane, due to the two new roads from the Croudace and later Stonebond developments. I believe that the proposed mitigation provided by the bollards on Alexander Lane will be greatly exceeded by the increased traffic from the two new roads. Alexander Lane is too narrow to cope with substantial volumes of traffic. In addition, cyclists will exit the cycle lanes onto Alexander Lane but will then be cycling on the road and contending with this increased traffic.

Increased risk to Pedestrians

The pavement from Farm Cottage towards Oliver Rd is very narrow in places and outside "Leclarely" only 0.5m wide. Today, it is unsafe for pedestrians to continue until traffic has passed and there is no space for widening the pavement here. The increase in traffic and pedestrians coming from the development will make this an even bigger safety hazard.

.
Proposal to reduce the amount of traffic:

a) The Croudace development shows a road running from Chelmsford Road to Alexander Lane. This through road is no longer needed as the site has effectively been split in two because of the

drainage mitigation measures which have now been added.

b) The proposed road in the Stonebond development should not exit onto Alexander Lane but be diverted to connect to the existing Croudace road network within the new development.

Proposed Cycle Path

In the Transport Assessment, Appendix O, there is a proposal for a cycle path through the Brentwood Borough Council's (BBC) Alexander Lane Recreation field exiting just at the side of Farm Cottage. How can a cycle path through BBC land be considered as this is not part of the development? If implemented, this would pose a significant risk to ourselves as well as pedestrians and cyclists when reversing out of our drive due to restricted visibility together with the increased traffic flow from the housing development.

Comments for Planning Application 23/01164/FUL

Application Summary

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Case Officer: Kathryn Williams

Customer Details

Name: Mr Peter Lee
Address: 223 Chelmsford Road, Shenfield, Brentwood, Essex CM15 8SA

Comment Details

Commenter Type: Member of the Public
Stance: Customer objects to the Planning Application
Comment Reasons:
Comment:152080/PD16 PROPOSED PUBLIC RIGHT OF WAY
The attached drawing shows the public footpath relocated by the developer. The route of the path, at the lower end of the drawing, takes it through an Attenuation basin (AB) and a LEAP. The aim of an AB is to temporarily hold excessive surface water. It is very likely that for a good part of the year, the area would be unusable if any part of the AB is at ground level or the water level in the AB reaches ground level. To keep the LEAP and path usable would require that the outfall from the AB is kept free of any obstructions. It seems to be a very poor choice of location for the footpath and LEAP.

Comments for Planning Application 23/01164/FUL

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Case Officer: Kathryn Williams

Customer Details

Name: Mr Gary OConnor
Address: 173, Chelmsford Road, Shenfiield CM15 8SA

Comment Details

Commenter Type: Neighbour
Stance: Customer objects to the Planning Application
Comment Reasons:
Comment:May views are represented by the Chelmsford Road Area residents association.
This proposed development would remove the meadows, the view is and walks from the rear of my property and the path to Alexander Lane. which were the attraction of my buying the property in 2001. This development and the negative impact on my life and property will also devalue my property and therefore would result in a financial loss to me and my family.
This proposed development is very worrying..
If planning permission is granted it would be extremely financially lucrative to the developer. In that case the existing house owners should be financially compensated to enable them to move home to a property where they may enjoy similar environment to which they currently have.
It is expected that this development could reduce the value of the houses on Chelmsford Road by 25% of their current value and therefore the developer should be required to compensate east home in the order of approx £250,000, but so far no proposal has been made by the developer.
Why should the existing house owners suffer for the benefit of the developer.
We hope that the council will refuse this proposed green belt development.

Comments for Planning Application 23/01164/FUL

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Case Officer: Kathryn Williams

Customer Details

Name: Miss Amrit Sandhu
Address: 116 Chelmsford Road, Shenfield, Brentwood, Essex CM15 8RN

Comment Details

Commenter Type: Member of the Public
Stance: Customer objects to the Planning Application
Comment Reasons:
Comment:I raise concern about an increase in speeding and traffic incidents. Living across from Shenfield School, we already suffer with lots of traffic and cars around school time. This is only to be made worse if the Alexander Lane entrance for the school is closed, with the Oliver Road entrance being the sole drop off/pick up point. We have cars parking in front of our drive and all along the road. There is the potential of an increase in crime. I raise my concern relating to NHS services including the GP services and those services running out of Brentwood Community hospital. With GP and dental services already struggling to cope with public demand, an influx of population will only further the lack of resources and availability. In the local area it is near impossible to access NHS dental services. I add that I agree and support the Chelmsford road residents association.

Comments for Planning Application 23/01164/FUL

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Case Officer: Kathryn Williams

Customer Details

Name: Mrs Kinny Bains
Address: 169 Chelmsford Road, Shenfield, Brentwood, Essex CM15 8SA

Comment Details

Commenter Type: Neighbour
Stance: Customer objects to the Planning Application
Comment Reasons:
Comment:My views are represented by the Chelmsford Road Area Residents Association

Comments for Planning Application 23/01164/FUL

Application Summary

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Case Officer: Kathryn Williams

Customer Details

Name: Mr Andy Pritchard
Address: 155 Chelmsford Road, Shenfield, Brentwood, Essex CM15 8RU

Comment Details

Commenter Type: Member of the Public
Stance: Customer made comments neither objecting to or supporting the Planning Application
Comment Reasons:
Comment:Our views are represented by the Chelmsford Road Area Residents Association.

Comments for Planning Application 23/01164/FUL

Application Summary

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Case Officer: Kathryn Williams

Customer Details

Name: Elaine Gillett
Address: 287 Chelmsford Road, Shenfield, Brentwood, Essex CM15 8SD

Comment Details

Commenter Type: Neighbour
Stance: Customer objects to the Planning Application
Comment Reasons:
Comment:I would like to state that myself and my husband are in agreement with the Residents Association's views in terms of major concerns regarding flooding, traffic, drainage and infrastructure.
Regards
Mr & Mrs Gillett

Comments for Planning Application 23/01164/FUL

Application Summary

Application Number: 23/01164/FUL
Address: Land North Of Shenfield Alexander Lane Shenfield Essex
Proposal: Hybrid planning application for 344 units including 35% affordable housing, safeguarded land for a 2FE primary school and early years facility, public open space and associated landscaping, drainage and highways infrastructure.
Case Officer: Kathryn Williams

Customer Details

Name: Mr Robert West
Address: 229 Chelmsford Road, Shenfield, Brentwood, Essex CM15 8SA

Comment Details

Commenter Type: Member of the Public
Stance: Customer objects to the Planning Application
Comment Reasons:
Comment:This development would cause significant damage to the Shenfield area due to the failure to take full consideration of the environmental, infrastructural, and public services impact it will have.
Current plans back onto existing properties, cutting across a historical footpath to the ancient woods. There are too many properties in too small a space. As a first step the development must take the previous paths into account.
There are environmental implications in this development, which takes place where air pollution levels already higher than the average for Brentwood. There is a fair chance of higher NO2 concentrations due to the additional traffic. The applicant fails to address the impact on Chelmsford Road, which is regularly flooded. A large number of properties will inevitably add to the frequency of floods as the sewage pipes are not fit for purpose.
Lead local flood authorities must maintain a register of a river's structures or features which might have an effect on a flood risk. The newer properties by Mountnessing Roundabout have already upgraded that postcode area into medium flood risk. River Wid will be impacted by this development potentially even problems on the nearby railway line.
There appears to be no consideration of lack of shopping amenities. Currently there is only a shop as part of a Petrol Station.
The impact of the wider traffic management issues do not appear to have been considered, especially along the narrow Alexander Lane, and Oliver Road where the school already causes traffic issues. Recent smaller housing developments in the area are already having a negative effect.
Availability of NHS services, such as doctors and dentists we be negatively impacted leaving public services unable to cope.

As one of a series of developments proposed for the area there must be a joined up approach to avoid the chaos that will ensue. Approving this application without improvements will place Brentwood Council at risk of future litigation.

197, Chelmsford Road
Shenfield
Essex
CM15 8SA

27th October 2023

Re: Current Planning Application, no: 23/01164/FUL
Address: Land north of Shenfield, Brentwood Essex
Case Officer: Kathryn Williams

Dear Ms Williams

The above planning application has been submitted to Brentwood Borough Council and as a neighbour, I have been notified by the Council to review and make representation. The applicant may have knowingly and recklessly overstated a proportion of their land, without following the lawful procedure as required by the Town and Country planning Act 1990. The applicant has stated intention to encroach into our garden for the purposes of this development and has been served with a legal warning.

With specific regard to Land ownership Certificate the Government guidance for the effective delivery of planning application process states;

> *The planning system entitles anyone to apply for permission to develop any plot of land, irrespective of ownership. However, an applicant is required to notify owners of the land or buildings to which the application relates, as well as any agricultural tenants, in accordance with article 13 of the Town and Country Planning (Development Management Procedure) (England) Order 2015. When making an application, an applicant is required to sign a certificate confirming the ownership of the land to which the application relates and that the relevant notices have been served.*
>
> *A certificate which applicants must complete that provides certain details about the ownership of the application site and confirms that an appropriate notice has been served on any other owners (and agricultural tenants). The forms of notice are in Schedule 2 to the Town and Country Planning (Development Management Procedure (England) (Order) 2015.*
>
> *An application is not valid, and therefore cannot be determined by the local planning authority, unless the relevant certificate has been completed. It is an offence to complete a false or misleading certificate, either knowingly or recklessly, with a maximum fine of up to £5,000.*

The Town and Country Planning Act 1990, Section 65 states:

> *It is an offence to complete a false or misleading certificate, either knowingly or recklessly. A person guilty of an offence under this section shall be liable on summary conviction to a fine not exceeding level 5 on the standard scale (Section 65(7) of the Town and Country Planning Act 1990). The onus is on the applicant/agent to provide the correct information.*
>
> *(6) If any person—*

(a)issues a certificate which purports to comply with any requirement imposed by virtue of this section and contains a statement which he knows to be false or misleading in a material particular; or

(b)recklessly issues a certificate which purports to comply with any such requirement and contains a statement which is false or misleading in a material particular,
he shall be guilty of an offence.

As part of their planning application referenced above, the Applicant has knowingly and/or recklessly made the following false declaration.

> *I have/The applicant has given the requisite notice to everyone else (as listed below) who, on the day 21 days before the date of this application, was the owner* and/or agricultural tenant** of any part of the land or building to which this application relates.*

The law is clear that applicants must produce certification to show whether they are building on land they own or which is in third party ownership in the subsequent section requiring name, address and date appropriate notice served on all persons with a freehold interest or leasehold interest with 7 years to run. The Council must pay attention to which certificate the applicant provides as it must not "entertain" an application with incorrect certification. There is no discretion in that.

We believe the certificate accompanying this application is knowingly false or misleading

Yours sincerely

Andrew & Linda Marshall

175 Chelmsford Road
Shenfield
Essex
CM15 8SA

3rd November 2023

Re: Current Planning Application, no: 23/01164/FUL
Address: Land north of Shenfield, Brentwood Essex
Case Officer: Kathryn Williams

Dear Ms Williams

The above planning application has been submitted to Brentwood Borough Council and as a neighbour, I have been notified by the Council to review and make representation. The applicant may have knowingly and recklessly overstated a proportion of their land, without following the lawful procedure as required by the Town and Country planning Act 1990. The applicant has stated intention to encroach into our garden for the purposes of this development and has been served with a legal warning.

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As part of their planning application referenced above, the Applicant has knowingly and/or recklessly made the following false declaration.

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We believe the certificate accompanying this application is knowingly false or misleading

Yours Sincerely

M Jarvis & T Jarvis

Mark Jarvis & Tracey Jarvis

177 Chelmsford Road
Shenfield
Essex
CM15 8SA

3rd November 2023

Re: Current Planning Application, no: 23/01164/FUL
Address: Land north of Shenfield, Brentwood Essex
Case Officer: Kathryn Williams

Dear Ms Williams

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he shall be guilty of an offence.

As part of their planning application referenced above, the Applicant has knowingly and/or recklessly made the following false declaration.

> *I have/The applicant has given the requisite notice to everyone else (as listed below) who, on the day 21 days before the date of this application, was the owner* and/or agricultural tenant** of any part of the land or building to which this application relates.*

The law is clear that applicants must produce certification to show whether they are building on land they own or which is in third party ownership in the subsequent section requiring name, address and date appropriate notice served on all persons with a freehold interest or leasehold interest with 7 years to run. The Council must pay attention to which certificate the applicant provides as it must not "entertain" an application with incorrect certification. There is no discretion in that.

We believe the certificate accompanying this application is knowingly false or misleading

Yours Sincerely

J Weadley

Joyce Weadley

Comments for Planning Application 23/01164/FUL

Application Summary

Application Number: 23/01164/FUL
Address: Land North Of Shenfield Alexander Lane Shenfield Essex
Proposal: Hybrid planning application for 344 units including 35% affordable housing, safeguarded land for a 2FE primary school and early years facility, public open space and associated landscaping, drainage and highways infrastructure.
Case Officer: Kathryn Williams

Customer Details

Name: Ms Sabina Rashid
Address: 265 Chelmsford Road, Shenfield, Brentwood, Essex CM15 8SD

Comment Details

Commenter Type: Member of the Public
Stance: Customer objects to the Planning Application
Comment Reasons:
Comment:Our views are represented by the Chelmsford Road Area Residents' Association. I would like to stress the following points in particular: the lack of amenities in terms of shopping, healthcare and education to cope with the increase in number of residents in the area. I would like the Council commit to the extra services they would be responsible for providing. Family homes will usually have at least 2 cars as it is unreasonable to think that babies and children will be transported on foot or on bikes and so there will be a huge increase in traffic especially given the number of houses that are planned on this site. It appears the pathway planned to get across to the other end of Alexander Lane from the Arnolds Wood would be longer. This affects the time it takes to walk to the station (something that I would regularly do).
I would like to see the planning applications from all the parties for the entire area on both sides of Chelmsford Road. Without taking this into account as a whole, how can anyone judge the facilities required, the environmental impact and services required?

Comments for Planning Application 23/01164/FUL

Application Summary

Application Number: 23/01164/FUL
Address: Land North Of Shenfield Alexander Lane Shenfield Essex
Proposal: Hybrid planning application for 344 units including 35% affordable housing, safeguarded land for a 2FE primary school and early years facility, public open space and associated landscaping, drainage and highways infrastructure.
Case Officer: Kathryn Williams

Customer Details

Name: Mrs Ruksana Ahad
Address: 171 Chelmsford Road, Shenfield, Brentwood, Essex CM15 8SA

Comment Details

Commenter Type: Member of the Public
Stance: Customer objects to the Planning Application
Comment Reasons:
Comment:My views are in agreement with and represented by the Chelmsford Road Area Residents Association.
My neighbour had to stop Croudace employee's from removing my fence panel from his garden to trespass onto my property. They actually climbed onto a stack of concrete blocks next to his shed to peer into my garden. I find this very disturbing that Croudace can just wander into my garden from the rear unannounced and unwelcome. I find this absolutely disgraceful behaviour. I am most disgusted that Croudace actually believe this is acceptable. I believe this is a form of bullying.
Furthermore, my concerns are regarding the impact the huge development will have on noise, pollution, traffic, infrastructure, flooding, biodiversity, ecology, drainage etc.

Comments for Planning Application 23/01164/FUL

Application Summary

Application Number: 23/01164/FUL
Address: Land North Of Shenfield Alexander Lane Shenfield Essex
Proposal: Hybrid planning application for 344 units including 35% affordable housing, safeguarded land for a 2FE primary school and early years facility, public open space and associated landscaping, drainage and highways infrastructure.
Case Officer: Kathryn Williams

Customer Details

Name: Mrs Tracy Underwood
Address: Oak Croft Alexander Lane, Shenfield, Brentwood, Essex CM15 8QE

Comment Details

Commenter Type: Member of the Public
Stance: Customer objects to the Planning Application
Comment Reasons:
Comment:I object to this development for the following reasons:

1. Croudace is only 1 of 4 developers planning to build on this land. I feel that the Council need to look at all the 4 developers plans together as a whole.
2. Traffic, noise, air quality and congestion will all increase with this development. Increased pressure on the Chelmsford Road will impact the daily journey for school and business travel. Traffic is regularly brought to a standstill at the Mountnessing roundabout during the morning commute due to the tailback from the Chelmsford Road. This then has an impact on the A12 going into London.
3. There will also be a substantial increase in traffic on Alexander Lane if there are 2 roads going in and out of the new development.
4. Doctor surgeries are all ready over capacity in the Shenfield area.
5. There are no plans for shops, cafes or local services so everyone from the development will come into Shenfield. The majority of these will probably be by car putting a strain on the parking at Shenfield.
6. The impact of the daily rail commute with travellers going into London from Shenfield. Trains are already over crowded with standing room only during rush hours.
7. Loss of natural green open space.
8. Dwellings being built on flood plains.

We fully support the comments and points raised by the Chelmsford Road Residents Association.

Mr and Mrs Underwood

Comments for Planning Application 23/01164/FUL

Application Summary

Application Number: 23/01164/FUL
Address: Land North Of Shenfield Alexander Lane Shenfield Essex
Proposal: Hybrid planning application for 344 units including 35% affordable housing, safeguarded land for a 2FE primary school and early years facility, public open space and associated landscaping, drainage and highways infrastructure.
Case Officer: Kathryn Williams

Customer Details

Name: Mr Christopher Powell
Address: 253 Chelmsford Road, Shenfield, Brentwood, Essex CM15 8SD

Comment Details

Commenter Type: Neighbour
Stance: Customer objects to the Planning Application
Comment Reasons:
Comment:The points raised by the Chelmsford Road Area Residents Association fully represent our concerns.

In particular we do not feel the application adequately addresses the following:
- Additional stress on the local health services in Shenfield.
- Negative impacts to wildlife and biodiversity due to the loss of green space.
- Additional traffic and changes to the road layout in Chelmsford Road increasing congestion, increasing noise and air pollution, and impacting safety.

In addition, we are very concerned that the various development proposals being put forward under the Local Plan (Land North Of Shenfield) are being submitted individually and that the cumulative impact of these cannot be evaluated as a whole.

Comments for Planning Application 23/01164/FUL

Application Summary

Application Number: 23/01164/FUL
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Proposal: Hybrid planning application for 344 units including 35% affordable housing, safeguarded land for a 2FE primary school and early years facility, public open space and associated landscaping, drainage and highways infrastructure.
Case Officer: Kathryn Williams

Customer Details

Name: Mrs Lesley Kavanagh
Address: 6 Fen Close, Shenfield, Brentwood, Essex CM15 8SB

Comment Details

Commenter Type: Neighbour
Stance: Customer objects to the Planning Application
Comment Reasons:
Comment:A letter with full details of our objection has been sent via email to Kathryn Williams and the Planning Team. This covers our concerns around:
1. Drainage/flooding
2. Traffic
3. Facilities (or lack thereof)
4. Environmental impacts
Our letter should be read in conjunction with the submission from the Chelmsford Road Residents Association.
Mr and Mrs Kavanagh

20/10/23

41 Oliver Road
Shenfield
CM15 8QA

Dear Sir

Re:- Land North of Shenfield
No:- 23/01164/FUL

With regards to the above planning application I wish to object to this Application on the grounds the local roads will not cope with further traffic and the extra people in doctors & schools.

The traffic around Oliver Road when the school starts & finishes are grid locked for residents. The schools and doctors are unable to meet the demands without further developements.

I would make these comment on-line if only I could login in!!

Your faithfully

Moore (MRS A. MOORE)

20/10/23

21 Oliver Road
Shenfield
CM15 8QA

Dear Sir

Re:- Land North of Shenfield
No:- 23/01159/OUT

As I am unable to login into your website on this application I wish to object to this planning At the moment Oliver Road can not cope with traffic for Shenfield High School. When school starts & finishes the road is grid locked for residents another school is out of the question.

Also Chelmsford Road wouldn't be able to cope with extra traffic in the morning/evening rush hours.

Extra residents from the other planning 23/01159/OUT the infrastructure of doctors/schools will bring further strain to the residents.

Yours faithfully

A Moore (MRS A MOORE)

Comments for Planning Application 23/01164/FUL

Application Summary

Application Number: 23/01164/FUL
Address: Land North Of Shenfield Alexander Lane Shenfield Essex
Proposal: Hybrid planning application for 344 units including 35% affordable housing, safeguarded land for a 2FE primary school and early years facility, public open space and associated landscaping, drainage and highways infrastructure.
Case Officer: Kathryn Williams

Customer Details

Name: Mrs Alison England
Address: 181 Chelmsford Road, Shenfield, Brentwood, Essex CM15 8SA

Comment Details

Commenter Type: Neighbour
Stance: Customer objects to the Planning Application
Comment Reasons:
Comment:We strongly object to the development on Green Belt land and the points raised by the Chelmsford Road Area Residents Association fully represent our concerns.

In particular, we do not feel the application adequately addresses the following:
- Chelmsford Road regularly floods at the moment. Any additional houses are going to make this worse. This does not seem to have been considered adequately in the plans.
- Additional stress on local health services in Shenfield.
- Loss of natural green open space and negative impacts to wildlife and biodiversity
- The additional traffic and changes to the road layout in Chelmsford Road which will increase congestion, noise and air pollution, and impact safety.
- Additional facilities such as shops, cafes and other services have not been considered

If the development goes ahead then I would like to see how Brentwood Council has considered all of the combined planning applications from all of the developers for the entire area encompassing both sides of Chelmsford Road. This must be done in order to judge the facilities required and the environmental impact.
Additionally, we would like clarification of the exact boundaries for this particular development. Croudace have tried to encroach on our land at 181 Chelmsford Road in order to peg out a new boundary. They have been served with a legal notice with regard to this issue and we would like them to confirm their agreement, in writing, that they will accept and not contest our boundaries in order to continue with this application.
We also have sent in an application (along with several neighbours) which is currently being considered by Essex Legal Services for the footpath behind our houses to be regarded as an established footpath and therefore a public right of way. This has not been reflected in the current

plans

Comments for Planning Application 23/01164/FUL

Application Summary

Application Number: 23/01164/FUL
Address: Land North Of Shenfield Alexander Lane Shenfield Essex
Proposal: Hybrid planning application for 344 units including 35% affordable housing, safeguarded land for a 2FE primary school and early years facility, public open space and associated landscaping, drainage and highways infrastructure.
Case Officer: Kathryn Williams

Customer Details

Name: Mr Stephen Bartholomew
Address: 82 Oliver Road, Shenfield, Brentwood, Essex CM15 8PZ

Comment Details

Commenter Type: Neighbour
Stance: Customer objects to the Planning Application
Comment Reasons:
Comment:In addition to my comments below I endorse those of the Chelmsford Rd Area RA.
The 4 sites North of Shenfield, being Green Belt land, have been identified for over 800 new homes and buildings. The GB was established by the 1947 Planning Act, it is Brentwood BC's duty and the people in Brentwood area to preserve and protect this land. There are numerous 'brown field sites' in the Brentwood, some abandoned for years, these should be developed and it is incumbent upon BBC to facilitate these developments.
This development is one of four potential developments, all will have an interaction between themselves and a cumulative impact upon Shenfield. This proposal cannot be considered in isolation, it is essential all are considered as a whole, and an independent investigation is required on the impacts on the land and surrounding environs.
The proposed development could have a deleterious impact upon the area for a number of reasons, in particular:
Parking: many homes have two or more cars it is vital there is adequate parking per dwelling and to discourage parking on pavements and verges.
Sewers: the sewer in Chelmsford Rd has had problems with blockages in recent years. All developments need to combine to install a future proof sewer infrastructure and treatment system, and Anglian Water can accommodate the additional discharge from the properties. The additional discharge will only increase pressure upon Anglian Water and the existing treatment works with the potential risk for discharges.
Rainwater: buildings affect the ability of the ground to absorb rainwater, Chelmsford Rd is regularly flooded. There will be a greater need for surface water drainage, soak-aways will not suffice in heavy rainfall they soon fill and the clay sub-strata is slow to absorb the water. Discharging rainwater into the foul sewers is not feasible as it will only increase the burden on Anglian Water.

The L/Plan advocates conservation measures for water efficiency and management; 'Grey water' systems for harvesting and recycling rainwater should be mandated for all new developments, this will alleviate the risks of flooding and reduce water charges.
Electricity: there will be a significant increase in the demand for electricity for heating and EV charge points. What are the anticipated loads for all four developments? Can the infrastructure cope with the demand and increased current flow? Each development cannot progress in isolation each will have a distribution network and a separate incoming supply. An overall distribution network combining all four developments is required.
Shops: to suggest the BP service station shop can support existing and new residents is ludicrous, at times it is very busy. The service station being just off the roundabout is in a dangerous location, often vehicles are queuing out on the road preventing vehicles from exiting the slip road and blocking access to Chelmsford Road.
Alexander Lane: to close access to Shenfield school with the sole drop off/pick up point in Oliver Rd entrance is unacceptable. The roads around the school are very busy in the mornings and afternoons. The double yellow lines set out earlier this year have had no real effect, vehicles park anywhere, there is no 'policing'. Between 15.00 and 15.15 it is mayhem with traffic in Oliver Rd and vehicles trying to access Chelmsford Rd and school buses use the Oliver Rd access. The proposal will exacerbate the problem.
It is apparent this development does not fully address the criteria set out in the Brentwood Local Plan and could undermine it.
It is incumbent upon the developers to ensure and guarantee the infrastructure can accommodate the increased demands. Lack of coordination, conflicts and discord between the developers will occur unless all issues and compliance with all regulations, and the Brentwood LP, are resolved and all sign up to a binding agreement, including accord with the residents in the area.

6 Fen Close,

Shenfield,

Essex,

CM15 8SB

4th November, 2023

Re. Planning Application 23/01164/FUL

Address: Land North of Shenfield, Brentwood, Essex

Case officer: Kathryn Williams

Dear Ms Williams,

We would like to express our concerns and raise our objections regarding the above planning application on the following basis:

DRAINAGE/FLOODING

Research shows that unmaintained attenuation basins (and the proposal includes several of these) can increase flood risks to surrounding areas however the proposal doesn't include any detail about who will acquire responsibility for maintenance of the attenuation basins included in the site plan after the developer has moved on to their next project.

INFRASTRUCTURE

1. Footpaths/Cycleways - The Statement of Community involvement states that "A section of Alexander Lane (south of the secondary school) will be closed to through vehicular traffic and repurposed as a shared footway/cycleway to improve sustainable access to the school and routes leading to Shenfield Station" however "Transport Assessment – Appendices A-C" clearly shows that the footpaths and cycle paths that extend from the new entrance to the proposed site in Alexander Lane towards Shenfield are incomplete and inconsistent. The footpath is on different sides of the roads at different points without reference to any crossings and it disappears entirely at one point because of existing property boundaries extending up to the highway. Document 152080/PD11/A Realignment of Alexander Lane also shows the footpaths/cycle paths ending after they leave the proposed site meaning that pedestrians and cyclists will be forced onto the public highway, that is already busy and dangerous, to complete any journey to the station unless they use the existing, poorly maintained pavement from the Chelmsford Road entrance which may create a bottle neck. All other references to transport links only detail movement around and through the site not connecting it beyond the proposed site entrance on Alexander Lane and on to Shenfield Station or providing any new transport links.
2. Roads - Despite proposing 344 new properties, the only new roads being created are roads that service this development. Existing roads are already overused, particularly, at peak times and the increase in residents in the area with no investment in infrastructure beyond the site is irresponsible. The proposal makes reference to a plan to share details of

bus times and recommendations that people car share but there are no measurables to indicate the success (or otherwise of this plan) and no ongoing accountability for the impact. The claim in the "Statement of Community involvement" that "The effects of this on the transport network have been considered and it has been considered that the impacts will not be significant on the existing transport infrastructure in Shenfield" can only have been written by someone with no first hand experience of the delays and congestion at peak times.

3. There are no shops or facilities (food/post office/bakery/chemists etc) designated for the development so all residents requiring these will need to access Shenfield town centre. As detailed above there is no safe way to access the town centre from the proposed site on foot or by bike without heading back onto the Chelmsford Road and using existing poorly maintained footpaths/cycle paths.

ECOLOGICAL/ENVIRONMENT

Aside from the obvious destruction of significant portions of open space, the development will destroy the habitat of several species of wildlife detailed in the Landscape and Biodiversity Management Strategy document e.g. hedgehog, brown hare, harvest mouse, adult slow worm, common lizard and grass snake.

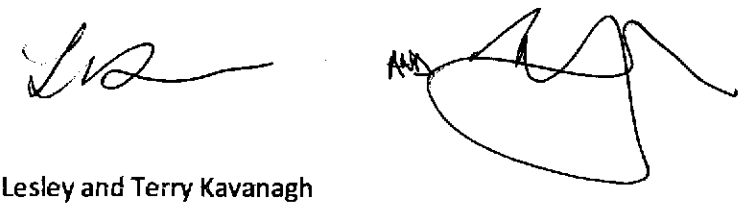
IMPOSITION TO EXISTING PROPERTIES

The property shown directly behind our own house is angled to directly face the back of our home and although the scale isn't quite clear it is considerably closer to our existing property than any other properties listed on the plans. If this property were angled differently it would afford more privacy to both the new and existing homeowners.

GENERAL

This application forms part of a bigger portfolio of land development but the detail of those are not currently available to view making it impossible to assess the overall impact.

Regards,



Lesley and Terry Kavanagh

Comments for Planning Application 23/01164/FUL

Application Summary

Application Number: 23/01164/FUL
Address: Land North Of Shenfield Alexander Lane Shenfield Essex
Proposal: Hybrid planning application for 344 units including 35% affordable housing, safeguarded land for a 2FE primary school and early years facility, public open space and associated landscaping, drainage and highways infrastructure.
Case Officer: Kathryn Williams

Customer Details

Name: Mr Peter Franklin
Address: 221 Chelmsford Road, Shenfield, Brentwood, Essex CM15 8SA

Comment Details

Commenter Type: Neighbour
Stance: Customer objects to the Planning Application
Comment Reasons:
Comment:Having grown up in Shenfield, and lived at this current address for nearly 30 years, I know the area extremely well.
The application site has been wrongly described. It is not Officers Meadow and it is very misleading to describe it as such. The area in question is only part of a larger area described in the Local Plan as R03 which does include Officers Meadow.
My objections are as follows:

1) On highway grounds. The A1023, Chelmsford Road, is very busy at most times of the day and queuing regularly occurs at peak times in the morning, especially during school term times.
In the event of RTC's and other traffic delays on the A12 Brentwood By-Pass traffic can be almost at a standstill.
Further development on the scale you are suggesting will only exacerbate this serious problem.

Back in 1994 an application to build a par 3 golf course on Officers Meadow, BRW/710/94, was refused by Brentwood Borough Council for the following reasons:
"The proposed development would lead to the introduction of significant traffic movements, to and from a new access, on this busy principal road which would interfere with the free and safe flow of traffic and cause danger and inconvenience to other highway users."
Since 1994 the highways situation has worsened hugely. There will be even more traffic movements on Chelmsford Road when the Hutton FC football pitches are completed (opposite Alexander Lane).

2) Redrow,s consultation leaflet states "The site forms part of a wider area allocated under Policy

R03 in the recently adopted Local Plan (2022)".
This includes a total of up to 825 residential dwellings, residential care home co-located primary school and childcare nursery and employment land.
The Redrow development is only part of this development and cannot and should not be judged on a standalone basis.

The L.P. Environmental Impact Screening Report includes a Statement of Common Ground between yourselves and the other three development companies involved and Brentwood Borough Council.
Point 2.1 third line says - As the plan at Appendix A shows, the allocation comprises a number of parcels of land which could be brought forward at different times; however, in accordance with Policy R03, the parties have agreed to provide a comprehensive masterplan and phasing strategy to inform detailed proposals as they come forward. The parties are working together to produce this masterplan and phasing strategy.

Before any consultations this "Comprehensive Masterplan" should be produced, and all residents within the vicinity of R03 should have an opportunity to view it and make their views known.

Comments for Planning Application 23/01164/FUL

Application Summary

Application Number: 23/01164/FUL
Address: Land North Of Shenfield Alexander Lane Shenfield Essex
Proposal: Hybrid planning application for 344 units including 35% affordable housing, safeguarded land for a 2FE primary school and early years facility, public open space and associated landscaping, drainage and highways infrastructure.
Case Officer: Kathryn Williams

Customer Details

Name: Mr Alex Kensit
Address: 96 Chelmsford Road, Shenfield, Brentwood, Essex CM15 8RL

Comment Details

Commenter Type: Neighbour
Stance: Customer made comments neither objecting to or supporting the Planning Application
Comment Reasons:
Comment:A number of points to make as a resident of Chelmsford Road.

Firstly, in respect of the school. It has always been promised a school would be provided. Now it is seemingly conditional dependant on need and Essex CC. Passing the buck. The suggestion that Long Ridings can be expanded is a valid one, if there was an actual connection between the site and Long Ridings. I suggested to the developers they provide a footbridge over the railway to enable such access, but they never responded to my email. Presumably if the school is not developed, more homes will be built, which could ironically increase the need for a school.

Secondly, it is bizzare why no provisions are being made for shopping and other facilities. It is not a quick walk to Shenfield town centre. The BP garage is not capable of serving the development. Countryside seem intent on using their employment land allocation for a care home - a bizzare choice for land straddling a major dual carriageway and another main road - as opposed to something, say a supermarket. Provisions should be made for this.

Thirdly, bus services are too infrequent to meaningfully serve the development. Can Croudace demonstrate they will provide the funding to increase the frequency?

Overall the scheme is a well thought out one and I do not object in principle to the scheme, but rather it should not just include housing alone; but the promised school, and retail facilities. Funding for a new GP should be provided as Rockleigh Court Surgery will surely be unable to cope with +3,200 new residents as the overall scheme with countryside, redrow etc will create.

Comments for Planning Application 23/01164/FUL

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Case Officer: Kathryn Williams

Customer Details

Name: Mr Robin Penny
Address: 207 Chelmsford Road, Shenfield, Essex CM15 8SA

Comment Details

Commenter Type: Neighbour
Stance: Customer made comments neither objecting to or supporting the Planning Application
Comment Reasons:
Comment:I recognise the real shortage of housing in the UK and don't want to be a Nimby, but would like to share some concerns:/thoughts
Traffic is a concern. The traffic survey was not realistic & access to the site very limited. On Chelmsford Rd, I often have difficulty getting off my drive with the car. I see the logic of closing Alexander lane off, but no easy answers to the traffic issues. I wonder if an additional access point from the adjacent site (behind BP) across the stream onto Widvale Rd would help (where the illegal encampment was some years ago). A slip road on/off the A12 in Brentwood would reduce through traffic along Chelmsford Rd as well as supporting the town centre, possibly also giving the Brentwood Centre a boost.
Drainage is a concern as water sometimes runs off Officers Meadows down into my garden (has flooded my garage at times).
Young Oak trees regularly sprout in the field, maybe wishful thinking, but I had hoped at some point to see it return naturally to English Oak forest (it would if left - I counted over 200 young Oaks near the paths, one day while walking round). There is a diverse range of wildlife that uses the Meadows which would no doubt suffer loss of habitat and would be a shame to lose. We recently had screech owls with young, in one of the tall trees just beyond the end of our garden. I can share a recording of these if needed.

Comments for Planning Application 23/01164/FUL

Application Summary

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Case Officer: Kathryn Williams

Customer Details

Name: Mr Derek Barker
Address: 57 Oliver Road, Shenfield, Essex CM15 8PX

Comment Details

Commenter Type: Member of the Public
Stance: Customer objects to the Planning Application
Comment Reasons:
Comment:We strongly object to the application for the building of 344 units on land north of Shenfield. This application alone could effectively relate to 700 people and at least 500 cars.
The amount of properties, along with the applications from the other proposed developers which will no doubt follow, with have a severe detrimental effect on Shenfield. There is a proposal for a school but no Doctors or Dentists. The Health Services in Shenfield are stretched to the limit. The proposed alterations to Alexander lane will bring more traffic to Oliver Road and Shenfield Park Estate roads which are often at a standstill now.
Also the environmental aspects of removing trees and hedgerows, building on green belt on what has always been regarded as a flood plain. This area regularly floods now, what will it be like with so many extra properties. The removal of foot paths and meadow walks which have been used by the people of Shenfield for years.
Shenfield is a village, it was built as a village and that is why residents chose to live here.

We fully support the Chelmsford Road Residents Association.

Peter Franklin 221, Chelmsford Road, Shenfield, Essex CM15 8SA

Firstly, as a member of Chelmsford Road Area Resident's Association I fully support their comments in recent correspondence regarding this application.

My objections are as follows: This application is only part of the Local Plan, a huge area known as R03. For this part of Shenfield.

1. The Local Plan Impact Screening Report clearly states:

"The L.P. Environmental Impact Screening Report includes a Statement of Common Ground between the four development companies involved and Brentwood Borough Council.

Point 2.1 third line says - As the plan at Appendix A shows, the allocation comprises a number of parcels of land which could be brought forward at different times; however, in accordance with Policy R03, the parties have agreed to provide a comprehensive masterplan and phasing strategy to inform detailed proposals as they come forward. The parties are working together to produce this masterplan and phasing strategy."

As yet I am unaware of such a plan being bought in for public consultation. Before any decisions are made this "Comprehensive Masterplan" should be produced, and all residents within the vicinity of R03 should have an opportunity to view it and make their views known.

Also, R03 must be considered with other development of sites close by such as Hutton Football Club playing field /football ground (currently under construction) with access/egress onto Chelmsford Road which will have an impact on highway layout and traffic volumes on what is already an extremely busy stretch of road.

2. The re-routing of footpath 86 should not be diverted via the development which makes a longer walking route. It should be more direct, as alongside Arnolds Wood and along the Railway boundary, connecting to existing route alongside railway and to Alexander Lane

3. The Croudace application shows the boundary including Arnold's Wood? I would like evidence of proof of ownership of this protected Ancient Woodland before any development takes place.

Comments for Planning Application 23/01164/FUL

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Case Officer: Kathryn Williams

Customer Details

Name: Mr Peter Franklin
Address: 221 Chelmsford Road, Shenfield, Brentwood, Essex CM15 8SA

Comment Details

Commenter Type: Neighbour
Stance: Customer objects to the Planning Application
Comment Reasons:
Comment:Peter Franklin 221, Chelmsford Road, Shenfield, Essex CM15 8SA
Firstly, as a member of Chelmsford Road Area Resident's Association I fully support their comments in recent correspondence regarding this application.
My objections are as follows: This application is only part of the Local Plan, a huge area known as R03. For this part of Shenfield.
1. The Local Plan Impact Screening Report clearly states:
"The L.P. Environmental Impact Screening Report includes a Statement of Common Ground between the four development companies involved and Brentwood Borough Council.

Point 2.1 third line says - As the plan at Appendix A shows, the allocation comprises a number of parcels of land which could be brought forward at different times; however, in accordance with Policy R03, the parties have agreed to provide a comprehensive masterplan and phasing strategy to inform detailed proposals as they come forward. The parties are working together to produce this masterplan and phasing strategy."

As yet I am unaware of such a plan being bought in for public consultation. Before any decisions are made this "Comprehensive Masterplan" should be produced, and all residents within the vicinity of R03 should have an opportunity to view it and make their views known.
Also, R03 must be considered with other development of sites close by such as Hutton Football Club playing field /football ground (currently under construction) with access/egress onto Chelmsford Road which will have an impact on highway layout and traffic volumes on what is already an extremely busy stretch of road.
2. The re-routing of footpath 86 should not be diverted via the development which makes a longer

walking route. It should be more direct, as alongside Arnolds Wood and along the Railway boundary, connecting to existing route alongside railway and to Alexander Lane
3. The Croudace application shows the boundary including Arnold's Wood? I would like evidence of proof of ownership of this protected Ancient Woodland before any development takes place.

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Case Officer: Kathryn Williams

Customer Details

Name: Mr Alex Kensit
Address: 96 Chelmsford Road, Shenfield, Brentwood, Essex CM15 8RL

Comment Details

Commenter Type: Member of the Public
Stance: Customer made comments neither objecting to or supporting the Planning Application
Comment Reasons:
Comment:I am not opposed to the application in principle but I have the following observations/objections to make

1) First, the provision of a school is no longer guranteed. Before it was essentially promised, now the developers appear to be favouring an expansion of Long Ridings Primary instead, arguing there is not a demand for a new school. They will presumably reuse any vacant school site for housing which would ironically then probably result in demand for a new school surfacing.

2) It is ridiculous to suggest the development can rely on a petrol station shop for the retail needs of the development. The developers point out Shenfield town centre is "close" - but in practise it is at least a 1.2 km walk from the site, in practise longer as the site is quite vast. There is plenty of room on the site allocation to provide a small parade of shops or similar facility. As part of the wider masterplan there is even more room - surely a supermarket would be better suited to an area between a dual carriageway and a major road rather than a care home?

3) The NHS have confirmed the site will overwhelm local GP surgeries. Croudace and the other developers should include a medical facility on the site of the scheme.

Aside from this I am not opposed to the scheme which appears to be, for the most part, well considered and thought out of. I am slightly baffled some people here are surprised to see this materialise when it has been talked about for years (at least 2015).

Comments for Planning Application 23/01164/FUL

Application Summary

Application Number: 23/01164/FUL
Address: Land North Of Shenfield Alexander Lane Shenfield Essex
Proposal: Hybrid planning application for 344 units including 35% affordable housing, safeguarded land for a 2FE primary school and early years facility, public open space and associated landscaping, drainage and highways infrastructure.
Case Officer: Kathryn Williams

Customer Details

Name: Mr Peter Lee
Address: 223 Chelmsford Road, Shenfield, Brentwood, Essex CM15 8SA

Comment Details

Commenter Type: Neighbour
Stance: Customer objects to the Planning Application
Comment Reasons:
Comment:Member of the Chelmsford Road Area Residents Association.

Reference: 22.1643.208/A HOUSE TYPE DISTRIBUTION

The above document indicates that plots 117 and 118 are marked as "affordable housing". These back onto existing properties in Chelmsford Road, there is no buffer between the ends of the gardens. This leaves property owners in Chelmsford Road with the prospect of being faced with the problems that some occupiers of affordable housing bring with them.

I would therefore request that any properties to be used for affordable housing be relocated away from existing houses in Chelmsford Road.

Peter Lee

Comments for Planning Application 23/01164/FUL

Application Summary

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Case Officer: Kathryn Williams

Customer Details

Name: Mrs Mary Roche
Address: Farm Cottage, Alexander Lane, Shenfield Brentwood, Essex CM15 8QE

Comment Details

Commenter Type: Member of the Public
Stance: Customer objects to the Planning Application
Comment Reasons:
Comment:My objections:

Increased Traffic on Alexander Lane

This will become a rat run, with hugely increased traffic into Alexander Lane, due to the two new roads from the Croudace and later Stonebond developments. I believe that the proposed mitigation provided by the bollards on Alexander Lane will be greatly exceeded by the increased traffic from the two new roads. Alexander Lane is too narrow to cope with substantial volumes of traffic. In addition, cyclists will exit the cycle lanes onto Alexander Lane but will then be cycling on the road and contending with this increased traffic.

Increased risk to Pedestrians

The pavement from Farm Cottage towards Oliver Rd is very narrow in places and outside "Leclarely" only 0.5m wide. Today, it is unsafe for pedestrians to continue until traffic has passed and there is no space for widening the pavement here. The increase in traffic and pedestrians coming from the development will make this an even bigger safety hazard.

.
Proposal to reduce the amount of traffic:

a) The Croudace development shows a road running from Chelmsford Road to Alexander Lane. This through road is no longer needed as the site has effectively been split in two because of the

drainage mitigation measures which have now been added.

b) The proposed road in the Stonebond development should not exit onto Alexander Lane but be diverted to connect to the existing Croudace road network within the new development.

Proposed Cycle Path

In the Transport Assessment, Appendix O, there is a proposal for a cycle path through the Brentwood Borough Council's (BBC) Alexander Lane Recreation field exiting just at the side of Farm Cottage. How can a cycle path through BBC land be considered as this is not part of the development? If implemented, this would pose a significant risk to ourselves as well as pedestrians and cyclists when reversing out of our drive due to restricted visibility together with the increased traffic flow from the housing development.

Comments for Planning Application 23/01164/FUL

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Case Officer: Kathryn Williams

Customer Details

Name: Mr Maurice Roche
Address: Farm Cottage Alexander Lane, Shenfield, Brentwood, Essex CM15 8QE

Comment Details

Commenter Type: Member of the Public
Stance: Customer objects to the Planning Application
Comment Reasons:
Comment:My views are represented by the Chelmsford Road Area Residents Association.

Comments for Planning Application 23/01164/FUL

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Case Officer: Kathryn Williams

Customer Details

Name: Mr Peter Lee
Address: 223 Chelmsford Road, Shenfield, Brentwood, Essex CM15 8SA

Comment Details

Commenter Type: Member of the Public
Stance: Customer objects to the Planning Application
Comment Reasons:
Comment:Member of the Chelmsford Road Area Residents Association.

Rerouting of Alexander Lane traffic flow through the new estate.

The new estate has, according to the webinar, only parking for one car per house. There will inevitably be two cars per household which implies that the roads through the estate will be narrowed considerably due to parking. This will discourage through
traffic from using the route, forcing it into Oliver Road. This will make what is a difficult road at some times of day, impossible. A better solution would be not to close the north end
of Alexander Lane but instead to upgrade it to be slightly wider, with lighting, proper kerbs and a pedestrian crossing.

Proposed PROW Diversion Officers Meadow, Shenfield - 152080/PD16

The proposed re-routing of the Public Footpath changes the path from a green woodland route to a cement and tarmac path. It will take the land forming the existing public footpath and replace it with a path that the developers would have had to create anyway. It offers nothing to existing users, the gain is all on the side of the developer. To all intents and purposes, the developer is simply
removing the public footpath.

Comments for Planning Application 23/01164/FUL

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Case Officer: Kathryn Williams

Customer Details

Name: Mr Mark Feeley
Address: 108 Chelmsford Road, Shenfield, Brentwood, Essex CM15 8RN

Comment Details

Commenter Type: Member of the Public
Stance: Customer objects to the Planning Application
Comment Reasons:
Comment:1) Why is this development necessary. There doesn't appear to be a business case amongst the 313 documents.
2) This is only part of a potential development involving five companies. Surely a plan should be presented in a single package for all five. Otherwise how can we judge the merits and avoid disjointed development over time?
3) The development is inconsistent with the "look and feel" of Shenfield. There are too many units per acre and the aesthetic quality of the design leaves much to be desired. The look should be more in keeping with the neighbouring Shenfield Park Estate.
4) Over development is a real issue, increasing pressure on local services such as GP services etc. The proposal will not provide any additional facilities.
5) Traffic will be funnelled into Chelmsford Road, which is already a busy road. A school will only add to the number of vehicles. What provisions will there be for pedestrians, including school children, who wish to cross the Chelmsford Road. I can see no reference to traffic calming measures or a pedestrian crossing.
6) Alexander Lane is a public thoroughfare. I don't see why it should be closed to benefit a housing development. It will simply lead to more traffic on other local roads.

Comments for Planning Application 23/01164/FUL

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Case Officer: Kathryn Williams

Customer Details

Name: Mr Jason Peers
Address: 44 Oliver Road, Shenfield, Brentwood, Essex CM15 8QA

Comment Details

Commenter Type: Neighbour
Stance: Customer objects to the Planning Application
Comment Reasons:
Comment:I totally object to this planning application, the traffic infrastructure is already terrible in Shenfield around Alexander Lane and Oliver Road especially around school times and normal working hours. To add another 344 units into an already busy area makes no sense. I also do not see any improvements to the area that alleviates this problem

Comments for Planning Application 23/01164/FUL

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Case Officer: Kathryn Williams

Customer Details

Name: Mark Mumford
Address: 72 Oliver Road, Shenfield, Brentwood, Essex CM15 8PZ

Comment Details

Commenter Type: Member of the Public
Stance: Customer objects to the Planning Application
Comment Reasons:
Comment:No developments in this area until Essex County Council and Brentwood Council resolve existing traffic and policing issues.
Traffic- Consultants appear oblivious to unique issue we face
1) Since Covid appears more parents driving students. Roads are clogged 2.30 to 3.30
2) West Ham home games create excessive traffic and parking which have been made worse by parking restrictions on cross streets
3) Abellio,'s persistent trackworks have led to more people driving to Shenfield to pick up the train rather than the bus provided again making roads impassable.

Police- The decision to close Brentwood Police Station and reducing patrols leave us open to increasing crime

Comments for Planning Application 23/01164/FUL

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Case Officer: Kathryn Williams

Customer Details

Name: Mrs Emma Lingard
Address: 4 Lordship Close, Hutton, Brentwood, Essex CM13 2QY

Comment Details

Commenter Type: Member of the Public
Stance: Customer objects to the Planning Application
Comment Reasons:
Comment:I strongly object to these proposals.

Firstly, traffic - these proposals do not take into regard any of the issues that residents in Shenfield already face. There is excess traffic at school drop offs and 5-6pm which will get a lot worse if this development goes ahead. This development is certainly not a walking distance to Shenfield centre as its being sold as. These days most people will drive to the station when its more than a 10 min walk and these homes will be considerably further.

Over development is a big issue which we already feel day to day in Shenfield. Schools, doctors, dentists will all become even more over subscribed and whilst there is a site safeguarded for a school there is no guarantee this will be utilised.

Alexander Lane being closed will be of massive inconvenience to current residents.

There seems to be no provisions for shopping - an entire housing development cannot rely on a petrol station on the edge of a dual carriage way. That is firstly quite dangerous and secondly not sustainable in the long run.

The environmental impact of removing trees and hedgerows. This will be destroying wildlife habitats.

This proposal seems to be only part of a larger plan involving multiple developers. How are residents meant to judge this when its just a small portion of what is actually being proposed? The

consideration of this plan should be paused until it can be considered as a whole.

Its very interesting to see that in 1994 (!) a proposal for a golf course was turned down on this land for the reason that is would lead to the introduction of significant traffic movement causing danger to other highway users. The traffic situation has worsened since then hugely so I struggle to see how this increased traffic isn't going to be a danger to road users, pedestrians and children.

Given this proposal affects almost all of Shenfield, there has been little awareness given to residents and most people have found out on social media/word of mouth.

Comments for Planning Application 23/01164/FUL

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Case Officer: Kathryn Williams

Customer Details

Name: Mr Robert West
Address: 229 Chelmsford Road, Shenfield, Brentwood, Essex CM15 8SA

Comment Details

Commenter Type: Neighbour
Stance: Customer objects to the Planning Application
Comment Reasons:
Comment:This application continues to fail to fully address concerns raised by residents and other stakeholders . This is part of a proposed development involving five companies, that fails to consider the impact each will have on the other most specifically upon:
* Increasing pressure on already stretched local services such as Health.
* Traffic which will be funnelled into Chelmsford Road, which is already a busy road often gridlocked.
* Environmental pollution caused by this considerable extra traffic.
* Alexander Lane as a public thoroughfare.
* Flooding - raising the risk of major flooding on the roads (as is already seen in the area)

The proposal also falls to take account of traditional footpaths across used for many years in its attempt to squeeze as many properties as possible into a space entirely unsuitable for such numbers.

My views are also represented by the Chelmsford Road Area Residents Association.

I cannot support this application unless and until we see something much smaller that addresses current issues (traffic and water drainage being foremost) and concerns. A development more beneficial to the health and well being of current and future residents is possible, but approving this plan will cause problems for generations to come.

Comments for Planning Application 23/01164/FUL

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Case Officer: Kathryn Williams

Customer Details

Name: Mr William Beattie
Address: 120 Chelmsford Road, Shenfield, Brentwood, Essex CM15 8RN

Comment Details

Commenter Type: Neighbour
Stance: Customer objects to the Planning Application
Comment Reasons:
Comment:We are unable to support the application at this point due to the insufficient evidence provided on the mitigation of traffic, parking, flood risk and wider environmental issues. Our views are represented by those put forward by the Chelmsford Road Residents Association.

Comments for Planning Application 23/01164/FUL

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Case Officer: Kathryn Williams

Customer Details

Name: Mr David Baker
Address: 179 Chelmsford Road, Shenfield, Brentwood, Essex CM15 8SA

Comment Details

Commenter Type: Member of the Public
Stance: Customer objects to the Planning Application
Comment Reasons:
Comment:My views are also represented by the Chelmsford Road Area Residents Association.

I cannot support this application unless certain areas are addressed correctly.
There should be a central plan for all the Developers and this should be passed at the same time. This will allow all the external agencies to fully understand the extent of the changes involved. To allow each developer to submit plans individually and be approved is foolhardy at best.
Flooding : Chelmsford road now floods frequently when it rains heavily. This will only get worse with additionally housing.
Traffic : Closing Alexander lane will worsen the situation not improve it. Additional traffic from 344 houses will make the situation far worse. Most households today have at least 2 cars to ensure that they can get from place to place. I cant see that reducing by the measures proposed here. Traffic queues regularly on Chelmsford Road now, any additional traffic will make it far worse at peak times (noise and pollution levels need to be addressed).
Healthcare : Doctors and Healthcare is currently full in Shenfield and there is no allocation for anything in this plan.
Boundaries : We need confirmation that Croudace will accept the current boundaries that are in place.
Some of these areas have been addressed in this plan but most seem either inadequate or passing the buck to other agencies.
There needs to be an overall plan.

Comments for Planning Application 23/01164/FUL

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Case Officer: Kathryn Williams

Customer Details

Name: Mr Niels Andersen
Address: 231 Chelmsford Road, Shenfield, Brentwood, Essex CM15 8SA

Comment Details

Commenter Type: Neighbour
Stance: Customer objects to the Planning Application
Comment Reasons:
Comment:My general objection against the current proposal are represented by the Chelmsford Road Area Residents Association.

Specifically, my objection concerns the Flood Risk Assessment and Drainage Strategy submitted as part of the application which does not appear to adequately address potential impacts on the neighbourhoods in Long Ridings, Whitegates, Fen Close and the immediate Chelmsford Road area identified by the EA as being at high risk from surface water flooding.

The importance of subsurface flows for natural drainage and the associated risk of groundwater flooding has largely been ignored in contradiction of established drainage processes within a natural flood plain environment and evidenced by season waterlogging at different locations across the proposed development site.

Two of the main subsurface drainage structures within the proposed drainage design are located in areas subject to seasonal waterlogging adjacent to the neighbourhoods at risk of surface water flooding where the construction of subsurface drainage structures may impede existing subsurface drainage.

Construction of subsurface drainage structures at these locations also appear to be in conflict with general design guidelines published by ECC, CIRIA and Anglian Water, and the design would require a more detailed review.

The flood risk assessment only addresses surface water flows draining into the Shenfield

watercourse and fails to recognise that a significant part of the site targeted for the highest housing density forms part of a different catchment draining across the adjacent site for the proposed Redrow development. And joint drainage strategy should ideally be provided across all proposed developments within the B03 area.

The costs of maintaining the proposed drainage structures should also be considered, and whether this is funded via the general Council budget or ground rents for residents with a risk of making the affordable housing less affordable for the intended targets.

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Case Officer: Kathryn Williams

Customer Details

Name: Ms Elizabeth Jerrard
Address: 231 Chelmsford Road, Shenfield, Brentwood, Essex CM15 8SA

Comment Details

Commenter Type: Neighbour
Stance: Customer objects to the Planning Application
Comment Reasons:
Comment:Please note that my views are represented by the commentary provided by the Chelmsford Road Area Residents' Association. I have specific comments about the bio-diversity implications.

The application fails to take account of the recent update to Brentwood Borough Council's policies on biodiversity. At the Full Council meeting on 27 September a motion was passed unanimously saying the target for Biodiversity Net Gain (BNG) should be lifted from 10% to 20%, sustainable over at least 30 years.

There is little of substance in the planning application to explain how the current richness of wildlife, flora and fauna will be protected during development and how it will be supported post development - who is responsible and who will bear the costs ?

There is no comment on how any BNG will be protected in the long-term. This is important because once the site is populated there will be an inevitable degradation of biodiversity. We know that there are badgers, slow-worms, bats, newts, moles, rabbits, stoats and dormice that currently live in the ancient woodland and its surrounding areas. If the development were to go ahead we need to know that these will be protected during all stages of development to ensure that these animals can continue to live there post development. I would like a more comprehensive report provided that addresses these issues for a sustainable future.

Chelmsford Road Area Residents' Association

Planning Department
Brentwood Borough Council

30th November 2023

Dear Kathryn,

RE: OBJECTION TO PLANNING APPLICATION - NORTH SHENFIELD (RO3) DEVELOPMENT 23/01164/FUL

We write on behalf of the Chelmsford Road Area Residents' Association, a collective voice representing the concerns of residents in Chelmsford Road, Alexander Lane, Fen Close, and Oliver Road. Our purpose is to express our concerns and objection to the proposed North Shenfield (RO3) development 23/01164/FUL; the planning application submitted by Croudace.

We assert that the current version of this application raises several significant concerns that necessitate a comprehensive examination and reconsideration. It is imperative for the developers to ascertain and assure that the proposed developments do not unduly strain infrastructure, traffic, biodiversity, health services, and the overall well-being of the community. The developers bear the responsibility to ensure that both the infrastructure and the community can effectively accommodate the increased demands resulting from the proposed developments.

The potential for lack of coordination, conflicts, and discord among the developers is likely unless all pertinent issues, compliance with regulations, and adherence to the Brentwood Local Plan are adequately addressed. To foster harmonious development, it is essential for all parties involved to resolve these matters and commit to a binding agreement, which should include alignment with the preferences and concerns of the residents in the area.

Our detailed objections are focussed on several categories, each of which contributes to our collective concerns:

Roads and Traffic

There is inadequate consideration of a wide range of traffic management, road safety and right of way issues.

There is a plan for a toucan crossing on Chelmsford Road south of the new development access, as outlined in the main traffic report RO4 SGT, Section 4.22. We believe this proposal to be inadequate when the totality of the developments across all four developers is considered.

As a primary school is included in the application, a future application to build houses and a care home on the opposite side of Chelmsford Road pending, this should be addressed now. There will clearly be a need for safe crossings near to the proposed entrance to the development for children to cross and near the site of the proposed care home for the residents there to cross the road safely. We would expect that this will require an extended pedestrian phase to cope with the anticipated mobility issues of the care home residents. These should be paid for by the developers once the locations have been agreed with Essex Highway and applications revised accordingly.

In addition to the obvious need for at least two pedestrian crossings, a proper overall plan needs to be drawn up by all the developers and reviewed by Essex Highways. This needs to show where the various junctions will be and how they will interact with each other. Until Countrywide submits its application this will not be possible, and this application should therefore be deferred until that time.

To summarise, from the junction of the Mountnessing roundabout with Chelmsford Road to the existing junction with Alexander Lane there will need to be at least one, possibly two, junctions from the Countrywide site onto Chelmsford Road; a junction from the Redrow site (very near to the existing Fen Close junction); a new junction next to the Zen House; at least one junction from the Croudace site; and a still to be agreed junction from the Hutton Football Club site. All this on an already congested road.

The existing service station sited just off the roundabout is already in a dangerous location, where vehicles frequently queue onto Chelmsford Road preventing vehicles from exiting the slip road and blocking access to Chelmsford Road itself. None of the traffic surveys submitted take any of this into account.

The speed limits on the stretch of the A1023 will need to be reduced and made consistent. At present, it is 60mph as vehicles come off the roundabout at the junction with the A12, reducing to 40mph for a stretch on the A1023 before being lowered again to 30mph. This variation in speed limits will clearly be inappropriate and dangerous with all the new crossing and junctions. There is a proposal to reduce the speed limit on Chelmsford Road to 30mph (Section 4.24 of the main traffic report RO4 SGT). We would suggest that should be reduced to 20mph to reflect the increased population density being proposed across all four developments as well as the additional traffic generated by the inclusion of a nursery, a primary school and a care home.

We suggest that at a minimum the traffic surveys are re-run with the impacts of all developments considered when analysing effects on the local infrastructure. Much of the data submitted was collected in May 2022. We believe that this data is not indicative of the usual traffic flows as they will have been affected by a reduction in traffic volumes as a result of the additional Bank Holiday for the Queen's Platinum Jubilee.

The map of the overall site submitted with this application shows a road running from Alexander Lane, through the proposed drainage mitigation area to Chelmsford Road. We suggest that this is no longer required as the site has effectively been split into two distinct sections because of the newly introduced drainage mitigation measures. It is worth noting that this had not been properly addressed in the original Local Plan and were added at the insistence of the Environment Agency. The proposed road has the potential to become a rat-run and would also push far too much traffic into Alexander Lane, the lower part of which is too narrow to cope with substantial volumes of traffic.

The pavement along that stretch of Alexander Lane is already a problem as in places it is less than 1 metre wide, making the proposal for that road to accommodate more cars, a cycle path and encourage people to walk into Shenfield impossible to achieve. The pavement from Farm Cottage towards Oliver Rd is very narrow in places and outside "Leclarely" only 0.5m wide. Today, it is unsafe for pedestrians to continue until traffic has passed and there is no space for widening the pavement here. The increase in traffic and pedestrians coming from the development will make this an even bigger safety hazard.

The developers should be addressing this if walking is to be encouraged, which is a stated aim and proposed outcome of this development.

Removing the proposed (rat-run) road through the estate will necessitate dropping the poorly considered proposal to stop access to Alexander Lane beyond Shenfield School from Chelmsford Road as outlined in the original Local Plan. We suggest that this would also stop Oliver Road being turned into a major through road, another of the consequences of the development that needs serious consideration but which has not been taken into account.

Furthermore, in the light of the motion passed at the last Full Council about improving biodiversity in new developments (see Biodiversity comments) we should see the drainage mitigation measures as a golden opportunity to achieve the sort of improvements envisaged by the Council on this site. Any chance of doing that will be lost if a road is constructed through this flood-plain. All that is needed is a footpath, with a cycle path alongside. However, the continued vulnerability of the site to flooding must be addressed so that any footpaths remain usable at all times of the year. This must raise a question mark over the routing of a footpath across a flood mitigation area.

The Local Plan requires enhancement of public rights of way yet there is no mention of the current consideration by Essex Legal Services of the application for formal recognition of the long-established network of footpaths across Officers' Meadow. This is a serious omission as, if approved, they would significantly impact the planned layout of the site.

There should be just one road from the Croudace and Stonebond sites onto Alexander Lane. Having two roads exiting the development sites in such close proximity is unnecessary and potentially dangerous as they will be near a tight bend with limited visibility. The proposed road in the Stonebond development should not exit onto Alexander Lane but be diverted to connect to the existing Croudace road network within the new development (or vice-versa).

In addition, cyclists will exit the cycle lanes onto Alexander Lane but will then be cycling on the road and contending with this increased traffic.

The proposed cycle path shown traversing Brentwood Borough Council (BBC) land (in Appendix 0 of the Transport Assessment), currently a playing field and one of only two open spaces in Shenfield, should be accommodated with the main development proposals. This will require co-operation between Croudace and Stonebond, yet another reason for deferring this application until the North Shenfield development can be considered as a whole. If implemented, this would pose a significant risk to residents when reversing out of their drives due to restricted visibility, as well as to pedestrians and cyclists. It would also lead to a loss of public open space. Surely, a development on this scale should be looking to enhance that open space, not curtail it? It has potential to be better used if upgraded.

Community facilities and employment

The application falls short of the requirements of the Local Plan and good development in many regards, especially when it comes to community facilities and employment.

It fails to provide any community facilities. The so-called "community hub" seems to be comprised of a tree and is only there because the tree in question is protected. There are no shops, cafes, or community buildings. There are no shops within a 15-minute walk of North Shenfield, which must be the gold standard for all future major developments. The nearest community hall is 1.5 miles away.

For people living in the centre or at the far end of the proposed development, the nearest shops and cafes will be at least a 30-minute walk and will inevitably encourage the use of vehicles.

The suggestion that the small shop at the garage at the far end of Chelmsford Road could meet the needs of new and existing residents is risible. This is at the back of a busy, cramped and often congested garage forecourt and is not safe for an increase in the number of pedestrians that would result from the proposed developments.

Health service professionals have identified isolation and loneliness as a key contributor to poor health outcomes. This development will exacerbate those problems, especially as none of the associated developments by Redrow, Stonebond or Countrywide address the problems. It will be a large, soulless estate with no focus, no sense of community. This will almost certainly lead to significant levels of anti-social behaviour, especially if there are large numbers of teenagers living there. This needs to be addressed in consultation with the local NHS and Essex Police and a major revision of the plans to meet these shortcomings is clearly essential, especially as the health service has already identified the inability of existing GP and related services to cope with the demand from the new development. Concerns have been raised and lodged as part of the consultation process from both the police and health services – these concerns must be addressed and mitigated.

The Local Plan requires the provision of employment opportunities as part of the RO3 development. There are none in this application. All the developers should be contributing to this. Without shops and cafes, community workshops, spaces for small businesses and perhaps a gym or similar, this will not only be a soulless development, it will add nothing to the local economy in terms of employment.

There is nothing that will contribute to wellness - no pharmacy, no wellness hub of the type the health service is asking for. We believe the developers should commission a joint report from all relevant health service organisations that addresses these broader health and wellness needs. This should include clear commitments to fund the recommendations.

Both Redrow and Croudace's applications fall short in providing adequate employment opportunities and open spaces for the community. The absence of community-centric amenities and sports facilities is of serious concern. It is hard to understand why no provisions are being made for shopping and other facilities. It is not a quick walk to Shenfield town centre. The BP garage is not capable of serving the local community. We understand that Countryside will submit proposals to use their employment land allocation to site a care home. We struggle to see how land straddling a major dual carriageway (A12) and a major through road to Brentwood (A1023) could be considered a suitable site for this type of development. A more appropriate use of this site could be the provision of local amenities which we believe should be incorporated into these proposals.

There is ambiguity surrounding the proposals for primary school provision in the area. We understand that the developers are favouring the expansion of Long Ridings Primary school as opposed to building a new school on the North Shenfield site, thus raising doubts about the development's alignment with the Local Plan. We know that Croudace would increase the numbers of proposed houses if this school were not required.

If Essex County Council eventually decides it does not require the proposed new primary school, the land earmarked for it should be re-allocated to community use – a park, allotments etc – and not additional housing.

Ecology and biodiversity

The application fails to take account of the recent update to Brentwood Borough Council's policies on biodiversity. At the Full Council meeting on 27 September a motion was passed unanimously saying the target for Biodiversity Net Gain (BNG) should be lifted from 10% to 20%, sustainable over at least 30 years.

The application falls short of this target.

It shows a predicted gain of habitat units of 16.33%, watercourse units gain of 22.35% (which exceeds the 20% target). Hedgerows however are currently predicting only a 0.49% gain which is clearly unacceptable given how important they are to biodiversity. There is no comment on how any BNG will be protected in the long-term. This is important because once the site is populated there will be an inevitable degradation of biodiversity.

Arnold's Wood at the far end of the Croudace site is a small ancient wood well populated with bats. We know there are dormice and slowworms at several locations within the development area and one resident along Chelmsford Road has recently found what we believe are crested newts at the end of her garden backing on to the meadow (see below photographs). There are many wild hedgerows that the developer proposes removing without any obvious replacement.

The whole area is rich in biodiversity and residents are anxious that a proper baseline is established for this so the requirement for the developers to enhance the biodiversity can be meaningfully measured.

As the site is divided up between four developers, we fear that they will pass the responsibility for protecting the biodiversity and ecology of the site among each other with important elements falling between them. Moreover, if parallel development goes ahead at the proposed Croudace and Redrow development sites it is unlikely that the existing wildlife populations within the ancient woodland

extension of Arnold's Wood, including badgers and bats, can be sustained for the duration of the development.

While the Biodiversity Net-gain report makes provisions for the introduction of vegetation in relation to the proposed drainage structures, this will require up to 3 years to establish from the point at which the development is completed, and the impact on fauna is explicitly ruled out of scope for the report. We would like the impact on fauna to be considered and would request this to be included in a report. Similarly, the Woodland Management report makes provisions for establishing future habitats for animals. However, impacts on existing wildlife during and after development has not been addressed. And there is no clear provision for how wildlife would be re-established once the proposed development is complete.

Instead, it should be considered if existing wildlife can be retained during and after the proposed development of the sites within the wider B03 development area, where parallel development of the proposed Croudace and Redrow sites could impact the ability of the existing wildlife populations to remain within area.

We believe that a single, independent ecology survey should be carried out for the entire North Shenfield (RO3) area, paid for by the four developers.

Drainage and Sewers

Serious concerns are raised about the proposed road dividing the drainage mitigation area. This division could lead to flooding, and alternative footpaths and cycle paths should be considered to mitigate such risks. - Chelmsford Road regularly floods now. Any additional houses are going to make this worse. This does not seem to have been considered adequately in the plans.

The capacity of sewers, rainwater drainage, and electricity infrastructure needs careful assessment. Sustainable solutions should be prioritised to avoid overburdening existing infrastructure. The sewer in Chelmsford Road has had many problems with blockages in recent years. All developments need to combine to install a future proof sewer infrastructure and treatment system, provided Anglian Water can accommodate the additional discharge from the properties. The additional discharge will only increase pressure upon Anglian Water and the existing treatment works with the potential risk for discharge(s)

Rainwater

Buildings affect the ability of the ground to absorb rainwater. As Chelmsford Road is regularly flooded, there will be a greater need for surface water drainage, soak-aways will not suffice in heavy rainfall, they soon fill, and the clay sub-strata is slow to absorb the water. Discharging rainwater into the foul sewers is not feasible as it will only increase the burden on Anglian Water. The L/Plan advocates conservation measures for water efficiency and management; 'Grey water' systems for harvesting and recycling rainwater should be mandated for all new developments, this will alleviate the risks of flooding and reduce water charges.

A thorough examination of the impact of traffic on drainage, particularly during peak times, is warranted. This assessment should form an integral part of the overall planning considerations.

Flood Risks

The flood risk assessment and drainage strategy report provided by Croudace appears to only address flood risk from surface water run-off. Firstly, it does not consider flood risks related to groundwater within what is a floodplain catchment and therefore subject to seasonal waterlogging. Secondly, it does not consider the impacts to areas immediately outside the boundary of the proposed development site. Specifically:

- The flood risk assessment is carried out using unknown modelling of surface runoff from the area of the proposed development site that drains into the Shenfield watercourse. It does not consider that a significant area to the north targeted for the highest development density is located within a catchment draining across the ancient woodland and into the river Wid via a drainage channel along the adjacent field targeted for development by Redrow.

- The proposed drainage design relies on the construction of a series of subsurface attenuation tanks where several of the tanks are located within areas subject to seasonal waterlogging. The efficiency of such structures will require further assessment. Challenges with their construction and ongoing maintenance need to be better understood in the context of published ECC design guidelines. Similar concerns exist regarding the construction of SuDS below a water table and within a functional floodplain referenced in the design manuals published by CIRIA and Anglian Water.

- Construction of a subsurface attenuation tank at the norther corner of the proposed development site is likely to impact subsurface drainage across the ancient woodland. This appears to be within what appears to be the main outlet from the catchment area draining into the river Wid. The associated impacts on the immediate Fen Close and Chelmsford Road neighbourhood within what is identified by the EA as a high-risk area for surface water flooding needs to be assessed. This should be as part of a joint study covering the proposed Croudace and Redrow development site to define a consolidated drainage strategy.

- The proposed location of a subsurface attenuation tank in the northeastern corner along the railway line appears to be within what would appear to form part of the functional floodplain along the Shenfield watercourse. This acts to provide natural attenuation of surface runoff from the upstream catchment. The impacts on the immediate Long Riding and Whitegates neighbourhoods are also identified by the EA as a high-risk area for surface water flooding; none of has not been considered.

- The Anglian Water SuDS design manual also recommends that surface water runoff from impermeable ground areas is collected separately from ‘clean’ runoff from roof areas and cleaned as it travels towards the watercourse. It is unclear to what extent this is accommodated within the proposed drainage design, and a more detailed design review may be required.

- A section of drainpipes connecting the attenuation tanks by Fen Close and the railway line also appear to be located below the mean water level of the lower attenuation tank. This raises further questions regarding the accuracy of the proposed drainage design and further reviews would be required.

- The presence of groundwater has been rapidly dismissed with a reference to a shallow confined aquifer at a depth of 3-4 meters while the standard hydrology of a floodplain environment has not been considered. Unconfined groundwater is typically found with drainage along preferential subsurface flow paths towards the main drainage channel (the Shenfield watercourse), and the proposed development can be expected to significantly alter the subsurface flows with impact for flora and fauna along the Shenfield watercourse and within the ancient woodland, these impacts need to be considered.

- The Environment Agency in their comments on the application state 'The development is unlikely to be granted a Flood Risk Activity Permit (FRAP)'. This reinforces what we are saying about the implications for the Shenfield watercourse. The Environment Agency warns that without the permit the Developer would be breaking the law.

In conclusion, our association objects to the current planning application. We propose a temporary halt to the progression of this application until all developers can submit detailed, cohesive plans that address the myriad concerns outlined above. A comprehensive and integrated approach must be submitted to ensure the development aligns with the policies outlined in the Local Plan and the standards set by Brentwood Borough Council.

We advocate for a holistic evaluation of all planning applications for the entire RO3 area to ensure the long-term sustainability of the development.

On behalf of Chelmsford Road Area Residents' Association

Michael Bains – Chair	Elizabeth Jerrard – Vice Chair	Tracey Underwood - Member
michaelbains55@gmail.com	elizabeth.Jerrard@yahoo.co.uk	traceyunders1@yahoo.co.uk
Ruksana Ahad – Secretary	Maurice Roche – Treasurer	David Worsfold – Member
r.ahad@btinternet.com	rochefamily5@sky.com	david.worsfold@Zen.co.uk

Mrs T Atalon
167 Chelmsford road
Shenfi ld

1 December 2023

Dear Sirs

23/01164/FUL | Hybrid planning application for 344 units including 35% affordable housing, safeguarded land for a 2FE primary school and early years facility, public open space and associated landscaping, drainage and highways infrastructure. | Land North Of Shenfield Alexander Lane Shenfield Essex
Re: Objection to Proposed Car Park Placement
Traffic and Pollution - Request to redesign the Master Plan

I am wri ng to formally register my objecti n to the proposed placement of a car park by your development project in close proximity to our property boundary. This objecti n is based on the signifi ant security concerns that arise from this proposed placement.

The current plan necessitates the removal of existi g bushes that presently contribute to the security of our property. These bushes act as a natural barrier and provide a level of privacy and security. The removal of these elements raises apprehensions about the potenti l compromise of our security and privacy.

In light of the foregoing, I kindly request that you provide assurances regarding the security measures that will be implemented to mi gate the impact of the proposed car park on our property. Speci cally, I seek detailed information on the security measures that will be in place to compensate for the removal of the aforementioned b shes and to ensure the conti ued privacy and safety of our premises.

I appreciate your prompt a ention o this ma er and look forward to receiving comprehensive information that addresses these security concerns. Please consider this objec on as an expression of our commitment to safeguarding the well-being and security of our property.

Request to redesign the Master Plan to redesign the road so that no vehicles have access to Chelmsford Road, only footpaths and bikes to facilitate the already established heavy tra c to address the pollu on level. Wash road access could be the answer.

Thank you for your understanding and coopera on.

Yours faithfully

T Atalon

Comments for Planning Application 23/01164/FUL

Application Summary

Application Number: 23/01164/FUL
Address: Land North Of Shenfield Alexander Lane Shenfield Essex
Proposal: Hybrid planning application for 344 units including 35% affordable housing, safeguarded land for a 2FE primary school and early years facility, public open space and associated landscaping, drainage and highways infrastructure.
Case Officer: Kathryn Williams

Customer Details

Name: Mr Craig Elkins
Address: 4 Sebastian Avenue, Shenfield, Brentwood, Essex CM15 8PN

Comment Details

Commenter Type: Neighbour
Stance: Customer objects to the Planning Application
Comment Reasons:
Comment:I am writing to formally register my objection to the planning application for the construction of a large housing estate on the Land North Of Shenfield. I believe the multiple applications should be collectively considered.

As a concerned resident and stakeholder in the community, I strongly oppose this development for the following reasons:

Overdevelopment and Strain on Infrastructure: The proposed housing estate is excessively large and dense for the existing infrastructure to support. Our local roads, schools, healthcare facilities, and other essential services are already under strain. The introduction of a large number of residences would exacerbate these issues, leading to traffic congestion, overburdened public services, and a decline in the quality of life for current residents of Shenfield.

Environmental Impact and Loss of Green Spaces: The proposed development would result in the destruction of valuable green spaces and wildlife habitats. Preserving these areas is crucial for biodiversity, local ecosystems, and the overall well being of the community. Moreover, the increased urbanisation could lead to additional pollution and a decrease in air quality, adversely affecting the environment and public health.

Risk of Flooding and Safety Concerns: The proposed housing estate is situated within a flood plain area, presenting a risk to future residents' safety and property. The construction of housing in this area could exacerbate flooding concerns for both the new development and the existing neighbouring properties, posing a considerable threat to the wider community.

Impact on Area's Charm and Character: Introduction of a large housing estate in this location has the potential to drastically alter the area's charm and character. The current ambiance and aesthetic appeal of Shenfield, which likely attracted residents initially, could be irreversibly compromised by the proposed development diminishing the unique character that defines this area.

Comments for Planning Application 23/01164/FUL

Application Summary

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Case Officer: Kathryn Williams

Customer Details

Name: Mrs Deborah Buggle
Address: 22 Sebastian Avenue, Shenfield, Brentwood, Essex CM15 8PN

Comment Details

Commenter Type: Member of the Public
Stance: Customer objects to the Planning Application
Comment Reasons:
Comment:I object to the development on the basis of its considerable size (in conjunction with the two adjacent developments) and the impact that this will inevitably have on traffic congestion on Chelmsford Road, which is already very busy during 'rush hour' along with the increased demand for local services. I am also concerned about the likelihood of local flooding given the removal of so much natural land drainage.

Comments for Planning Application 23/01164/FUL

Application Summary

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Case Officer: Kathryn Williams

Customer Details

Name: Mrs Mary Roche
Address: Farm Cottage, Alexander Lane, Shenfield Brentwood, Essex CM15 8QE

Comment Details

Commenter Type: Member of the Public
Stance: Customer objects to the Planning Application
Comment Reasons:
Comment:
I wish to object to this application as none of the concerns that I raised in my original objection on 14 November 2023 have been addressed. ie

1. Increased Traffic on Alexander Lane
2.Increased risk to Pedestrians
3. The proposed cycle path through the Alexander Lane Playing Field.

Also, there has been no response to my proposals to reduce the amount of traffic which I submitted on 14 November 2023.

Comments for Planning Application 23/01164/FUL

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Case Officer: Kathryn Williams

Customer Details

Name: Mr Maurice Roche
Address: Farm Cottage Alexander Lane, Shenfield, Brentwood, Essex CM15 8QE

Comment Details

Commenter Type: Member of the Public
Stance: Customer objects to the Planning Application
Comment Reasons:
Comment:My views are represented by the Chelmsford Road Area Residents Association.

I wish to object because none of the previous concerns raised about flooding, traffic, health services , pedestrian safety,ecology etc have been addressed.

In addition, all four planning applications for the four developers working on the Officers Meadow development should be considered together.

Comments for Planning Application 23/01164/FUL

Application Summary

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Case Officer: Kathryn Williams

Customer Details

Name: Mr RICHARD HARRENDENCE
Address: 1 St Marys Avenue, Shenfield, Brentwood, Essex CM15 8PY

Comment Details

Commenter Type: Neighbour
Stance: Customer objects to the Planning Application
Comment Reasons:
Comment:Why does the Council bother with the formality of consulting local residents when it is absolutely futile and a foregone conclusion that these developments will go ahead, despite local residents' reasonable and justified objections and concerns about the impact this type of development will have on the area and individual peoples' lives.

There are 562 documents attached to this application so realistically the Council know full well that residents are not going to waste their time in ploughing through these documents in there entirely for the reasons already stated above, i.e. it is a foregone conclusion already and a formality.

Shenfield is at risk of losing its village status by being swamped with ever more larger encroaching developments of this nature, which will undoubtedly bring noise, pollution, undesirables, excessive traffic, strain on the local amenities, need we go on...

We have taken the time to read through the public comments and opposition to this, and we confirm that we back every single one of them and strongly oppose this development for what it is worth.

Comments for Planning Application 23/01164/FUL

Application Summary

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Case Officer: Kathryn Williams

Customer Details

Name: Mrs Caroline Lynch
Address: 41 Oliver Road, Shenfield, Brentwood, Essex CM15 8QA

Comment Details

Commenter Type: Member of the Public
Stance: Customer objects to the Planning Application
Comment Reasons:
Comment:I object to the planning. I views are represented by the Chelmsford Road Residents Association. Further points to raise:1. I am concerned about the traffic during construction- where will the personnel working on site park? 2. Will this construction be coordinated with the other organisations who are also developing adjacent land? 3. How will the new residents access NHS services which are already oversubscribed? 4. Essex County Council has said they don't support another school. 5. Oliver Road is overrun with traffic on football match days causing congestion, angry drivers and residents with difficulty accessing their properties. We have issues with speeding motorist. This will only get worse with all these developments. 6. The proposed houses are not in keeping with the surrounding area. They will look out of place and ugly in this landscape. 7. Residents moved here as there plenty of green space which is good for wellbeing and health. This will make shenfield overdeveloped, overcrowded and unpleasant. 8. There's no provision for dentists, doctors, chemists, shops or community hubs. 9. The developers need to make an effort to coordinate their developments to make it clearer to local residents. This is confusing and feels deliberately misleading. 9. Traffic at peak times will be horrendous. It's already bad. 10. There is concern about flooding and this is not clear in the applications about how this will be managed.

Comments for Planning Application 23/01164/FUL

Application Summary

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Proposal: Hybrid planning application for 344 units including 35% affordable housing, safeguarded land for a 2FE primary school and early years facility, public open space and associated landscaping, drainage and highways infrastructure.
Case Officer: Kathryn Williams

Customer Details

Name: Mrs Tracy Underwood
Address: Oak Croft Alexander Lane, Shenfield, Brentwood, Essex CM15 8QE

Comment Details

Commenter Type: Member of the Public
Stance: Customer objects to the Planning Application
Comment Reasons:
Comment:My original objections to this planning application still stand as Croudace have made no further alterations or addressed the issues that were raised in their first planning application. They seem to have ignored issues on the infrastructure, the impact on Shenfield's main high street, parking, surgeries and flooding that all need to be addressed. During the past 2 weeks the flooding in Alexander Lane and along the Chelmsford Road has been extremely bad.

This is only one of four planning applications that will have an impact on the whole of Shenfield and should be considered together to look at the whole site and infrastructure,

My views are represented by the CRARA.

Comments for Planning Application 23/01164/FUL

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Case Officer: Kathryn Williams

Customer Details

Name: Mrs Tracy Underwood
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Comment Details

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Comments for Planning Application 23/01164/FUL

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Case Officer: Kathryn Williams

Customer Details

Name: Mr David Worsfold
Address: 183 Chelmsford Road, Shenfield, Essex CM15 8SA

Comment Details

Commenter Type: Councillor
Stance: Customer objects to the Planning Application
Comment Reasons:
Comment:The new submission from Croudace fails to address any of the serious objections from residents and statutory consultees.
My initial comments still stand and I fully support the detailed submission of the Chelmsford Road Area RA.
Since then the following significant issues need to be added to the list of serious failings in this application.
1. It has moved further away from the Local Plan as the Countryside application has confirmed that the Care Home planned for the back of Officers' Meadow will not be built there.
2. The Care Home was intended to be part of the community benefit delivered alongside the development. Croudace has failed to suggest how it will deliver a community benefit to replace this.
3. Despite the claims of the developers and the planning department that the four applications (of which we have only seen three) for the North Shenfield (RO3) development have to be dealt with separately, the secret deal done between Croudace and Countryside to move the Care Home and, in the process, let Countryside escape from the requirement to provide 2 hectares of employment land, shows that when it suits them co-operation is possible. Such substantial changes to the Local Plan should be subject to full, open public consultation, not dealt with in this fragmented way across multiple applications.
4. The obvious way to address the need to provide greater community benefit is to provide the multi-function community space demanded by the Residents Association, Essex County Council and the NHS.
5. Since the flood risk and drainage assessments were carried out the flooding in Officers' Meadow and Alexander Lane has got worse. The original proposals for flood mitigation did not

satisfy the Environment Agency. As the flooding is now more extensive this needs a complete reassessment.
The failure to provide shops, cafes and community facilities means the whole RO3 development will be soulless and car dependent, failing far short of modern urban planning concepts.

SITE PLAN ATTACHED

. **LAND NORTH OF SHENFIELD ALEXANDER LANE SHENFIELD ESSEX**

HYBRID PLANNING APPLICATION FOR 344 UNITS INCLUDING 35% AFFORDABLE HOUSING, SAFEGUARDED LAND FOR A 2FE PRIMARY SCHOOL AND EARLY YEARS FACILITY, PUBLIC OPEN SPACE AND ASSOCIATED LANDSCAPING, DRAINAGE AND HIGHWAYS INFRASTRUCTURE

APPLICATION NO: 23/01164/FUL

WARD	Shenfield	**8/13 WEEK DATE**	08/01/2023
PARISH	N/A	**Extension of Time**	None
CASE OFFICER	Kathryn Williams		

Drawing no(s) relevant to this decision:

- Proposed drawings (See list of drawings in Condition 2)
- Planning Statement including Affordable Housing Statement
- Design and Access Statement
- Draft Section 106 Heads of Terms
- Schedule of Accommodation
- Statement of Community Involvement
- Landscape and Visual Impact Assessment
- Transport Assessment and Travel Plan Measures
- Air Quality Assessment
- Noise Impact Assessment
- Archaeological Desk Based Assessment
- Health Impact Assessment
- Arboricultural Impact Assessment
- Veteran Tree Survey
- Energy Strategy
- Sustainability Statement
- Desk based Heritage Assessment
- Lighting Strategy
- Ecological Assessment
- Biodiversity Net Gain Assessment
- Landscape and Biodiversity Management Plan
- Flood Risk Assessment

1. Outline of the Proposals

1.1 This application is submitted by Croudace Homes (Croudace) for the construction of 344 dwellings (including 35% affordable dwellings) accessed from Chelmsford Road and Alexander Lane, together with associated highway works, landscaping, utilities, drainage infrastructure and parking. The application is part of a hybrid scheme, comprising outline application ref. 23/01159/OUT for the erection of a primary school and early years facility to the centre-north of the wider Croudace site. The school site will be safeguarded by Essex County Council (ECC), the Education Authority, for 10 years. Should the need for a new primary school and early years facility be confirmed during this timeframe, ECC will deliver the school to their specification. Should ECC not require a new school, this parcel of land will be returned to the applicant.

1.2 It is noted that the documents submitted for the hybrid application cover both the residential and school components.

1.3 The site forms the largest parcel of land within Site R03, Land North of Shenfield (also known as Officer's Meadow), allocated within the adopted Brentwood Borough Council (BBC) Local Plan (LP, March 2022) to deliver a mix of housing, employment, a primary school and a care home. Site R03 will be delivered by four developers: Croudace Homes, Countryside Properties, Redrow Homes and Stonebond Properties.

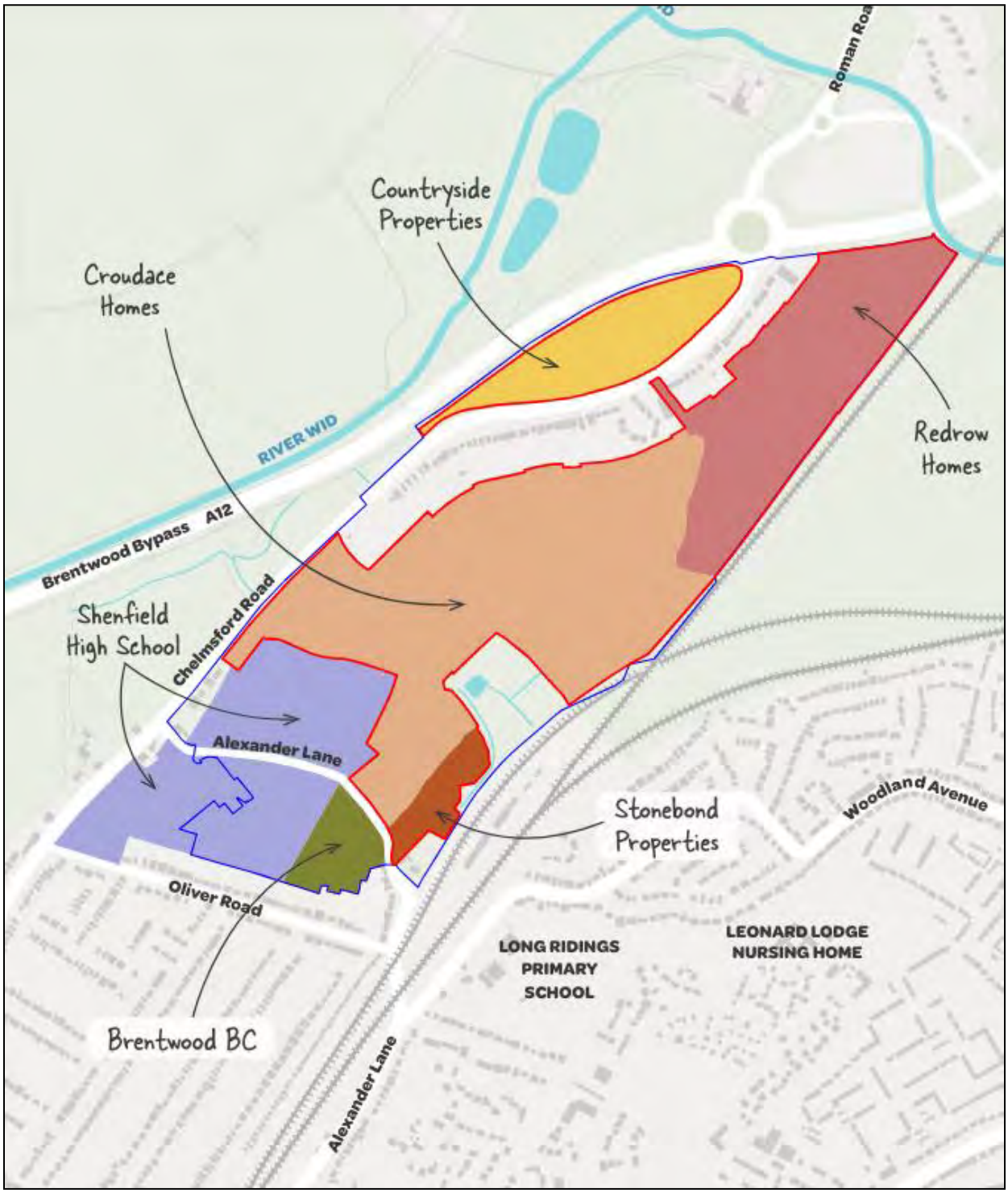
1.4 Due to its location in close proximity to services and facilities, and its public transport accessibility, Land North of Shenfield was allocated in the Local Plan as it constitutes a sustainable urban extension to the existing category 1 settlement of Shenfield.

1.5 Whilst the four developers have been progressing their proposals through the planning process individually, the combined development is guided by an overarching Masterplan Development Principles Framework (DF), as required by LP Policy R03 (2.a). This ensures that all proposals will have a coordinated and comprehensive approach to matters such as connectivity within the site and with the wider area, flood mitigation, landscape, housing design and impact on traffic.

1.6 Policy R03 does not require formal adoption of the DF by the Council but is a material consideration in the determination of this planning application. The weight given to the material consideration is for the decision maker to attribute as such, BBC officers, other key stakeholders and technical consultees were engaged at length through the production of the DF, and BBC officers are satisfied that the document is acceptable to guide and inform the planning applications for the allocated site.

1.7 Figure 1 shows the outline of the allocated site, and the 4 parcels of land that are being brought forward by the individual developers.

Figure 1 – Extract from the Masterplan Development Principles Framework, published in August 2023 (Land Ownership Plan).



1.8 The proposed development for the Croudace parcel of the R03 allocated site includes:

- 344 units, of which 121 (35%) are affordable housing.

- Six areas of public open space, of which a very large park measuring 2.87ha.
- Two equipped play areas and one informal play area, as well as opportunities for incidental play.
- Comprehensive drainage and flood risk mitigation strategy, supported by Essex County Council and the Environment Agency, comprising attenuation basins, swales and permeable paving.
- Retention of existing trees, including a veteran English Oak, tree belts and category A trees.
- Management Plan for Arnold's Wood (Ancient Woodland and Local Wildlife Site).
- A Biodiversity Net Gain of 24% in habitat units, a hedgerow scoring of 13% and a watercourse scoring of 22%.
- Pedestrian and cycle connections to Redrow and Stonebond sites.
- Two bus stops serving a new bus route, which will connect Shenfield railway station with the allocated R03 site.
- An energy strategy confirming that the scheme will target 85% reduction in carbon emissions above the requirements of Part L 2021 (policy requirement is 10%), 63% renewable energy generation and an electric only strategy allowing the proposed development to achieve net zero emissions in operation once the mains grid decarbonises.

1.9 This proposal has been subject to extensive pre-application consultation with BBC and ECC officers (Planning, Housing, Strategic Policy, Tree, Landscape, Ecology, Environmental Health, Urban Design, Highways, Education). The applicant also undertook separate pre-application discussion with ECC Highways and the Environment Agency (EA). The developer has responded to these discussions by providing revisions of drawings and technical reports during the assessment process.

1.10 Community engagement has been undertaken in conformity with objectives of the Localism Act 2011, the National Planning Policy Framework (2023) and the BBC 'Statement of Community Involvement' (SCI) (Adopted 2018).

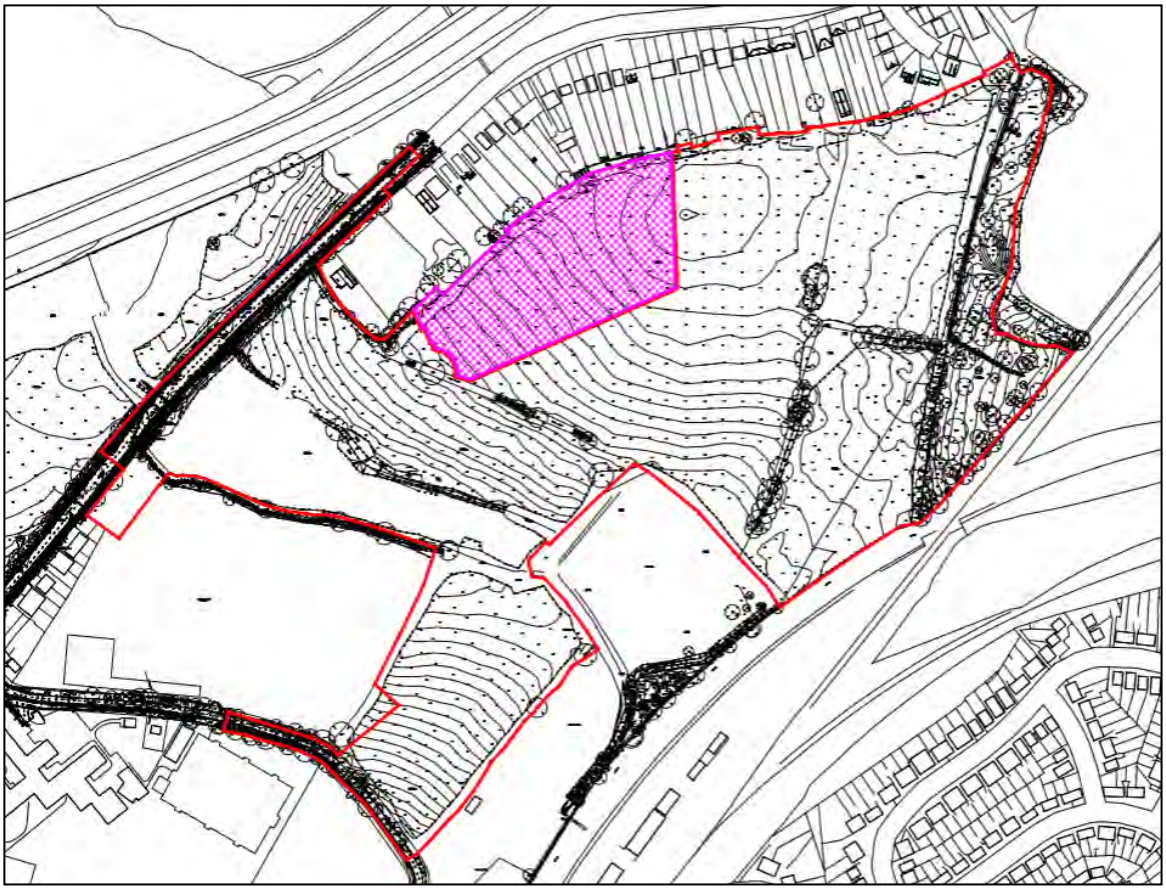
2. Site and Surroundings

2.1 The site subject to the hybrid application extends approximately 21.32ha in total and is located to the north of Shenfield. The parcel subject to this planning application, for the residential development and associated works only, measures 19.14ha.

2.2 The overall site has an irregular shape and consists of six tree-lined agricultural fields, predominantly featuring rough grassland/scrubland. The site has a varied topography, with land sloping down towards the centre of the site, where there is a Critical Drainage Area (CDA) and a smaller area that falls within Flood Zones 2 and 3.

2.3 Figure 2 shows the site location plan, illustrating both the residential and the school parcels.

Figure 2 – Extract from the Site Location Plan (ref. 22.1643.120 revA). The school parcel is indicated in pink. The approximate location of the CDA, crossing the Croudace and Stonebond sites, is shown in blue.



2.4 The arboricultural character of the site is defined by native broadleaved trees growing in belts along the site perimeter and internal field boundaries, and which together delineate the mosaic of fields that constitute the site at large. The key elements are a veteran tree in proximity of the Chelmsford Road entrance, the Ancient Woodland (Arnold's Wood, also a Local Wildlife Site) located along the east boundary, and 47 trees covered by a tree preservation order (TPO).

2.5 Vehicular, cycle and pedestrian access into the site is both from Chelmsford Road to the west and Alexander Lane to the south-west. A Public Right of Way (PRoW 272_86) runs along the western edge of Arnold's Wood and parallel to the railway to the south-east, connecting Chelmsford Road with Alexander Lane further to the south-west.

2.6 To the west and north, the site is bounded by Chelmsford Road (A1023), which runs south-west to Shenfield and north-east to Mountnessing. Whilst a part of the

site lies adjacent to Chelmsford Road, much of the northern boundary, where the school parcel is, is separated from the highway by a single line of residential houses. These houses front onto Chelmsford Road, so the school parcel is partly adjacent to rear garden boundaries to the north. Chelmsford Road comprises largely of 2-storey detached and semi-detached houses. There are various architectural styles, with no uniform character.

2.7 Further to the south and south-west is more arable land, the grounds of Shenfield High School and the Alexander Lane playing fields.

2.8 Further to the north, the A12 separates the site from the wider agricultural landscape, and a narrow strip of agricultural land (located within the R03 allocation boundary: the Countryside Properties scheme) separates Chelmsford Road from the A12.

2.9 To the east, Arnold's Wood separates the site from arable land (also within the R03 allocation boundary: the Redrow Homes scheme). The Great Eastern Main Line railway tracks run along the south-east boundary of the site. Further to the south is the area of Hutton and Long Ridings Primary School.

2.10 There are no listed heritage assets located on the site. The closest asset is a Grade II Listed Milestone, on the road verge opposite No. 179 Chelmsford Road.

2.11 The site is located a 20-minute walk and a 10-minute cycle to Shenfield Town Centre where multiple local services, facilities and amenities are located. This is where Shenfield railway station is located, providing regular services to London and Heathrow Airport (Elizabeth Line), Southend, Colchester, Chelmsford, and Ipswich (Great Eastern Main Line).

2.12 There are also bus stops on Chelmsford Road to the north-west and Long Ridings Avenue to the south, approximately 400m and 500m walking distance from the site, providing services to Brentwood, Shenfield, Chelmsford, and other neighbouring towns and villages. Therefore, the site benefits from very good public transport accessibility.

2.13 From the site, cyclists can access Shenfield to the south-west, including the train station, Ingatestone to the north-west, as well as Brentwood town centre further to the south-west within a 5km distance.

2.14 The road network around the site includes the Chelmsford Road (A0123) to the northwest, and the A12 (dual carriageway) just beyond this, offering convenient vehicular access to Shenfield, Brentwood and beyond. Many smaller, residential roads are located within close proximity to the site, offering access to surrounding facilities and communities.

3. Policy Context

3.1 Adopted Brentwood Local Plan (LP) 2016-2033:

- Policy R03: Land North of Shenfield
- Policy MG01: Spatial Strategy
- Policy MG04: Health Impact Assessment
- Policy MG05: Developer Contribution
- Policy BE01: Carbon Reduction and Renewable Energy
- Policy BE02: Water Efficiency and Management
- Policy BE03: Establishing Low carbon and Renewable Energy Infrastructure Network
- Policy BE04: Managing Heath Risks
- Policy BE05: Sustainable Drainage
- Policy BE07: Connecting New Developments to Digital Infrastructure
- Policy BE08: Strategic Transport Infrastructure
- Policy BE09: Sustainable means of travel and walkable streets
- Policy BE11: Electric and Low Emission Vehicles
- Policy BE12: Mitigating the Transport Impacts of Development
- Policy BE13: Parking Standards
- Policy BE14: Creating Successful Places
- Policy BE15: Planning for Inclusive Communities
- Policy BE16: Conservation and Enhancement of Historic Environment
- Policy HP01: Housing Mix Matrix
- Policy HP03: Residential Density
- Policy HP05: Affordable Housing
- Policy HP06: Standards for New Housing
- Policy PC11: Education Facilities
- Policy NE01: Protecting and Enhancing the Natural Environment
- Policy NE02: Green and Blue Infrastructure
- Policy NE03: Trees, Woodlands, Hedgerows
- Policy NE05: Open Space and Recreation Provision
- Policy NE08: Air Quality
- Policy NE09: Flood Risk

3.2 Supplementary Planning Document (SPD):

- BBC Planning Obligations SPD, 2023
- ECC Developers' Guide to Infrastructure Contributions, 2023

3.3 Other material consideration:

- BBC Infrastructure Delivery Plan (IDP), 2021
- Masterplan Development Principles Framework, 2023 (not adopted and not part of the Development Plan)

3.4 National Policy:

- National Planning Policy Framework (NPPF) 2023
- Planning Practice Guidance (PPG)
- National Design Guide (2021)

4. Local Plan Policy R03, Land north of Shenfield

4.1 As previously mentioned, LP Policy R03 allocates the site subject to this planning application and its surroundings for residential-led mixed-use development.

4.2 The policy reads:

Land north of Shenfield, known as Officer's Meadow and surrounding land is allocated for residential-led mixed-use development.

1 Amount and Type of Development
Development should provide:

a. *around 825 new homes;*
b. *around 2.1 hectares of land for a co-located primary school and early years and childcare nursery;*
c. *around 60 bed residential care home or an appropriate mix of specialist accommodation to meet identified needs, in accordance with policy HP04;*
d. *5% self-build and custom build across the entire allocation area; and*
e. *around 2ha of land for employment purposes which may include light industrial, offices, research and development (within class E) or other sui generis employment uses which are compatible with the residential development.*

2 Development Principles
Development should:

a. *be accompanied by a comprehensive masterplan and phasing strategy to inform detailed proposals as they come forward;*
b. *be of a design quality and layout that reflects its key gateway location, particularly on land near to Junction 12, A12;*
c. *provide vehicular access via Chelmsford Road (A1023) and Alexander Lane;*
d. *allow if possible for the diversion of Alexander Lane to create a quiet lane for pedestrians and cyclists, with the provision for new and improved route through the development site linking to Chelmsford Road;*
e. *enhance walking, cycling and public transport services with Shenfield station and local services and facilities in the wider area, including Brentwood Town Centre;*
f. *provide well-connected internal road layouts which allow for good accessibility;*
g. *provide new multi-functional green infrastructure including public open space in accordance with Policies NE02 and NE05;*

h. *maintain and enhance Public Rights of Way within the site and to the wider area;*
i. *protect and where appropriate enhance the Local Wildlife Site (Arnold's Wood).*
j. *provide for appropriate landscaping and buffers along sensitive boundaries adjoining the A12 and railway line.*
k. *maintain the same amount of existing playing field provision on site or, where this cannot be achieved, provide replacement playing fields (including supporting ancillary facilities) of equivalent or better provision in terms of quantity and quality in a suitable location prior to commencement of development on the playing field. Any replacement playing field provision should not prejudice Shenfield High School or the community from meeting their playing pitch needs; and*
l. *be designed to ensure a coherent functional relationship with the existing development, which should be well integrated into the layout of the overall masterplan.*

3 Infrastructure Requirements
Proposals should:
a. *provide pedestrian and cycle crossing points across Chelmsford Road (A1023) where appropriate;*
b. *provide an improved bus service;*
c. *as the site is located within a Critical Drainage Area, development should minimise and mitigate surface water runoff in line with Policy BE05 Sustainable Drainage.*

4 Infrastructure Contributions
Applicants will also be required to make necessary financial contributions via planning obligations towards:
a. *off-site highway infrastructure improvements as may be reasonably required by National Highways and Essex County Council in accordance with policies MG05 and BE08 (the planning obligation will determine the level and timing of payments for these purposes);*
b. *'quiet way' cycle routes connecting transfer hubs to schools in Brentwood Town Centre.*

4.3 It is important to note that the R03 site has a number of physical constraints, the most significant ones being flood risk and drainage, which had not been explored in detail before the allocation of the site in the LP. Further survey work confirmed that it is not possible to deliver the 825 homes originally anticipated and set out in Policy R03 (1.a), as no buildings can be located within the CDA which crosses the Croudace and Stonebond parcels, and due to the high number of trees to be retained.

4.4 Therefore, BBC officers and Place Services actively encouraged the developers to use a variety of housing typologies and urban design solutions, in order to

maximise the number of new dwellings delivered on the four parcels. At the time of writing this report, it is expected that the R03 site will comprise a total of 718 units.

4.5 In considering the provision of employment land within the allocated site, it is important to note that LP Policy R03 clearly refers to 'light industrial, offices, research and development (within class E) or other sui generis employment uses which are compatible with the residential development'. There is no reference to retail uses, or local shops in particular, and these were not considered at Examination in Public stage, when an independent Inspector considered the soundness and validity of the proposed policies (prior to the adoption of the LP). This is due to the proximity to Shenfield town centre, which is the most viable location for retail uses.

4.6 LP paragraph 9.103 clearly states that the new community services and facilities required for the allocated site are a new co-located primary school and early years and childcare nursery, open space and play facilities. Open space and play facilities are delivered within the site subject to this planning application, whilst school is delivered as part of outline application 23/01159/OUT, part of the hybrid scheme.

5. The Masterplan Development Principles Framework

5.1 Although not formally adopted, the DF is also a material consideration when determining this application. The production of a DF is required by LP Policy R03(2.a), which states that the development of the allocated site should *"be accompanied by a comprehensive masterplan and phasing strategy to inform detailed proposals as they come forward"*. The policy does not set out any requirement for the DF to be adopted, and thus the document does not form part of BBC Development Plan.

5.2 Whilst the DF has been prepared by the four developers, it has been informed by stakeholder feedback following several revisions. A high-level Masterplan was presented to officers in June 2022, revisions were first submitted in December 2022, and then February and May 2023. The DF was also presented to the Essex Quality Review Panel in June 2023. BBC officers (Planning, Housing, Strategic Policy, Tree, Landscape and Ecology, Environmental Health) and Place Services Urban Design team have reviewed and provided comments to all the DF iterations.

5.3 The DF defines the vision for the site as *"a new neighbourhood within a significant landscaped area that will provide improved biodiversity, new areas of play, a number of pockets of open spaces and a network of pedestrian and cycle routes that will link to Shenfield and the rail station to optimise use of the new Elizabeth Line service".*

5.4 The DF is an important document as it ensures that there is an overall strategy for the future development of the site, that all 4 developers need to abide to. Matters such as land use, landscape, ecology, connectivity within the site and with the wider area (pedestrian, cycle and vehicular), flood mitigation, impact on traffic, have all been looked at holistically: not only does the DF set out development principles, but it also defines the location of key internal roads, connections between parcels, areas of public open space and play areas (among other things) and includes a design code applicable to each character area.

5.5 Specifically, the DF provides overarching guidance on the following:

- Nature
  - Green and Blue Infrastructure
  - Ecology and Biodiversity
  - Flood mitigation and Sustainable Urban Drainage (SuDS)
  - SuDS, public open space and play areas
- Public Spaces
  - Overall Strategy
  - Open Space
  - Play Areas
- Connectivity
  - Public Transport Plan
  - Pedestrian and Cycle Links
  - Vehicular Movement Plan
  - Car Parking
- Identity / Character Areas
  - Urban Edge
  - Green Street (Boulevard Streets Character)
  - Green Street (Mews Streets Character)
  - Green Edge (Woodland Edge Character)
  - Green Edge (The Lanes Character)
- Built Form
- Land Uses
  - Housing
  - School
  - Employment / Care Home
- Sustainability
- Delivery and Phasing

5.6 The approach adopted in the DF guarantees that the individual applications, if approved, will not result in piecemeal development, but in a well-coordinated urban extension, where cumulative impacts are understood and addressed. The components of the DF reflect the requirements set out in LP Policy R03.

5.7 The DF also includes a very detailed analysis of the local context, that was used to inform the overall layout and design principles for the allocated site, as well as for the individual planning applications.

5.8 BBC officers and technical consultees were engaged at length throughout the production of the DF. BBC officers have confirmed that the document is acceptable to guide and inform the planning applications for the allocated site.

5.9 With regards to the Croudace parcel, the DF expects it to deliver a residential development (subject to this planning application) and a safeguarded school site (part of the hybrid scheme). No other land uses were identified as being required within this parcel of the allocated site.

5.10 The DF does not include retail uses or community facilities in addition to the ones set out in LP paragraph 9.103, as these are not required by LP Policy R03.

6. Relevant History

6.1 There is no planning history available for the site.

7. Neighbour Responses

7.1 346 neighbour consultation letters were issued, site notices erected around the site and surrounding areas and an advertisement was published in the Brentwood Gatezze. Where applications are subject to public consultation, those comments are summarised below. The full version of each neighbour response can be viewed on the Council's website via Public Access at the following link: http://publicaccess.brentwood.gov.uk/online-applications/

7.2 At the time of writing this report, 56 responses have been received for this application, including 1 in support, 46 objections, and 9 representatives. Some residents submitted more than one objection.

7.3 They are summarised as follows:

- Too many properties (overdevelopment).
- Proposal will add pressure on local road system, the road within the development will become a rat-run.
- Pressure on healthcare.
- Lack of cohesive approach on development of the allocated site, with no possibility of assessing the cumulative impact. A comprehensive masterplan should be produced.
- Lack of community facilities, wellness facilities or local shops.
- The proposal deviates significantly from Local Plan.
- Impact on local biodiversity. The application fails to meet biodiversity targets.
- Impact of closing Alexander Lane: pick up / drop off of pupils of Shenfield High School and increase in traffic long Oliver Road.
- Ongoing dispute over boundary with Chelmsford Road properties.
- Existing bus services insufficient.

- Risk that the school will not be delivered.
- Proposed PROW re-routing is inconvenient.
- Impact on existing sewers and electricity infrastructure.
- There are other brownfield sites suitable for development.
- Implications of development on land subject to flooding.
- The proposal will devalue existing properties.
- Levels of crime will increase.
- No care home delivered on this site.
- The development will be built on Green Belt land.
- Non-compliance with the LP's employment land allocation.
- The application fails to meet biodiversity targets.
- Concerns about site design, including proposed three-storey houses and narrow roads.
- Absence of adequate provision for electric vehicle charging points.

7.4 Although the majority of the above concerns have been addressed throughout the report, below is a summary of the responses:

- The proposed development is in line with Local Plan policies and the DF. It is allocated for housing and is not in the Green belt. The proposal is informed by the DF, which ensures a cohesive approach to the development of the allocated site.
- The care home will be delivered within the Countryside parcel of the allocated site (ref. 24/00051/FUL).
- Under the DF, this parcel of land is not required to deliver employment uses.
- The Croudace parcel will deliver fewer units that originally envisaged due to the presence of the CDA and part of the site being within Flood Zones 2 and 3.
- No houses are located within the area designated as CDA or Flood Zone 2 and 3. The proposed flood and drainage strategies are supported by the Environment Agency and the Local Lead Flood Authority (ECC SuDS).
- The impact on existing sewers and electricity infrastructure is not a planning consideration. Should this planning application be approved, the applicant will liaise with relevant authorities and providers. Nonetheless, Anglian Water confirmed that, at present, their sewerage system has available capacity for the anticipated flows.
- The proposal has been reviewed by the Highways Authority and National Highways, who raised no objections. The Transport Assessment demonstrates that the cumulative impact of the R03 schemes will not have an adverse effect on the local road system. The internal road system has been designed to avoid becoming a rat-run.
- The diversion of Alexander Lane is a policy requirement, its impact has been taken into account in the Transport Assessment. The Highways Authority has raised no concerns about this aspect of the proposal.

- If approved, the proposal will need to pay a contribution towards improving the existing bus service, and towards creating a new service linking the allocated site to Shenfield railway station.
- The proposed PROW re-routing is being determined by the ECC PROW team. It has been designed to cover a desirable route from Arnold's Wood to the proposed area of public open space, where a play area will also be delivered, providing safe and easy access to the proposed facilities for existing and future residents. The new route will also ease the pressure on the ancient woodland, which is supported by the Tree and Ecology Officer.
- The safeguarded school site is not part of this planning application. The school is a requirement of the education authority, ECC, who will confirm in due course whether the school is required or not.
- No community facilities (apart from the school), wellness facilities or local shops are required by LP Policy R03.
- If approved, the proposal will need to pay a contribution towards local healthcare facilities, as requested by the NHS.
- The proposal retains the existing features of ecological value, and delivers significant net biodiversity gains, well above local and national requirements.
- The proposal has been designed taking into account 'secure by design' principles. Should the application be approved, the applicant is encouraged to liaise with Essex Police and apply for the relevant Secured by Design accreditation.
- The proposed design is supported by BBC Officers and Place Services, further to lengthy discussions and a high number of revisions to achieve a high quality, sustainable urban extension.
- All units will be provided with active electric vehicle charging points.
- The matter of property values is not a planning consideration.

7.5 The applicant addressed the boundary dispute in a letter dated 5 January 2024, confirming that they have taken the view that, whilst not accepting any claim by residents, they will not include any of the disputed land within the red line. Hence, the red line area is solely within the control of the applicant. It is also important to note that this matter, although raised in neighbours' responses, is not relevant to the determination of this planning application.

7.6 The application is accompanied by a Statement of Community Involvement (SCI), which provides detail on the public consultation exercise carried out by the applicant prior to the submission of the application.

8. Consultation Responses

8.1 Detailed below is a summary of the consultation responses.. The full version of each consultation response can be viewed on the Council's website via Public Access at the following link: http://publicaccess.brentwood.gov.uk/online-applications/.

- **Place Services**

Thank you for re- consulting us on the Hybrid application for the above proposed development. Our response follows previous consultation letters written on 12th April and 16th November 2023 and pre-application consultation letters on 9th March, 26th July 2023 and 22nd May 2024.

The architecture of the most prominent character areas is positive, and where house types have been adapted by the architects to be contemporary, these have become exemplary. Subject to the resolving the below issues, we would be prepared to support the scheme.

- Confirmation of secured gated access to overcoming safety and security issues.
- More detail around the school plaza landscaping to provide increased definition.
- Addition of plots to provide active frontage and overlook the path and tree belt between plots 173 and 180.
- Removal of single aspect apartments to block C.
- Confirmation that all windows will be aligned.
- Revision of house type S4028M Variant 5 to introduce active frontage on the first floor and to produce a well-balanced elevation on the gable.
- Revision of house type G4031M to produce a less dominant porch and full height render or weatherboard.
- Revision of the DAS to bring it up to date.

- **Planning Policy**

FIRST RESPONSE

Infrastructure contributions

Part 4 of Policy R03 sets out the identified key pieces of site-specific infrastructure required to support the development of allocation R03, making its development acceptable in planning terms. Additionally, the relevant infrastructure requiring contributions from allocation R03 are listed in the IDP Part B. As set out within Chapter 15 of the IDP in apportioning costs to developers; costs will be apportioned based on the level of impact or generated demand e.g., the number of houses delivered, or additional trips generated. Contributions should also be equable between developers, in proportion to their level of impact or generated demand. Based on the Council's apportionment methodology, the estimated costs to be requested from the Croudace parcel of allocation R03 have been provided.

With regards to contributions to M25 Junction 28 & 29 and A12 J12 (IDP ref T28, T29 and T31), National Highways should be consulted to provide more detailed comments on the potential impacts of development on the highways network which will determine the level of contributions.

As part of the detailed consideration, there may be additional specific requirements towards off-site highway infrastructure improvements to mitigate the impacts from

development to an acceptable level; however, Essex County Council as the Local Highways Authority would be more appropriate to advise should that be the case.
Policy HP05: Affordable Housing

There is a significant need for affordable housing in the borough as evidenced in the Council's SHMA which supports an affordable housing target of 35% on major developments. It's noted the application provides a policy compliant 35% affordable housing, this provision is welcomed.

With acknowledgement of paragraph 6.40 of the Local Plan:
"The Council encourages applicants to work with registered providers and to engage with them and the Council's housing department at an early stage in the planning process, further guidance on early engagement and preferred partner registered providers is provided in the Housing Strategy."

It's noted the proposed affordable housing mix broadly accords with the SHMA 2022 and the proposed tenure split is policy compliant being 86% affordable rent and 14% shared ownership. However, there is a further policy requirement that the "type, mix and size of the affordable homes will meet the identified housing need as reported by the Council's most up-to-date housing evidence". Informed by the latest evidence from the Council's Housing Register, the Council's Housing Team have identified a greater need for larger affordable rented homes within this location.

To seek to reflect the latest identified local housing need, it's requested the applicant reconsider the tenure split and the number of larger rented affordable housing units offered; with the aim of decreasing the number of 1 bed affordable rent (which recent market indicators show RP's may be reluctant to take on) and increasing the number of 3 or 4 bed rental units. To accommodate this shift, driven by up to date local needs data, a degree of flexibility on the tenure split can be offered.

Note on CIL and Policy MG05: Developer Contributions
The infrastructure items are set out in the Council's IDP Schedule. Information on the indicative phasing, costing, delivery mechanism, priority ranking, and relevant site allocations of identified infrastructure can also be found in this Schedule.

The items are either identified as priority 1 or 2 in the IDP Schedule meaning they are considered critical, essential or necessary to mitigate the impacts arising from development or site-specific objectives. We therefore require those items to be provided directly or secured via S106.

CIL is a general levy on all development, payable on a pound per metre square basis (of net new development) as set out in the charging schedule and subject to a number of exemptions. The receipts can be applied to provide infrastructure not related to the particular development making the payments. CIL is designed to raise funds for infrastructure needed generally as a result of an increase in development in an area. As demonstrated through the CIL Examination (August 2023), CIL will contribute towards the

funding of the shortfall identified in the Council's IDP. In Brentwood Borough new major development will therefore be expected to pay the CIL and make payments under S106 obligations.

SECOND RESPONSE
The proposed changes respond to the Policy Teams request for the applicant to reconsider the tenure split and the number of larger rented affordable housing units offered. It is accepted that to facilitate this revision (driven by up to date needs data from the Housing Register) a degree of flexibility on the tenure split can be justified in this circumstance. Subject to the Housing Teams final comments, we are supportive of the below affordable housing offer and the provision of a policy compliant 35% affordable housing delivered on site.

The estimated costs to be requested from the Croudace parcel of allocation R03 have also been updated.

- **Housing Manager**

Following on from the discussions between the applicant, the planning consultant, planning policy team and the housing team. The applicant has responded to the requests of the housing team and brought the mix of affordable housing more in line with housing need as requested. The applicant is fully compliant in providing 35% affordable housing on the site but, in order to reduce the number of smaller one bed units it has been agreed, in consultation with the policy team, that the tenure mix can been adjusted. The Housing team are supportive to this approach. The applicant has also responded to the request to avoid clustering and, where possible, this has been achieved. We are happy to support the higher clustering in the apartment blocks where this is unavoidable and, from a management perspective, would be much more acceptable to a Registered Provider.

- **Tree / Landscape / Ecology**

FIRST RESPONSE
Ecology
The site is predominately former arable farmland and therefore has a generally restricted ecology. The most significant features are Arnolds Wood the tree belt to the west of it, some of the hedgerows and the veteran tree.
Arnold's Wood, an ancient woodland Local Wildlife Site, forms the eastern site boundary. The layout has been designed to secure a minimum 15m buffer to the site in accordance with national guidance. The proposal to realign the public footpath would be beneficial as it would move part of the footpath outside the buffer. If it were retained on the definitive route it could require trees and shrubs that now form an important woodland edge habitat to be cut back.
The External Lighting Strategy illustrates that street lighting has been designed to avoid sensitive ecological features such as the ancient woodland and Oak Walk (Zone 2) tree line.
An initial Biodiversity Net Gain calculation has been undertaken. This shows a predicted gain of habitat units of 16.33%, watercourse units gain of 22.35% which exceed the 10% target set out in the Environment Act 2021 (although BNG is not yet a mandatory

requirement). Hedgerows however are currently predicting only a 0.49% gain. Following discussions with the applicant there could be scope to increase this figure by creating more hedges.
To enable a more accurate review of the BNG calculation I request that the applicant provides the full current metric spreadsheet as it is not possible to read all the columns that have been provided in the report.
The Outline Woodland Management Strategy describes the current condition of the woodland. It is typical of most local ancient woods, being primarily hornbeam coppice with oak standards. Lack of management over several decades means that there is little understorey or ground flora. The strategy recommends that recreational use is managed rather than trying to prevent access to the wood. This is considered the best approach for this wood given its long history of de facto access.
It is noted that this is an outline strategy and a detailed plan would be required. There is a mention of coppicing in Objectives; however I would wish to see a commitment in the full plan to reintroducing coppicing as this is effective in promoting natural regeneration and ground flora as it removes excessive shading and also reduces the risk of old coppice stools collapsing.
Given the scale of the development I would require a Construction Environmental Management Plan to be produced to ensure all the ecological and arboricultural protection measures are followed. This can be secured by condition.
Landscape and visual impact
An LVIA prepared in accordance with the Guidelines for Landscape and Visual Impact Assessment 3rd Edition, which is up to date good practice.
The LVIA concludes that while there would be significant effect on landscape character within the site due to the proposed development, this would be localised and contained. This conclusion is considered appropriate.
The visual assessment concluded that the site had a localised visual envelope due to topography and existing vegetation and development screening views. The most significant effects would be experienced by residents on Chelmsford Road backing directly onto the site. Visual effects from other viewpoints were not assessed as being significant. These conclusions are considered appropriate.
Landscape Strategy
The strategy has sought to create a significant area of open space with associated NEAP, flood attenuation and cycle and pedestrian access. This should result in a meaningful, attractive space that is proportionate to the scale of the development. This should help manage visitor pressure on Arnolds Wood.
The School Plaza should create a large-scale focal point close to the entrance of the development. The large buffer around the veteran Oak with a new tree planted as a future replacement is welcome. The hard landscaped areas should help guide pedestrians towards the school. As there are no details yet for the school it is accepted that some of the details, particularly relating to the eastern boundary with the school may need refinement; however I would not wish to see significant changes to the overall approach.
The proposed boardwalk feature in the northeast corner adjacent to the wood should help create a more attractive pedestrian entrance to the development.
The detailed planting strategy proposes a diverse mix of trees and shrubs. As well as providing visual interest they will increase resilience to the effects of climate change and

plant diseases. The details of the hard landscape elements are considered appropriate for the development.

Conclusion

Overall it is considered that the scheme is broadly acceptable on ecological and landscape grounds; however I do wish to see the full BNG metric spreadsheet to allow a detailed assessment of this. If the scheme is permitted I would require a full Woodland Management Plan be conditioned. The landscape scheme contains enough details not to require a landscape condition, unless there are any significant changes to the scheme to take account of other consultee responses. A CEMP Is also required.

SECOND RESPONSE

Further to my consultation response of 13th November 2023, I wish to make the additional comments.

Lighting Strategy

The lighting strategy has been developed in consultation with the project ecologists. Specific avoidance and mitigation measures include the use of 3000K warm white colour temperature lighting, avoidance of lighting in private areas, selecting lighting optics to avoid light spill and the use of back light shields. The lighting plans provided in Appendix B provide the lux contour lines. These show minimal lighting being provided close to Arnolds Wood and other treed boundaries. There is some light spill into the open space as a result of the highway lighting at the site entrance; however most of the area would not be impacted.

Based on the information provided I am satisfied that the external lighting would not have any significant adverse effects on bats or other wildlife.

Landscape and Biodiversity Management Strategy

The document sets out the long-term management objectives for the various areas within the site and provides maintenance recommendations for ensuring the successful establishment and development of each element. The Strategy is considered to be appropriate for the scheme.

Arnolds Wood Outline Management Plan

Arnold's Wood, an ancient woodland Local Wildlife Site, forms the eastern site boundary. The Outline Woodland Management Strategy describes the current condition of the woodland. It is typical of most local ancient woods, being primarily hornbeam coppice with oak standards. Lack of management over several decades means that there is little understorey or ground flora. The strategy recommends that recreational use is managed rather than trying to prevent access to the wood. This is considered the best approach for this wood given its long history of de facto access.

It is noted that this is an outline strategy and a detailed plan would be required. There is a mention of coppicing in Objectives; however I would wish to see a commitment in the full plan to reintroducing coppicing as this is effective in promoting natural regeneration and ground flora as it removes excessive shading and also reduces the risk of old coppice stools collapsing.

THIRD RESPONSE

An updated BNG calculation has been submitted which shows the scheme resulting in a net gain in

- habitat – 24.04
- hedgerows – 13.19%

- watercourses – 22.19%

I have reviewed the metric and assessment report and consider the assumptions to be appropriate. Based on this calculation the scheme would achieve in excess of the 10% net gain required by the Environment Act 2021.
The details of the proposed habitat creation and enhancement measures are included on the amended BNG Plan.
The scheme previously did not achieve a 10% gain for hedgerows; however there have been amendments made to the mix of hedge and scrub which ensure these gains are achieved. The Soft Landscape Plan and Landscape and Biodiversity Management Strategy have been updated to include these changes.
I am happy that sufficient information has been provided regarding BNG provision being delivered as part of the scheme.

- **Environmental Health Manager**

I have reviewed the Air Quality and the Noise and Vibration assessments provided by the applicant. I am satisfied that the Air Quality Objectives will not be likely to be exceeded at the site as a result of the proposed development and that the effects on air quality from site generated construction as a result of dust etc. can be managed to acceptable levels provided that the mitigation measures indicated in section 7.0 are implemented.
I would suggest that the proposed dust mitigation measures are incorporated into a Construction Environmental Management Plan to be submitted and agreed by condition.
The noise and vibration assessment report indicates that noise exposure to proposed residents from the existing road and rail traffic noise sources adjacent to the site can be controlled to acceptable levels with the use of appropriate window design to enable compliance with usual internal noise standards. This can be achieved using the specifications proposed in Table 4.2 of the report submitted and this can be controlled by condition. Depending on the locations and facades affected this will either require installation of glazing and ventilation schemes to meet the 'low' or 'medium' specifications indicated in the Table. In some areas affected by rail noise alternative means of background ventilation will be necessary and will need to be installed, this can again be dealt with by condition.

Noise levels in external areas can be controlled by the use of 1.8m timber fences to the private gardens and the external areas for the proposed school will also be satisfactory, with the school building itself providing additional noise mitigation to part of the school site to reduce noise levels for outdoor teaching activities.

The effects of vibration on the proposed development is not considered to be likely to cause adverse effects and therefore there are no measures proposed or required to deal with this aspect.

In conclusion it would appear that subject to the proposed mitigation measures for construction dust management and the specification for window and ventilation design that the site would be considered suitable for the proposed development.

The required measures for air quality and noise exposure can be appropriately controlled by the use of planning conditions as indicated. If needed suitable conditions can be drafted and the above comments included in a more formal response format, please advise if this is required at this stage.

- **Public Health Officer**

At the time the HIA document was submitted the group could only comment on the information provided. As long as these have been addressed through the application package, then the group will not need to be reconsulted. The only items that would need possible further input is if the concerns had not been addressed through the application process.

- **Highway Authority (Essex County Council)**

- The documents submitted with the planning application have been duly considered and a number of site visits have been carried out. It is noted that the site is included in Brentwood Borough Council's adopted Local Plan of March 2022 (Site R03).
- The proposals entail the provision of a site access on the A1023 Chelmsford Road via a new roundabout which fully complies with modern highway standards. There is an additional access from the south via a realigned Alexander Lane. Both have been satisfactorily safety-audited.
- The proposals' parking provision falls marginally below the level to fully comply with Brentwood's adopted standards. However, Brentwood Borough Council, in their role as the parking authority, have indicated their wish to reduce carbon emissions and have not insisted on the full provision. The Highway Authority is prepared to accept this on the condition that, should any issues with parking on the highway outside the site arise post-development, the applicant should fund the cost of a Traffic Regulation Order to restrict such practice and thus ensure the future safety of all highway users.
- The proposals include good pedestrian, cycling and public transport facilities which will help to link the site to Shenfield and the local area and should help to restrict private car trips in the immediate area.
- A detailed Transport Assessment and a number of subsequent technical notes to answer questions and issues raised by the Highway Authority have been submitted by the applicant. Along with National Highways and Brentwood's own transport consultants who have also reviewed the impact of the development, we have now been satisfied that the proposals can be accommodated without a severe impact on the safety and efficiency of the local highway network, which is the NPPF criteria for refusing an application on highway grounds.
- Therefore, from a highway and transportation perspective, the impact of the proposal is acceptable to the Highway Authority subject to the following requirements (conditions provided).

- **National Highways (Previously Highways England)**

Referring to the consultation on a planning application dated 9th January 2024 referenced above, in the vicinity of the A12 that forms part of the Strategic Road Network, notice is

hereby given that National Highways' formal recommendation is that we recommend that conditions should be attached to any planning permission that may be granted.

It should be noted that this site forms part of a larger area allocated in the Local Plan and consequently it will need to be considered in that context and the overall need to provide mitigation for the whole of the local plan sites. The local plan identified that cumulatively the identified sites required the A12 J12 to be converted to signal control, although it is accepted this development on its own does not require this. The planning committee are advised to seek an appropriate contribution from this development towards this scheme.

The following condition is recommended:
No part of the development herby approved shall be brought into use unless and until the Travel Plan has been approved in writing by the Local Planning Authority who shall consult with Essex County Council as Highways Authority.

The Travel Plan shall be in line with prevailing policy and best practice and shall as a minimum include:-

- The identification of targets for trip reduction and modal Shift
- The methods employed to meet these targets
- The mechanisms for monitoring and review
- The mechanisms and review
- The penalties to be applied in the event that targets are not met
- The mechanisms for mitigation
- Implementation of the travel plan to an agreed timescale or timetable and its operation thereafter
- Mechanisms to secure variations to the Travel plan following monitoring and reviews

Reason:
To ensure that the A12 continues to serve its purpose as a part of a national system for through traffic in accordance with Section 10 of the Highways Act 1980, and to satisfy the reasonable

- **Essex County Council (ECC) SUDS**

Having reviewed the Flood Risk Assessment and the associated documents which accompanied the planning application, we do not object to the granting of planning permission based on 4 conditions.

- **Environment Agency**

Thank you for all previous correspondence we've had regarding this application. We are removing our objection to the application and recommend that the following conditions are included in your decision. As per the National Planning Policy Framework, we would object to the application without these conditions included.
As stated in our previous response referenced AE/2023/128907/03 and dated 28 May 2024, the modelling undertaken was for the most part acceptable – although we did highlight that there were still some outstanding issues still to be addressed.

However, we deem it possible that these outstanding issues could be conditioned to ensure that both the modelling and flood risk assessment are completed to an acceptable standard before any works on the site commence.

- **Mid & South Essex Health Care**

The development would have an impact on healthcare provision in the area where there is already a deficit of primary care facilities. If unmitigated, the development would be unsustainable. Planning obligations could be used to secure contributions to mitigate these impacts and make an otherwise unacceptable development acceptable in relation to healthcare provision.

The ICS therefore requests that the sum of £170,700 be secured through a planning obligation in the form of a S106 agreement is linked to any grant of planning permission in order to increase capacity for the benefit of patients of the Primary Care Network operating in the area. This may be achieved through any combination of extension, reconfiguration or relocation of premises.

- **Essex County Council (ECC) Education**

Thank you for reconsulting Essex County Council (ECC) on the above planning applications. ECC provided an initial corporate response on 20 December 2023, and an updated corporate response on 9th February 2024.

Since then, ECC has been engaging with Brentwood Borough Council (BCC) colleagues and the applicant on outstanding matters, specifically noise and mitigation. This response should be read in conjunction with ECC's initial responses.

Summary
ECC welcomes the opportunity to review and provide a final corporate response to the full and outline planning applications for Strategic Site R03 'Officer's Meadows'. We have considered the application material and identified matters for further consideration, with recommended amendments where appropriate.

ECC is prepared to support the planning applications as proposed, subject to the imposition of a condition(s) and s106 provision to mitigate the impact of noise on the school site.

Noise and Mitigation
It is understood that the noise levels across the site currently (without development) are identified to be between 55-60 dB(A). With the development, it is suggested that the school building, and the small residential development to the northwest of the application site (under BBC ref. 22/00453/FUL) would provide noise mitigation such that levels within the site are predicted to fall to 50-55 dB (A) to the south of the building form.

Currently there is however no guarantee as to the form the school building on this site will take or where this or they (if a separate building is proposed for the Early Years provision) may be positioned. That said, it is recognised the access points will be fixed by the full

planning application for the residential development (ref. 23/01164/FUL), and it is considered, without prejudice, likely that at least part of a building will run parallel to the northwestern boundary. In addition, based on the current baseline designs for schools issued by the Education and Skills Funding Agency, which have been produced to demonstrate good practice that can be achieved within the set costs and area allowances, the classrooms would face out towards this boundary, together with an element of designated outdoor teaching space. These classrooms would not benefit from any noise attenuation afforded by the school building itself; and as such without specific mitigation it is unlikely that these would meet the levels advocated in guidance to the point that the quality of these areas for teaching would be compromised.

Therefore, it is considered as part of any outline consent granted for the primary school that a condition should be imposed to ensure the school environment is appropriate and fit for purpose.

The wording of this condition is necessary for the outline application to set a baseline understanding of acceptability for the proposed use for both the internal and designated external teaching environments. The condition is relevant to both planning and the development and is necessary and reasonable in all other respects. Policies contained within the Brentwood Local Plan support mitigating the impact of potential nuisance, including noise, and they are also the levels advocated in nationally applied guidance as a maximums.

With this condition imposed, ECC also request that the s106 includes a requirement of a financial payment to cover the uplift in construction costs to comply with this condition. This is on the basis of the Noise Assessment Technical Note (dated 19th February 2024) submitted by applicant, that it considered likely that compliance would likely mean an enhanced building specification and noise mitigation/attenuation around some external areas.

ECC have calculated the cost for enhanced windows and mechanical interventions to address the acoustic requirements within the school will cost around £200,000. It should therefore form part of the Heads of Terms in BBC Officers report to Planning Committee stating a financial contribution of up to £200,000 towards noise mitigation is required to ensure the appropriate teaching environment within the new school is delivered. This would allow then further discussions between ECC, BBC and the applicant as to the exact wording, payment structure and drawback in due course, without causing any delay to the determination of the planning applications.

ECC is a key infrastructure and service provider with statutory responsibilities to ensure that the right infrastructure in this instance a new school is delivered in the right place at the right time to support new and existing communities. ECC has carefully considered the information submitted in support of the hybrid and outline planning applications, we are prepared to make this work subject to creating a quality learning environment for the school if we can reduce the level of noise.

ECC supports the planning applications subject to the imposition of the conditions and s106 provisions, as set out above.

- **Essex County Council (ECC) Environment and Green Infrastructure**

No objection.

- **Essex County Council (ECC) Employment and Skills**

Legal agreement to include a requirement or the preparation of an Employment and Skills Plan as per the Developers' Guide 2023.

- **Essex County Council (ECC) Minerals and Waste**

No objection subject to condition requesting a Minerals Supply Audit, on the basis of the recycling of construction materials on site.

- **Essex County Council (ECC) Climate and Planning Unit (CaPU)**

No objection subject to conditions.

- **Essex County Council (ECC) Archaeology**

As attested by the submitted archaeological desk-based assessment and the Essex Historic Environment Record (EHER), the proposed development site has the potential to contain archaeological remains. The site is located to the south of the main Roman road (EHER 5428) between Chelmsford and London (the modern-day Chelmsford Road). It is also located to the north-east of the historic core of Brentwood (EHER 525), and to the south-west of the settlement of Mountnessing (EHER 1353) both of which have medieval origins.
Roman roads often have contemporary field systems, settlement activity and cemeteries located within their proximity, and similar remains may be present on this site. Additionally, extramural settlement evidence related to the nearby medieval towns of Brentwood and Mountnessing could survive within the development area. Any archaeological features or deposits present on the site are likely to be negatively impacted by the groundworks associated with the development.
Accordingly, this office recommends that 5 conditions are applied to any consent, in line with National Planning Policy Framework, paragraph 205 and the Brentwood Local Plan policy BE16.

- **Historic England**

Historic England provides advice when our engagement can add most value. In this case we are not offering advice. This should not be interpreted as comment on the merits of the application.
We suggest that you seek the views of your specialist conservation and archaeological advisers. You may also find it helpful to refer to our published advice at https://historicengland.org.uk/advice/find/

- **Sport England**

I am writing to confirm that Sport England's objection set out in our response dated 1st November 2023 to the above objection is withdrawn subject to the financial contributions

to outdoor and indoor sports facilities recommended in our email dated 1st July 2024 being secured through a planning obligation if the application is approved. The contributions will need to be ring fenced for the relevant sports facility types and index linked. The planning obligation will also need to detail the potential projects that the contributions will be used towards.

- **Natural England**

Natural England has no specific comments to make on this proposal or issue.

- **Essex Badger Protection Group**

On the basis of an assurance that SES reviewed the site for badgers on 14th July 2023, and subsequently during dormouse surveys, and confirmed their absence from the site, I am happy to remove my holding objection for this proposal.
However, in view of the setts recorded by the Essex Badger Protection Group in the wider area, I still recommend that a number of mitigation measures are included by way of condition on any planning approval given.
SECOND CONSULTATION
We would strongly recommend the following:

- An updated commentary from the applicant or ecologist to better explain the badger mitigation plan and why other options are not being pursued in line with Badger Trust Guidance.
- Proposed Badger Construction Safeguards to be enforced by way of condition to any ultimate planning approval, with the following additions -
- All site personnel to be fully briefed concerning the presence of badgers on site and the mitigation measures to be followed.
- Retained Badger Setts to be surrounded by a clearly marked exclusion zone extending 20m from the sett. No site personnel are to enter the exclusion zone and no site materials are to be stored within it.
- Adherence to these measures to be confirmed to planners at regular intervals by the project ecologist.
- No additional badger setts are to be closed under licence without the prior permission of the Local Planning Authority and without the submission of a further badger survey by way of explanation.

- **Essex Wildlife Trust**

Essex Wildlife Trust initially issued an objection in November 2023 that reads the following:

“I have examined the Biodiversity Net Gain Assessment (Aspect Ecology) and can confirm that our position will be one of objection. This is due to the trading rules for hedgerows in the Defra Metric not being satisfied.”

It is noted that this objection concerns Biodiversity Net Gain (BNG). While developers are encouraged to meet BNG targets, it is not a mandatory requirement for Croudace, as this application was submitted before the mandatory BNG requirement came into effect.

Additionally, the BBC's Ecology & Landscape Officer provided the following comments in November 2023 in response to this matter.

"EWT identified two issues in its objection which related to hedges and impacts on protected species.

The first relates to trading rules within the BNG calculation not being met as the net gain for hedgerows was 0.49%. This is a matter that I have raised with the applicant and they are reviewing whether it is possible to create more hedgerow, although this would result in less scrub be available for dormouse mitigation.

It is important to remember that while developers are being encouraged to meet BNG targets, it is not yet a mandatory requirement. I will draw your attention to the High Court judgement of 16th November 2023, NRS Saredon Aggregates Ltd V Secretary of State for Levelling Up, Housing and Communities and Anor [2023 EWHC 2795 (Admin) where an Appeal hearing was dismissed as the Inspector had considered BNG in his decision as if it were already mandatory. Based on this ruling it is clear that without specific local planning policies requiring a specific level of net gain, it is not possible to refuse an application based on failure to meet 10% BNG in advance of the legislation becoming mandatory. Currently this is anticipated that BNG will become mandatory in January 2024 and it is expected to apply only to applications validated after that date.

There are 6 sections of hedgerow identified on site, with all but H4 meeting the criteria to be assessed as 'important'. These total 1350m in length of which 770m would be retained.

H1 & H4 would be fully retained. H5 beside Chelmsford Road which measures 160m would require removal to create the main site entrance. Impacts to H1 and H3 would be limited to creating a pedestrian and a vehicular access respectively. H6 which is an 80m section of hedge to the rear of the proposed parking area for apartment block at the site entrance would be impacted.

The BNG metric suggests 822m of new species-rich native hedgerow would be created. With the retained hedge this would result in a total of 1592m of hedgerow on site compared to the existing 1350m; however the loss of good quality habitat and the risk and time required to create hedges of a similar quality means that overall net gain calculation is only 0.49%.

The surveys identified a small population of dormice in an area of dense scrub within the proposed school site which unfortunately would require removal under a European Protected Species licence. The mitigation strategy proposed new scrub and woodland creation to provide new appropriate habitat.

The scheme manages to avoid significant impacts on bat roosts and commuting features and measures such as the proposed external lighting strategy should minimise effects.

On balance it is considered that there is a robust mitigation strategy to address the loss of hedges and habitat for dormice. It could be possible to increase the amount of hedgerow but this could result in less scrub which is also suitable dormouse habitat."

Therefore, in consideration of the above comments, the officer considers this objection does not hold any weight. Essex Wildlife Trust was consulted during the second consultation in March 2024 and has not provided any additional responses.

- **Royal Society for the Protection of Birds**

No response received.

- **Essex Police**

Comments were made on:

- Physical Security and Access control
- Electrical Vehicle Charging
- Landscape plan
- School drop-off/pick up plan

- **Essex County Fire & Rescue Service**

The proposal does not appear to affect Fire Service access to existing premises in the vicinity and therefore in compliance with Clause 13 (1)(b) of The Act. Fire Service access to all relevant areas of the development will be expected to be in full compliance with the requirements of the Building Regulations, Approved Document "B" Fire Safety Volumes 1 & 2 Sections B5 (and so address Clause 13 (1)(a) of The Act). Should the application be successful additional water supplies / fire hydrants for firefighting purposes will be required for this development. There is clear evidence that the installation of Automatic Water Suppression Systems (AWSS) can be effective in the rapid suppression of fires. Essex County Fire & Rescue Service (ECFRS) therefore uses every occasion to urge building owners and developers to consider the installation of AWSS.

- **Anglian Water**

There are assets owned by Anglian Water or those subject to an adoption agreement within or close to the development boundary that may affect the layout of the site. Anglian Water would ask that informatives be included within your Notice should permission be granted.

The foul drainage from this development is in the catchment of Shenfield And Hutton Water Recycling Centre that will have available capacity for these flows.

"This response has been based on the following submitted documents: FRA and Drainage Strategy Rev P02 September 2023. The sewerage system at present has available capacity for these flows. If the developer wishes to connect to our sewerage network, they should serve notice under Section 106 of the Water Industry Act 1991. We will then advise them of the most suitable point of connection.

From the details submitted to support the planning application the proposed method of surface water management does not relate to Anglian Water operated assets. As such, we are unable to provide comments in the suitability of the surface water management.

- **Affinity Water**

Affinity Water has no comments to make regarding planning application 23/01164/FUL.

- **Essex & Suffolk Water**

No response received.

- **Thames Water Development Planning**

Thank you for consulting Thames Water on this planning application. Having reviewed the details, we have no comments to make because this does not fall within Thames Water area.

- **UK Power Networks**

UK Power Networks typically only reply to planning applications when they have an objection or wish to offer advice. As is allowed, where no response is sent, please assume we have nothing to say.

- **National Grid**

No response received.

- **Cadent Gas**

We have no objection to this proposal from a planning perspective, informative note required.

9. Summary of Issues

Consideration of the proposal

9.1 The starting point for determining a planning application is the current development plan, which is the Brentwood LP 2022. Planning legislation states that applications must be determined in accordance with the relevant development plan policies unless material considerations indicate otherwise. Additional policies, as relevant material considerations for determining this application, are the NPPF and the PPG. Although individual policies in the LP should not be read in isolation, the adopted plan contains policies of particular relevance to this proposal, which are listed in section 3 of this report.

9.2 As already explained, the DF is a material consideration in the determination of this planning application.

Principle of development

9.3 The principle of residential development in this location is acceptable and is in line with LP Policy R03 (Land north of Shenfield) and the DF, which identifies this parcel of land as suitable for residential development.

9.4 The following sections explore how the various components of the proposed development meet the detailed requirements of LP Policy R03 and of other local and national policies.

9.5 The principles of the DF are also addressed, as the document provides overarching guidance for all the R03 applications and reflects the requirements of LP Policy R03.

Layout and massing

9.6 The layout and massing of the proposed development closely follow the DF principles and character areas, and the expectations for this parcel of the allocated site as shown on the Indicative Built Form Strategy Plan of the DF, which were the result of extensive discussion with the case officer and technical consultees.

9.7 The layout has been informed by a number of significant constraints:

- The location of the school, which was identified as the most suitable further to analysis undertaken ahead of the Examination in Public for the LP.
- The presence of the CDA crossing the centre of the site from east to west, and of Flood Zones 2 and 3 that partially overlap the CDA.
- The requirement to provide two entrances into the site, from Chelmsford Road and Alexander Lane, as per LP Policy R03.
- The requirement to divert the southern section of Alexander Lane into the site, to allow the conversion of the northern section of this road into a quiet lane for pedestrians and cyclist, linked with Chelmsford Road, as per Policy R03.
- The presence of a veteran tree (English Oak) in proximity to the Chelmsford Road entrance.
- The presence of Arnold Wood to the east, which is approximately 10 to 12m high (equivalent to a 3 to 4 storey building) and requires a 15m buffer.
- The presence of the following trees and tree belts that need to be preserved and embedded into the development proposal:
  - A north/south tree belt within the northern field, to the east.
  - An east/west tree belt connecting Arnold's Wood to the north/south tree belt.
  - Category A trees within the northern field.
  - Boundary trees along the northern edge of the site, and to the east and west of the southern field.
  - Boundary trees along the southern edge of the site.
- The PRoW along the eastern boundary cuts diagonally through the small eastern field and needs to be diverted (this is subject to a separate application being determined by the ECC PRoW team).

9.8 Taking into account the above fixed constraints, the proposed layout has been articulated around a primary road that crosses the site west to east (starting from the Chelmsford Road entrance) and north to south (starting from the Alexander

Lane entrance). From this, a network of secondary roads (mainly shared surfaces) and pedestrian and cycle links extend throughout the site, providing connections between residential blocks, extensive areas of public open space, attenuation basins, play areas and retained tree belts.

9.9 In line with the DF, the areas towards the centre of the site are higher density, being surrounded predominantly by buildings and defined by the primary road. Areas towards the development edges are lower density and form a 'green edge' to the development.

9.10 The proposed layout is characterised by six key components, as illustrated in Figure 3 below.

Figure 3 – Extract from the Design and Access Statement, Design Areas Key Map

Figure 20: Design Areas Key Map
Source: FINC Architects

Western Gateway

9.11 During the officer review of the DF the Western Gateway was identified as a key location for the allocated site, as it defines the vehicular, cycle and pedestrian entrance into the R03 site for those travelling along Chelmsford Road. In line with LP Policy R03, the DF clearly states that the Western Gateway has potential for higher density and taller buildings, to create a sense of arrival, mark vistas and create definition in the urban fabric.

9.12 In accordance with the above requirements, it is proposed to deliver 3 and 2 storey buildings in this location, providing a strong continuous frontage to the eastern side

of the entrance: from the corner with Chelmsford Road, where a new roundabout will be located, into the Croudace site.

9.13 A 3-storey block of flats (Block A) acts as the focal point of the Western Gateway, delivering a way-finder building, assisting with legibility towards the new school. The formal terrace along the entrance road, at 3-storeys high, will complement the apartment block and guide residents and visitors into the site.

9.14 On the opposite side of the entrance, residents and visitors will be welcomed by a new parkland, a very generous area of public open space, which will include (among other things) a Neighbourhood Equipped Area for Play (NEAP), open grassland area for recreation and play, and a central wetland area with habitat enhancement.

9.15 This area of the site is defined as the Green Streets (Western Gateway) character area in the DF and reflects the requirements of this character area.

School Plaza Area

9.16 Past the Western Gateway, residents and visitors will enter the 'school plaza area', defined from the presence of the school site (subject to a separate outline application) and the veteran tree. Whilst these pose significant physical constraints to this section of the site, the trees presence had already been identified in the DF as an opportunity to create a 'community heart'.

9.17 In accordance with the DF, a multi-use large 'school plaza', measuring 530sqm, will front the school site and provide the following benefits:

- pedestrian access to the school;
- a safe, enclosed area for children and parents to congregate during pick-up / drop-off times;
- a meeting point for local residents, with potential to host small events and local markets.

9.18 The veteran tree, which bounds the plaza to the west, will be protected by a buffer area with retained and enhanced scrub vegetation, and an integrated seating and lighting system along its perimeter. An information board will be located at the edge of the buffer area to provide details about the protected tree and associated ecosystem.

9.19 The plaza will have a distinctive paving, to mark its role as the link between the school and the local community. A raised table crossing will connect the school to the parkland to the south. The raised table will contribute to slowing down of traffic and will be defined by large planters placed at the edge of the plaza, preventing children from running into the street. A green verge, running along the primary road, will act as an additional barrier increasing safety.

9.20 To the east of the plaza, it is proposed to locate 3-storey high terraced houses, which will ensure natural surveillance.

9.21 There are also high terraces on the western side of the veteran tree, and three blocks of flats (Blocks B, C and D) to the south of the raised table. At 3-storeys high, the terraces and blocks will provide a visual enclosure to this area of the site. Importantly, the blocks of flats will also provide natural surveillance over the raised table and over the parkland.

9.22 The proposed school plaza area conforms with the expectation for this area set out in the Indicative Built Form Strategic Plan and the Primary School section of the DF.

Primary Streets

9.23 These formal streets are lined by trees (green verges) and are defined as being part of the Green Streets (Boulevard Streets) character area in the DF. They are the main routes that connect the site's two entrances to the main places and uses in the development.

9.24 To underline the formality of these primary streets, the layout employs a symmetrical repetition of house types with side car parking to deliver a strong, regular frontage.

9.25 In line with the DF, the proposed buildings are mainly semi-detached and 2/2.5-storeys high, with two detached 3-storey buildings and one 3-storey block of flats (Block E) in key focal points.

Eastern Field and North-South Tree Belt

9.26 This area is located along Arnold's Wood, the existing north-south tree belt, and the existing east-west tree belt. It is identified as being part of the Green Edge (Woodland Edge) character area in the DF.

9.27 In accordance with the DF, it is less formal in its arrangement, less dense, with shared drives and 2-storey semi-detached and detached units with varied pitches and roofscapes. Overall, this area creates a more intimate setting in close proximity to the existing landscape.

9.28 The Eastern Field area includes an area of public open space to the south, with a Local Equipment Area for Play (LEAP) and a Local Area for Play (LAP). The diverted PRoW also runs through this section of the layout, providing connectivity to the Redrow parcel to the north-east and the wider locality to the south.

Northern Gateway

9.29 This area is directly adjacent to Arnold's Wood and is also part of the DF Green Edge character area.

9.30 It is characterised by an area of public open space to the north-east corner and a section of the PRoW, providing direct access to the Redrow parcel to the north-east, and to the rest of the site to the south. A boardwalk allows pedestrians and cyclists to cross over the basin, giving the area a distinctive 'woodland feel'.

9.31 In accordance with the DF, the buildings within the Northern Gateway feature 2-storey semi-detached and detached units, sitting within an informal road layout with informal, organic landscaping to plot boundaries to front onto Arnold's Wood.

Southern Gateway

9.32 The access into the site from Alexander Lane, the Southern Gateway, forms part of the Green Edge (The Lanes) character area and is traversed by the primary road (Green Streets (Boulevard Streets) character area). As a consequence, it is a multifaceted area comprising:

- 3-storey blocks of flats (Blocks F and G), one on either side of the Alexander Lane entrance, to signpost the entrance into the site.
- A 2-storey block of flats (Block H) to the east of the entrance, providing a transition between the existing Alexander Lane buildings and the taller gateway entrance.
- 2-storey buildings with green verges along the primary road, providing a formal, regular frontage.

9.33 The design approach to the Southern Gateway accords with the principles of the DF.

Other areas

9.34 In accordance with the DF, the remaining areas fall within the Green Streets (Mews Street) to the north, east and west of the primary road, and the Green Edge (Woodland Edge) fronting the proposed area of public space to the south-east.

9.35 These character areas form the majority of the internal streets throughout the development, where shared surface streets provide an attractive and safe movement network, where pedestrians and cyclists will have priority over cars, with a less formal urban arrangement compared to the primary road.

9.36 In terms of housing types, these areas include semi-detached and detached 2-storey high dwellings, with the exception of 2.5-storey high semi-detached houses fronting the public open space to the south-east, providing a strong frontage and natural surveillance.

Officers' Analysis

9.37 The site layout has been subject to extensive discussion and has reached a form that is supported by both BBC officers and Place Services.

9.38 The proposal comprises a variety of character areas, all in accordance with the DF, depending on their location, proximity to landscape features, and their function within the site and the wider allocation. Officers welcome the variation to the site layout, avoiding the risk of a monotonous and repetitive large urban development.

9.39 The layout has been designed to ensure that all routes are legible and usable for all members of the public, with clear connections between the key points of interest. All residents will live in close proximity to areas of public open space and will have easy access to play areas, which is supported. The connectivity of the proposal (internal and with the wider area) is analysed in the Connectivity section of this report.

9.40 A mini-roundabout has been placed at the intersection of the two primary roads, acting as a traffic calming measure and eliminating the need for traffic signals or stop signs, in turn increasing safety and allowing continuous traffic flow.

9.41 The inclusion of areas of public open space, play areas, pedestrian and cycle links result in a development that will be enjoyed by residents outside of the application boundary, ensuring that the R03 site is a sustainable urban extension, integrated within the community. If delivered by ECC, the primary school and early years facility will further facilitate this integration.

9.42 Place Services' Urban Design teamcommended various components of the scheme, such as the character of the Western Gateway, the frontage of Block A, the layout of the plots to the west of the school plaza and the plaza itself, as well as the connectivity across the site. They also highlighted how important it is that the spine street has been designed with a strong and coherent building line, to signify its place in the route hierarchy and to create legibility.

9.43 There are a small number of elements where Place Services would have preferred additional amendments, such as increased east-west connectivity or the three lines of tandem parking between dwellings to the west of the school plaza. However, Place Services confirmed that these points have been balanced by the overall quality of the layout and the benefits of the scheme, and that the proposal is therefore supported.

9.44 Overall, it is considered that the proposed layout is of very high quality, and that it will provide high living standards for future residents.

9.45 The proposed development will be delivered in phases, given the size of the site, in accordance with the Phasing Plan (ref. 988/000).

9.46 To conclude, the proposed development is in full compliance with LP Policies BE14 (Creating Successful Places), BE15 (Planning for Inclusive Communities) and R03 (Land North of Shenfield), subject to conditions about materials and details of the school plaza's landscape.

Interaction with safeguarded school site

9.47 As previously explained, the school site will be safeguarded by Essex County Council (ECC), the Education Authority, for 10 years. Should the need for a new primary school and early years facility be confirmed during this timeframe, ECC will deliver the school to their specification. Should ECC not require a new school, this parcel of land will be returned to the applicant.

9.48 The interaction between the proposed development and the safeguarded school site has been subject to extensive dialogue between BBC officers, ECC officers (including the Highways and Education teams) and the applicant.

9.49 No drop-off area has been provided, as requested by the Education Team, to facilitate school trips via sustainable transport modes. Should parents wish to utilise the visitors car parking spaces to the south-west of the school plaza (nos. V1 to V5 on the site layout), these are connected to the pedestrian and cycle route fronting the raised table opposite the school plaza, ensuring safe crossing to the school entrance.

9.50 The school will have its dedicated car parking area for staff and visitors within the safeguarded site.

9.51 There are a total of 3 entrances into the school site, details of which will form part of a future reserved matter application, should application ref. 23/01159/OUT be approved:

- The pedestrian entrance from the school plaza.
- A vehicular entrance to the north-east of the mini-roundabout.
- A maintenance access to the north of the layout.

9.52 The maintenance access for the school can be reached through a private driveway, by plots 101 to 105. Crossing through this driveway will be guaranteed by a provision in the legal agreement and also included in the Estate Management Strategy.

9.53 The Education Team confirmed that they have no objections to the proposed entrances.

9.54 The ECC Education Team requested that a double fence be erected to the back gardens of the units abutting the school site, along the southern and eastern boundaries. This is to avoid overlooking and potential noise issues, and also to

create a buffer area to facilitate maintenance of fences and trees when required. The fence along the school boundary (but immediately outside it) will be 2.4m high of welded mesh, in line with ECC Developers' Guide to Infrastructure Contributions. The fencing for the residential plots could be a lower timber fence (the Environmental Health Officer suggested 1.8m), details of which have been conditioned.

9.55 A number of mature trees are located immediately to the north of the safeguarded school site. In order to avoid root protection areas to be included within the school, the Education Team requested the creation of two buffer areas alongside the northern boundary, with a width ranging between 1.5 and 3m. The two aforementioned fences will be erected on either side of the buffer area. Only a minimal section of root protection areas will now be included in the school site, which has been deemed acceptable.

9.56 Access to the north-east buffer area will be through the school's maintenance access. Access to the south-west buffer area will be through the private drive-through of plots 31 to 33. This will also have the advantage of creating a welcome separation between the school site and the car parking spaces of plots 32 and 33.

9.57 It is noted that there is no direct access between the school plaza and the private drive serving plots 30 to 33, ensuring that no child could walk unsupervised along the drive or by the car parking spaces of these plots.

9.58 This aspect of the proposal is considered to be in full compliance with LP Policies BE14 (Creating Successful Places), BE15 (Planning for Inclusive Communities), PC11 (Education Facilities) and R03 (Land North of Shenfield), subject to condition requesting details of the proposed fencing along the safeguarded school site.

Connectivity and Public Right of Way

9.59 The proposal is accompanied by a Proposed Permeability Plan (ref. 22.1643.209 rev.C) illustrating the connectivity within the site and with the wider area, including other sites within the R03 allocation.

9.60 The plan demonstrates that there is extensive pedestrian and cycle connectivity within the site, as required by LP Policy R03 and the DF. Dedicated pedestrian and cycle routes have been located along the primary roads, ensuring safe connections from and to the site entrances and the key components of the site: the safeguarded school site, the school plaza, the large parkland to the south of the school and the areas of public open space to the south. The pedestrian and cycle routes are 3.5m wide as per Essex standards, separated from the road by green verges for additional safety.

9.61 All the secondary roads are shared surfaces, which will accommodate pedestrians and cyclists and reduce the dominance of motor vehicles. As these surfaces are

'shared', there are no formal cycle routes. To ensure that the shared surfaces are truly accessible to all users, including those with disabilities, a condition has been imposed asking for details of the proposed paving.

9.62 In addition to primary and secondary roads, the site benefits from an extensive network of pedestrian and cycle routes throughout the areas of public open space.

9.63 As required by LP Policy R03, the PRoW will be retained, although following a different route as shown in the DF. The proposed diversion, which is being determined by the ECC PRoW team, ensures that the northern section of the PRoW will continue running along Arnold's Wood, whilst the southern section will be diverted along the retained tree belts and end up in the area of public open space, to then reconnect with the PRoW that runs along the railway tracks. By doing so, future residents will benefit from increased access to the PRoW, and existing residents will benefit from safe and easy access to the new area of public open space and the LEAP. Moreover, the diverted PRoW will retain its natural landscape feel, that is its main characteristic at present.

9.64 The above considerations demonstrate that the site will benefit from very high levels of internal connectivity, which is a key component of the proposal. This complies with the requirements of LP Policies BE14 (Creating Successful Places), BE15 (Planning for Inclusive Communities) and R03 (Land North of Shenfield).

9.65 Through the PRoW, the proposed development will be linked to the Redrow parcel to the north-east, to Chelmsford Road to the north and the area south of the allocated site. The site will also benefit from pedestrian, cycle and vehicular access from both Chelmsford Road and Alexander Lane, as required by LP Policy R03, which will allow users to reach Shenfield, Brentwood Town Centre and other neighbouring towns and villages, depending on the chosen mode of transport.

9.66 In line with LP Policy R03, the northern section of Alexander Lane will be diverted into the site, being replaced by a pedestrian and cycle link between the southern section of Alexander Lane and Chelmsford Road. This will ensure that existing and future residents will be able to choose their preferred route between Chelmsford Road, the south of the proposed development and Alexander Lane.

9.67 The site is also in very close proximity to existing bus stops, on Chelmsford Road to the north-west and Long Ridings Avenue to the south, providing services to Brentwood, Shenfield, Chelmsford and beyond.

9.68 As required by LP Policy R03 and the IDP, the applicant has agreed to make contributions towards:

- The improvement of the pedestrian and cycle routes along Chelmsford Road.
- The creation of a cycle route along Hunter Avenue.

- The creation of other 'quiet way' cycle routes in the Brentwood Urban Areas (details to be agreed with the Highways Authority).
- Upgrade of signal at the Chelmsford Road/Hutton Road/Shefield Road junction.
- The improvement of the existing bus service along Chelmsford Road.
- Brentwood and Shenfield Railway Station public realm and cycle infrastructure improvement.

9.69 In addition to this, a substantial contribution will be made towards the creation of a new bus route to connect Shenfield train station to the R03 site. The new bus route will enter the Croudace scheme from Chelmsford Road, continue through the primary route and exit on Alexander Lane.

9.70 The new service will operate every half an hour with a single-decker bus, running in one direction. Notably, Alexander Lane has previously been used for rail replacement bus services. Considering that this proposed route ensures every dwelling of Croudace parcel is within 400 metres of a bus stop, thereby promoting sustainable development, the ECC Sustainable Transport team deems this route acceptable.

9.71 Just like internal permeability, the connectivity of the proposal with the wider locality is a key component of the scheme. Officers support the proposal as not only it is well connected with the wider area, but it will also contribute to a significant enhancement of the existing connectivity, benefiting existing local residents, ensuring the sustainability of this urban extension and contributing towards a shift towards sustainable transport modes. The inclusion of the new bus route within the scheme is particularly welcomed.

9.72 Although the PRoW diversion is currently being determined by the ECC PRoW team, the principles underpinning this diversion had already been discussed with ECC officers. A condition has been imposed requesting the diversion to take place only after permission is granted by ECC.

9.73 To conclude, the proposal is in line with the requirements of LP Policies BE14 (Creating Successful Places), BE15 (Planning for Inclusive Communities) and R03 (Land North of Shenfield).

Appearance

9.74 The appearance of the proposed development has been informed by the design code set out in the DF per character area and is summarised as follows.

Western Gateway

9.75 The 3-storey apartment building and formal terrace have been designed as a distinct focal/gateway into the development. They take design cues from the

Brentwood School, located further south on Chelmsford Road, to create brick-clad focal buildings. The Western Gateway is characterised by gable roofs with a red brick and slate roof tile combination, with extruded feature brick work and brick patterning, including brick window surroundings. Light green cladding is used to accentuate the importance of the entrances to the units and to balconies fronting the Chelmsford Road corner, to add interest and variation to this key location.

School Plaza Area

9.76 This area has both blocks of flat and terraces, all with gable roofs. These buildings are clad with a variety of materials: both red and buff brick, slate, rustic red and brown roof tiles. Additional materials include light green cladding (also featured at the Western Gateway) as well as some off-white render and white eternit cedral boarding. Modern contemporary black front doors and vertical fenestration are used for a more modern design approach.

Primary Streets

9.77 The primary streets are characterised by formal tree-lined streets. As noted in the Design and Access Statement, the primary streets connect the key areas of the proposal and employ repetition of house types to provide formality and hints of the detailing used in the school plaza to knit the different parts of the site together for vehicles, cyclists and pedestrians. The buildings, detached and semi-detached, feature both red and buff brick, with both dark and light wooden boarding being heavily used. The gable roof finishes comprise slate as well as red and rustic red tiles.

Eastern Field and North-South Tree Belt

9.78 This portion of the site, part of the Green Edge (Woodland Edge) character area, adopts a less formal approach compared to the Primary Streets, with a higher variety of typologies, roofscapes and lower buildings. The choice of materials is similar to that of the Primary Streets and reflects the woodland area: both dark and light wooden boarding are prevalent with the occasional unit featuring render instead. Buildings feature both red and buff brick, as well as all four available tile materials: slate, red, rustic red, and brown roof tiles, creating a varied material palette finished with modern black front doors.

Northern Gateway

9.79 This is also part of the Green Edge character area and adopts the same approach of the Eastern Field and North-South Tree Belt area: a variety of 2-storey high units, with a choice of materials reflecting the woodland located immediately to the east of this character area.

Southern Gateway

9.80 This gateway location presents sightly taller buildings than those in the rest of the Green Edge character areas, with house types reflecting those of the Primary Streets, designed as a modern take on a traditional Essex barn.

Other areas

9.81 The rest of the development reflects the house types, roof scape and materials proposed for the other Green Edge and Green Streets character areas.

Officers' comments

9.82 The appearance of the proposed development reflects the design guidance set out in the DF and has gone through a number of refinements during the course of assessment, to ensure that all the house types and blocks of flats are of the highest quality, as demonstrated in the street scenes that accompany this proposal.

9.83 Place Services confirmed that the architecture of the most prominent character areas is positive, and where house types have been adapted by the architects to be contemporary, these have become exemplary

9.84 There are a small number of elements where Place Services would have preferred additional amendments, such as the rear elevation of block of flats A or some details to the houses on the Northern Gateway. However, when balanced with the rest of the development and the overall quality of the scheme, these are acceptable.

9.85 Therefore, the appearance of the proposed development is fully supported and is in compliance with LP Policy BE14 (Creating Successful Places).

Density

9.86 LP Policy HP03 (Residential Density) expects new residential developments to achieve a net density of at least 35 dwellings per ha (dw/ha), rising to above 65 dw/ha in the town centre.

9.87 The site measures 19.14ha with a developable area of 9.47ha, to account for the CDA and preserved tree belts. This equates to a density of 36 dw/ha, which is policy compliant and appropriate for a residential extension in this location.

Unit Mix and Affordable Housing

9.88 From the beginning of the DF discussion, all applicants have been encouraged to deliver a variety of housing typologies, to facilitate the creation of different character areas and add variety to the development proposals. This became

particularly important once the constraints of the site were better understood, and it became clear that the anticipated 825 units could not be delivered.

9.89 Therefore, the applicant is proposing a variety of housing types: flats, semi-detached unit, detached units and terraces, for a total of 344 dwellings, with the following unit mix:

Table 1 – Proposed unit mix (market and affordable)

Size / Type	Market	Affordable	Total
1 bed	21	33	54
2 bed	41	73	114
3 bed	76	13	89
4 bed	85	2	87
Total	223 (65%)	121 (35%)	344

9.90 The detailed schedule of accommodation submitted with the application demonstrates that all the proposed units are compliant with the nationally described space standards as required by LP Policy HP06 (Standards for New Housing).

9.91 In line with LP Policy HP01 (Housing Mix), all units will be constructed to meet requirement M4(2) accessible and adaptable dwellings, as per policy requirement, and 5% of the affordable homes will be M4(3) wheelchair accessible ground floor units (7.5%). The introduction of these wheelchair accessible units is strongly welcomed.

9.92 In line with LP Policies HP01 and R03, 5% (18no.) of all homes will be provided as custom-build.

9.93 In terms of tenure, 223 units will be open market housing (65%) and 121 units will be affordable housing (35%) in line with LP Policy HP05 (Affordable Housing).

9.94 The proposed market unit mix is acceptable.

9.95 The initial affordable housing offer comprised an 86% / 14% ratio of affordable rent to low-cost homeownership, in line with LP Policy HP05. However, the Housing Manager advised that the policy requirement no longer reflects the BBC Housing Need Register, which clearly shows a strong, long-term need for family units (2 bed+). It was therefore requested that the number of family units be increased.

9.96 The Strategic Policy Team confirmed that, in order to facilitate the requested change, an amendment in tenure ratio would be allowed, to 45% affordable rent and 55% low-cost homeownership.

9.97 Further to discussion with officers, the applicant agreed to amend their affordable housing mix, significantly increasing their provision of 2-bedroom houses. This is strongly supported. The new mix was also tested with four Registered Providers, to ensure that the proposed quantum of affordable housing could be delivered. It should be noted that, in order to maintain the desired wide range of housing types, it was not possible to reduce the number of flats.

9.98 The table below sets out the proposed affordable housing mix, which is considered acceptable by the Housing Services Manager and by the Strategic Policy Team:

Table 2 - Proposed affordable housing mix

Property Type	**No. of units**	**%**	**Affordable Rent**	**Shared Ownership**
1B Apartment	33	27%	17	16
2B (4 people) Apartment	14	12%	6	8
2B (4 people) House	59	48%	27	32
3B House	13	11%	6	7
4B House	2	2%	1	1
Total	121		57 (47%)	64 (53%)

9.99 The affordable dwellings will be tenure blind and will meet nationally described space standards. All of the affordable apartments will have their own parking space and all affordable houses will have 2 parking spaces each.

9.100 In terms of location, the proposed affordable units will be delivered along the primary road (including by the school and the southern gateway), in the centre of the site, to the north and to the east, in proximity to Arnold's Wood. The variety of locations ensures that the proposal will deliver mixed and inclusive communities.

9.101 In three instances, the group of units exceed the requirements of the new Planning Obligations SPD on clustering, which set out that affordable housing should be provided in groups of no more than 15% of the total number of dwellings being provided (in this case, 18) or 12 affordable dwellings, whichever is the lesser. There is a group of 16 units along the primary road, that sits between the minimum 12 units and the 15% of the total number of affordable dwellings. This is a very small departure from the recommendations in the SPD and officers consider that on balance this is acceptable.

9.102 Where three blocks of flats are proposed in close proximity (Blocks B, C and D by the school plaza, and Blocks F, G and H by the southern gateway), the clustering requirement is inevitably exceeded. However, this is considered acceptable: the proposed blocks of flats are required to maintain the required variety of house types and to create a gateway entrance from Alexander Lane. Notwithstanding these groups of flats, the proposal will support a mixed and inclusive community, which is the objective of the SPD.

9.103 To conclude, the proposal includes a wide range of house types to cater for all needs and will make an important contribution to the housing supply of Shenfield and BBC, in line with LP Policy MG01 (Spatial Strategy). The applicant's willingness to amend the affordable proposal to contribute to easing the pressure on the BBC Housing Need Register is commended.

9.104 The proposed housing provision, both market and affordable, is supported and meets the requirements of LP Policies HP01 (Housing Mix), HP05 (Affordable Housing) and HP06 (Standards for New Housing), and of the Planning Obligations SPD.

Private and Communal Amenity

9.105 All houses, market and affordable, enjoy generous private amenity: all 1 and 2 bed properties feature gardens of 50sqm and above, and 3 bed+ properties feature gardens of 100sqm and above. This comfortably exceeds the standards of the Essex Design Guide.

9.106 The Essex Design Guide stipulates that development on sites larger than 0.1 ha should provide at least 25sqm of private space for each home. For this scheme, this would equate to very large areas of communal open space. Only Blocks C and H meet this criterion. However, the Guide also notes that apartments adjacent to and overlooking a park or other large public space of high amenity value could be provided with a smaller amount of communal space. Incorporating balconies into residential accommodation is encouraged and will be expected where the private communal space provision does not equate to 25sqm per flat.

9.107 All the proposed apartments, market and affordable, will benefit from private balconies of at least 5sqm, and from communal amenity space. Whilst Blocks C and H meet the Guide's criterion of 25sqm per flat, the other blocks are located either adjacent or in very close proximity to areas of public open space: the proposed new parkland, the proposed area of public open space to the south-east and Alexander Lane Playing Fields.

9.108 Since these areas are not only very large, but also of high amenity value, the proposed communal amenity space for Blocks A, B, D, E, F and G is considered acceptable.

9.109 Overall, it is considered that the provision of private and community amenity spaces is acceptable and in line with LP Policy HP06 (Standards for New Housing).

Impact on Neighbouring Amenity (Privacy, Noise and Lighting)

9.110 The Western Gateway units sit next to no. 167 Chelmsford Road, a single dwelling, and land adjacent to it, which benefits from planning permission for the erection of six dwellings (ref. 22/00453/FUL).

9.111 The proposal has been designed to avoid any negative impact on the amenity of the existing and approved dwellings: no unit abuts the boundary with no.167 and land adjacent to it, and the side of Block A facing no.167 has no windows, protecting the privacy of existing residents. The distance between no.167 and Block A is such that there is no possibility of overlooking or overshadowing.

9.112 Part of the northern boundary is bound by the gardens of properties facing Chelmsford Road. Also in this case, the distance between the existing and proposed units ensures that there won't be any issues of overlooking or overshadowing.

9.113 Further to the south, the site runs adjacent to the western boundary of the Stonebond parcel, which is subject to application ref. 24/00332/FUL. Separation between the Croudace and Stonebond properties is guaranteed by the presence of retained trees along the boundary, which prevent overlooking or overshadowing between residential units.

9.114 The proposed development is for residential use only, and it will not result in any adverse noise or light pollution that could be detrimental to neighboring properties, existing or proposed.

9.115 The above confirms that there will be no negative impact on neighbouring amenity, as required by LP Policy BE14 (Creating Successful Places).

Green and Blue Infrastructure

9.116 The presence of the CDA, retained individual trees and tree belts, and ancient woodland mean that green and blue infrastructure has been embedded in the scheme from the outset, significantly dictating the design of the development.

9.117 The various typologies of open space are illustrated in the Open Space Typologies Plan (ref. LN-LD-102 rev.B) and comprise:

- Amenity green space (the central parkland and the retained trees to the south-west edge of the site): 2.89ha.
- Areas of public open space (defined as 'natural and semi-natural space' in the plan): 4.81ha.

9.118 The key feature of the development is the central parkland, measuring 2.89ha, with substantial new tree planting to replace the 34 trees being removed as a result of the realignment of the road, and native / ornamental planting to frame views across the development. A series of new pedestrian routes will be created through the new parkland to allow easy access to the open space, the NEAP, the plaza and then onwards into the development. This area will also feature open grassland area for recreation and play, and a species-rich wildflower meadow.

9.119 The parkland takes advantage of its location within the CDA to provide a central wetland area with habitat enhancement, and an attenuation basin.

9.120 The veteran tree and the school plaza are also important components of the landscape offer, as explained earlier in this report, as they define the 'community heart' of the development. The Ecology & Tree Officer supports the large buffer around the veteran tree.

9.121 In addition to the above, the proposal includes extensive areas of public open space, including equipped and incidental play areas, and attenuation basins, which will ensure that all future residents will live in very close proximity to high quality open space. Particularly, the areas to the north and south of the site will be an attractive feature as they comprise an attenuation basin with permanent standing water, with perimeter access restricted by timber post and rail fencing. A timber boardwalk is proposed to provide pedestrian and cycle access over the north SuDS basin.

9.122 The landscape offer includes the land within and surrounding the retained tree belts and along Arnold's Wood. The ancient woodland will be protected by a 15m buffer area, in line with national guidance, to ensure that the proposed development will have no negative impact on this protected element of the site. The Ecology & Tree Officer noted that the proposal to realign the PRoW is beneficial as it will move part of the footpath outside the buffer area, thus allowing the preservation of trees and shrubs that form an important woodland edge habitat, that would have otherwise been cut back.

9.123 Overall, officers are very supportive of the variety of recreational and amenity spaces included in the scheme, and the way the SuDS strategy has been used to add interest to the site, integrating water within the development. The proposed landscape strategy will provide important benefits to residents of the wider allocated site, as well as existing local residents.

9.124 The Landscape Officer confirmed that the proposed green and blue infrastructure strategy will result in a meaningful, attractive space that is proportionate to the scale of the development. This will have the added benefit of helping manage visitor pressure on Arnold's Wood. The officer commented that the diverse mix of trees and shrubs will provide visual interest, and also increase resilience to the effects of climate change and plant diseases.

9.125 The proposal is accompanied by detailed landscape plans and a Landscape and Biodiversity Management Strategy, which are supported by the Landscape Officer. The officer confirmed that it is not necessary to condition additional landscape details, with the exception of the design of the school plaza that needs to be further developed.

9.126 The proposal has also been reviewed by ECC Environment and Green Infrastructure, who raised no concerns.

9.127 Subject to the above condition, the proposal complies with LP Policies NE01 (Protecting and Enhancing the Natural Environment) and NE02 (Green and Blue Infrastructure).

Play Areas

9.128 The proposed development includes 0.16ha of children's play space, in the form of LAP, LEAP, and NEAP, as shown on the Open Space Typologies Plan (ref. 35229 LN-LD-102 rev.B).

9.129 The NEAP is designed for older children, with play opportunities for younger children as well. It is located within 1000m/15 minutes walking time from all the proposed homes, and the minimum activity zone will be 1000sqm, comprising an area for play equipment and structures, and a hard-surfaced area.

9.130 The LEAP is designed for children who are beginning to go out and play independently, within 400m/5 minutes walking time from all the proposed homes. The minimum activity zone will be 400sqm, including equipment for a range of activities and areas to play with natural materials such as sand and water.

9.131 It is important to note that the NEAP and LEAP are only expected to flood 1 to 2 times each year, for less than 6 hours, based on calculations that include climate change allowance, guarantying their use throughout the year.

9.132 Incidental play areas are provided throughout the site, with a dedicated LAP to the south-east area of public open space. Calmer areas with benches will also be provided for rest and relaxation.

9.133 The play area provision is in line with the play strategy set out in the DF and with LP Policy NE05 (Open Space and Recreation Provision). The proposal will cater for all ages and play preferences, providing an important mix of equipped and informal areas.

9.134 This is another component of the proposal that will be enjoyed by future and existing residents alike, and is strongly supported by officers.

Arboriculture

9.135 The Arboricultural Implications Report confirms none of the main arboricultural features, trees of high landscape value or category A trees will be removed and no category 'A', or trees of high landscape value, is welcomed and supported by officers.

9.136 The report concludes that the proposed removal of 34 individual trees and 13 groups of trees will represent no alteration to the main arboricultural features of the site, only a minor alteration to the overall arboricultural character of the site, which will not have a significant adverse impact on the wider arboricultural character and appearance of the local landscape.

9.137 The Tree Officer agrees with the conclusions of the Arboricultural Implications Report, and supports the measures taken to protect the most important arboricultural features of the site: the large buffer around the veteran Oak Tree and the 15m buffer from Arnold's Wood. The officer also supports the proposal to plant a new Oak Tree within the veteran tree buffer zone as a 'legacy / future veteran' tree, that will be the progeny of the existing tree when this reaches the end of its life.

9.138 The Outline Woodland Management Strategy confirms that, due to the lack of management over several decades, there is little understory or ground flora left within Arnold's Wood. This will be restored as part of the proposal. The strategy recommends that recreational use is managed rather than trying to prevent access to the woodland. The Landscape Officer confirmed that this is the best approach for Arnold's Wood given its long history of de facto access.

9.139 The Landscape Officer requested the following conditions: a final Woodland Management Plan for Arnold's Wood, a Tree Risk and Veteran Tree Management Strategy to cover the veteran tree as well as the other retained trees, and a Construction Environment Management Plan (CEMP).

9.140 A significant number of new trees, shrubs and hedgerows will be planted as part of the proposal, both within the urban areas and the public open space, which is welcomed and will make an important contribution to the quality of the proposal.

9.141 Subject to above conditions, the proposal is supported and is in line with LP Policies NE01 (Protecting and Enhancing the Natural Environment) and NE03 (Trees, Woodlands, Hedgerows).

Ecology and Biodiversity

9.142 The Ecological Appraisal that accompanies this application confirms that the site is not subject to any statutory ecological designation. A section of Arnold's Wood Complex Local Wildlife Site and Priority Habitat Ancient Woodland is present to

the east of the site. Other features of ecological importance include the ancient woodland, veteran and mature trees and a number of hedgerows.

9.143 As already explained, Arnold's Wood will be retained and protected, and will benefit from a dedicated Woodland Management Plan (an outline strategy has already been submitted). The veteran tree and mature trees within the site will also be retained, and will be subject to a dedicated Tree Risk and Veteran Tree Management Strategy. The majority of hedgerows will be retained and protected.

9.144 There is an unnamed watercourse within the site, referred to in the application documents as the 'Shenfield watercourse'. Whilst this is not an important ecological feature, it forms a linear wildlife corridor providing connectivity with the local landscape, and thus has some ecological value. The watercourse will be retained and enhanced, with the exception of a small section to be culverted to facilitate the construction of part of the primary road. The Ecological Appraisal also noted the presence of three ponds within the site, which have negligible ecological significance and will be removed.

9.145 A wet ditch is present within the site, which will be partially retained. This has some ecological value as it forms a linear wildlife corridor providing connectivity with the local landscape, including Arnold's Wood. There are also dry ditches within the site which have no ecological value and will not be retained.

9.146 A number of surveys have been undertaken prior to submission to investigate the presence of protected or notable species, and an additional badger survey was undertaken in January 2024. The surveys confirmed the presence of bats (roosting, foraging and commuting), dormice, badgers, reptiles and birds.

9.147 Vegetation clearance with potential to host dormice and the felling of trees with confirmed or potential bat roost will only be undertaken under a European Protected Species (EPS) development license, obtained from Natural England.

9.148 Precautionary measures are set out in the Ecological Appraisal to ensure any non-priority species of mammals, reptiles, amphibians and invertebrate present are safeguarded during works and clearance of vegetation. Air and water quality safeguards are recommended to protect retained hedgerows, trees, watercourse and ancient woodland, within and adjacent to the site, against any potential run-off or pollution events during construction.

9.149 The Ecology Officer requested to condition the above measures as part of a CEMP, to include a method statement to avoid injury to any animals entering the site during construction.

9.150 The invasive species Himalayan Balsam and Spanish Bluebell have been recorded within the site, and will be carefully eradicated during construction.

9.151 Although this planning application was submitted prior to the requirement for 10% Biodiversity Net Gain (BNG) that came into force in February 2024, the submission includes BNG calculations. Further to discussion with the Ecology Officer, the applicant agreed to amend the proposed landscape scheme, resulting in significant additional biodiversity improvements, well above the minimum 10% requirement:

- Habitat – 24.04 (against the initial 16.33%)
- Hedgerows – 13.19% (against the initial 0.49%)
- Watercourses – 22.19% (against the initial 22.35%)

9.152 Monitoring of the BNG at regular intervals over 30 years will be secured in the legal agreement.

9.153 The proposed enhancements include:

- New tree and shrub planting across the development, providing new roosting opportunities for bats and more diverse nesting habitats for birds.
- Wildflower grassland, especially within the parkland and its water features, where it will establish a mosaic of habitats of elevated value, providing new foraging, commuting and sheltering opportunities for a number of species.
- Enhancement and expansion of existing hedgerow network, contributing to commuting and sheltering opportunities.
- Wetland features: retention and enhancement of existing watercourse and wet ditch, and creation of attenuation basins. This will increase foraging and shelter opportunities for otter and water vole.
- Bat and bird boxes.
- Hibernacula and log piles to support reptiles.
- Hedgehog nest domes.
- Woodpiles and bee bricks to support invertebrates.

9.154 A Landscape and Biodiversity Management Strategy has been submitted, including a Landscape and Biodiversity Management Plan which clearly illustrates the key management zones and their components. The External Lighting Strategy illustrates that street lighting has been designed to avoid sensitive ecological features, such as the ancient woodland.

9.155 To ensure that the proposed BNG can be delivered, the proposed parkland (where the bulk of the ecological enhancements are located) will be laid out within Phase 1, but will only be available to the public at the end of the Phase 2 works.

9.156 The Ecology Officer supports the proposal and is satisfied that no additional management strategies or surveys are required, subject to a CEMP being conditioned.

9.157 The proposal has also been reviewed by Natural England and ECC Environment and Green Infrastructure, who raised no concerns. The Essex Badger Protection Group asked for additional information, which was not considered necessary by

the Ecology Officer, and requested for safeguarding measures to be included in the CEMP, which have been incorporated in the condition.

9.158 To conclude, the proposal retains and enhances all the existing features of ecological importance and provides an opportunity to significantly increase existing biodiversity, as required by LP Policy NE01 (Protecting and Enhancing the Natural Environment). Officers strongly welcomed this aspect of the proposal and commend the increase in BNG achieved during the determination process.

Access and implications of Alexander Lane diversion

9.159 The primary access to the site will be in the form of a priority-controlled roundabout on Chelmsford Road. This will be a three-arm roundabout that will provide a suitable access to the proposed development, with through movement along Chelmsford Road retained. A toucan crossing is proposed to the south of the access, to link the shared footway/cycleways throughout the site to the existing route on the western side of Chelmsford Road.

9.160 To create a more conducive environment for pedestrians and cyclists travelling on or near the Chelmsford Road, it is proposed to extend the 30mph speed limit from the junction with the A12 with the Croudace entrance. This is to acknowledge that the R03 site is now part of the urban area of Shenfield.

9.161 A secondary access is proposed to the south of the site via Alexander Lane, which currently links Chelmsford Road to Rayleigh Road. As already explained, the proposed development would see the diversion of Alexander Lane north into the site, to form part of the proposed transport corridor running through the site.

9.162 As part of this access, there will be a significant upgrading of the highway with a 5.5m road width and a 2m footway maintained throughout on the eastern side of the highway within the site boundary and will continue onto the Stonebond site immediately to the south. Pedestrians and cyclists will be able to reach the pavement on the other side of Alexander Lane through a zebra crossing.

9.163 The Croudace footway will be delivered as part of the Phase 2 works. Should the Stonebond scheme not be available by then, the applicant will fund the creation and maintenance of a pedestrian and cycle route through the Alexander Lane playing fields, accessible through a zebra crossing, which will connect to the existing Alexander Lane pavement on the left-hand side of the road. This work will be funded by Section 106 legal agreement and detailed schedule of work will be set out in Section 278 agreement.

9.164 Access to the secondary school will remain as existing. The section of Alexander Lane that will be closed is to be upgraded to a quiet lane, providing a new and safe, pedestrian and cycle link to Chelmsford Road. A new turning head would be installed at the close of Alexander Lane.

9.165 The proposed access strategy is considered appropriate and is supported by ECC Highways. It is in line with the requirements of LP Policy R03 and the DF, and importantly, it will improve the pedestrian and cycle links of the site with the wider area. As a consequence of the Alexander Lane diversion, the local community will benefit from a new quiet route, particularly to for students travelling to Shenfield High School and users of its playing fields.

Internal Street Network

9.166 As already explained, the internal street network reflects the hierarchy set out in the DF and is supported. These streets have been designed with tighter corners and a non-direct route to discourage through-traffic and to slow vehicles travelling within the site.

9.167 As a result, the proposed internal street network will discourage inappropriate traffic from travelling through residential areas and promote low driver speeds within residential environments.

9.168 Given the extensive connectivity within and between the R03 parcels, the enhanced connectivity with the wider area and the new bus route, the proposal will discourage the use of the private car, particularly for short or local trips. This is a welcomed approach and is supported by officers.

Parking

9.169 With the exception of visitor spaces, the proposed car and cycle parking arrangements comply with the current adopted EPOA Essex standards, for both flats and houses. All 1-bed units are provided with 1 car parking space, and all 2-bed + units are provided with 2 car parking spaces. 84 visitors car parking are provided, at a ratio of 0.25 spaces per dwelling, marginally below the standards. All parking spaces will be provided with an active electric vehicle charging point.

9.170 All units will be provided with at least 1 secure covered cycle space per dwelling, whether within a dedicated cycle store or within the curtilage of houses.

9.171 The proposals fall marginally below the adopted Essex standards, to reduce carbon emissions. Essex County Council accept this, subject to the applicant funding any Traffic Regulation Order amendment for parking on the highway post development.

9.172 Therefore, the proposal meets the requirements of LP Policies BE11 (Electric and Low Emissions Vehicles) and BE13 (Parking standards) and is supported.

Highways Considerations

9.173 The estimated traffic impact of the hybrid scheme on the local highway network is based on the data agreed by the Redrow transport consultant with the Highways Authority at scoping opinion stage. This data has been adopted within the Transport Assessments (TAs) of all the R03 developers, to ensure that they all account for the cumulative impact of the total development in a consistent and appropriate manner.

9.174 The data takes into account the following scenarios:

- 2022 base – i.e. what happens today, with Alexander Lane still open.
- 2028 baseline – i.e. what happens with the other three R03 schemes (the committed developments) but without Croudace, Alexander Lane is still open.
- 2028 Baseline plus Development – i.e. what happens with committed developments and with Croudace, including the closure of Alexander Lane.

9.175 All four R03 site applicants utilise the same transport data and adopt similar modelling approaches. The cumulative impact of the entire R03 site has been reviewed as part of the local plan evidence base exercise conducted by BBC, as detailed in the Brentwood Borough Local Plan Transport Assessment 2018. Section 10.6.1 of this report states, "*the transport work identified within this report has demonstrated that through sustainable transport measures and in some cases, limited physical highway improvement works, the impact of the Local Plan can be mitigated and that there are no major residual impacts that might prevent the delivery of the Local Plan development*." Therefore, the precedent for the development has already been established.

9.176 During the course of determination, the applicant provided additional information to substantiate the review of the cumulative impact of the developments on the highway network, including a more details analysis of the trips that could be generated by the school, should it be delivered.

9.177 The modelling results confirm that the additional traffic generated by the proposed development can be accommodated on the highway network. Although the realignment of Alexander Lane results in the distribution of exiting traffic either through the proposed site or via Oliver Road, this has been shown to be acceptable with all junctions on the local network operating within their operational capacity.

9.178 The increase in traffic on the A12 slip road results in an increase in queuing length during the AM peak hour. However, this has been shown not to be a safety risk, and the increase in delay of approximately 69 seconds does not justify mitigation measures on the junction as the effects are not considered severe as set out in NPPF.

9.179 As already explained and in addition to the above considerations, there will also be improvements to local transport network, through contributions towards:

- The improvement of the pedestrian and cycle routes along Chelmsford Road.
- The creation of a cycle route along Hunter Avenue.
- The creation of other 'quiet way' cycle routes in the Brentwood Urban Areas (details to be agreed with the Highways Authority).
- Upgrade of signal at the Chelmsford Road/Hutton Road/Sheffield Road junction.
- Brentwood and Shenfield Railway Station public realm and cycle infrastructure improvement.
- The improvement of the existing bus service along Chelmsford Road.
- The creation of a new bus route to connect Shenfield train station to the R03 site. The new bus route will enter the Croudace scheme from Chelmsford Road, continue through the primary route and exit on Alexander Lane.

9.180 It is concluded that the proposal, as part of the wider development for the allocated site, will not have an adverse impact on the local transport network. Instead, through a number of contributions agreed with the Highways Authority (some part of the IDP), it will deliver important contributions.

9.181 Therefore, the proposal is supported as it is compliant with LP Policies BE08 (Strategic Transport Infrastructure), BE09 (Sustainable means of travel and walkable streets) and BE12 (Mitigating the Transport Impacts of Development).

Flood Risk and Drainage

9.182 Whilst the majority of the site is within Flood Risk Zone 1, an east-west area of land adjacent to Alexander Lane, the lowest part of the site, is located within Flood Risk Zones 2 and 3. Also, a significant central portion of the site is designated as CDA, which partially overlaps with Flood Risk Zones 2 and 3.

9.183 Since the approach to flood risk and surface water drainage for this site are intrinsically linked, the application is supported by a Flood Risk Assessment which includes a Drainage Strategy. The document confirms that the Shenfield watercourse crosses the site in an east to west direction, between Chelmsford Road and the railway line and that there are also three small ponds. It also confirms that waterlogging across the site is the result of the clayey topsoil preventing the infiltration of runoff, rather than an elevated water table. The water table is estimated to be 3 to 4m below ground level.

9.184 The flood risk and drainage strategy has been subject to extensive discussion with the Environment Agency (EA), at pre-application stage and during determination, to ensure that the proposal would be safe for all users and that flooding would not increase within and in proximity to the site. In order to manage flood, a number of measures have been proposed, which are supported by the EA, including:

- Locating all residential units and school within Flood Zone 1, with finished floor levels (FFL) set at least 600mm above the estimated 1.0% return period (AEP, this is a flood with an annual exceedance probability of 1%) + 32% climate change allowance fluvial flood levels.
- Safe access to the proposed development for storm events up to 0.1% AEP (the least probable level flood risk in any given year) provided via the diverted Alexander Lane, using a new crossing of the Shenfield watercourse linking the northern and southern parts of the site.
- A new crossing of the Shenfield watercourse proposed within the undeveloped area of the site. In addition to minimising the impact of the crossing in terms of floodplain volume, the box-culverts crossing the embankment also provide a safe corridor for the movement of animals.

9.185 To complement the above, the proposed surface water drainage strategy has been designed so that flooding does not occur on any part of the site for all events up to 3.3% AEP (the most high risk flood event) and flooding does not occur in any dwelling (or the school) for all events up to 1.0% AEP + 45% climate change allowance.

9.186 The proposed surface water drainage strategy is in compliance with ECC's strict guidance to ensure (as far as reasonably possible) that runoff leaving the site post-development improves on the current conditions, thus not increasing surface water flood risk elsewhere, such as Alexander Lane, for events up to 1.0% AEP + 45% climate change allowance (and potentially reducing flood risk elsewhere for the most extreme storm events).

9.187 As part of the SuDS for the site, 'less vulnerable' parts of the proposed development (e.g. public open spaces, formal play areas, roads and parking areas) have been designed to integrate water in a sustainable way through the use of swales and attenuation basins. All non-adoptable roads will have permeable paving. Under the areas of public open space, there will also be attenuation storage tanks, places above the water table. All units will be provided with water butts to minimise the waste of clean/treated water in gardening activities.

9.188 FFLs of all 'more vulnerable' parts of the proposed development (i.e. residential dwellings and school) have been set at least 150 mm above surrounding external ground levels, which are designed to safely route overland flows away from buildings and towards natural flow paths, using 'less vulnerable' parts of the proposed development to convey and attenuate overland flow, as explained in the above paragraph.

9.189 The proposed rainwater drainage system will not use soakaways nor discharge to foul water sewers. The system has been designed to attenuate the runoff generated by the proposed development to very low (i.e. greenfield) rates that will be discharged to the nearby watercourse without posing any flood risk on or off-

site (slightly reducing flood risk) to areas downstream of the proposed development).

9.190 Subject to conditions, both the EA and ECC SuDS support the flood risk and drainage strategies for the site, which ensure that the proposal will not only be safe for all users, but that it will not increase flooding elsewhere, such as Alexander Lane. Indeed, the current runoff conditions will be improved.

9.191 To conclude, the proposal is in line with LP Policies NE09 (Flood Risk) and BE05 (Sustainable Drainage).

9.192 In response to concerns raised by local residents about the impact of the proposal on the Long Riding and Whitegates neighbourhoods, identified by the EA as a high-risk area for surface water flooding, the applicant noted that these are located on the east side of the railway line, at significantly higher elevations than the application site. The high flood risk in this area is a consequence of the obstruction caused by the railway embankment and insufficient capacity of the culverts underneath the railway. The proposed flood risk and drainage strategy cannot do anything to reduce (or in fact increase) this flood risk.

Noise

9.193 An Acoustic Assessment has been undertaken, which confirms that the ambient noise on site during the attended surveys was dominated by road traffic from the A12 and Chelmsford Road. On the southernmost boundary, the road traffic noise is lessened and interspersed by noise from passing trains on local and main line railways.

9.194 The Assessment concludes that no noise mitigation would be required for the majority of the site during the day. Properties along the north-east edge of the site and within the Western Gateway will require ‘low’, and very few along Block A require a ‘medium’ noise mitigation. This can be achieved using ‘off the shelf’ windows and ventilation systems, with a low or medium level of acoustic performance, depending on the receptor. During the night, the majority of the properties would require low noise mitigation and would need to keep their windows closed and use a ventilation system.

9.195 Throughout the development, 1.8m high timber fences have been assumed to be provided to all private gardens, which is considered reasonable. These provide some sound reduction due to screening. External noise levels would be below 55dB in the vast majority of external amenity areas, with parts of a very small number of some gardens in the north-west corner experiencing noise levels a little above this. No further noise mitigation is therefore required for private external areas.

9.196 The Environmental Health Manager agrees with the findings of the Acoustic Assessment and raised no concerns. A condition has been imposed requesting the submission of the window specification and ventilation requirements. Subject to this condition, the proposal is therefore in accordance with LP Policy BE14 (Creating Successful Places).

Air Quality

9.197 The Air Quality Report that accompanies this submission confirms that the annual mean air quality objective will be met at the most exposed receptor locations. Also, the actual changes due to traffic generated by development are small and not significant. Therefore, it can be concluded that the air quality at the site is acceptable for the proposed development, and that development traffic will not lead to significant adverse impact upon existing air quality. Routine construction dust mitigation measures are proposed.

9.198 The Environmental Health Manager confirmed that the proposed construction dust mitigation measures are appropriate and sufficient, and that no additional mitigation measures will be necessary to achieve compliance with air quality objectives. The proposal is thus in compliance with LP Policy NE08 (Air Quality).

Sustainability

9.199 The proposed development is supported by an Energy Strategy. This confirms that the proposal has followed the nationally adopted energy hierarchy of reducing energy demands in the first instance, using energy efficiently, and only then, implementing low carbon and renewable sources where appropriate.

9.200 The fabric efficiency of the proposed dwellings has been designed to reduce heat demand and energy needs in line with policy requirements, with high levels of insulation and low air permeability. The proposed heating strategy is electric led, using Air Source Heat Pumps (ASHPs) which are expected to be a primary technology in line with the Future Homes Standard, ensuring the proposed development is in accordance with the national path to low carbon buildings. Solar PV will be provided and, following discussion with ECC Climate and Planning Unit (CaPU), their provision has been sized to exceed LP Policy BE01 significantly, which requires development to provide at least 10% of the predicted energy needs of a development from renewable energy. The scheme will provide 63% which is afforded considerable weight.

9.201 The proposed electric only strategy will allow the proposed development to achieve net zero emissions in operation once the mains grid decarbonises.

9.202 The results demonstrate that the proposed development will achieve a 15% improvement over the Target Fabric Efficiency Rate, a 61% improvement over the Target Primary Energy Rate and an 85% improvement over the Target Emission

Rate (TER) for Part L 2021. This significantly exceeds LP Policy BE01's requirement to achieve a 10% reduction in carbon emissions above the requirements of Part L 2021 and is very welcome.

9.203 The Energy Strategy explains that the 64% improvement over the TER is indicative for the purposes of the planning application. The exact percentage improvement over Part L 2021 will be confirmed in Building Regulation, to meet Part L and d Policy BE01 will be maintained.

9.204 The proposal has been reviewed by ECC Climate and Planning Unit (CaPU) Further to some adjustments to the Energy Strategy, ECC CaPU support the proposal subject to conditions, and commends the 63% increase of annual PV generation rate made by the applicant during the course of determination.

9.205 Subject to the above conditions, the proposal is supported and meets LP Policies BE01 (Carbon Reduction and Renewable Energy), BE02 (Water Efficiency and Management), BE03 (Establishing Low carbon and Renewable Energy Infrastructure Network) and BE04 (Managing Heat Risk).

Refuse and Recycling

9.206 Refuse collection will be undertaken on street or within the forecourts of the proposed blocks of flats, as it is typical of residential areas across the county. The swept path analysis that supports the proposal confirms that a standard refuse vehicle and fire tender will be able to access all the areas of the development.

9.207 No objections have been raised by consultees on this aspect of the proposal, which is therefore supported and in line with LP Policy BE14 (Creating Successful Places).

Archaeology

9.208 The Archaeological Desk-Based Assessment that supports this application confirms that the proposed development site has the potential to contain archaeological remains. The site is located to the south of the main Roman road between Chelmsford and London (the modern-day Chelmsford Road). It is also located to the north-east of the historic core of Brentwood, and to the south-west of the settlement of Mountnessing both of which have medieval origins.

9.209 Place Services Archaeology confirmed that they have no objections to the proposal subject to conditions (including archaeological trial trenching evaluation), to ensure that no groundworks could impact on any archaeological features or deposits present on the site. Therefore, subject to conditions, the proposal is in line with LP Policy BE16 (Conservation and Enhancement of Historic Environment).

Health Impact Assessment

9.210 A Health Impact Assessment (HIA) has been prepared to cover the whole allocated site, which was jointly reviewed by the Public Health Officer and the HIA Steering Group. The officer and the Steering Group highlighted some minor points, which have been addressed within the proposal.

9.211 Therefore, the conclusions of the HIA are supported and in compliance with the requirements of LP Policy MG04 (Health Impact Assessment).

Digital Infrastructure

9.212 The applicant confirmed that fixed line gigabit-cable broadband and/or 5G connectivity are included in all their developments. A condition has been imposed requesting a Fibre to the Premises (FTTP) Statement, to ensure that FTTP is delivered prior to occupation of the residential units, in line with LP Policy BE07 (Connecting New Developments to Digital Infrastructure).

Secure by Design

9.213 The Secure by Design Officer raised a number of comments in their response, in relation to physical security and access control, electrical vehicle charging, landscape plan and school drop-off / pick-up plan. These comments related to a more advanced design stage and the applicant is encouraged to liaise with Essex Policy at the appropriate time, as set out in the informatives.

9.214 It is noted that the removal of any drop-off / pick-up area from the proposal was specifically requested by ECC Education during pre-application discussion.

Contribution towards outdoor and indoor sport facilities

9.215 In line with the Planning Obligations SPD, the applicant has agreed to make the required contribution towards outdoor and indoor sport facilities located in the surrounding area. The contributions will be spent by BBC to deliver improvements to a number of local facilities identified by BBC's Corporate Manager for Communities, Leisure and Health together with Sport England.

Compliance with Local Plan Policy R03

9.216 The table below confirms that the proposal has met the relevant requirements of LP Policy R03, Land North of Shenfield.

Table 3 – Compliance with Local Plan Policy R03

LP Policy R03 requirement	Compliance
1. Amount and Type of Development	
a. around 825 new homes	Contribution made towards the total number of units of 344.
b. around 2.1 hectares of land for a co-located primary school and early years and childcare nursery	Full compliance
d. 5% self-build and custom build across the entire allocation area	Full compliance
2. Development Principles	
a. be accompanied by a comprehensive masterplan and phasing strategy to inform detailed proposals as they come forward;	Full compliance, the DF has been produced, including a phasing strategy
b. be of a design quality and layout that reflects its key gateway location, particularly on land near to Junction 12, A12;	Full compliance, the proposal includes both the Western and the Southern Gateway
c. provide vehicular access via Chelmsford Road (A1023) and Alexander Lane;	Full compliance, both access are included in the proposal
d. allow if possible for the diversion of Alexander Lane to create a quiet lane for pedestrians and cyclists, with the provision for new and improved route through the development site linking to Chelmsford Road;	Full compliance, the Alexander Lane diversion is included in the proposal
e. enhance walking, cycling and public transport services with Shenfield station and local services and facilities in the wider area, including Brentwood Town Centre;	Full compliance, through IDP contributions
f. provide well-connected internal road layouts which allow for good accessibility;	Full compliance, the proposed development benefits from extensive and high quality internal accessibility
g. provide new multi-functional green infrastructure including public open space in accordance with Policies NE02 and NE05;	Full compliance, the proposal comprises a network of multi-functional areas of public open space

h. maintain and enhance Public Rights of Way within the site and to the wider area;	Full compliance, the PRoW will be maintained and enhanced, including a proposed diversion
i. protect and where appropriate enhance the Local Wildlife Site (Arnold's Wood).	Full compliance, a dedicated management strategy has been conditioned
j. provide for appropriate landscaping and buffers along sensitive boundaries adjoining the A12 and railway line.	Full compliance, see public open space along railway line
l. be designed to ensure a coherent functional relationship with the existing development, which should be well integrated into the layout of the overall masterplan.	Full compliance, the proposal takes into account the existing development and ensures that no adverse impact will be had on neighbouring amenity
3. Infrastructure Requirements	
a. provide pedestrian and cycle crossing points across Chelmsford Road (A1023) where appropriate;	Full compliance, contributions will be made towards enhancements along Chelmsford Road
b. provide an improved bus service;	Full compliance, contributions will be made towards improving the existing bus service and creating a new route connecting the R03 site to Shenfield Station
c. as the site is located within a Critical Drainage Area, development should minimise and mitigate surface water runoff in line with Policy BE05 Sustainable Drainage.	Full compliance, the proposal is supported by the Environment Agency
4. Infrastructure Contributions	
a. off-site highway infrastructure improvements as may be reasonably required by National Highways and Essex County Council in accordance with policies MG05 and BE08 (the planning obligation will determine the level and timing of payments for these purposes);	Full compliance, through IDP contributions towards ECC. National Highways did not request any additional contributions.

b. 'quiet way' cycle routes connecting transfer hubs to schools in Brentwood Town Centre.	Full compliance, contributions towards 'quiet way' cycle routes to be made as part of the IDP

Estate Management Strategy and coordination with other R03 parcels

9.217 If approved, the proposed development will need to be maintained and managed appropriately, and thus the legal agreement includes a requirement to prepare and submit an Estate Management Strategy. This is expected to cover, as a minimum, the areas of public open space, the play areas, the verges, all the non-adopted roads, the attenuation basins and other SuDS measures, all the new trees and vegetation (veteran tree, ancient woodland and retained trees will be subject to different management strategies), the school plaza, the maintenance access to the school, the car parking areas and the curtilage of the apartments.

9.218 This Estate Management Strategy will act as the template for the applicants of the other R03 applications to follow, irrespective of when they will be approved. This will guarantee that the whole R03 development is managed and maintained consistently and to the highest standards.

Legal agreement

9.219 The applicant has accepted that it is necessary for certain obligations in respect of the proposed application to be dealt with by way of an Agreement under Section 106 of the Town & Country Planning Act 1990. This is in line with LP Policy MG05 (Developer Contributions).

9.220 The contributions required to make the hybrid scheme acceptable (covering both residential and school applications) have been agreed by the applicant and BBC, and are being reviewed by the Highway Authority, Essex County Council (education) and the NHS. These include contributions towards highways improvements and mitigation, education, healthcare provision, open space, outdoor and indoor sport provision, ecology, details of market and affordable housing provision.

9.221 The contributions required to make the proposed residential development acceptable in planning terms are currently being discussed between the applicant, Council officers, the Highway Authority, Essex County Council (education) and the NHS. These are expected to include contributions towards highways improvements and mitigation, education, healthcare provision, open space, outdoor and indoor sport provision, ecology, details of market and affordable housing provision.

9.222 The legal agreement has been drafted and further work is needed to reach a format agreed by all parties. The agreement includes the requirement to set up

management companies to deal with the management of the whole site (in line with the aforementioned Estate Management Strategy), of Arnold's Wood, of the veteran tree and of the other retained trees.

9.223 As the legal agreement is outstanding, it is recommended to the Committee that this is delegated to Officers to resolve, should Members be minded to approve the application.

10. Recommendation

10.1 It is recommended that a RESOLUTION TO GRANT PERMISSION is issued subject to the legal agreement being resolved, and to the following conditions:-

1 TIM01 Standard Time – Full
The development hereby permitted shall be begun before the expiration of three years from the date of this permission.

Reason: To comply with Section 91 of the Town and Country Planning Act 1990, as amended by Section 51 of the Planning and Compulsory Purchase Act 2004.

2 DRA01A Development in accordance with drawings
The development hereby permitted shall not be carried out except in complete accordance with the approved drawing(s) listed below and specifications.

- Site Location Plan (22.1643.120A)
- Proposed Coloured Site Layout (22.1643.450V)
- Proposed Site Layout (22.1643.400V)
- Proposed Site Layout North (22.1643.401G)
- Proposed Site Layout South (22.1643.402G)
- Phasing Plan (988/000)
- MATERIALS PLAN – SOUTH (22.1643.201. 2D)
- MATERIALS PLAN – NORTH (22.1643.201.1D)
- MATERIALS PLAN (22.1643.201E)
- REFUSE STRATEGY (22.1643.202E)
- GARDEN AREA PLAN NORTH (22.1643.203.1D)
- GARDEN AREA PLAN SOUTH (22.1643.203.2D)
- GARDEN AREA PLAN (22.1643.203E)
- AFFORDABLE PLAN (22.1643.204D)
- PARKING LAYOUT PLAN (22.1643.205F)
- STOREY HEIGHTS PLAN (22.1643.206E)
- CHARACTER AREAS PLAN (22.1643.207E)
- HOUSE TYPE DISTRIBUTION PLAN (22.1643.208E)
- PERMEABILITY PLAN (22.1643.209C)
- COLOURED STREET SCENES AA and BB (22.1643.350B)
- COLOURED STREET SCENES CC (22.1643.352A)
- COLOURED STREET SCENES DD (22.1643.354C)

- COLOURED STREET SCENES EE (22.1643.356D)
- COLOURED STREET SCENES FF and HH (22.1643.358B)
- COLOURED STREET SCENES GG (22.1643.360B)
- COLOURED STREET SCENES JJ (22.1643.362B)
- STREET SCENE KK (22.1643.364)
- HOUSE TYPE (A2708M)-V1-PLANS-ELEVATIONS (22.1643.500D)
- HOUSE TYPE (A2708M)-V3-PLANS-ELEVATIONS (22.1643.502D)
- HOUSE TYPE (A2708M)-V4-PLANS-ELEVATIONS (22.1643.503D)
- HOUSE TYPE (A2708M)-V5-PLANS-ELEVATIONS (22.1643.504D)
- HOUSE TYPE (A3710M)-V1-PLANS-ELEVATIONS (22.1643.505C)
- HOUSE TYPE (A3710M)-V2-PLANS-ELEVATIONS (22.1643.506D)
- HOUSE TYPE (A3710M)-V3-PLANS-ELEVATIONS (22.1643.507C)
- HOUSE TYPE (A4715M)-V1-PLANS-ELEVATIONS (22.1643.510B)
- HOUSE TYPE (B2009M)-V1-PLANS-ELEVATIONS (22.1643.515D)
- HOUSE TYPE (B2009M)-V2-PLANS-ELEVATIONS (22.1643.516C)
- HOUSE TYPE (B2009M)-V3-PLANS-ELEVATIONS (22.1643.517C)
- HOUSE TYPE (B2013M)-V1-PLANS-ELEVATIONS (22.1643.520B)
- HOUSE TYPE (B3015M)-V1-PLANS-ELEVATIONS (22.1643.525C)
- HOUSE TYPE (B3015M)-V2-PLANS-ELEVATIONS (22.1643.526B)
- HOUSE TYPE (B3015M)-V3-PLANS-ELEVATIONS (22.1643.527B)
- HOUSE TYPE (B3016M)-V1-PLANS-ELEVATIONS (22.1643.530C)
- HOUSE TYPE (B3016M)-V2-PLANS-ELEVATIONS (22.1643.531C)
- HOUSE TYPE (B3016M)-V3-PLANS-ELEVATIONS (22.1643.532C)
- HOUSE TYPE (B3016M)-V4-PLANS-ELEVATIONS (22.1643.533C)
- HOUSE TYPE (B3017M)-V1-PLANS-ELEVATIONS (22.1643.535C)
- HOUSE TYPE (B3017M)-V2-PLANS-ELEVATIONS (22.1643.536C)
- HOUSE TYPE (B3017M)-V3-PLANS-ELEVATIONS (22.1643.537C)
- HOUSE TYPE (B3017M)-V4-PLANS-ELEVATIONS (22.1643.538B)
- HOUSE TYPE (B3017M)-V6-PLANS-ELEVATIONS (22.1643.539-1B)
- HOUSE TYPE (B3017M)-V5-PLANS-ELEVATIONS (22.1643.539C)
- HOUSE TYPE (F2004M)-V1-PLANS (22.1643.540C)
- HOUSE TYPE (F2004M)-V1-ELEVATIONS (22.1643.541C)
- HOUSE TYPE (F2004M)-V3-ELEVATIONS (22.1643.544-1C)
- HOUSE TYPE (F2004M)-V4-PLANS (22.1643.544-2C)
- HOUSE TYPE (F2004M)-V4-ELEVATIONS (22.1643.544-3C)
- HOUSE TYPE (F2004M)-V3-PLANS (22.1643.544C)
- HOUSE TYPE (F2005M)-V1-PLANS (22.1643.545C)
- HOUSE TYPE (F2005M)-V1-ELEVATIONS (22.1643.546C)
- HOUSE TYPE (F2005M)-V2-PLANS (22.1643.547C)
- HOUSE TYPE (F2005M)-V2-ELEVATIONS (22.1643.548C)
- HOUSE TYPE (G4031M)-V1-PLANS (22.1643.550C)
- HOUSE TYPE (G4031M)-V1-ELEVATIONS (22.1643.551C)
- HOUSE TYPE (G4031M)-V2-PLANS (22.1643.552D)
- HOUSE TYPE (G4031M)-V2-ELEVATIONS (22.1643.553D)

- HOUSE TYPE (G4032M)-V1-PLANS (22.1643.555C)
- HOUSE TYPE (G4032M)-V1-ELEVATIONS (22.1643.556C)
- HOUSE TYPE (S3019M)-V1-PLAN (22.1643.560B)
- HOUSE TYPE (S3019M)-V1-PLAN (22.1643.560B)
- HOUSE TYPE (s3019m)-V1-ELEVATIONS (22.1643.561B)
- HOUSE TYPE (S3019M)-V2-PLANS (22.1643.562B)
- HOUSE TYPE (S3019M)-V2-ELEVATIONS (22.1643.563B)
- HOUSE TYPE (S3019M)-V4-PLANS (22.1643.564-2B)
- HOUSE TYPE (S3019M)-V4-ELEVATIONS (22.1643.564-3B)
- HOUSE TYPE (S3019M)-V5-PLANS (22.1643.564-4B)
- HOUSE TYPE (S3019M)-V5-ELEVATIONS (22.1643.564-5B)
- HOUSE TYPE (S3020M)-V2-PLANS-ELEVATIONS (22.1643.566B)
- HOUSE TYPE (S3020M)-V3-PLANS-ELEVATIONS (22.1643.567C)
- HOUSE TYPE (S3020M)-V4-PLANS-ELEVATIONS (22.1643.568C)
- HOUSE TYPE (S3020M)-V5-PLANS-ELEVATIONS (22.1643.569B)
- HOUSE TYPE (S3020M)-V6-PLANS-ELEVATIONS (22.1643.569-1B)
- HOUSE TYPE (S3020M)-V8-PLANS-ELEVATIONS (22.1643.569-3B)
- HOUSE TYPE (S3022M)-V2-PLAN (22.1643.572C)
- HOUSE TYPE (S3022M)-V2-ELEVATIONS (22.1643.573C)
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Reason: To ensure that the development is as permitted by the local planning authority and for the avoidance of doubt.

3 CEMP
No development shall commence, until a Construction Environment Management Plan (CEMP) has been submitted to and approved in writing by the local planning authority. The CEMP should define best practice measures for ecological protection (including but not limited to protected species, in particular badgers and nesting birds), protection methods of retained trees, and adhere to the Proposed Badger Construction Safeguards set out in the Ecological Appraisal. The CEMP should include a method statement to avoid injury to any animals entering the site during construction.
The CEMP shall identify that construction activities so far as is practical do not adversely impact amenity, traffic or the environment of the surrounding area by minimising the creation of noise, vibration and dust during the site preparation and construction phases of the development. The CEMP shall also provide for:

- The parking of vehicles of site operatives and visitors
- Loading and unloading of plant and materials
- Storage of plant and materials used in constructing the development
- Wheel and underbody washing facilities

To reduce disturbance to nearby properties, construction and demolition activities should be restricted to the following hours: 08:00 to 18:00 Monday to Friday, 08:00 to 13:00 Saturdays with none on Sundays and Public Holidays.

The demolition and construction works shall be completed in accordance with the information agreed within the CEMP by the Local Planning Authority.

Reason: To ensure that appropriate measures are undertaken to ensure any disturbance to protected species is mitigated and to ensure trees are not harmed in the interests of visual amenity. To ensure that on-street parking of these vehicles in the adjoining streets does not occur and to ensure that loose materials and spoil are not brought out onto the highway in the interests of highway safety, and in accordance with Local Plan Policies BE09 and BE12.

4 Minerals Supply Audit
Prior to the commencement of the development, a Minerals Supply Audit and a Site Waste Management Plan shall be submitted to and be approved in writing by the Local Planning Authority. Without prejudice to the foregoing, the Plan and Audit shall reflect the scope set out by the Minerals and Waste Planning Authority in previous consultation responses and can be combined as a single document reflecting Circular Economy principles. The development shall thereafter be implemented in accordance with the approved Mineral Supply Audit and Site Waste Management Plan.

Reason: To ensure that each phase of the development's construction is in conformity with the Waste Hierarchy as set out in the National Planning Policy for Waste, as well as in conformity with Essex County Council Minerals Local Plan 2014 Policy S4 which seeks to reduce the use of primary mineral resources and the amount of construction, demolition, and excavation wastes going to landfill.

5 FLOOD RISK
No development shall take place or commence until the outstanding issues relating to the flood risk modelling for the scheme have been approved in writing by the Environment Agency.

Reason: To appropriately model the impacts of flood risk related to the scheme which will form a basis for assessing the submitted Flood Risk Assessment.

6 FLOOD RISK
Following the approval of the flood modelling, no development shall take place or commence until an updated Flood Risk Assessment (FRA) has been submitted to, and approved in writing by, the local planning authority and the Environment Agency. The FRA shall include a detailed design confirming levels used for the access road at the Chelmsford Road roundabout and the new crossing over the Shenfield Brook. The development shall be carried out in accordance with the approved flood risk assessment.

Reason: To reduce the risk of flooding to the proposed development and to prevent flooding elsewhere.

7 FLOOD RISK
Prior to the completion of the development, a scheme to ensure the maintenance of the culverts through the new crossing of the Shenfield Brook will be submitted to, and approved in writing by, the local planning authority. This excludes the existing culverts through Chelmsford Road.

Reason: To reduce the risk of flooding to the proposed development and future users through culvert blockage.

8 DRAINAGE
No works except demolition shall takes place until a detailed surface water drainage scheme for the site, based on sustainable drainage principles and an assessment of the hydrological and hydro geological context of the development, has been submitted to and approved in writing by the local planning authority. The scheme should include but not be limited to:

- Limiting discharge rates to flow matching rates with sufficient long-term storage to discharge at no more than 2 l/s/ha.
- Provide sufficient storage to ensure no off site flooding as a result of the development during all storm events up to and including the 1 in 100 year.
- Final modelling and calculations for all areas of the drainage system.
- The appropriate level of treatment for all runoff leaving the site, in line with the Simple Index Approach in chapter 26 of the CIRIA SuDS Manual C753.
- Detailed engineering drawings of each component of the drainage scheme.
- A final detailed drainage plan which details exceedance and conveyance routes, FFL and ground levels, and location and sizing of any drainage features.
- A written report summarising the final strategy and highlighting any minor changes to the approved strategy.

Each phase of the surface water drainage schemeshall subsequently be implemented prior to occupation of that phase. It should be noted that all outline applications are subject to the most up to date design criteria held by the LLFA.

Reason: To prevent flooding by ensuring the satisfactory storage of/disposal of surface water from the site. To ensure the effective operation of SuDS features over the lifetime of the development. To provide mitigation of any environmental harm which may be caused to the local water environment. Failure to provide the above required information before commencement of works may result in a system being installed that is not sufficient to deal with surface water occurring during rainfall events and may lead to increased flood risk and pollution hazard from the site.

9 DRAINAGE
With the exception of site clearance and archaeology investigation, no works shall take place until a scheme to minimise the risk of offsite flooding caused by surface water run-off and groundwater during construction works and prevent pollution has

been submitted to, and approved in writing by, the local planning authority. The scheme shall subsequently be implemented as approved.

Reason: The National Planning Policy Framework paragraph 163 and paragraph 170 state that local planning authorities should ensure development does not increase flood risk elsewhere and does not contribute to water pollution. Construction may lead to excess water being discharged from the site. If dewatering takes place to allow for construction to take place below groundwater level, this will cause additional water to be discharged. Furthermore, the removal of topsoils during construction may limit the ability of the site to intercept rainfall and may lead to increased runoff rates. To mitigate increased flood risk to the surrounding area during construction there needs to be satisfactory storage of/disposal of surface water and groundwater which needs to be agreed before commencement of the development. Construction may also lead to polluted water being allowed to leave the site. Methods for preventing or mitigating this should be proposed.

10 DRAINAGE
Prior to occupation a maintenance plan detailing the maintenance arrangements including who is responsible for different elements of the surface water drainage system and the maintenance activities/frequencies, has been submitted to and agreed, in writing, by the Local Planning Authority. Should any part be maintainable by a maintenance company, details of long term funding arrangements should be provided.

Reason: To ensure appropriate maintenance arrangements are put in place to enable the surface water drainage system to function as intended to ensure mitigation against flood risk. Failure to provide the above required information prior to occupation may result in the installation of a system that is not properly maintained and may increase flood risk or pollution hazard from the site.

11 DRAINAGE
The applicant or any successor in title must maintain yearly logs of maintenance which should be carried out in accordance with any approved Maintenance Plan. These must be available for inspection upon a request by the Local Planning Authority.

Reason: To ensure the SuDS are maintained for the lifetime of the development as outlined in any approved Maintenance Plan so that they continue to function as intended to ensure mitigation against flood risk.

12 ARCHAEOLOGY
No development or preliminary groundworks can commence until a programme of archaeological trial trenching evaluation has been secured in accordance with a Written Scheme of Investigation which has been submitted by the applicant and approved by the planning authority.

Reason: To safeguard heritage assets of archaeological interest that may survive on the site, in line with Local Policy BE16.

13 ARCHAEOLOGY
A mitigation strategy detailing the excavation/preservation strategy of the archaeological remains identified shall be submitted to the local planning authority following the completion of the archaeological evaluation.

Reason: To safeguard heritage assets of archaeological interest that may survive on the site, in line with Local Policy BE16.

14 ARCHAEOLOGY
No development or preliminary groundworks can commence on those areas containing archaeological deposits until the satisfactory completion of fieldwork, as detailed in the mitigation strategy, and which has been signed off by the local planning authority through its historic environment advisors.

Reason: To safeguard heritage assets of archaeological interest that may survive on the site, in line with Local Policy BE16.

15 ARCHAEOLOGY
The applicant will submit to the local planning authority a post-excavation assessment (to be submitted within six months of the completion of fieldwork, unless otherwise agreed in advance with the Planning Authority). This will result in the completion of post-excavation analysis, preparation of a full site archive and report ready for deposition at the local museum, and submission of a publication report.

Reason: To safeguard heritage assets of archaeological interest that may survive on the site, in line with Local Policy BE16.

16 Materials
Notwithstanding the details shown on the drawings hereby approved, no development above ground level shall take place in each phase until section details, photographs of samples, and specifications of the materials to be used in the construction of the external surfaces of the buildings and of ground hard surfaces (including shared surface streets, private drives and permeable paved areas), have been submitted to and approved in writing by the local planning authority. Development shall be carried out in accordance with the approved details and maintained thereafter.

Reason: In order to safeguard the character and appearance of the area, in line with Policy BE14.

17 Design detailing

No development above ground level shall take place in each phase until details of the brickwork, including brick patterns, to be used in the development, have been submitted to and approved in writing by the local planning authority. The details shall include: sample panels of the proposed brickwork to include mortar colour and jointing, and bonding. Development shall be carried out in accordance with the approved details and maintained thereafter.

Reason: In order to safeguard the character and appearance of the area, in line with Policy BE14.

18 Design Materials
No development above ground level shall take place in each phase until details of each type of cladding have been submitted to and approved in writing by the local planning authority. The details shall include: sample panels of the each type of cladding, including flashing details. Development shall be carried out in accordance with the approved details and maintained thereafter.

Reason: In order to safeguard the character and appearance of the area, in line with Policy BE14.

19 Roofing materials
No development above ground level shall take place in each phase until details of roofing material have been submitted to and approved in writing by the local planning authority. The details shall include: sample panels of the each roofing material, including flashing details and eaves/secret gutter details where appropriate. Development shall be carried out in accordance with the approved details and maintained thereafter.

Reason: In order to safeguard the character and appearance of the area, in line with Policy BE14.

20 Glazing
No development above ground level shall take place in each phase until the details and plot locations of all translucent glazing to protect privacy have been agreed. Details include specification of glass and photographs of sample panels.

Reason: to avoid unacceptable overlooking or loss of privacy in line with Policy BE14.

21 Fenestration
Notwithstanding the details shown on the drawings hereby approved, no development above ground level shall take place in each phase until detailed drawings by section and elevation at scales between 1:20 and 1:1 as appropriate of the fenestration details (i.e. mullions, typical reveals, concealed vent strips) and balustrades hereby permitted have been submitted to and approved in writing by the local planning authority. Development shall be carried out in accordance with the approved details and maintained thereafter.

Reason: To ensure the architectural language is consistent with the architectural period adopted, in line with Policy BE14.

22 External utilities
Notwithstanding the details shown on the drawings hereby approved, no meter boxes shall be installed until details and locations (including elevations of the buildings in which they would be located on and their materials including colour) of the meter boxes have been submitted to and approved in writing by the local planning authority. Development shall be carried out in accordance with the approved details and maintained thereafter.

Reason: In order to safeguard the character and appearance of the area and to ensure the resulting appearance of the buildings would not be harmed, in accordance with Policy BE14.

23 Boundary details
Prior to commencement of above ground works in each phase, a detailed scheme for the siting and design of all boundary treatments (including drawings of any gates, fences, the fence along the safeguarded school site, walls or other means of enclosure and any bollards) and way finding (including any signs indicating the public open space elements, the school and the play areas) shall be submitted to and approved in writing by the local planning authority. The approved scheme shall be fully implemented before first occupation and maintained thereafter.

Reason: In order to ensure high quality landscaping.

24
No development above ground level shall commence on Phase 4, until a Woodland Management Plan (WMP) for Arnold's Wood and the ancient woodland buffer has been submitted to and approved in writing by the local planning authority. The WMP shall include but not be limited to:

- Details of the tree thinning proposed.
- Identify when a Forestry Commission Felling Licence might be required.
- Details of reintroduction of coppicing.
- Details of the buffer zone between the woodland and the development, and how it will be maintained.
- Long term vision and management objectives for the woodland (across at least a 10 year period).
- Woodland survey.
- Details of those responsible for ensuring the implementation of the management plan
- Risk Assessment to consider any potential threats to the woodland.
- Stakeholder Engagement.
- Monitoring and Plan Review.

The plan shall be implemented in accordance with the approved details and reviewed at least every 5 years to incorporate any changes needed to the proposed management.

Reason: To ensure that the woodlands are protected and maintained, ensuring no harm to woodland species.

25
No development above ground level shall commence on site, until a Tree Risk and Veteran Tree Management Strategy, to cover at least a 10 year period, has been submitted to and approved in writing by the local planning authority, to include:

- The veteran tree in the school plaza
- Trees protected by a TPO
- All the other retained trees including:
    - The north/south tree belt within the northern field, to the east.
    - The east/west tree belt connecting Arnold's Wood to the north/south tree belt.
    - Category A trees within the northern field.
    - Boundary trees along the northern edge of the site, and to the east and west of the southern field.
    - Boundary trees along the southern edge of the site.

The Management Strategy shall include but not be limited to:

- Details of essential safety works proposed for the veteran tree.
- Details of the buffer zone between the veteran tree and the school plaza, and how it will be maintained.
- The type (pro-active or reactive) and frequency of survey in different areas of the site.
- Set out how record keeping for surveys will be managed and recommendations actioned.
- Detail the competency of the inspector.
- Provide a system for obtaining specialist advice where a survey reveals defects requiring a more detailed assessment or where a second opinion is required.
- Establish a reporting system for damage / failure to / of trees (e.g. vehicle collision, high winds).
- Discuss details of resources necessary for implementation including contract management and auditing of the system.
- Identify methods for recognising changing circumstance to amend the priority of inspection and frequency. The plan shall be implemented in accordance with the approved details.

Reason: To ensure that the trees on site are protected and maintained.

26

No development above ground level shall commence on site, until a scheme of hard and soft landscaping for the School Plaza has been submitted to and approved in writing by the Local Planning Authority, the details of which shall indicate and include:

- Details of retained vegetation around the veteran tree;
- Details of any new trees, hedges or plants;
- The location and species of all new trees, shrubs and hedgerows to be planted or transplanted, those areas to be grassed and/or paved;
- Minor artefacts and structures (e.g. furniture, planters, play equipment, refuse and other storage units including cycle stands, signs);
- Any external hard surface materials for pedestrian accesses, etc.

The landscaping scheme shall be completed during the first planting season after the date on which any part of the development is commenced or in accordance with a programme to be agreed in writing by the local planning authority, and maintained thereafter. Any newly planted tree, shrub or hedgerow or any existing shrub to be retained, that dies, or is uprooted, severely damaged or seriously diseased, within five years of the completion of the development, shall be replaced within the next planting season with another of the same species and of a similar size, unless the local planning authority gives prior written consent to any variation. All hard landscaping shall also be carried out in accordance with the approved details prior to the occupation of any part of the development or in accordance with a programme to be agreed in writing with the Local Planning Authority.

Reason: In order to safeguard and enhance the character and appearance of the area and preserve the natural environment.

27
No trees, shrubs or hedges within the site which are shown as being retained shall be felled, uprooted wilfully damaged or destroyed, cut back in any way or removed without previous written consent of the local planning authority; any trees, shrubs or hedges removed without consent or dying or being severely damaged or becoming seriously diseased within 5 years from the completion of the development hereby permitted shall be replaced with trees, shrubs or hedge plants of similar size and species and shall be planted at the same location in the next planting season unless the local planning authority gives written consent to any variation.

Reason: In order to safeguard and enhance the character and appearance of the area and preserve the natural environment.

28
Prior to commencement of all works, details of mitigation strategies and method statements shall be submitted to and approved in writing by the Local Planning Authority, in accordance with Ecological Appraisal, dated September 2023.

Reason: In order to minimise the risk of harm to protected species and preserve the natural environment.

29
No development above ground level shall commence on site, until a Landscape and Ecology Management Plan, including management of the Public Right of Way, covering the first 5 years of the development has been submitted to and approved in writing by the Local Planning Authority.

Reason: In order to safeguard and enhance the character and appearance of the area and preserve the natural environment.

30
Prior to any occupation of the approved development, the applicant shall submit the detailed specification for noise mitigation measures including glazing and ventilation requirements to the residential locations indicated in Figure C5 and C6 of the Sharps Acoustics report: Officers' Meadow Assessment of noise and vibration effects on proposed residential use September 2023.
The specification shall demonstrate that the indoor ambient noise levels contained in BS8233-2014 Table 4 will be achieved:

Table 4 **Indoor ambient noise levels for dwellings**

Activity	Location	07:00 to 23:00	23:00 to 07:00
Resting	Living room	35 dB $L_{Aeq,16hour}$	—
Dining	Dining room/area	40 dB $L_{Aeq,16hour}$	—
Sleeping (daytime resting)	Bedroom	35 dB $L_{Aeq,16hour}$	30 dB $L_{Aeq,8hour}$

Maximum internal night-time noise levels of 30dBLAeq, for living rooms and bedrooms and 55dBLAeq for external garden areas.
For bedrooms at night individual noise events (measured with F time-weighting) shall not (normally) exceed 45dBLAmax.
The specification shall indicate the required specification for glazing and ventilation proposed to all residential accommodation.

Reason: To safeguard the living conditions of future occupiers.

31
No residential unit shall be occupied until a Fibre to the Premises (FTTP) Statement has been submitted to and approved in writing by the local planning authority detailing a scheme for the installation of a high speed wholly FTTP connection to each premises within the approved development OR supplying evidence detailing reasonable endeavours to secure the provision of FTTP and where relevant, details of alternative provision for superfast broadband in the absence of FTTP. The FTTP infrastructure or alternative provision for superfast broadband in the absence of FTTP shall be laid out at the same time as other services during the construction process and be available for use on the first

occupation of each premise, or such other date agree in writing by the local planning authority (where supported by evidence detailing reasonable endeavours to secure the provision of FTTP and alternative provisions that have been made in the absence of FTTP).

Reason: Enable the enhancement of the Council's digital infrastructure in order to comply with Local Plan Policy BE07.

32
Prior to commencement of development above ground, a revised Energy Strategy shall be provided for approval by the local planning authority. The statement shall set out in detail how the development will comply with national and local sustainability planning policy requirements adopted at the time. This shall include the updated provision of Solar Photovoltaic Panel Energy generation values which reflect at least the same amount of energy generated as per the typology energy demand usage, as defined in requirement 4 of policy NZ1 of the Planning Policy Position for Net Zero Carbon in Operation for Greater Essex, and the provision of space heat demand, energy use intensity as defined in requirements 1 and 2 of policy NZ1 of the Planning Policy Position for Net Zero Carbon in Operation for Greater Essex.

Reason: To ensure that the development reduces its contribution to global heating by minimising operational and embodied carbon emissions and will be resilient to changes in the local climate, in-line with the NZ1 and NZ2 policies as documented in the Planning Policy Position for Net Zero Carbon in Operation for Greater Essex.

33
The development shall be carried out in accordance with the approved phasing plan ref 988/000, unless amended by agreement with the LPA.

Reason: To ensure that the development is as permitted by the local planning authority and for the avoidance of doubt.

34
The development shall be carried out in accordance with the approved Lighting Strategy, unless amended by agreement with the LPA.

Reason: To ensure that the development is as permitted by the local planning authority and for the avoidance of doubt.

Informative(s)

1 INF05

The following development plan policies contained in the Brentwood Local Plan 2016-2033 are relevant to this decision: MG01, MG04, MG05, BE01, BE02, BE03, BE04, BE05, BE07, BE08, BE09, BE11, BE12, BE13, BE14, BE15, BE16, HP01, HP03, HP05, HP06, PC11, NE01, NE02, NE03, NE05, NE08, NE09, and R03.

2 INF04
The permitted development must be carried out in accordance with the approved drawings and specification. If you wish to amend your proposal you will need formal permission from the Council. The method of obtaining permission depends on the nature of the amendment and you are advised to refer to the Council's web site or take professional advice before making your application.

3 INF22
The Local Planning Authority has acted positively and proactively in determining this application by identifying matters of concern within the application (as originally submitted) and negotiating, with the Applicant, acceptable amendments to the proposal to address those concerns. As a result, the Local Planning Authority has been able to grant planning permission for an acceptable proposal, in accordance with the presumption in favour of sustainable development, as set out within the National Planning Policy Framework.

4 Secure by Design
Where possible, each element of the proposal shall be constructed to the standard required to achieve Secured by Design accreditation (as awarded by Essex Police) to provide a good standard of security to future occupants and visitors to the site and to reduce the risk of crime, in accordance with Local Plan Policy BE15 and the aims and objectives of the NPPF Chapter 8.

5 SuDS
Essex County Council has a duty to maintain a register and record of assets which have a significant impact on the risk of flooding. In order to capture proposed SuDS which may form part of the future register, a copy of the SuDS assets in a GIS layer should be sent to suds@essex.gov.uk.
Any drainage features proposed for adoption by Essex County Council should be consulted on with the relevant Highways Development Management Office.
Changes to existing water courses may require separate consent under the Land Drainage Act before works take place. More information about consenting can be found in the attached standing advice note.
It is the applicant's responsibility to check that they are complying with common law if the drainage scheme proposes to discharge into an off-site ditch/pipe. The applicant should seek consent where appropriate from other downstream riparian landowners.
The Ministerial Statement made on 18th December 2014 (ref. HCWS161) states that the final decision regarding the viability and reasonableness of maintenance requirements lies with the LPA. It is not within the scope of the LLFA to comment

on the overall viability of a scheme as the decision is based on a range of issues which are outside of this authority's area of expertise.
We will advise on the acceptability of surface water and the information submitted on all planning applications submitted after the 15th of April 2015 based on the key documents listed within this letter. This includes applications which have been previously submitted as part of an earlier stage of the planning process and granted planning permission based on historic requirements. The Local Planning Authority should use the information submitted within this response in conjunction with any other relevant information submitted as part of this application or as part of preceding applications to make a balanced decision based on the available information.

6 Cadent Gas
Cadent Gas Ltd own and operate the gas infrastructure within the area of your development. There may be a legal interest (easements and other rights) in the land that restrict activity in proximity to Cadent assets in private land. The applicant must ensure that the proposed works do not infringe on legal rights of access and or restrictive covenants that exist.
If buildings or structures are proposed directly above the apparatus the development may only take place following diversion of the apparatus. The applicant should apply online to have apparatus diverted in advance of any works, by visiting cadentgas.com/diversions.
Prior to carrying out works, including the construction of access points, please register on www.linesearchbeforeudig.co.uk to submit details of the planned works for review, ensuring requirements are adhered to.

7 Anglian Water
Anglian Water has assets close to or crossing this site or there are assets subject to an adoption agreement. Therefore, the site layout should take this into account and accommodate those assets within either prospectively adoptable highways or public open space. If this is not practicable then the sewers will need to be diverted at the developers cost under Section 185 of the Water Industry Act 1991. or, in the case of apparatus under an adoption agreement, liaise with the owners of the apparatus. It should be noted that the diversion works should normally be completed before development can commence.
The development site is within 15 metres of a sewage pumping station. This asset requires access for maintenance and will have sewerage infrastructure leading to it. For practical reasons therefore it cannot be easily relocated.
Anglian Water consider that dwellings located within 15 metres of the pumping station would place them at risk of nuisance in the form of noise, odour or the general disruption from maintenance work caused by the normal operation of the pumping station.
The site layout should take this into account and accommodate this infrastructure type through a necessary cordon sanitaire, through public space or highway infrastructure to ensure that no development within 15 metres from the boundary

of a sewage pumping station if the development is potentially sensitive to noise or other disturbance or to ensure future amenity issues are not created.

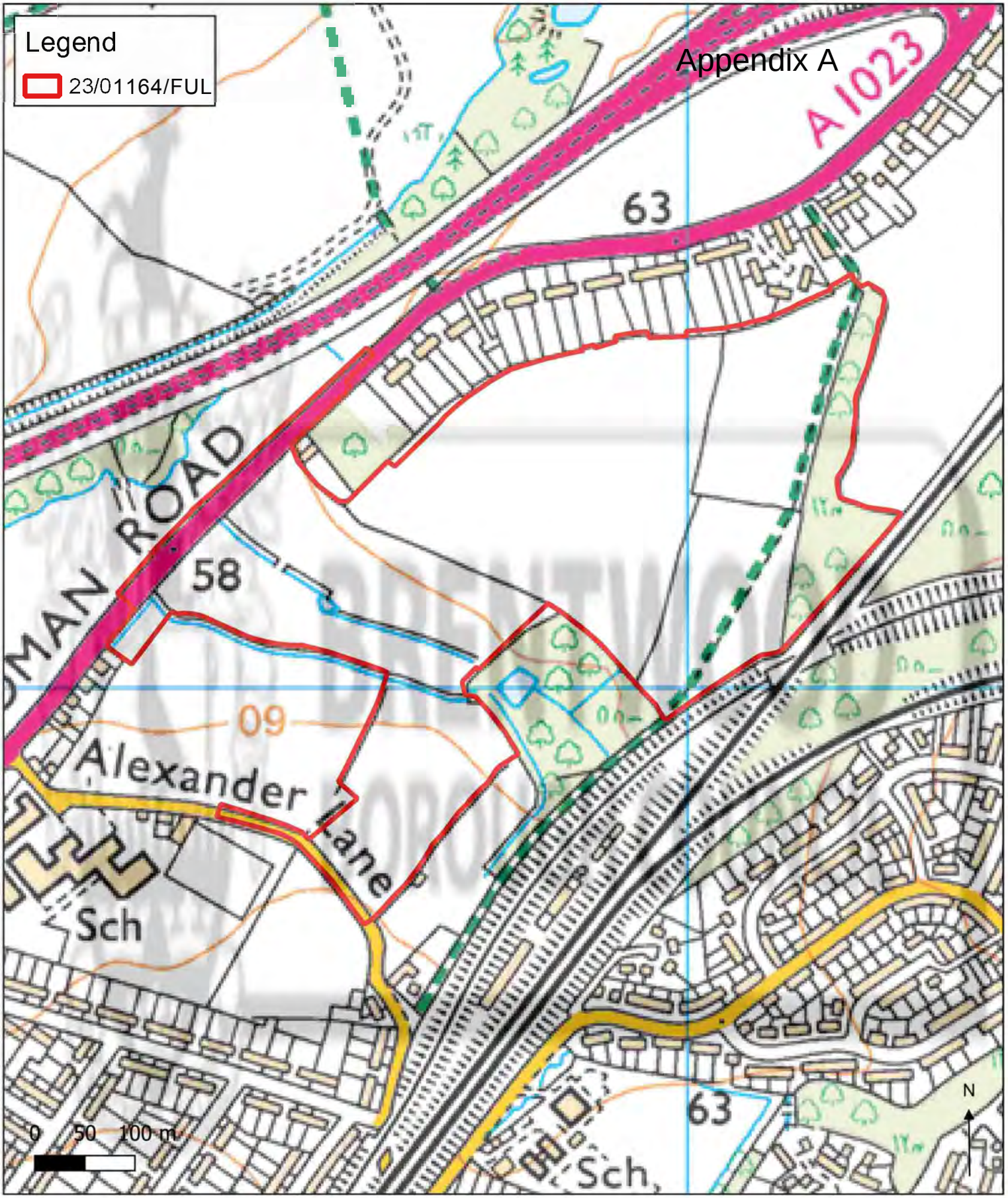
8 Anglian Water
Notification of intention to connect to the public sewer under S106 of the Water Industry Act Approval and consent will be required by Anglian Water, under the Water Industry Act 1991. Contact Development Services Team 0345 606 6087.
Protection of existing assets - A public sewer is shown on record plans within the land identified for the proposed development. It appears that development proposals will affect existing public sewers. It is recommended that the applicant contacts Anglian Water Development Services Team for further advice on this matter. Building over existing public sewers will not be permitted (without agreement) from Anglian Water.
Building near to a public sewer - No building will be permitted within the statutory easement width of 3 metres from the pipeline without agreement from Anglian Water. Please contact Development Services Team on 0345 606 6087.
The developer should note that the site drainage details submitted have not been approved for the purposes of adoption. If the developer wishes to have the sewers included in a sewer adoption agreement with Anglian Water (under Sections 104 of the Water Industry Act 1991), they should contact our Development Services Team on 0345 606 6087 at the earliest opportunity. Sewers intended for adoption should be designed and constructed in accordance with Sewers for Adoption guide for developers, as supplemented by Anglian Water's requirements.

8
Site clearance and demolition work shall only be undertaken between the months of September and February, after a nesting bird check to be undertaken by a suitably qualified ecologist.

BACKGROUND DOCUMENTS

All background documents including application forms, drawings and other supporting documentation relating to this application can be viewed online: https://www.brentwood.gov.uk/-/applicationsviewcommentandtrack

DECIDED:



Land North of Shenfield, Alexander Lane, Shenfield

Drawing No. : 23/01164/FUL
Scale at A4 : 1:5000
Drawn by: OSJ
Service: Communications and Digital Engagement
Date: 9th July 2024

BRENTWOOD BOROUGH COUNCIL
Jonathan Stephenson
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CM15 8AY
Tel.: (01277) 312500

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BRENTWOOD BOROUGH COUNCIL

Addendum Committee Report

LAND NORTH OF SHENFIELD ALEXANDER LANE SHENFIELD ESSEX

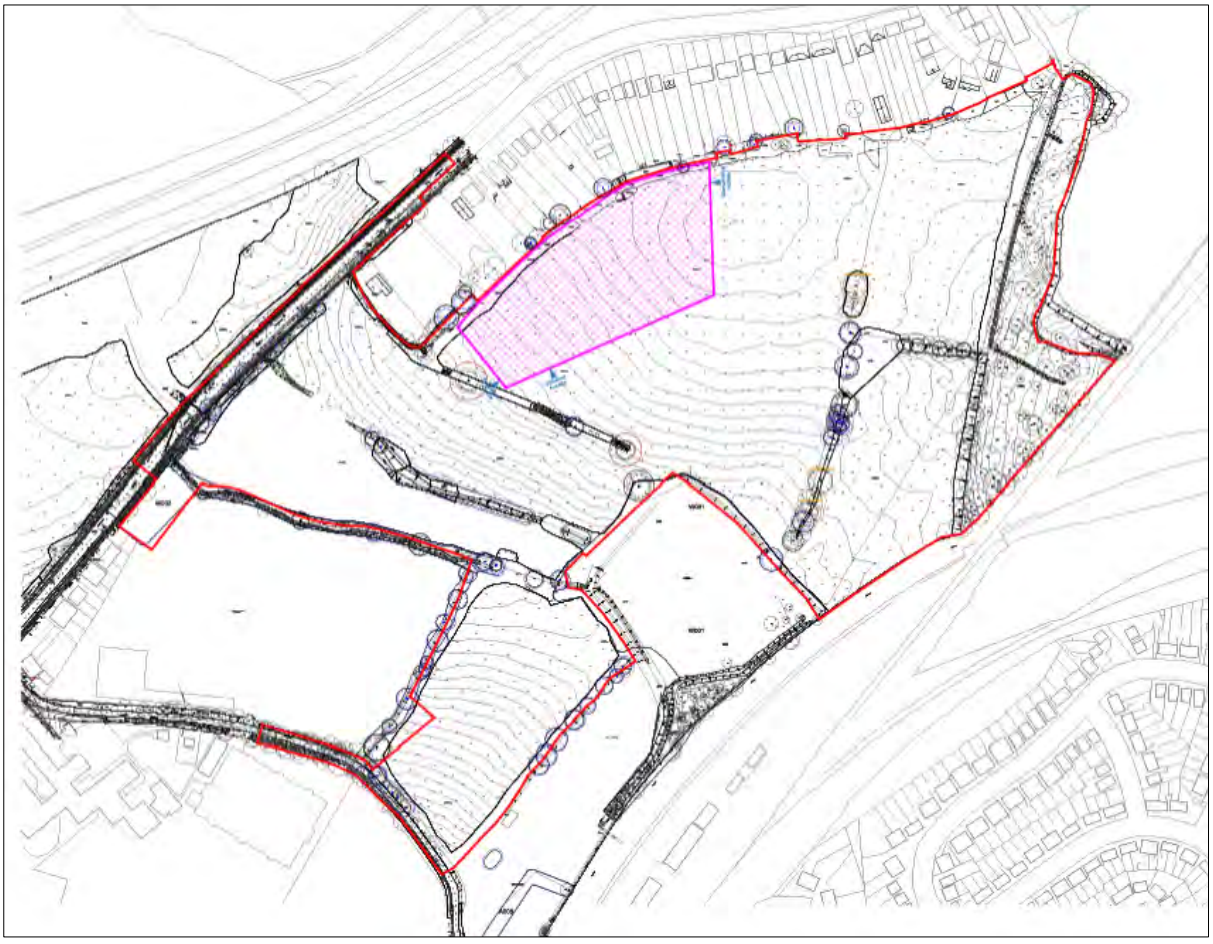
HYBRID PLANNING APPLICATION FOR 344 UNITS INCLUDING 35% AFFORDABLE HOUSING, SAFEGUARDED LAND FOR A 2FE PRIMARY SCHOOL AND EARLY YEARS FACILITY, PUBLIC OPEN SPACE AND ASSOCIATED LANDSCAPING, DRAINAGE AND HIGHWAYS INFRASTRUCTURE

APPLICATION NO: 23/01164/FUL

1. **Figure 2 caption under Paragraph 2.3 is amended and now reflects updated drawing reference. This now reads as follows:**

Figure 2 – Extract from the Site Location Plan (ref. 22.1643.120 revC). The school parcel is indicated in pink. The approximate location of the CDA, crossing the Croudace and Stonebond sites, is shown in blue.

2. **Figure 2 under Paragraph 2.3 is replaced with the below.**



3. **Condition 2 of the committee report is amended and now reads as follows:**

2 DRA01A Development in accordance with drawings

The development hereby permitted shall not be carried out except in complete accordance with the approved drawing(s) listed below and specifications.

- Site Location Plan (22.1643.120C)
- Proposed Coloured Site Layout (22.1643.450V)
- Proposed Site Layout (22.1643.400V)
- Phasing Plan (988/000)
- MATERIALS PLAN – SOUTH (22.1643.201. 2D)
- MATERIALS PLAN – NORTH (22.1643.201.1D)
- MATERIALS PLAN (22.1643.201E)
- REFUSE STRATEGY (22.1643.202E)
- GARDEN AREA PLAN NORTH (22.1643.203.1D)
- GARDEN AREA PLAN SOUTH (22.1643.203.2D)
- GARDEN AREA PLAN (22.1643.203E)
- AFFORDABLE PLAN (22.1643.204D)
- PARKING LAYOUT PLAN (22.1643.205F)
- STOREY HEIGHTS PLAN (22.1643.206E)
- CHARACTER AREAS PLAN (22.1643.207E)
- HOUSE TYPE DISTRIBUTION PLAN (22.1643.208E)
- PERMEABILITY PLAN (22.1643.209C)
- COLOURED STREET SCENES AA and BB (22.1643.350B)
- COLOURED STREET SCENES CC (22.1643.352A)
- COLOURED STREET SCENES DD (22.1643.354C)
- COLOURED STREET SCENES EE (22.1643.356D)
- COLOURED STREET SCENES FF and HH (22.1643.358B)
- COLOURED STREET SCENES GG (22.1643.360B)
- COLOURED STREET SCENES JJ (22.1643.362B)
- STREET SCENE KK (22.1643.364)
- HOUSE TYPE (A2708M)-V1-PLANS-ELEVATIONS (22.1643.500D)
- HOUSE TYPE (A2708M)-V3-PLANS-ELEVATIONS (22.1643.502D)
- HOUSE TYPE (A2708M)-V4-PLANS-ELEVATIONS (22.1643.503D)
- HOUSE TYPE (A2708M)-V5-PLANS-ELEVATIONS (22.1643.504D)
- HOUSE TYPE (A3710M)-V1-PLANS-ELEVATIONS (22.1643.505C)
- HOUSE TYPE (A3710M)-V2-PLANS-ELEVATIONS (22.1643.506D)
- HOUSE TYPE (A3710M)-V3-PLANS-ELEVATIONS (22.1643.507C)
- HOUSE TYPE (A4715M)-V1-PLANS-ELEVATIONS (22.1643.510B)
- HOUSE TYPE (B2009M)-V1-PLANS-ELEVATIONS (22.1643.515D)
- HOUSE TYPE (B2009M)-V2-PLANS-ELEVATIONS (22.1643.516C)
- HOUSE TYPE (B2009M)-V3-PLANS-ELEVATIONS (22.1643.517C)
- HOUSE TYPE (B2009M)-V4-PLANS-ELEVATIONS (22.1643.518)
- HOUSE TYPE (B2013M)-V1-PLANS-ELEVATIONS (22.1643.520B)
- HOUSE TYPE (B3015M)-V1-PLANS-ELEVATIONS (22.1643.525C)
- HOUSE TYPE (B3015M)-V2-PLANS-ELEVATIONS (22.1643.526B)
- HOUSE TYPE (B3015M)-V3-PLANS-ELEVATIONS (22.1643.527B)
- HOUSE TYPE (B3015M)-V4-PLANS&ELEVATIONS (22.1643.528)
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- HOUSE TYPE (B3016M)-V2-PLANS-ELEVATIONS (22.1643.531C)
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- HOUSE TYPE (S4029M)-V1-ELEVATIONS (22.1643.606B)
- FLAT BLOCK A PLANS (PLOTS1-18) (22.1643.650D)
- FLAT BLOCK A ELEVATIONS (PLOTS 1-18) (22.1643.651E)
- FLAT BLOCK D PLANS -1(PLOTS 57-70) (22.1643.655C)
- FLAT BLOCK D PLANS -2(PLOTS 57-70) (22.1643.656C)
- FLAT BLOCK D ELEVATIONS -1 (PLOTS 57-70) (22.1643.657B)
- FLAT BLOCK D ELEVATIONS -2(PLOTS 57-70) (22.1643.658D)
- FLAT BLOCK B PLANS -1(PLOTS 34-43) (22.1643.660D)
- FLAT BLOCK B PLANS -2(PLOTS 34-43) (22.1643.661C)
- FLAT BLOCK B ELEVATIONS (PLOTS 34-43) (22.1643.662C)
- FLAT BLOCK C PLANS -1(PLOTS 47-56) (22.1643.665C)

- FLAT BLOCK C PLANS -2(PLOTS 47-56) (22.1643.666C)
- FLAT BLOCK C ELEVATIONS (PLOTS 47-56) (22.1643.667C)
- FLAT BLOCK E PLANS (PLOTS 217-222) 22.1643.670B)
- FLAT BLOCK E ELEVATIONS (PLOTS 217-222) 22.1643.671C)
- FLAT BLOCK F PLANS (PLOTS 302-310) 22.1643.675C)
- FLAT BLOCK F ELEVATIONS (PLOTS 302-310) 22.1643.676C)
- FLAT BLOCK G PLANS -1(PLOTS 311-319) 22.1643.680B)
- FLAT BLOCK G PLANS -2(PLOTS 311-319) 22.1643.681B)
- FLAT BLOCK G ELEVATIONS (PLOTS 311-319) 22.1643.682B)
- FLAT BLOCK H PLANS (PLOTS 320-323) 22.1643.685B)
- FLAT BLOCK H ELEVATIONS (PLOTS 320-323) 22.1643.686B)
- GARAGES – PLANS – ELEVATIONS 22.1643.700A)
- CARPORTS – PLANS – ELEVATIONS 22.1643.701A)
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- FLAT BLOCK D ELEVATIONS (PLOTS 57-70) 22.1643.755B)
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- FLAT BLOCK C ELEVATIONS (PLOTS 47-56) 22.1643.765A)
- FLAT BLOCK E ELEVATIONS (PLOTS 217-222) 22.1643.770A)
- FLAT BLOCK F ELEVATIONS (PLOTS 302-310) 22.1643.775B)
- FLAT BLOCK G ELEVATIONS (PLOTS 311-319) 22.1643.780A)
- FLAT BLOCK H ELEVATIONS (PLOTS 320-323) 22.1643.785A)
- SUMMER HOUSE PLANS (22.1643.800)
- SUMMER HOUSE ELEVATIONS (22.1643.801)
- Landscape Hard and Soft GA Plan: Overall (LN-LD-00 Rev B)
- Landscape Hard GA Plan: Sheet 1 of 10 (LN-LD-01 Rev B)
- Landscape Hard GA Plan: Sheet 2 of 10 (LN-LD-02 Rev B)
- Landscape Hard GA Plan: Sheet 3 of 10 (LN-LD-03 Rev B)
- Landscape Hard GA Plan: Sheet 4 of 10 (LN-LD-04 Rev B)
- Landscape Hard GA Plan: Sheet 5 of 10 (LN-LD-05 Rev B)
- Landscape Hard GA Plan: Sheet 6 of 10 (LN-LD-06 Rev B)
- Landscape Hard GA Plan: Sheet 7 of 10 (LN-LD-07 Rev B)
- Landscape Hard GA Plan: Sheet 8 of 10 (LN-LD-08 Rev B)
- Landscape Hard GA Plan: Sheet 9 of 10 (LN-LD-09 Rev B)
- Landscape Hard GA Plan: Sheet 10 of 10 (LN-LD-10 Rev B)
- Landscape Soft GA Plan: Sheet 1 of 10 (LN-LD-11 Rev B)
- Landscape Soft GA Plan: Sheet 2 of 10 (LN-LD-12 Rev B)
- Landscape Soft GA Plan: Sheet 3 of 10 (LN-LD-13 Rev B)
- Landscape Soft GA Plan: Sheet 4 of 10 (LN-LD-14 Rev B)
- Landscape Soft GA Plan: Sheet 5 of 10 (LN-LD-15 Rev B)
- Landscape Soft GA Plan: Sheet 6 of 10 (LN-LD-16 Rev B)
- Landscape Soft GA Plan: Sheet 7 of 10 (LN-LD-17 Rev B)
- Landscape Soft GA Plan: Sheet 8 of 10 (LN-LD-18 Rev B)
- Landscape Soft GA Plan: Sheet 9 of 10 (LN-LD-19 Rev B)
- Landscape Soft GA Plan: Sheet 10 of 10 (LN-LD-20 Rev B)
- Planting Schedule and Notes (LN-LD-21 Rev B)
- GA Soft Landscape Plan Overview (LN-LD-22)
- Typical Landscape Details (LN-LD-30 Rev A)
- School Plaza Detail (LN-LD-40 Rev A)
- Illustrative Landscape Masterplan (LN-LD-100 Rev B)
- LBMS Plan (LN-LD-101 Rev A)

- Open Space Typologies Plan (LN-LD-102 Rev B)
- Landscape and Biodiversity Management Strategy (LN-LD-LBMS Rev C)
- BNG Plan (LN-LD-113 Rev C)
- Site Context Plan (LN-LP-01)
- Topography Plan (LN-LP-02)
- Landscape Character Plan (LN-LP-03)
- Site Appraisal Plan (LN-LP-04)
- Visual Appraisal Plan (LN-LP-05)
- Landscape and Visual Opportunities and Constrains Plan (LN-LP-06)
- Landscape Strategy Plan (LN-LP-07)
- Connectivity Plan (152080_SK04)
- Proposed PROW Diversion Plan (152080_PD2B)
- Highways GA Plan-P04 VD23856-VEC-S38-XXX-DR-CH-0250
- Highways GA Plan-P04 VD23856-VEC-S38-XXX-DR-CH-0251
- Highways GA Plan-P04 VD23856-VEC-S38-XXX-DR-CH-0252
- Highways GA Plan-P04 VD23856-VEC-S38-XXX-DR-CH-0253
- Proposed Site Access Roundabout 152080_A_01 Rev J
- Swept Path – SDV 152080_A_01_AT01
- Swept Path - Refuse Vehicle 152080_A_01_AT02
- Swept Path - DB32 Fire Appliance 152080_A_01_AT03
- Swept Path -_Alexander Lane Bus 152080_AT_A01
- Swept Path - Refuse Collection 152080_AT_C01 Rev B
- Swept Path – Fire tender 152080_AT-D01 Rev A
- Swept Path – SDV 152080_AT_C02
- Proposed Bus Stops South of Access (152080_PD08 Rev A)
- Proposed Relocated Bus stops North of Site Access (152080_PD9 Rev A)
- Proposed Re-alignment of Alexander Lane (152080_PD11 Rev A)
- Wider Masterplan Footway-Cycleway Connections - Stonebond Land (152080_PD13 Rev A)
- Alternative Turning Head Northern End of Alexander Lane (152080_PD14 Rev B)
- Boardwalk Cross Section (152080_PD15)
- Proposed Bus Stops and Pedestrian Crossing Adjacent to Site Access (1520880/PD19 Rev A)
- Proposed Parking Court Access Arrangement (152080/PD22)
- Proposed Internal Bus Stops (152080/PD23)
- Swept path analysis bus 152080/PD23/AT01)
- S38 Adoption Plan – P03 (VD23856-VEC-S38-XXX-DR-CH-0260)
- S38 Adoption Plan – P03 (VD23856-VEC-S38-XXX-DR-CH-0261)
- S38 Adoption Plan – P03 (VD23856-VEC-S38-XXX-DR-CH-0262)
- S38 Adoption Plan – P03 (VD23856-VEC-S38-XXX-DR-CH-0263)
- Swept Path Analysis-P04 (VD23856-VEC-S38-XXX-DR-CH-0270)
- Swept Path Analysis-P04 (VD23856-VEC-S38-XXX-DR-CH-0271)
- Swept Path Analysis-P04 (VD23856-VEC-S38-XXX-DR-CH-0272)
- Swept Path Analysis-P04 (VD23856-VEC-S38-XXX-DR-CH-0273)
- Lighting Strategy (WLC654 -LSR-001-R2)
- Indicative Lighting Strategy Plan (WLC654-LS-001-R2)
- Indicative Lighting Strategy Plan (WLC654-LS-002-R2)
- Indicative Lighting Strategy Plan (WLC654-LS-003-R2)
- Indicative Lighting Strategy Plan (WLC654-LS-004-R2)

- Area Calculations (WLC654-LC-AC-001-R3)
- Proposed Culvert Plan and Section (C86054-JN-XX-XX-DR-C-2005-PO1)

Reason: To ensure that the development is as permitted by the local planning authority and for the avoidance of doubt.

4. Condition 3 of the committee report is amended to request vehicle routing along with the other elements already provided in the original condition 3. It shall be included in the CEMP and now reads as follows:

3 CEMP
No development shall commence, until a Construction Environment Management Plan (CEMP) has been submitted to and approved in writing by the local planning authority. The CEMP shall define best practice measures for ecological protection (including but not limited to protected species, in particular badgers and nesting birds), protection methods of retained trees, and adhere to the Proposed Badger Construction Safeguards set out in the Ecological Appraisal. The CEMP shall include a method statement to avoid injury to any animals entering the site during construction.

The CEMP shall identify that construction activities so far as is practical do not adversely impact amenity, traffic or the environment of the surrounding area by minimising the creation of noise, vibration and dust during the site preparation and construction phases of the development. The CEMP shall also provide details of:

i. Vehicle routing
ii. The parking of vehicles of site operatives and visitors
iii. Loading and unloading of plant and materials
iv. Storage of plant and materials used in constructing the development
v. Wheel and underbody washing facilities
vi. Construction and demolition activities restricted to 08:00 to 18:00 Monday to Friday, 08:00 to 13:00 Saturdays with no work on Sundays and Public Holidays.

The demolition and construction works shall be carried out in accordance with the details of the approved CEMP.

Reason: To ensure that appropriate measures are undertaken to ensure any disturbance to protected species is mitigated and to ensure trees are not harmed in the interests of visual amenity. To ensure that on-street parking of these vehicles in the adjoining streets does not occur and to ensure that loose materials and spoil are not brought out onto the highway in the interests of highway safety, and in accordance with Local Plan Policies BE09 and BE12.

5. Condition 32 of the committee report is amended and now reads as follows:

32 Energy & Sustainability
Prior to commencement of development above ground, a revised Energy and Sustainability Statement shall be submitted to and approved in writing by the local planning authority. The statement shall set out in detail how the development hereby approved shall incorporate the energy efficiency measures, renewable energy, and sustainable design principles into the design and construction of the development in

full accordance with the sustainability statement titled ‘Officers’ Meadow, Shenfield Sustainability Statement’ by Stantec dated September 2023 (Rev 03) and the energy statement titled ‘Officers’ Meadow, Shenfield Energy Strategy’ by Stantec dated September 2023 (Rev 02), including the updated provision of solar photovoltaic generation, space heat demand reduction measures, and energy use intensity reduction measures as detailed in the technical note titled ‘Energy Strategy Technical Note’ by Stantec dated April 2024 (Rev 05). The development shall be carried out in accordance with the approved revised Energy and Sustainability Statement.

Reason: To ensure that the development incorporates measures to minimise the effects of, and can adapt to, a changing climate in line with the objectives of the Planning Policy Position for Net Zero Carbon in Operation for Greater Essex.

6. The following highways conditions are added to the committee report.

35 HIGHWAYS
Prior to the occupation of the proposed development, the main site access roundabout on the A1023 Chelmsford Road shall be provided as shown in principle in Drawing 152080/A/01 Rev J.

Reason: To ensure that vehicles can enter and leave the highway in a controlled manner, in the interest of highway safety in accordance with Local Plan Policy BE12 and paragraph 114 of the NPPF.

36 HIGHWAYS
Prior to the occupation of Phase 2 development, as indicated in Phasing Plan 988/100, the secondary site access on Alexander Lane shall be provided as shown in principle in Drawing 152080/PD11 Rev A.

Reason: To ensure that vehicles can enter and leave the highway in a controlled manner, in the interest of highway safety and in accordance with Local Plan Policy BE12 and paragraph 114 of the NPPF.

37 HIGHWAYS
Prior to the occupation of the proposed development, the developer shall provide pedestrian and cyclist infrastructure at the Chelmsford Road access as shown in principle in Drawing 152080/A/01 Rev J. This includes a toucan signalised crossing of Chelmsford Road (also shown in principle in Drawing 152080/PD08 Rev A in Appendix F of the Transport Assessment).

Reason: To provide safe and suitable access for pedestrians and cyclists, in accordance with Local Plan Policy BE09 and BE12 and paragraphs 114 and 116 of the NPPF.

38 HIGHWAYS
Prior to the occupation of the proposed development, full details of the combined 3 metre wide footway / cycleway on the west side of Chelmsford Road from the proposed toucan crossing to a point immediately south of the Alexander Lane junction where the current designated cycleway ends, as shown in principle in Drawing 152080/SK03, shall be submitted to and approved in writing by the local planning authority in

consultation with the local highway authority. The full details agreed in writing shall be implemented prior to occupation of the development.

Reason: To provide pedestrians and cyclists with safe accessibility to nearby facilities and services in accordance with Local Plan Policy BE12 and paragraph 116 of the NPPF.

39 HIGHWAYS
The proposed Traffic Regulation Order to restrict the central section of Alexander Lane to pedestrians and cyclists shall be funded by the developer. As part of the proposals, the developer shall provide a turning head and bollards to ensure there is no vehicle access, as shown in principle in Drawing No 152080/PD14 Rev B (provided in response to the Stage 1 Road Safety Audit). The works shall be carried out prior to first occupation of the development.

Reason: To allow vehicles to turn safely and provide pedestrians and the mobility impaired with safe accessibility to nearby facilities and services in accordance with Local Plan Policy BE09 and BE12 and paragraphs 114 and 116 of the NPPF.

40 HIGHWAYS
Prior to occupation of the proposed development, the proposed pedestrian island together with dropped kerb and tactile paving to the northeast of the proposed access roundabout, shall be provided as shown in principle in Drawing 152080/PD19 Rev A.

Reason: To provide pedestrians and the mobility impaired with safe accessibility to nearby facilities and services in accordance Local Plan Policy BE09 and BE12 and paragraphs 114 and 116 of the NPPF.

41 HIGHWAYS
Prior to occupation of the proposed development and as indicated in Drawing 152080/A/01 Rev J, two new bus stops shall be provided on the A1023 Chelmsford Road southwest of the proposed access roundabout. Both stops shall be provided with a shelter with lighting and flag attached, raised kerbs and Real Time Passenger Information display. Both stops shall be provided with bus stop clearway markings on the road and the southwest bound stop shall incorporate the removal of the existing traffic island southwest of the stop.

Reason: To encourage trips by public transport and in the interest of accessibility, in accordance with Local Plan Policy BE09 and BE12 and paragraphs 114 and 116 of the NPPF.

41 HIGHWAYS
Prior to the occupation of the proposed development, full details of two new bus stops shall be provided on the main spine road through the development shall be submitted to and approved in writing by the local planning authority in consultation with the local highway authority. One bus stop shall be provided close to the Chelmsford Road entrance to the development in an eastbound direction and the other at the southern end of the site in a southbound direction. Both stops shall be provided with a shelter with lighting and flag attached, raised kerbs and Real Time Passenger Information

display. The development shall not be occupied until the approved bus stops have been implement.

Reason: To encourage trips by public transport and in the interest of accessibility, in accordance with Local Plan Policy BE09 and BE12 and paragraphs 114 and 116 of the NPPF.

42 HIGHWAYS
Notwithstanding the Proposed Site Layout Drawing No 1643.100 Rev T, the proposed footway linking the south-east of the development site to the northern part of the proposed neighbouring development site (application reference 24/00332/FUL) shall be provided with a minimum width of 3m.

Reason: To enable both pedestrians and cyclists to use the facility safely together, in accordance with Local Plan Policy BE09 and BE12 and paragraphs 114 and 116 of the NPPF.

43 HIGHWAYS
Prior to commencement of Phase 3 of the development as indicated in the Phasing Plan 988/100, an order to secure the diversion of the existing definitive right of way (public footpath no 86, Brentwood Parish) has been confirmed and the new route constructed to the satisfaction of the Local Planning Authority. The diverted route shall be submitted to and agreed in writing by the Local Planning Authority in consultation with Essex County Council prior to commencement of Phase 3 of the development.

Reason: To ensure the continued safe passage of pedestrians on the public right of way and accessibility in accordance with Local Plan Policy BE09 and BE12 and paragraphs 114 and 116 of the NPPF.
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44 HIGHWAYS
Prior to occupation of the proposed development, the developer shall pay for a Traffic Regulation Order together with the provision of the associated signage to extend the existing 30mph speed limit on the A1023 Chelmsford Road to a location north-east of the proposed site access roundabout. The precise location is to be agreed in consultation with the Highway Authority and shall include a gateway feature and road markings.

Reason: In the interests of highway safety in accordance with Local Plan Policy BE09 and BE12 and paragraph 114 of the NPPF.

45 HIGHWAYS
The proposed development shall not be occupied until such time as the vehicle parking area indicated on the approved plans, including any parking spaces for the mobility impaired, has been hard surfaced, sealed and marked out in parking bays. The vehicle parking area and associated turning area shall be retained in this form at all times. The vehicle parking shall not be used for any purpose other than the parking of vehicles that are related to the use of the development unless otherwise agreed with the Local Planning Authority.

Reason: To ensure that on street parking of vehicles in the adjoining streets does not occur in the interests of highway safety and that appropriate parking is provided in accordance with Local Plan Policy BE09 and BE12 and paragraph 114 of the NPPF.

46 HIGHWAYS
Cycle parking shall be provided in accordance with Brentwood Borough Council's adopted standards. The approved facilities shall be secure, convenient, covered and provided prior to occupation and retained at all times.

Reason: To ensure appropriate cycle parking is provided in the interest of highway safety and amenity in accordance with Local Plan Policy BE09 and BE12 and paragraphs 114 and 116 of the NPPF.

47 HIGHWAYS
No part of the development herby approved shall be brought into use unless and until the Travel Plan has been approved in writing by the Local Planning Authority who shall consult with Essex County Council as Highways Authority. The Travel Plan shall be in line with prevailing policy and best practice and shall as a minimum include:-

- The identification of targets for trip reduction and modal Shift
- The methods employed to meet these targets
- The mechanisms for monitoring and review
- The mechanisms and review
- The penalties to be applied in the event that targets are not met
- The mechanisms for mitigation
- Implementation of the travel plan to an agreed timescale or timetable and its operation thereafter
- Mechanisms to secure variations to the Travel plan following monitoring and reviews

Such approved travel plan shall be actively implemented for a minimum period from first occupation of the development until 1 year after final occupation. It shall be accompanied by an annual monitoring fee of £1,759.29 (index linked) to be paid to Essex County Council.

Reason:
To ensure that the A12 continues to serve its purpose as a part of a national system for through traffic in accordance with Local Plan Policy BE09 and BE12 and paragraphs 114, 116 and 117 of the NPPF.

48 HIGHWAYS
Prior to occupation of the development, the Developer shall be responsible for the provision and implementation of a Residential Travel Information Pack for sustainable transport to each dwelling, as approved by Essex County Council (to include six one day travel vouchers for use with the relevant local public transport operator).

Reason: In the interests of reducing the need to travel by car and promoting sustainable development and transport in accordance with Local Plan Policy BE09 and BE12 and paragraphs 114, 116 and 117 of the NPPF.

Officers had received lengthy representations late in the application process, and after the publication of the committee report, which raised a number of questions. Officers were of the view that further details are required from the applicant and comments from consultees in order for these matters to be addressed. The Legal team have advised that this is a sensible course.

The Chair advised the Committee he was varying the order of the Agenda to enable Application No: 23/01159/OUT and Application No: 23/01164/FUL Land North of Shenfield, Alexander Lane, Shenfield to be heard before Application No: 23/01607/FUL 2 Weald Road, Brentwood Essex.

57. APPLICATION NO: 23/01505/FUL LAND AT BEGGAR HILL BEGGAR HILL FRYERNING ESSEX

This item was deferred prior to the Committee.

Officers had received lengthy representations late in the application process, and after the publication of the committee report, which raised a number of questions. Officers were of the view that further details are required from the applicant and comments from consultees in order for these matters to be addressed. The Legal team have advised that this is a sensible course.

The Chair advised the Committee he was varying the order of the Agenda to enable Application No: 23/01159/OUT and Application No: 23/01164/FUL Land North of Shenfield, Alexander Lane, Shenfield to be heard before Application No: 23/01607/FUL 2 Weald Road, Brentwood Essex.

58. APPLICATION NO: 23/01164/FUL LAND NORTH OF SHENFIELD ALEXANDER LANE SHENFIELD ESSEX

The Chair took the decision for this application and the following application to be presented and debated together. However, a separate vote was taken on each application.

Ms Kathryn Williams presented the reports.

Mr Roche, resident, addressed the Committee objecting to the application. Ms Lynch also spoke as an objector on behalf of Oliver Road residents.

The committee then heard from Mr Andersen as a resident objector. Also Mr Baines addressed the Committee objecting on behalf of Chelmsford Road residents.

The Committee then heard from Ms Piper in support of both applications, on behalf of the Applicant.

Cllr Worsfold, Ward Cllr, was present and raised his concerns regarding both sites including the absence of a school drop off zone, road safety, road closures and travel issues, the lack of care home or community centre and flooding.

Ward Cllr Gordon, who was not present, had his statement read out. His concerns included the increase in traffic and negative impact on residents of Oliver Road and Alexander Lane.

Cllr Aspinell also spoke as County Councillor agreeing with residents and members on the local issues such as drainage and highways.

Members raised concerns regarding the flood risk, and was advised by officers that the Environment Agency had been consulted on the application.

Affordable housing was another issue raised by Members and how the 35% allocation mix was derived. Officers advised the demand from the Council's housing service had been met and they had worked hard with developers offer policy compliant affordability.

Members raised concerns about the availability of major documents and the uploading of late documentation which prevented them from making an informed decision.

Following a full discussion a motion to **DEFER** was **MOVED** by Cllr Barber and **SECONDED** by Cllr Mynott.

This motion was subsequently withdrawn.

Following discussion, the meeting was adjourned for a short period of time for officers to gather highways data requested by members.

Mr Johnstone, from Essex Highways, was present at the meeting to advise members on technical issues. Data supporting the reasons for no drop off zone was presented.

Concerns were raised by Members regarding the three-storey designs of some of the homes on the proposed development and whether they were policy compliant.

Cllr Mynott **MOVED** a motion to **DEFER** the application. This was SECONDED by Cllr Cuthbert.

A vote was taken and Members voted as follows:

FOR: Cllrs Mynott, M Cuthbert, Gorton (3)

AGAINST: Cllrs Dr Barrett, Barber, Mrs Gelderbloem, Barrett, Marsh, Naylor, Patel, Sunger (8)

ABSTAIN: Cllrs Mrs N Cuthbert, Baldock (2)

The motion to **DEFER** was **LOST**.

A motion to **REFUSE** the application was **MOVED** by Cllr Mrs Marsh and **SECONDED** by Cllr Naylor.

FOR: Cllrs M Cuthbert, Dr Barrett, Mrs N Cuthbert, Baldock, Barber, Mrs Gelderbloem, Barrett, Mrs Marsh, Naylor, Patel, Sunger (11)

AGAINST: (0)

ABSTAIN: Cllrs Mynott, Gorton (2)

The motion to **REFUSE** the application was **APPROVED**.

The application was **REFUSED** for the following reasons:

As per the Council's Constitution, the final wording of reasons are to be delegated to officers in consultation with the chair and vice chair.

[Cllr Mynott declared a non-pecuniary interest as a Member of Essex Wildlife Trust]

59. APPLICATION NO: 23/01159/OUT LAND NORTH OF SHENFIELD ALEXANDER LANE SHENFIELD ESSEX

The Chair took the decision for this application and the following application to be presented and debated together. However, a separate vote was taken on each application.

Ms Katharine Williams presented the reports.

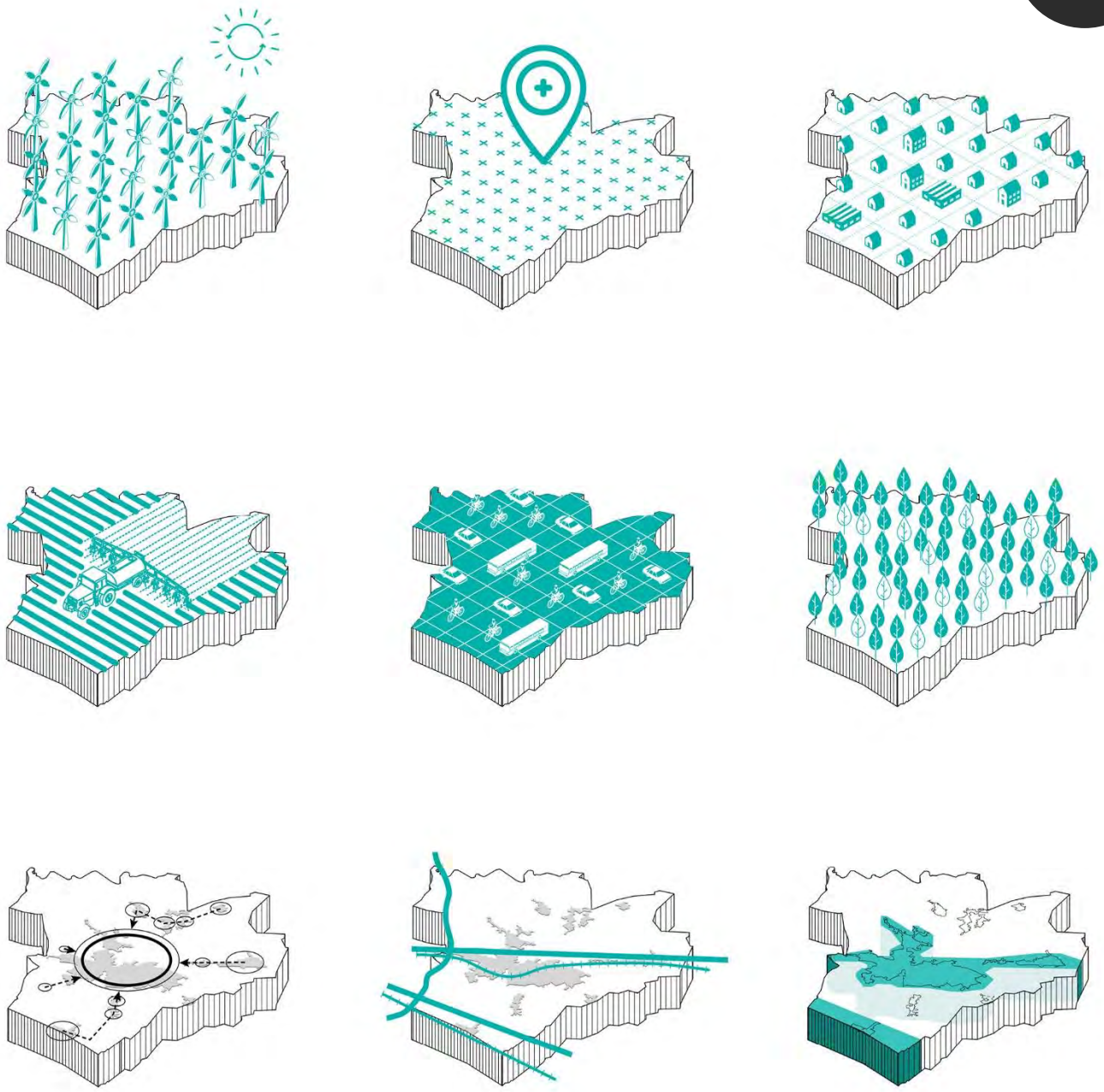
Mr Roche, resident, addressed the Committee objecting to the application. Ms Lynch also spoke as an objector on behalf of Oliver Road residents.

The committee then heard from Mr Andersen as a resident objector. Also Mr Baines addressed the Committee objecting on behalf of Chelmsford Road residents.

The Committee then heard from Ms Piper in support of both applications, on behalf of the Applicant.

Cllr Worsfold, Ward Cllr, was present and raised his concerns regarding both sites including the absence of a school drop off zone, road safety, road closures and travel issues, the lack of care home or community centre and flooding.

Adopted
March 2022



BRENTWOOD LOCAL PLAN

2016 - 2033

BRENTWOOD
BOROUGH COUNCIL

Sustainable Construction and Resource Efficiency

Renewable Energy and Low Carbon Development

5.12 The NPPF requires the planning system to support the transition to a low carbon future in a changing climate, encourage the use of renewable and low carbon energy and associated infrastructure in line with the Climate Change Act 2008.

5.13 The Brentwood Renewable Energy Study (2014)[13] states that around half of all energy used in the borough is from road transport, with a third from domestic use and about a fifth from the commercial and industrial sector.

5.14 Statistical information from the Department for Business, Energy and Industrial Strategy (BEIS) [14], indicates that Brentwood Borough has relatively high levels of domestic gas and electricity consumption. Over the period 2010 - 2015, Brentwood had the highest level of domestic customer mean gas consumption in the County and was also significantly higher than the England and East of England averages for the same period. Electricity usage for Brentwood ranks about 4th in the County and also significantly higher than the England and East of England averages for the period 2010 - 2015. One of the reasons for the higher domestic energy use in Brentwood maybe that homes in the borough are 13% larger than homes in England on average.

5.15 Over the period of the Plan, energy use and carbon emissions may increase by 10% following a 'business as usual' trajectory.

STRATEGIC POLICY BE01: CARBON REDUCTION AND RENEWABLE ENERGY

1. Carbon Reduction and Construction Standards

Development should meet the minimum standards of sustainable construction and carbon reduction as set out below:

a. All major development will be required to achieve at least a 10% reduction in carbon dioxide emissions above the requirements of Part L Building Regulations; and

[13] University of Exeter (2014) Brentwood Renewable Energy Study
[14] BEIS Sub-national consumption statistics

b. New Non-residential development will be required to achieve a certified 'Excellent' rating under the BREEAM New Construction (Non-Domestic Buildings) 2018 scheme, or other equivalent standards.

The version of BREEAM that a building must be assessed under should be the latest BREEAM scheme and not be based on scheme versions that have been registered under at the pre-planning stages of a project. Other construction standards, such as LEEDs or Passivhaus, will be supported provided that they are broadly at least in line with the standards set out above.

2. Renewable Energy

Wherever possible, application of major development will be required to provide a minimum of 10% of the predicted energy needs of the development from renewable energy. Where on-site provision of renewable technologies is not appropriate, or where it is clearly demonstrated that the above target cannot be fully achieved on-site, any shortfall should be provided through:

a. 'allowable solutions contributions' via Section 106 or CIL. These funds will then be used for energy efficiency and energy generation initiatives or other measure(s) required to offset the environmental impact of the development; or

b. off-site provision, provided that an alternative proposal is identified, and the measures can be secured.

3. Application of major development, including proposals involving the redevelopment of existing floor space, should be accompanied by a Sustainability Statement outlining their approach to the following issues:

a. adaptation to climate change;

b. carbon reduction;

c. water management;

d. site waste management;

e. use of materials;

4. Where it is not possible to meet these standards, applicants must demonstrate compelling reasons and provide evidence, as to why achieving the sustainability standards would not be technically feasible or economically viable.

5.16 The Climate Change Act 2008 (2050 Target Amendment) Order 2019 commits the UK Government by law to reducing greenhouse gas emissions to zero by 2050.

5.17 Improvements in resource efficiency to meet the government's carbon target were made through Building Regulations which set standards for design and construction that applies to most new buildings, regardless of type.

5.18 However, local authorities can still require energy efficiency standards above Building Regulation, as allowed by the Planning and Energy Act 2008 and confirmed by the government in its summary response to the NPPF 2018 consultation.

5.19 As such, this policy requires an on-site reduction of at least 10 per cent beyond the baseline of part L of the current Building Regulations on major development. This takes into account the Local Plan Viability Assessment (2018)'s recommendation for the Council to only seek standards that are over and above those set out in Building Regulation in the case of major development where there is a requirement for 10% renewable energy.

5.20 According to the Brentwood Renewable Energy Study (2014), an international analysis of certified buildings has shown that the additional cost of achieving BREEAM 'Very Good' is expected to be minor and therefore should not be burdensome for developers. The version of BREEAM that a building must be assessed under should be the latest BREEAM scheme and not be based on scheme versions that have been registered under at the pre-planning stages of a project.

5.21 There are many approaches that can be taken to meeting the construction standards required by this policy. The Council will be supportive of innovative approaches to meeting and exceeding the standards set out in the policy. Where other construction standards are proposed for new developments, for example Leadership in Energy and Environmental Design (LEED) or construction methods such as Passivhaus Standard, these will be supported, provided that it can be demonstrated that they are broadly in line with the standards set out above, particularly in relation to carbon reduction and water efficiency.

5.22 Consideration of sustainable design and construction issues should take place at the earliest possible stage in the development process. This will provide the greatest opportunities for a well designed and constructed development and at the same time enable costs to be minimised. Therefore, developers should consider sustainable construction issues in pre-application discussions with the Local Planning Authority. Proposals should be captured within a Sustainability Statement, which can form part of the Design and Access Statement.

5.23 Sustainable design and construction are concerned with the implementation of sustainable development in individual sites and buildings. It takes account of the resources used in construction, and of the environmental, social and economic impacts of the construction process itself and how buildings are designed and used.

5.24 The choice of sustainability measures and how they are implemented may vary substantially from development to development. However, the general principles of sustainable design and construction should be applied to all scales and types of development. The Sustainability Statement should demonstrate how proposals avoid increased vulnerability to the impacts arising from climate change through sustainable and resilient design. The Sustainability Statement should be proportionate to the proposed scale of development and

clearly set out, providing sufficient detail on how sustainable design solutions have been integrated for both the construction and operation phases of the development. More guidance on areas to be covered in the Sustainability Statement is set out in Figure 5.1.

Adaptation to climate change

Adaptation measures can be implemented at a variety of scales, from individual buildings up to community and conurbation scale. Measures that will have benefits beyond site boundaries, and that will have a cumulative impact in areas where development is to be phased, should also be pursued. Applicants should refer to best practice guidance.

Carbon reduction

Proposals should demonstrate how the carbon reduction target will be met, in particular how the proposals:

a. minimises the energy demand of new buildings by means such as fabric first approach and design;

b. utilises energy efficient supply through low carbon technologies;

c. supplies energy from new, renewable energy sources; and

d. where on-site provision of renewable technologies is not appropriate, confirmation of offsite arrangement should be submitted.

Proposals for major development should contain a calculation of the energy demand and carbon dioxide emissions covered by Building Regulations and, separately, the energy demand and carbon dioxide emissions from any other part of the development, including plant or equipment, that are not covered by the Building Regulations (i.e. the unregulated emissions).

Proposals should also explain how the site has been future-proofed to achieve zero-carbon on-site emissions by 2050.

Water management

Development must optimise the opportunities for efficient water use, reuse and recycling, including integrated water management and water conservation.

Site waste management

Developments should be designed in a way that reduces the amount of construction waste and maximises the reuse and recycling of materials at all stages of a development's lifecycle.

All new development should be designed to make it easier for future occupants to maximise levels of recycling and reduce waste being sent to landfill. In order to do so, storage capacity for waste, both internal and external, should be an integral element of the

design of new developments. The Council will be supportive of innovative approaches to waste management.

Use of materials

Although this is not a policy requirement, the Council will encourage all developers to maximise resource efficiency and identify, source, and use environmentally and socially responsible materials. There are four principal considerations that should influence the sourcing of materials:

a. **Responsible sourcing** – sourcing materials from known legal and certified sources through the use of environmental management systems and chain of custody schemes including the sourcing of timber accredited by the Forestry Stewardship Council (FSC), or the Programme for the Endorsement of Forest Certification (PEFC);

b. **Secondary materials** – reclaiming and reusing material arising from the demolition of existing buildings and preparation of sites for development, as well as materials from other post-consumer waste streams;

c. **Embodied impact of materials** – the aim should be to maximise the specification of major building elements to achieve an area-weighted rating of A or B as defined in the Building Research Establishment (BRE) Green Guide to Specification. Consideration should also be given to locally sourced materials; and

d. **Healthy materials** – where possible developers should specify materials that represent a lower risk to the health of both construction workers and occupants. For example, selecting materials with zero or low volatile organic compound (VOC) levels to provide a healthy environment for residents.

Other

As well as the consideration of the above issues, the sustainability statement in support of the application should also address how the proposals meet all other policies relating to sustainability throughout the plan, including:

a. biodiversity and ecology;

b. land, water, noise and air pollution;

c. transport, mobility and access;

d. health and well-being, including provision of open space;

e. culture, heritage and the quality of built form, including efficient use of land.

Figure 5.1: Areas to be covered in the sustainability statement and recommended approach

Allowable Solution

5.25 As part of the government's policy for achieving zero carbon performance, the policy seeks to establish realistic limits for carbon compliance (on site carbon target for buildings) and allows for the full zero carbon standard to be achieved through the use of 'allowable solutions'. These are envisaged as mainly near site or off-site carbon saving projects which would compensate for carbon emissions reductions that are difficult to achieve on site. Local authorities can explore opportunities for using carbon offset funds and community energy funds as a way of delivering the concept of allowable solutions in their areas.

Renewable Energy Generation

5.26 Incorporating renewable energy generation and energy efficiency measures into new development will be essential in order to achieve carbon reduction targets.

5.27 All developments should maximise opportunities for on-site electricity and heat production as well as use innovative building materials and smart technologies to reduce carbon emissions, reduce energy costs to occupants and improve the borough's energy resilience.

POLICY BE02: WATER EFFICIENCY AND MANAGEMENT

Water Efficiency

1. Development should incorporate water conservation measures in the proposals and meet the minimum standards for water efficiency as set out below:

    a. New residential development will be required to achieve limits of 110 litres per person per day.

    b. New non-residential development is expected to meet BREEAM 'Excellent' rating in category Wat 01.

    c. Major developments and high or intense water use developments (such as hotels) is expected to provide more substantial water management measures such as rain/ and grey water harvesting.

Waste Water and Sewage

2. Development proposals should:

    a. seek to improve the water environment and demonstrate that adequate wastewater infrastructure capacity is provided;

    b. ensure that misconnections between foul and surface water networks are eliminated and not easily created through future building alterations;

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c. incorporate measures such as smart metering, water saving and recycling, including retrofitting and rain/grey water harvesting, to help to achieve lower water consumption rates and to maximise futureproofing;

3. Applications will need to demonstrate that the sewerage network has adequate capacity both on and off-site to serve the development and to assess the need to contribute to any additional connections for the development to prevent flooding or pollution of land and water courses. Where sewerage capacity is identified as insufficient, development will only be permitted if it is demonstrated that improvements will be completed prior to occupation of the development.

Water Quality

4. All development proposals should have regard to the Water Cycle Study and:

   a. seek to improve water quality;

   b. not cause deterioration in the quality of a water course or groundwater;

   c. not lead to adverse impacts on the natural functioning of the watercourse, including quantity, flow, river continuity, groundwater connectivity, or biodiversity impacts;

   d. where development is likely to have an impact, proposals must set out how impacts will be mitigated.

5.28 Brentwood Water Cycle Study 2018 identifies the borough as lying within an area of Serious Water Stress. A semi-arid climate and succession of dry winters can lead to groundwater levels within Brentwood being susceptible to multi-season droughts. The quality of the borough's watercourses is generally poor, while sewerage infrastructure in the north of the borough is operating at full capacity. The study recommends requiring all new developments to submit a water sustainability assessment and developers to demonstrate that they will achieve the water consumption reduction to Level 3/4 of the Code for Sustainable Homes for all residential developments and for non-residential developments to achieve BREEAM 'Very Good' standard for water consumption targets. As the Code for Sustainable Homes has been withdrawn, water conservation measures will be required to ensure a 110 litres per person per day limit, at the level formerly considered at Level 3-4 in line with the Water Cycle Study 2018.

5.29 Major developments are encouraged to incorporate more substantial water management measures, such as grey water harvesting. This is supported by the Interim Sustainability Appraisal (2016, paragraph 21.1.4 and 2018, paragraph 10.8.3).

POLICY BE03: ESTABLISHING LOW CARBON AND RENEWABLE ENERGY INFRASTRUCTURE NETWORK

Renewable energy infrastructure

1. Innovative approaches to the installation and/or construction of energy generation facilities or low carbon homes which demonstrate sustainable use of resources and high energy efficiency levels will be supported.

Decentralised energy infrastructure

2. New development proposals of over 500 dwelling units, including brownfield and urban extensions, or where the clustering of new sites totals more than 500 units, should include energy masterplans to incorporate decentralised energy infrastructure in line with the following hierarchy:

    i. where there is an existing decentralised heat network with sufficient capacity or the capacity to expand, new development will be expected to connect to it;

    ii. where there is no existing decentralised heat network with sufficient capacity or the capacity to expand, new development will be expected to deliver an onsite heat network, unless it can be demonstrated to the Council's satisfaction that this would render the development unviable;

    iii. where a developer is unable to deliver a decentralised heat network, it will need to be demonstrated to the satisfaction of the Council that the applicant has fully assessed all reasonably available options for its incorporation and delivery and has designed the development to allow future connection to a heat network unless it can be demonstrated that a lower carbon alternative has been put in place

3. New development will be expected to demonstrate that the heating and cooling systems have been selected according to the following heat hierarchy:

    i. connection to existing CHP/CCHP distribution network;

    ii. site-wide renewable CHP/CCHP;

    iii. site-wide gas-fired CHP/CCHP;

    iv. site-wide renewable community heating/cooling;

    v. site-wide gas-fired community heating/cooling;

    vi. individual building renewable heating.

5.30 According to the International Renewable Energy Agency (IRENA, 2018)[15], renewable energy will be cheaper than fossil fuels by 2020 as a result of improvements in technology. Renewables are experiencing a virtuous cycle of technology improvement and cost reduction.

Stand-alone renewable energy

5.31 It is acknowledged that standalone technologies such as large-scale wind turbines and photovoltaic (PV) arrays could be significant sources of energy. The resource assessment in the Brentwood Renewable Energy Study (2014) demonstrated that the borough's renewable energy target will not be possible without deploying large commercial scale renewable technologies. However, stand-alone renewable energy schemes would occur within and could impact on the Green Belt and would also be constrained by proximity to suitable connection to the national electricity grid. Therefore, whilst the Council would encourage opportunities for stand-alone renewable energy schemes within Brentwood, this will need careful consideration and be assessed on a case-by-case basis. Selection of the most appropriate locations would depend on balancing technical factors (such as proximity to substations) with minimising the impact of those developments through careful siting and mitigation measures. The Council would also support community-led initiatives for renewable and low carbon energy, including developments outside areas identified in local plans or other strategic policies that are being taken forward through neighbourhood planning, in line with the NPPF.

Decentralised energy

5.32 Decentralised energy broadly refers to energy that is generated off the main grid, including micro-renewables, heating and cooling. It can refer to energy from waste plants, combined heat and power, district heating and cooling, as well as geothermal, biomass or solar energy. Schemes can serve a single building or a whole community, even being built out across entire cities. Decentralised energy is a rapidly deployable and efficient way to meet demand, whilst improving energy security and sustainability at the same time. Other benefits of decentralised energy include:

i. increased conversion efficiency (capture and use of heat generated, reduced transmission losses);

ii. increased use of renewable, carbon-neutral and low-carbon sources of fuel;

iii. more flexibility for generation to match local demand patterns for electricity and heat;

iv. greater energy security for businesses that control their own generation;

v. greater awareness of energy issues through community-based energy systems, driving a change in social attitudes and more efficient use of our energy resources.

5.33 District heating and cooling systems (DH) are an important enabling technology for the use of renewables and need to be a central component of the decentralised system. DH can combine different sources of heat and can play a positive role in the integration of variable renewable energy. In 'the Future of Heating'[16] the government highlighted the role for heat

[15] IRENA (2018) Renewable Power Generation Costs in 2017, International Renewable Energy Agency
[16] DECC (2013) The Future of Heating: Meeting the challenge

networks for delivering low carbon heat. District heating can be retrofitted for existing heat customers or installed in developments as part of a site wide low or zero carbon energy solution.

5.34 The East of England resource assessment and the Brentwood Renewable Energy Study 2014 suggest that there are unlikely to be major anchor and high heat density areas in the borough suitable for retrofit-only DH networks. New development will therefore play an important role in heat network development in the borough. Strategic allocations could play a key role in establishing a decentralised energy network, offering great opportunities to create or expand the borough's decentralised energy infrastructure.

5.35 According to the Brentwood Renewable Energy Study (2014), DH is a viable low and zero carbon energy solution for new development; the viability of DH and CHP schemes are improved with increased scale, density and mix of uses. Smaller sites close to large exiting loads, on the other hand, provide opportunities for collaboration which provides cost effective, energy efficient, low carbon heat and electricity. Therefore, applicants of strategic sites should engage at an early stage with the Council, stakeholders and relevant energy companies to establish the future energy requirements and infrastructure arising from large-scale development proposals and clusters of significant new development.

5.36 The financial opportunity from DH schemes exists as there are economies of scale where the costs of providing a central heat source that also generates power, together with the associated distribution infrastructure, outweighs alternative means of complying with Part L. Where development occurs piecemeal, it is likely that individual developers for each site would choose traditional means of meeting Part L Building Regulations, which may result in a loss of opportunity.

5.37 Energy masterplanning at the large scale offers a unique opportunity to consider and plan for a robust infrastructure that will support the aspirations of a sustainable community – not only in terms of demand reduction, energy efficiency and renewable energy supply, but also in relation to water and waste management, transport and biodiversity. All these issues must be considered from the earliest stage and will have a major influence on the energy masterplan concept. Particular attention should be given to opportunities for utilizing existing decentralised and renewable or low-carbon energy supply systems and to fostering the development of new opportunities to supply proposed and existing development. Such opportunities could include co-locating potential heat customers and heat suppliers. Using the masterplanning process to map out zero-carbon and renewable energy opportunities in the area will help in identifying the potential for renewables at all scales, including community-scale schemes (TCPA, 2016, Practical Guides for Creating Successful New Communities, Guide 4: Planning for Energy and Climate Change).

5.38 An Energy Masterplan should identify:

i. major heat loads (including anchor heat loads, with particular reference to sites such as schools, hospitals and social housing);

ii. heat loads from existing buildings that can be connected to future phases of a heat network major heat supply plant;

iii. opportunities to utilise energy from waste;

iv. secondary heat sources;

v. opportunities for low temperature heat networks;

vi. land for energy centres and/or energy storage;

vii. heating and cooling network routes;

viii. opportunities for futureproofing utility infrastructure networks to minimise the impact from road works;

ix. infrastructure and land requirements for electricity and gas supplies;

x. implementation options for delivering feasible projects, considering issues of procurement, funding and risk.

Building scale technologies

5.39 Brentwood Borough has relatively high levels of domestic gas and electricity consumption, therefore building-scale technologies have the potentials to meet the borough's domestic energy demands. Building scale technologies often comprise permitted development and can be included in new development or retro-fitted to existing units. Building scale technologies with the greatest potential include rooftop solar technologies and biomass boilers in the commercial and industrial sector.

POLICY BE04: MANAGING HEAT RISK

1. All development proposals should minimise internal heat gain and the risks of overheating through design, layout, building orientation and use of appropriate materials.

2. Major development proposals should demonstrate how they will reduce the potential for overheating and reliance on air conditioning systems by:

    a. minimising internal heat generation through energy efficient design;

    b. reducing the amount of heat entering a building through orientation, shading, albedo, fenestration, insulation and the provision of green roofs and walls;

    c. managing the heat within the building through exposed internal thermal mass and high ceilings;

    d. maximising passive ventilation; and

    e. where necessary, providing mechanical ventilation and active cooling systems.

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5.40 For some, climate change and severe weather events could cause them discomfort; for others, especially children, the elderly, and those who have certain health conditions, the effects can be potentially lethal. According to the first UK Climate Change Risk Assessment (CCRA) in 2012, there are around 2,000 heat-related deaths in the UK; it projects that this number could more than double by the 2050s. Much of this increased risk is thought to be caused by exposure to high indoor temperatures. Overheating risks to health also emerged as one of the top six key risks where more action is required in the most recent UK Climate Change Risk Assessment 2017[17].

5.41 The Climate Change Act (2008) and the NPPF (2021, paragraph 153) also require planning to take a proactive approach to mitigating and adapting to the risk of overheating from rising temperatures.

5.42 Many aspects of building design can lead to increases in overheating risk, including high proportions of glazing and an increase in the air tightness of buildings. There are a number of low-energy-intensive measures that can mitigate this risk; these include but not limit to solar shading, building orientation, solar-controlled glazing, living walls and green roof. For major developments, a landscape scheme integrating multi-functional green and blue infrastructure should be developed along the built form as this can be part of a sustainable and energy efficient development.

5.43 Developers should refer to most up to date guidance and best practice examples. The Chartered Institution of Building Services Engineers (CIBSE) produces a series of guidance on assessing and mitigating overheating risk in new developments, in particular:

i. TM 59: Design Methodology for the Assessment of Overheating Risk in Homes - is relevant for domestic developments; and

ii. TM52: The Limits of Thermal Comfort: Avoiding Overheating in European Buildings - is relevant for non-domestic developments.

These can also be applied to refurbishment projects.

[17] UK Climate Change Risk Assessment, HM (2017) https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/584281/uk-climate-change-risk-assess-2017.pdf

Sustainable Drainage

POLICY BE05: SUSTAINABLE DRAINAGE

1. All developments should incorporate appropriate Sustainable Drainage Systems (SuDS) for the disposal of surface water, in order to avoid any increase in surface water flood risk or adverse impact on water quality.

2. Development within areas identified as a Critical Drainage Area (CDA) on the policies map, should optimise the use of Sustainable Drainage Systems by providing an individually designed mitigation scheme to address the site-specific issues and risk, as informed by a site specific Flood Risk Assessment. This could be provided as part of the Drainage Strategy and must address any issues highlighted in the Surface Water Management Plan, where relevant.

3. Greenfield developments, major development and all development within a Critical Drainage Area must achieve a greenfield runoff rate. Where it is demonstrated that this is not possible on brownfield developments then a runoff reduction of 50% minimum should be achieved. The technical approach should be justified in the Drainage Strategy.

4. Applicants are required to submit a surface water Drainage Strategy and a Flood Risk Assessment for all major development as well as for all development within a Critical Drainage Area. The Drainage Strategy must include a SuDs Management Plan setting out the long-term management and maintenance arrangements.

5. SuDs will be required to meet the following design criteria:

    a. the design must follow an index-based approach when managing water quality. Implementation in line with the updated CIRIA SuDS Manual[18] is required. Source control techniques such as green roofs, permeable paving and swales should be used so that rainfall runoff in events up to 5mm does not leave the site;

    b. SuDS should be sensitively designed and integrated into the Green and Blue infrastructure to create high quality public open space and landscaped public realm, in line with Strategic Policy NE02: Green and Blue Infrastructure;

    c. maximise opportunities to enhance biodiversity net-gain;

[18] CIRIA (2017) The SuDS Manual (C753). Available at: https://www.ciria.org/CIRIA/Bookshop/Free_Publications/Books/Free_CIRIA_Publications.aspx?hkey=ca8794b8-b1b3-4742-880d-6c7a27719afb

d. improve the quality of water discharges and be used in conjunction with water use efficiency measures;

e. function effectively over the lifetime of the development;

f. the preferred hierarchy of managing surface water drainage from any development is through infiltration measures, secondly attenuation and discharge to watercourses, and if these cannot be met, through discharge to surface water only sewers;

g. have regard to Essex County Council SuDS Design Guide 2020, or as amended.

6. When discharging surface water to a public sewer, developers will be required to provide evidence that capacity exists in the public sewerage network to serve their development, in line with policy requirements in BE02 Water Efficiency and Management.

7. Development proposals should be designed to include permeable surfaces wherever possible. Proposals for impermeable paving, including on small surfaces such as front gardens and driveways, will be strongly resisted unless it can be suitably demonstrated that this is not technically feasible or appropriate.

5.44 Sustainable Drainage Systems (SuDS) are the primary means by which increased surface run-off can be mitigated. They can manage run-off flow rates to reduce the impact of urbanisation on flooding, protect or enhance water quality and provide a multi-functional use of land to deliver biodiversity, landscape and public amenity aspirations. They do this by dealing with run-off and pollution as close as possible to its source and protect water resources from point pollution. SuDs allow new development in areas where existing drainage systems are close to full capacity, thereby enabling development within existing urban areas. Reference must be made to the criteria outlined in the Essex County Council SuDS Guide.

5.45 Wherever possible, Sustainable Drainage Systems techniques must be utilised to dispose of surface rainwater so that it is retained either on site or within the immediate area, reducing the existing rate of run-off. Such systems may include green roofs, rainwater attenuation measures, surface water storage areas, flow limiting devices and infiltration areas or soakaways. This approach is commonly known as the ‘surface water management train’ or ‘source-to-stream’.

5.46 SuDS must have regard to the criteria outlined in the Essex County Council SuDS Guide .

5.47 Essex County Council is the Lead Local Flood Authority. Applicants will need to prove compliance with the above drainage hierarchy and ensure sustainable drainage has been

adequately utilised, taking into account potential land contamination issues and protection of existing water quality, in line with local and national policy and guidance.

5.48 The applicability of SuDS techniques for use on potential development sites will depend upon proposed and existing land-uses influencing the volume of water required to be attenuated, catchment characteristics and the underlying site geology.

5.49 When run-off does occur, treatment within SuDS components is essential for frequent rainfall events, for example up to 1:1 year return period event, where urban contaminants are being washed off urban surfaces, for all sites.

5.50 For rainfall events greater than the 1:1 event, it is likely that the dilution will be significant and will reduce the environmental risk. It is important that the SuDS design aims to minimise the risk of re-mobilisation and washout of any pollutants already captured by the system.

5.51 Developers are encouraged to refer to the Strategic Flood Risk Assessment 2018 (which maps infiltration areas) and guidance provided by the Construction Industry Research and Information Association (CIRIA) for design criteria, technical feasibility, to ensure the future sustainability of the borough's drainage system. Essex County Council has produced a SuDS Design Guide (2015) to help steer what is expected from development to complement national requirements and prioritise local needs.

Communications Infrastructure

5.52 The Council recognises the growing importance of modern, effective telecommunications systems to serve local business and communities and their crucial role in the national and local economy.

5.53 High quality communications infrastructure including ultrafast broadband and mobile communication will be provided by working collaboratively with Essex County Council, communications operators and providers, and supporting initiatives, technologies and developments which increase and improve coverage and quality throughout the borough.

STRATEGIC POLICY BE06: COMMUNICATIONS INFRASTRUCTURE

1. The Council will support proposals for high quality communications infrastructure and superfast broadband, including community-based networks, particularly where alternative technologies need to be used in rural areas of the borough.

2. Proposals from service providers for new or the expansion of existing communications infrastructure (including telecommunications masts,

justification for the proposed development including the area of search, details of any consultation undertaken, the proposed structure and measures to minimise its visual impact.

5.56 Although the impact from telecommunications equipment on health is a source of public concern, the government has indicated that the planning system is not the place to determine health safeguards. However, the Council will nevertheless require all applicants to demonstrate their proposed installation complies with the latest national and international guidelines. This currently requires applicants to demonstrate they comply with the International Commission of Non-Ionizing Radiation Protection (ICNIRP)[19] which should take into account the cumulative impacts of all operators' equipment located on the mast/site.

POLICY BE07: CONNECTING NEW DEVELOPMENTS TO DIGITAL INFRASTRUCTURE

1. To support Brentwood's economic growth and productivity now and in the future, all development proposals should:

    a. Provide up to date communications infrastructure as an integral part of development proposals. As a minimum, all new developments must be served by the fastest available broadband connection, installed on an open access basis. This includes installation of appropriate cabling within dwellings and business units and full connection of the developed areas to the main telecommunications network;

    b. ensure that sufficient ducting space for future digital connectivity infrastructure (such as small cell antenna and ducts for cables, that support fixed and mobile connectivity and therefore underpins smart technologies) is provided wherever possible;

    c. support the effective use of the public realm, such as street furniture andother installations, to accommodate new state of the art well-designed and integrated mobile digital communication infrastructure;

2. When installing new and improving existing digital communication infrastructure in new development, proposals should:

    a. identify and plan for the telecommunications network demand and infrastructure needs from first occupation;

    b. take into account the Highway Authority's land requirements so as not to impede or add to the cost of the highway mitigation schemes where the location and route of new utility services in the vicinity of the highway network or proposed new highway network;

[19] https://www.icnirp.org/

c. ensure the scale, form and massing of the new development does not cause unavoidable interference with existing communications infrastructure in the vicinity. If so, opportunities to mitigate such impact through appropriate design modifications should be progressed including measures for resiting, re-provision or enhancement of any relevant communications infrastructure within the new development;

d. demonstrate that the siting and design of the installation would not have a detrimental impact upon the visual and residential amenity of neighbouring occupiers, the host building (where relevant), and the appearance and character of the area;

e. seek opportunities to share existing masts or sites with other providers; and

f. all digital communication infrastructure should have the capacity to respond to changes in technology requirements over the life of the development.

3. Where applicants can demonstrate, through consultation with broadband infrastructure providers, that superfast broadband connection is not practical, or economically viable:

a. the developer will ensure that broadband service is made available via an alternative technology provider, such as fixed wireless or radio broadband; and

b. ducting to all premises that can be accessed by broadband providers in the future, to enable greater access in the future. Only where this is not practicable or viable, the Council will seek developer contribution towards off-site works to enable those properties access to superfast broadband, either via fibre optic cable or wireless technology in the future to provide like capacity.

5.57 Fast, reliable digital connectivity is essential in today's economy and especially for digital technology and creative sector. The provision for digital infrastructure is important for the functioning of development and should be treated with importance.

5.58 Digital connectivity supports smart technologies in terms of the collection, analysis and sharing of data on the performance of the built and natural environment, including for example, water and energy consumption, air quality, noise and congestion. Where it is appropriate and viable to do so, development should be fitted with smart infrastructure, such as sensors, to enable better collection and monitoring of such data. As digital connectivity and the capability of these sensors improves, and their cost falls, more and better data will become available to improve monitoring of planning agreements and impact assessments.

5.59 Digital connectivity also supports smart technologies such as Artificial Intelligence (AI), wireless motion sensors and Virtual Reality (VR) which are increasingly used to assist an ageing population and people living with dementia, by reducing isolation, promoting independent living and assisting and complementing care and support.

5.60 Provision of high capacity broadband will support businesses and attract investment to Brentwood. It allows residents and businesses to access essential online services, social and commercial networks. It also has the potential to increase opportunities for home-working and remote-working, reducing the demand on travel networks at peak periods. The importance is demonstrated by recent census returns which show that the biggest change in journey to work patterns in the last 20 years has been the increase in people working from home.

5.61 The Council aspires to have ultrafast broadband or fastest available broadband at all new employment areas and all new residential developments through fibre to the premises/home (FTTP/H). Fibre to the curb, copper connections to premises and additional ducting for future provision will be considered if developers can show that FTTP/H is not viable or feasible.

5.62 It is recognised that at present, in some rural areas of the borough, fast, reliable broadband is not available as it is uneconomic or unviable to serve small numbers of properties in isolated locations. These places generally have poor access to other facilities and as such would not be expected to provide significant levels of growth. Lack of fast, reliable broadband or lack of scale to deliver broadband may be considered as unsustainable in these locations.

5.63 Where new development is proposed in rural areas, investment in superfast reliable broadband will be required, subject to viability. This means that developers should explore all the options, and evidence of this engagement should be submitted with a planning statement.

Transport and Connectivity

Sustainable Transport

5.64 Sustainable transport is a key component of sustainable development, for its many benefits go beyond helping the environment. It encourages an active lifestyle, contributes to improving air and noise quality, helps improve public health, provides safer environments for children, increases social interaction in the neighbourhoods and can save travel time by reducing congestion.

5.65 Sustainable transport refers to:

i. Transport strategies that increases accessibility/mobility while minimising traffic volume and overall parking levels, for example allocating development in highly accessible locations, or providing public transport and a cycling network (Strategic Policy BE08 Strategic Transport Infrastructure, Strategic Policy BE09 Sustainable Means of Travel

and Walkable Street, Policy BE10 Sustainable Passenger Transport, Policy BE13 Parking Standards)

ii. Means of transport which reduces the impact on the environment such as sustainable public transport, low emission vehicles, vehicle charging points and car sharing, as well as non-motorised transport, such as walking and cycling (Policy BE10 Sustainable Passenger Transport, Policy BE11 Electric and Low Emission Vehicle,).

iii. Mitigating the transport impact of development (Policy BE12 Mitigating the Transport Impacts of Development)

5.66 Many aspects of transport and travel need to be considered, including reducing the need to travel, encouraging walking and cycling to reduce dependency on car travel and to improve public health, making public transport cleaner and more accessible to all users.

5.67 It is also important that we consider car ownership and be realistic about the fact that most households in the borough will own a car. While public transport links into London are good for Brentwood town and other areas along the transport corridors, villages are more remote with less good access. Therefore, it is acknowledged that some level of car travel and parking considerations will remain important for Brentwood as we consider the future.

POLICY BE08: STRATEGIC TRANSPORT INFRASTRUCTURE

In order to support and address the cumulative impacts of planned and other incremental growth, allocated development within the Local Plan and any other development proposals shall (where appropriate) provide reasonable and proportionate contributions to required mitigation measures to strategic transport infrastructure, including:

a. circulation arrangements, public realm and multimodal integration around Brentwood, Shenfield and Ingatestone stations;

b. circulation arrangement and public realm around West Horndon station, and the creation of associated multimodal interchange through phases to support new residents and employees;

c. improvements to the highway network as deemed necessary by transport evidence or as agreed by National Highways and Essex County Council as appropriate, other statutory bodies, stakeholders and passenger transport providers; and

d. additional and/or improved pedestrian, cycling infrastructure and bus services connecting development to key destinations such as railway stations, education facilities, employment, retail and leisure.

5.68 Strategic transport infrastructure is that which is critical to the delivery of the Local Plan as such their timely provision must be in place in order to support development. Strategic transport infrastructure are assigned a priority category 1 in the Infrastructure Delivery Plan.

5.69 This policy seeks to align strategic transport infrastructure improvements with Brentwood's proposed allocations and economic growth and to contribute to health and well-being whilst preserving the environment. This would be achieved by maximising the value of Elizabeth Line, improving the capacity of the stations and road network, ensuring the main settlements and new development have convenient access to high quality and frequent public transport services which connect to the town centre, main employment centres, rail stations, ports and airports in the wider region.

5.70 Development proposed within this Plan will only be deliverable and supported if suitable transport measures and investment are led, coordinated and, where appropriate, delivered by Brentwood Borough Council and strategic partners. Development should seek to enhance transport, particularly public transport, and wider connectivity between new and existing employment areas. The Council's positive approach to planning may require it to use its compulsory purchase powers under section 226 of the Town and Country Planning Act 1990. That power gives the Council a positive tool to help bring forward necessary works to support planned growth in the borough, where strong planning justifications for the use of the power exist and statutory requirements are satisfied.

Maximising the value of railway connectivity and Elizabeth Line

5.71 Previously known as Crossrail, the new Elizabeth Line is a 118 km railway under development crossing through the heart of London, enabling access between Reading and Heathrow in the west, through central London to Shenfield and Abbey Wood in the east. The full route is expected to be fully operational by May 2023. The arrival of Elizabeth Line will provide an improved and more frequent service to Brentwood's residents and visitors thus benefiting businesses and facilitating growth. The Council will work with partners to improve the station environment at both Brentwood and Shenfield stations, specifically in terms of non-motorised users and enhanced public transport access, with improved forecourt and pedestrian crossing facilities.

5.72 It is expected that the introduction of this new railway will have both positive impacts, as a result of additional rail trips, and potentially negative impacts, with potential for increased travel by car to access the stations (Transport Assessment, PBA, 2021). There will be a need to monitor and review the situation once the services are operational. Any impacts identified should be addressed through the implementation and promotion of sustainable transport measures, for example the provision for non-car modes and the implementation of parking restrictions and pedestrian wayfinding system.

5.73 The proximity of new housing developments close to railway stations can provide the opportunity to improve cycling and walking infrastructure for shorter distance trips, to access rail services. Improving links to Brentwood and Shenfield stations will benefit both existing population as well as the new Local Plan developments within easy access of the stations. Proposed allocations and future development near Brentwood and Shenfield stations are required to demonstrate that the planning and design for movement connect well to the surrounding walking, cycling and public transport links to the station, and give priority to pedestrians and cyclists.

Improvements to the train stations

5.74 In order to support a transit-oriented growth strategy and support projected travel demands from future development as well as provide the opportunity for non-motorist travel, it is important to achieve integration of transport modes. This should support regional trips by public transport and reduce pressure on the road network at the critical peak period. The Council will encourage improvements to the public realm surrounding existing train stations and look to improve access, interchange facilities, installation of wayfinding signs and introduce parking control where appropriate. Park and Ride/ Cycle/ Stride schemes to improve access to the stations will be considered subject to a future detailed feasibility study prepared by the Council.

5.75 The railway stations in the borough have potentials to assist in providing additional benefits to sustainable travel. New development should seek to provide new or improved links and access to the station. Where appropriate contributions will therefore be sought from nearby developments:

a. Brentwood station: located on the Great Eastern Mainline, Brentwood station is served by TfL rail services operating between Shenfield and London Liverpool Street and Abellio Greater Anglia services operating between Southend Victoria and London. The emphasis on accessibility to both Shenfield and Brentwood stations will be on sustainable travel as a means of access, with improvements to pedestrian and cycle infrastructure and bus services, linking both new and existing developments near the stations, and on introducing new parking controls where needed to discourage parking around the stations, therefore reducing car travel.

b. Shenfield station: also located on the Great Eastern Mainline, Shenfield station is served by TfL and Greater Anglia rail services to Stratford and London Liverpool Street station and Greater Anglia services to Southend Victoria, Colchester Town, Ipswich, Braintree and Clacton-on-Sea, as well as some services to Norwich. From May 2023 it will be the terminus of the Elizabeth Line which will run from Reading and Heathrow Airport in the west through London. During 2014 JMP Associates undertook a station parking study for Shenfield prior to the development of the Elizabeth line. From the Rail User Survey carried out as part of the study, the study demonstrates that with the introduction of better bus services to the station, a reduction in the number of people who park at Shenfield who live in the vicinity as well as from any future Local Plan developments in the region could be witnessed, reducing overall traffic on the local network. As mentioned above, enhancement to Shenfield station would centre around improving pedestrian and cycle infrastructure and bus services and where necessary, parking controls. Where appropriate contributions will therefore be sought from nearby developments.

c. West Horndon station: West Horndon station is on the London, Tilbury and Southend Railway line and is served by C2C with two trains per hour to London Fenchurch Street and Shoeburyness. It is currently identified that parking capacity is fully utilised most weekdays for commuters into London from the A127/A13 corridors. The location of a number of the Local Plan development sites will mean that West Horndon Station will play an important role in future transport provision. The Transport Assessment (PBA, 2021) proposed that over the lifetime of this Plan, the improvements to the station, bus and cycle infrastructure and interchange facilities are phased to create a

new integrated transport hub. An increased capacity on the existing train service will be central to the new cycling, walking and bus movements of the new residents and employees. To ensure the new development will provide convenient access to the future interchange at West Horndon, the Transport Assessment (PBA, 2021) proposed that interim bus service(s) connecting the developments sites to the interchange should be built into the development agreements to be funded. This should allow time for enough customer demand for a commercial operator to take on the routes. This is particularly the case with Dunton Hills where new opportunities will exist.

d. Ingatestone station: Ingatestone railway station is on the Great Eastern Main Line, currently served by Greater Anglia. New development should seek to provide new or improve links and access to Ingatestone station.

Delivering improvements to the highway infrastructure capacity

5.76 As the backbone of our transport system, roads keep the population connected and the economy flowing. In light of planned development, it is important to grasp the opportunity to transform our roads and the experience of driving on them, whilst also addressing strategic imperatives such as economic growth and climate change.

5.77 It should be noted, however, that providing additional highway capacity will only have a short-term impact and may be quickly taken up by suppressed traffic. Therefore, investment in providing alternatives is important. Non-highway measures[20] such as sustainable transport measures and behavioural change that go beyond physical improvements could assist in alleviating pressures on the highway network. These measures are embedded in other policies in this Plan.

5.78 The Council is working with Associations of South Essex Local Authorities (ASELA) to prepare a statutory Joint Strategic Plan (JSP) which will identify ways to transform transport connectivity, among other required work to deliver growth. This work will inform public transport services needed to follow suit if the wider development needs of south east England are to be sustainably provided.

5.79 In Brentwood, the strategic highway infrastructure includes:

i. the A12 which connects the market town and major settlements in central Brentwood Borough to London and the wider region, providing access to services, jobs and recreation;

ii. the A127 which travels through the south of Brentwood Borough and connects it to London, Basildon, Rochford, Southend, Southend Airport and surrounding employment areas. The A127 corridor is a vitally important primary route for the south of Essex;

iii. the M25 in the west which connects Brentwood Borough to London and Stansted Airport;

iv. and associated key junctions.

5.80 The Transport Assessment (PBA, 2021) assessed how the highway network within the borough copes at a strategic level as a result of the new Local Plan Development and

[20] More details on non-highway measures can be found in the Transport Assessment (PBA, 2021).

committed developments within adjacent local authorities that would likely have an impact on Brentwood Borough highways. This work identified a number of junctions that may require mitigation as well as a number of non-highway[21] related mitigation measures. The results of the modelling and junction assessments highlight the need to continue to monitor throughout the Local Plan period to identify any additional impact from other schemes on the highway network in Brentwood, such as the Lower Thames Crossing project, the A127 and any highway effect from the opening of the Elizabeth Line. Since the level of growth planned along the A127 and A12 are reliant on new and improved strategic infrastructure of regional and national importance (including the Lower Thames Crossing), the Council will continue to work with the highway authority (Essex County Council), statutory bodies (including National Highways), the Essex Heart and Haven Strategic Transport Boards[22] other partners (including the ASELA and the A127 Task Force), and developers to secure the mitigation measures to the highways and related junctions to deliver growth. The impact of individual access junctions for individual sites would be expected to be undertaken by promoters of individual sites.

5.81 It is recognised that existing mitigation undertaken by third parties is being considered and will assist in improving capacity of the highway network in the borough. These include:

i. A127/A128: several studies, led by Essex County Council, have been progressing on the A127 corridor between Southend-on-Sea in the East to the M25 in the west, the final section of this road is within Brentwood Borough. Within the A127 Corridor for Growth study[23] there are individual pieces of work currently at various stages of planning and development, many of which are focussed on interchange capacity and/or safety improvements. Continued joint working with ECC and other neighbouring authorities will be important, so any outcomes from this study can feed through to the South Brentwood Growth Corridor Masterplan;

ii. M25 Junction 28: National Highways are currently undertaking work to develop improvements at M25 Junction 28[24]. Further engagement will be required with National Highways on this scheme;

iii. M25 Junction 29: mitigation measures at this junction are being considered with the aim to improve the junction's operation with the introduction of the Brentwood Enterprise Park. Proposals for the Lower Thames Crossing route that impact M25 Junction 29 will need further consideration as part of these overall aims.

iv. The A127 Task Force has representation from all South Essex authorities including BBC. This Task Force will oversee much of the public affairs interaction between the Councils and Government to ensure that the route is seen as strategic and as a

[21]: Non-highway measures within this Plan include sustainable transport measures and behavioural change that go beyond physical improvements to assist in reducing the impact of developments on the overall road network. More details on non-highway measures can be found in the Transport Assessment (PBA, 2021), and under Policy BE16 Mitigating the Transport Impacts of Development.

[22]: The Heart and Haven Strategic Transport Boards was established by ECC with the primary roles to determine infrastructure priorities, encourage partnership working on transport and growth issues, and fulfil the duty to co-operate on transport planning and delivery in the context of Local and National Plans.

[23] https://www.essexhighways.org/uploads/docs/nevendon-a127-corridor-for-growth-paper2.pdf

[24] https://highwaysengland.co.uk/projects/m25-junction-28-improvements/

potential candidate for re-trunking in order to bring about the long-term improvement required for an area of South Essex with over 600,000 residents. The planning and design work for any improvement of this scale will of necessity require a short-term, medium and long term phasing. Whilst the A127 is the main focus ECC would be looking to work collaboratively with BBC and other councils in the area.

5.82 Brentwood high schools and some primary schools are very attractive not only to residents within the borough, but also for many children from the surrounding Essex and London authorities. The five high schools located in the central area of Brentwood Borough generate a significant volume of parents dropping off and picking up their children; therefore, the impact of an increasing population of children and school related traffic should be taken into consideration as a part of mitigation measures to the highway network. Development in proximity to schools and education facilities should be designed with priority given to safety and convenience of pupils' walking, cycling to school, as well as other measures that can address the impacts of school run traffic, in line with ECC's Developers Guide to Infrastructure Contributions.

5.83 For Central Brentwood Growth Corridor, the Council is considering a sustainable transport strategy to help address traffic and associated air quality issues, based on non-highway measures identified in the Transport Assessment (PBA, 2021), options including but not limited to School Clear Zones and Low Emission Zone:

i. The School Clear Zones concepts seeks to remove school related trips from the town centre and to encourage greater use of non-car modes for such trips. In these zones, vehicles will be restricted from stopping, parking for drop off during AM/PM peak hour. The pupils will be encouraged to walk or cycle from drop off zones to relieve pressure on the highway network. The measure has the added benefit of encouraging more physical activity for children their parents, and all other users to walk or cycle from a reasonable distance. In addition, it would help improve air quality and address illegal car parking affecting residents living close to the schools. The Council intends to continue exploring the potential and deliverability of this concept;

ii. A Low Emission Zone is a defined area where access by polluting vehicles is restricted or deterred with the aim of improving the air quality. This may favour vehicles such as alternative fuel vehicles, electric vehicles, or zero-emission vehicles. Currently feasibility analysis is being considered for Low Emission Zone as part of a long-term assessment (Brentwood IDP).

iii. Other measures and behavioural change measures are detailed under Policy BE16 Mitigating the Transport Impacts of Development, and can also be found in the Transport Assessment (2021).

5.84 For South Brentwood Growth Corridor, there is a recognition that provision of sustainable transport in this area is poor. To mitigate the impact of future development on the highway network in the South, the Council will work proactively with developers, key stakeholders and service providers to implement new area-specific sustainable transport measures, which would seek to mitigate transport impacts of sites on the highway infrastructure, improve bus links across the area and improve capacity of West Horndon station. The measures would also seek to reduce the impacts of northward movements into central Brentwood. Where

northward movement happens, they should be undertaken by electric car club vehicles, electric bikes or bus.

5.85 It is considered that the preferred route of the Lower Thames Crossing, developed by National Highways, will have impacts on opportunities as well as cumulative impact on the local and strategic transport network. The Lower Thames Crossing is a proposed new road crossing of the River Thames which will connect the counties of Essex (north) and Kent (south). The planned route is expected to run from the M25 near North Ockendon, cross the A13 at Orsett before crossing under the Thames east of Tilbury and Gravesend. A new link road will then take traffic to the A2 near Shorne, close to where the route becomes the M2. At this stage, information on the impact of this scheme on the highway network in Brentwood is limited. The impact of the scheme on travel in the borough will need to be reviewed as the scheme progresses, in particular, if delivery of the scheme comes forward during the Plan period.

5.86 The Lower Thames Crossing Statutory Consultation commenced on October 10th 2018[25], the forecast reporting released as part of the consultation evidence does not provide detailed analysis of flow changes on the A128 and A127; however, the non-technical summary identifies a reduction in traffic on these links, demonstrating that this is likely to have a beneficial effect in the operation at these junctions. Currently, National Highwaysanticipate that, subject to funding and planning consent, the scheme would open in 2027, within the Plan period. However, there is still uncertainty regarding the timescales for the delivery of this scheme (Transport Assessment 2021, PBA).

POLICY BE09: SUSTAINABLE MEANS OF TRAVEL AND WALKABLE STREETS

1. Sustainable modes of transport should be prioritised in new developments to promote accessibility and integration with the wider community and existing networks. Priority should be given to cycle and pedestrian movements and access to public transport.

2. Development proposals should provide the following sustainable measures as appropriate:

    a. the provision of pedestrian, cycle, public transport and where appropriate, bridleway connections within development sites and to the wider area, including key destinations;

    b. the creation of safe, secure, well connected and attractive layouts which minimise the conflicts between traffic, cyclists and pedestrians, and allow good accessibility for passenger transport within sites and between sites and adjacent areas, and where appropriate improve

[25] https://highwaysengland.citizenspace.com/ltc/consultation/

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areas where passenger transport, pedestrian or cycle movement is difficult or dangerous;

c. the provision of community transport measures promoting car pools, car sharing, voluntary community buses, cycle schemes;

d. safeguarding existing and proposed routes for walking, cycling, and public transport, from development that would prejudice their continued use and/or development; and

e. any development requiring a new road or road access, walking and cycling facilities and public transport, will be required to have regard to the adopted Essex County Council's Development Management Policies or successor documents, in order to assess the impact of development in terms of highway safety and capacity for both access to the proposed development and the wider highway network.

5.87 Securing public transport improvements and better provision for walking and cycling would reduce pollution, make it safer and easier for people to travel to jobs and services and lead to better health, less congestion and more pleasant streets.

5.88 This policy seeks to ensure that development proposals will be designed to promote sustainable travel choices by improving choices and making development easily accessible by different modes of transport, especially walking, cycling and public transport. An important policy tool to achieve this is the modal hierarchy. All development should follow the modal hierarchy by providing access for all of the following (most preferable first, least preferable last):

a. walking and providing access for all, including people with mobility impairment;

b. cycling;

c. public transport;

d. powered two wheelers;

e. commercial vehicles and taxis;

f. car sharing;

g. electric and low emission vehicles;

h. private cars.

5.89 Barriers to walking should be addressed in development proposals, to ensure that walking is promoted and that street conditions, especially safety/security and accessibility for disabled people, are enhanced. Walking networks and facilities in and around all new developments should be direct, safe, attractive, accessible and enjoyable.

5.90 Cycling is a space efficient mode compared to cars so making streets attractive for cycling can bring benefits to all road users while also improving the experience of living, working and getting around.

5.91 Cycling should be promoted through the provision of improved cycle parking and other facilities and new cycle routes as part of highway infrastructure improvements/traffic management measures. When providing for cycle parking, cycle parking areas should be secure and covered, and allow easy access for occupiers and their visitors, and provide facilities for all, including disabled cyclists. This could include identifying and reserving specific spaces which provide step-free cycle parking and opportunities for people using adapted cycles, as well as providing facilities for other non-standard cycles such as tricycles, cargo bicycles and bicycles with trailers. Space for folding bicycles should be provided as well as space for conventional bikes to cater for rail commuters. However, space for folding bicycles is not an acceptable alternative to conventional cycle parking as these are less popular in some areas, tend to be less affordable and present difficulties for some users. Surface level parking is preferable to stacked parking which may be difficult for some people to use. Visitor parking should be quickly and easily accessible to front entrances of buildings and not require cyclists to visit parts of a site restricted to occupiers only.

5.92 The Council strongly supports contributions to and provision for car clubs at new developments to help reduce the need for private car parking.

5.93 The Council will work with partners and stakeholders to facilitate and promote sustainable transport links from new development to key destinations and the wider network. This include new or improved infrastructure, services and promotion to support walking, cycling and public transport, and provision of charging points for electric vehicles. The Sustainable Modes of Travel Strategy (SMOTS) produced by Essex County Council provides a framework for the Council and its partners to co-ordinate the provision of services and infrastructure to achieve its objectives.

5.94 The design of streets, parking areas, and other transport elements should reflect current national guidance, including the National Design Guide and the National Model Design Code. The Essex County Council's Transportation Development Management Policies provide further detail on requirements relating to accessibility and access, including Transport Assessment and Statement thresholds for each land use category.

POLICY BE11: ELECTRIC AND LOW EMISSION VEHICLES

All development proposals should wherever possible maximise the opportunity of occupiers and visitors to use electric and low emission vehicles, and maximise the provision of electric vehicle charging / plug-in points and/or the space and infrastructure required to provide them in the future.

5.100 According to the Brentwood Renewable Energy Study[26], transport emissions in Brentwood are higher than the national average, due to increased car ownership and access to vehicles. Electric or other low emission vehicles will help reduce pollution, climate change impacts, oil use from the transport sector while improving energy independence, air and noise quality, thus well-being of Brentwood residents.

5.101 The development of a robust infrastructure network is widely considered a key requirement for a large-scale transition to electromobility. Research[27] has found that the availability of public charging is generally linked with electric vehicle uptake as providing charging stations can help meet charging demand and increase electric vehicle consumer confidence. National Highways has plans to install charging infrastructure every 20 miles along the major road network as part of its Road Investment Strategy[28].

5.102 The Council may seek infrastructure for electric and low emission vehicle where it is appropriate and viable. This could be in the form of public charging infrastructure or make-ready infrastructure for charging stations. The design and operation of such infrastructure should follow best practice so that their operation would not undermine the quality of public realm nor refract from the shift towards active travel.

5.103 In addition, the provision of private charging infrastructure at home and at workplace will be encouraged:

i. Home charging stations could help to make electric vehicles more accessible. In multi-unit dwellings, where residents frequently do not have dedicated parking spots, installation of charging infrastructure in shared parking facilities or public curbside charging stations could be sought. The UK Government's Office for Low Emission Vehicles currently offers incentive programs towards the up-front cost of each electric vehicle charge point purchased and installed to defray the added costs of charging infrastructure at home[29].

[26] University of Exeter (2014) Brentwood Renewable Energy Study.
[27] Hall D., Lutsy N (2017) Emerging Best Practices for Electric Vehicle Charging Infrastructure, the International Council on Clean Transportation. Available at: https://www.theicct.org/sites/default/files/publications/EV-charging-best-practices_ICCT-white-paper_04102017_vF.pdf
[28] Jones A. (2015) Off Road Trials for 'Electric Highways' Technology, Highways England
[29] Office for Low Emission Vehicles (OLEV) (2016). Electric Vehicle Homecharge Scheme Guidance for Customers: Version 2.1. UK Department for Transportation. Available at: https://www.gov.uk/government/publications/electric-vehicle-homecharge-scheme-guidance-for-customers-version-22

ii. Workplace charging can serve as the primary charging opportunity for drivers without a dedicated home charge point, allowing increased flexibility for drivers who commute with their electric vehicle. Since cars charging at a workplace tend to be plugged in for many hours during the middle of the day, it is an ideal setting for smart charging programs and could further the integration between electric vehicles and daytime renewable energy, especially solar. Pilots projects in the UK[30] and elsewhere[31] have shown that people are much more likely to switch to electric vehicles if there is access to charging infrastructure at their workplace. The UK Government's Office for Low Emission Vehicles offers financial support[32] towards the cost of installing EV charging to encourage organisations to install electric vehicle charging facilities at their workplace.

POLICY BE12: MITIGATING THE TRANSPORT IMPACTS OF DEVELOPMENT

1. Developments must not have an unacceptable impact on the transport network in terms of highway safety, capacity and congestion.

2. New development proposals will be required to be supported by:

    a. Travel Plans, Transport Assessments and/or Statements in accordance with the thresholds and detailed requirements for each land use category as set out in the Essex County Council's Development Management Policies or its successors; and engage in an appropriate and proportionate assessment process with National Highways where development has a likelihood to have a material impact on the Strategic Road Network which is not otherwise catered for by programmed works or improvements;

    b. where necessary, reasonable and proportionate financial contributions and/or take reasonable measures to:

        i. mitigate the cumulative transport impact of the development to an acceptable degree, including relevant highways measures identified in the IDP Part B; and

        ii. accommodate the use of sustainable modes of transport including borough-wide sustainable transport measures identified in the IDP Part B, investment in infrastructure, services, Low Emission Zone,

[30] https://www.businessgreen.com/bg/news/3007028/could-workplace-charge-points-trigger-electric-vehicle-demand
[31] Olexsak, S. (2014) Survey Says: Workplace Charging Is Growing in Popularity and Impact, U.S. Department of Energy. Available at: https://www.energy.gov/eere/articles/survey-says-workplace-charging-growing-popularity-and-impact
[32] Office for Low Emission Vehicles (OLEV) (2016) Workplace Charging Scheme Guidance for Applicants, Installers and Manufacturers, UK Department for Transportation. Available at: https://www.gov.uk/government/publications/workplace-charging-scheme-guidance-for-applicants-installers-and-manufacturers

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or measures to promote behavioural change (including enforcement).

5.104 Development resulting in an unacceptable impact on highway safety, or significant and harmful residual cumulative impacts on the road network will be prevented or refused on highways grounds, unless any impact will be effectively mitigated to an acceptable degree, in line with the NPPF.

5.105 Traffic congestion and road capacity remain key issues on the borough's transport network and the need to mitigate their impacts and to promote modal shift remains imperative, especially as growth in and around Brentwood increases.

5.106 Joint working has been undertaken with National Highways, Essex County Council (highways authority), developers and all relevant partners to identify necessary mitigations at key junctions, to addressthe cumulative impact of growth within the borough over the Plan period. In addition to strategic transport infrastructure, a number of highways junction improvements will need to be made to facilitate new growth, these are assigned a priority category 2 in the Infrastructure Delivery Plan.

5.107 As noted earlier in this chapter, providing physical improvements to the highway will only have a short-term impact therefore it is important to invest in long term alternatives. The Council will work with developers, highways authority and service providers to consider potential sustainable transport measures that could assist in reducing the impact of developments on the overall road network. The Transport Assessment (PBA, 2021) identifies a sustainable transport measures package that could be implemented in Brentwood Borough. These are listed in the IDP with priority category 3 which may be revised from time to time.

5.108 Applicants are expected to consult with the Highways Authority on transport matters and adhere to Essex County Council's development management policy requirements (or equivalent) in respect of Travel Plans, Residential Travel information Packs and other highways considerations. Please refer to the Essex County Council Highways Authority Development Management Policies.

Managing Parking

5.109 The Council will continue to promote lower levels of private car parking to help achieve modal shift, particularly for non-residential developments where more sustainable transport alternatives such as walking, cycling and public transport exist. This will be particularly important in the Town Centre, where the transport strategy is to increase access without an increase in overall parking levels.

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5.110 Car parking standards are an important means of managing traffic levels in and around a development, especially when combined with measures to increase access to transport alternatives to the private car.

POLICY BE13: PARKING STANDARDS

1. Development proposals must take account of the Essex Parking Standards – Design and Good Practice (2009), or as subsequently amended. The decision-maker will have regard to these standards when determining planning applications.

2. Proposals which make provision below these standards should be supported by evidence detailing the local circumstances that justify deviation from the standard.

5.111 Developers should account for the following when proposing the level of car parking for a site:

a. the location of the development, in terms of whether the site has convenient walkability and cyclability to the Town Centre, District Shopping Centres, major employment centres, and whether or not it has high public transport accessibility;

b. the type of development (fringe site, infill site, etc.) - infill sites are much more likely to be located in areas with existing travel patterns, behaviours and existing controls, and may be less flexible;

c. the type of residence (houses, flats, etc.) - houses tend to have higher car ownership than flats, even if they have the same number of habitable rooms;

d. local car ownership levels;

e. for developments requiring a Transport Assessment, it should be demonstrated that the level of parking proposed is consistent with the recommendations of this Transport Assessment;

f. the need to ensure an adequate provision of spaces for charging plug-in and other ultra-low emission vehicles. Electric vehicle charging points or the infrastructure to ensure their future provision should be provided within a development where reasonable and proportionate; and

g. adequate provision should be made for efficient deliveries and servicing.

5.112 Brentwood Borough Council adopted the Essex Parking Standards– Design and Good Practice (2009) as a Supplementary Planning Document (SPD) in 2011 and will expect these standards to apply until such time as they are revoked or superseded by other standards. This document sets out a range of standards to be applied depending on the proposed use of new development, such as minimum parking for residential development to address issues of on-street parking and maximum standards for parking in non-residential developments in order to encourage more sustainable transport methods. This document is subject to revision by Essex County Council in light of changes made to the NPPF (July 2021).

5.113 Parking associated with offices has the potential to generate car travel in the morning and evening peaks when streets are the most congested. This makes bus travel less reliable and active travel less attractive and road network more congested in some parts of the borough. Office parking also has the potential to induce car dependence even where alternatives to the car exist. Census 2011 origin and destination statistics indicate that workers commuting to Brentwood from the surrounding local authorities mainly commute by car. Reduced office parking provision where alternative choices are convenient and available can facilitate higher-density development and support the creation of mixed and vibrant places that are designed for people rather than vehicles. Applicants should ensure that the use of non-car modes are provided for where appropriate.

5.114 It is important that local retail and leisure sector businesses are provided with suitable facilities to continue to thrive. Current parking provision in Brentwood Town Centre, District Shopping Centres and Local Centres often have negative visual impacts yet does not always meet parking space demands of shoppers and visitors. The Council seeks to improve the quality of parking so that it is convenient, safe and secure, alongside measures to promote accessibility for pedestrians and cyclists.

5.115 The shared parking provision in the Town Centre and District Shopping Centres is encouraged to allow visitors, shoppers and commuters to share parking facilities at different times of the day and week and to relieve the current high parking demands in these areas.

5.116 Free commuter parking could contribute to congestion and pollution, it also undermines public transport, including park-and-ride and rural bus services. Reducing free commuter parking will therefore reduce congestion and pollution and create demand for public transport. The net effect will be to start a virtuous circle of more convenient and reliable bus services attracting more passengers, creating demand for an expansion in services.

5.117 The quantum of any parking provision, as well as its design and implementation, should have regard to the need to promote active modes and public transport use. The operation of car and cycle parking and the associated public realm should be designed and managed in a way that it would not have negative transport, visual and safety impacts on the surrounding areas, and that under-utilised parking space is converted to other uses such as additional cycle parking, amenity space or green and blue infrastructure. Parking provision should be flexible for different users and adaptable to future re-purposing in the context of changing requirements, including technological change. Applicants should refer to best practice and guidance on the design, layout, landscaping and lighting of parking as set out in the Essex Design Guide, Brentwood Town Centre Design Guide and British Parking Association.

5.118 While the aim will be to offer a choice of transport, reducing dependency on the car will reduce congestion and pollution and improve resilience in the face of future fuel shortages or price rises. The government's Active Travel Strategy (Department of Health and Department for Transport, 2010) aims to get more people walking and cycling in recognition of the many benefits these bring. As the Strategy notes, walking or cycling can be quicker and cheaper than driving or taking public transport for many short trips and are an easy way to become more physically active thereby improving health and well-being.

5.119 The dominance of vehicles on streets is a significant barrier to walking and cycling and reduces the appeal of streets as public places. When properly implemented in appropriate locations, car-limited development could have significant benefits including:

a. accommodating more dwellings on a given site, without overdeveloping;

b. leaving more space for landscaping and green space;

c. safer streets for children's play, and more social interaction;

d. reduced car dependency, while supporting walking, cycling, public transport and local car clubs;

e. less traffic congestion and pollution associated with the new development.

Larger car-limited developments will be encouraged to incorporate a car club, which can be an attractive alternative to private car ownership and boost the attractiveness of car-limited housing.

Design and Place-making

Good Design

5.120 The Council attaches great importance to high quality and inclusive design for all development, irrespective of size - including individual buildings, public and private spaces and wider area development schemes.

5.121 Good design is a key aspect of sustainable development and is intrinsic to good planning. The form, layout and character of buildings and public spaces contribute greatly to creating quality of life, improving health and well-being, making effective use of land, and facilitating activities and services.

5.122 The term 'high quality design' is frequently used yet is frequently misunderstood as architectural styles. Although visual appearance and the architecture of individual buildings are very important factors, high quality and inclusive design go beyond aesthetic considerations and address the connections between people and places and the coherent integration of new development into the natural, built and historic environment.

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5.123 The Essex Design Guide 2018 is a useful starting point for a development and provides guidance regarding amenity standards, layouts and case studies. The Essex Design Guide contains five cross cutting themes (ageing population, digital & smart technologies, health & wellbeing, active design, garden communities). For developments within or in the vicinity of Brentwood Town centre, applicants should take into account the Brentwood Town Centre Design Plan and Design Guide SPD . The Design Plan sets out how future development opportunities can collectively enhance Brentwood Town Centre, whilst the Design Guide SPD provide specific design guidance for development proposals in the area. Proposals should also take into account the most up to date design guidance, including Manual for Streets, Building for a Healthy Life, and Secured by Design.

STRATEGIC POLICY BE14: CREATING SUCCESSFUL PLACES

1. Proposals will be required to meet high design standards and deliver safe, inclusive, attractive and accessible places. Proposals should:

    a. provide a comprehensive design approach that delivers a high quality, safe, attractive, inclusive, durable and healthy places in which to live and work;

    b. make efficient use of land and infrastructure;

    c. deliver sustainable buildings, places and spaces that can adapt to changing social technological, economic, environmental and climate conditions;

    d. create permeable, accessible and multifunctional streets and places that promotes active lifestyles;

    e. respond positively and sympathetically to their context and build upon existing strengths and characteristics, and where appropriate, retain or enhance existing features which make a positive contribution to the character, appearance or significance of the local area (including natural and heritage assets);

    f. integrate and enhance the natural environment by the inclusion of features which will endure for the life of the development, such as planting to enhance biodiversity, the provision of green roofs, green walls and nature based sustainable drainage;

    g. where applicable, ensure that new streets are tree-lined and opportunities are taken to incorporate trees elsewhere in developments;

h. employ the use of high-quality street furniture, boundary treatments, lighting, signage, high quality materials and finishes to help create a durable development with local distinctiveness;

i. avoid unacceptable overlooking or loss of privacy;

j. safeguard the living conditions of future occupants of the development and adjacent residents;

k. sensitively integrate parking places and functional needs for storage, refuse and recycling collection points;

l. mitigate the impact of air, noise, vibration and light pollution from internal and external sources, especially in intrinsically dark landscapes and residential areas.

2. Proposals for major development should be supported by an area specific masterplan. Where appropriate, the Council will consider the use of a complementary design guide/code, to help guide the necessary design coherence across the entire development site. Design proposals will be expected to:

   a. demonstrate early, proactive, inclusive and effective engagement with the community and other relevant partners;

   b. have regard to Supplementary Planning Documents and Guidance published by the Council, Essex County Council and other relevant bodies;

   c. address feedback from the Council through its Pre-application Advice Service and where appropriate, feedback from an independent Design Review Panel.

3. Development proposals should be supported by a statement setting out the sustainable long-term governance and stewardship arrangements for the maintenance of supporting infrastructure including community assets, and open spaces; the statement should be proportionate to the scale of the scheme and quantum of infrastructure being delivered.

5.124 Achieving well-designed places is fundamental to creating distinctive and sustainable communities. It also ensures the development will function well over the lifetime of the development, ensuring that the design of the buildings and places have taken a proactive approach to mitigating and adapting to climate change. All proposals must clearly demonstrate that a comprehensive design approach has been used to inform the development and that all issues within this policy are positively addressed through the Design and Access /Planning Statements that accompany applications. Additionally,

sustainable development must also factor in how supporting infrastructure will be maintained throughout the life-time of the development. The design should therefore, factor in the lifespan of materials being used, and provide details for how these assets will be maintained over time, such as stewardship arrangements, where necessary.

5.125 The Council will require design to be addressed through early engagement in the pre-application process on major and strategic developments and in connection with all heritage sites. Where appropriate, the Council will require the use of masterplans and design codes to clearly set out the design rationale of the development site. Applicants should work collaboratively with those affected by their proposals to evolve designs that take account of the views of the community and ensure proposals have responded positively to local knowledge and context of the site. The NPPF is clear that applicants will be expected to work closely with those directly affected by their proposals to evolve designs that take account of the views of the community. Therefore, early discussion with the Council and the local community about the design of emerging schemes is important for clarifying expectations and reconciling local and commercial interests. Applicants that can demonstrate early, proactive, inclusive and effective engagement with the community will be looked on more favourably than those that cannot. Design codes will usually be prepared between outline and reserved matters stage on larger sites, especially those whose development will be spread over long periods. Where a site involves more than one developer, a collaborative masterplanning approach is expected to ensure the coherent application of design principles across the whole development site. The level of prescription will vary according to the nature of the site and the development proposed. The Council may, at its discretion, appoint an independent Quality Design Review Panel to review the detailed design proposals, to help provide additional rigour to the design-thinking process, thereby ensuring the longer-term sustainable success of the development.

Local Character and Context

5.126 An important part of making successful places is to ensure that new buildings are attractive, appropriate in their setting and fit for purpose. Their massing, scale and layout should enhance, activate and appropriately frame the public realm, complement the existing streetscape and surrounding area.

5.127 Where development is in the vicinity of any of Brentwood's distinctive natural, cultural or historic assets, delivering high quality design that complements the asset will be essential. These natural and historic features are of high value and need to be protected and enhanced by the quality of development. Proposals that show a thorough understanding of the context of the site and demonstrate how the design proposal is sympathetic to its context, reinforcing local distinctiveness and sense of place are more likely to be successful.

5.128 The Design and Access Statements should clearly show an analysis of the site context, indicating the opportunities and constraints, and justify the principles that have informed the design rationale.

5.129 Existing landscape features on site such as trees, ponds and built-forms of value could also be integrated in the layout to establish a sense of place and/or a sense of legibility. The incorporation of existing landscape features is particularly important to people with dementia, as familiar landmarks can serve as visual cues to aid in wayfinding.

5.136 The lighting of the public realm needs careful consideration to ensure it is appropriate to address safety and security issues and make night-time activity areas and access routes welcoming and safe, while also minimising light pollution.

5.137 Trees that line new streets are considered part of the GBI of the developments and as such proposals should provide appropriate long-term maintenance of newly-planted trees throughout the life of the development, in line with Strategic Policy NE02 Green and Blue Infrastructure.

POLICY BE15: PLANNING FOR INCLUSIVE COMMUNITIES

To plan for and build inclusive environment that supports our residents and communities, the Council will require new development proposals to:

a. provide access to good quality community spaces, services and amenities and infrastructure that accommodate, encourage and strengthen communities and social interaction for all users;

b. create places that foster a sense of belonging and community, where individuals and families can develop and thrive;

c. ensure that streets and public spaces are planned for everyone to move around and spend time in comfort and safety, are convenient and welcoming with no barriers to the disabled or impaired, providing independent access without additional undue effort, separation or special treatment;

d. ensure buildings and places are designed in a way that everyone regardless of their ability, age, income, ethnicity, gender, faith, sexual orientation can use confidently, independently, with dignity and without engendering a sense of separation or segregation; and

e. ensure that new buildings and spaces are designed to reinforce inclusivity of neighbourhoods and are resilient and adaptable to changing community requirements.

5.138 A key aspect of design that should be integral in all development proposals is its role in creating a safe and accessible environment. Inclusive and safe design principles should therefore be integral to the design and layout of the scheme, ensuring that people of all ages and abilities are able to benefit from high quality, accessible, safe and secure environments. This can be achieved by good natural surveillance, accessible and legible walkways, appropriate lighting, and active frontages. The Council strongly encourage the use of ‘Secured by Design’ principles to help reduce crime and improve perceptions of safety.

5.139 Enabling everyone to have safe access to places regardless of their age, ability, ethnicity, gender, faith, economic circumstance will create more inclusive communities, and improve the quality of life for people with a range of health conditions and older people. The Essex Design Guide 2018 provides guidance on residential development which is flexible and adaptable throughout its lifetime.

Heritage

5.140 Brentwood Borough is rich in heritage assets - built, landscape and cultural. Brentwood's organic growth is recognisable by the historic settlement patterns for its villages and hamlets, these are largely sited on routes to and from London and East Anglia and often interspersed by high quality green infrastructure.

5.141 Brentwood's landscapes and villages are well documented by the Historic Environment Records[33], its places, green areas and distinctive characteristics are often joined by historic thoroughfares which have grown over centuries into main routes following the urban expansion in the town at the end of the 19th century.

5.142 The Council positively encourages the enhancement and understanding of the significance of heritage assets and apportions great weight to the protection of the heritage assets in any decision-making process for future development.

Heritage Assets

5.143 In Brentwood Borough, there are more than 500 entries on the statutory list of buildings of architectural or historic interest[34], 12 scheduled monuments and 2 Grade II* registered parks and gardens. In addition, the borough contains 13 designated Conservation Areas.

5.144 Understanding the significance of heritage assets whether of national designation or local significance is fundamental to their care, protection and long-term conservation. The term 'heritage assets' refers to those buildings, places or areas of national importance, registered on the Statutory list, but also includes those buildings, places or areas that are of local significance, these are referred to as non-designated heritage assets.

5.145 Designation affords a building, site or area of special interest and value which is protected under law or policy.

5.146 Non-designated heritage assets can include buildings, places, lanes or areas of cultural and/or local significance, or non-designated archaeological sites and deposits which whilst not nationally designated make a positive contribution to the Historic Environment and its understanding. In decision making, proposals which affect locally listed heritage assets

[33] http://www.heritagegateway.org.uk/gateway/
[34] https://historicengland.org.uk/listing/the-list/

5.130 Proposals should either enhance local distinctiveness or seek to introduce distinctiveness to poor quality areas. When undertaking context appraisals, applicants should consider and set out in the Design and Access Statement the following:

i. the built context: providing a demonstrable appreciation of built form in the vicinity covering analyses of building style, form, height and as well as the pattern of streets and spaces, morphology, skylines and landmarks;

ii. the environmental context: open spaces, bio-diversity structure, landscape character, areas liable to flood;

iii. the functional context: examining the existing activities and functions in the vicinity of the site including the existing pattern of uses, economic development initiatives, health, education & community facilities and public art;

iv. the spatial context: identifying the development site's position within the urban hierarchy;

v. the operational context: showing how infrastructure and facilities are used and their capacity to accommodate further demands;

vi. the community context: seeking to determine the reasonable and realisable needs and demands for space within an area and to associate these demands with the known existence of vacant or under-used space and the potential for creating new space; and

vii. the historic context: seeking to encourage new development that respects, incorporates and is informed by the character of and traditional historic form of the settlement in which the development will take place.

Design Considerations

5.131 Permeable and legible layout is at the heart of good design and making successful places. Applicants are encouraged to optimise the layout, including spaces between and around buildings, to form a legible, safe and coherent pattern of streets and blocks. The overarching layout of a site should be informed by its context rather than technical demands of traffic.

5.132 Attention should be paid to the design of the parts of a building that people most frequently see or interact with, i.e. the ground plane and its legibility, use, detailing, materials and entrances.

5.133 New developments should be designed and managed so that online deliveries and goods deliveries can be received without causing unacceptable disturbance to residents and traffic.

5.134 Bin storage for dry recyclables and waste should be considered in the early design stages to help improve recycling rates, reduce smell and vehicle movements, and improve street scene and community safety.

5.135 Stimuli targeted at each of the senses (sight, scent, touch, sound and taste) should be incorporated into the landscape structure from the outset, to ensure that the development caters for people of all physical and mental abilities. This relates to both the natural, soft elements of the landscape – such as planting – and hard elements like sculptures, water features and furniture. Planning for users of all abilities and ages from the beginning can reduce the need for costly future adaptations.

5.136 The lighting of the public realm needs careful consideration to ensure it is appropriate to address safety and security issues and make night-time activity areas and access routes welcoming and safe, while also minimising light pollution.

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[34] https://historicengland.org.uk/listing/the-list/

and/or their setting, must take into account the strong requirement for their retention and the enhancement of their significance locally.

5.147 Locally listed buildings within the borough are to be recorded on a live database. Whilst the Local Listing Programme is at embryonic stage, this list and its future enrichment is essential in conserving local distinctiveness and community engagement in the historic environment. The Council supports the ethos of local listing and the opportunities it brings to engage a diverse range of stakeholders into the management and education of the local historic environment.

5.148 The Council will apply a level of protection to and keep under review its heritage assets in order to preserve, and where appropriate enhance their special architectural or historic interest. A high standard of design for all new development affecting Heritage Assets and their setting is required.

POLICY BE16: CONSERVATION AND ENHANCEMENT OF HISTORIC ENVIRONMENT

A. All Designated Assets

1. Great weight will be given to the preservation of a designated heritage asset and its setting. Development proposals affecting a designated asset, including a listed building, conservation area, registered parks and gardens, or scheduled monument, will be required to:

    a. sustain and wherever possible enhance the significance of the assets and its settings (including views into and out of conservation areas and their settings);

    b. be supported by a Heritage Statement providing sufficient information on the significance of the heritage asset (according to its importance), the potential impacts of the proposal on the character and significance of the asset and its setting, and how the proposal has been designed to take these factors into account. The Statement should make an assessment of the impact of the development on the asset and its setting and the level of harm that is likely to result, if any, from the proposed development;

    c. provide clear justification for any works that would lead to any harm to the asset.

2. Proposals that make sensitive and appropriate use of heritage assets, particularly where these bring redundant or under used buildings or buildings on the At Risk Register, into appropriate use consistent with their conservation status will be supported.

3. Proposals designed to enhance an asset and/or its setting and which reinforce its significance and contribution to the character of an area will be supported.

4. Development proposals that would be likely to cause either less than substantial or substantial harm to, or loss or partial loss of, a designated asset or its setting will be assessed in accordance with the statutory framework and national planning policy.

5. Where a proposed development involves the loss or partial loss of a designated asset, applicants will be required to record and advance understanding of the asset in a manner proportionate to its importance and the impact which will be caused.

B. Conservation Areas

In addition to satisfying the relevant criteria in A above:

1. Permission for proposals which involve the demolition or partial demolition of a building in a conservation area will only be granted subject to a condition and/or a planning obligation (as appropriate) that no demolition will take place until an enforceable contract has been let for the carrying out of the new development.

2. Development will be permitted in a conservation area where the siting, design and scale of the proposed development would preserve or enhance its character or appearance and important views into and out of the area are preserved or enhanced.

C. Non-Designated Heritage Assets

Development proposals that affect non-designated heritage assets and their settings, including protected lanes, should seek to preserve and wherever possible enhance the asset and its setting. When considering proposals which are likely to cause harm to such an asset consideration will be given to:

a. the significance of the asset and its setting; and

b. the extent to which the scale of any harm or loss harm has been minimised.

D. Specific Requirements

Specific requirements in relation to particular heritage assets identified in housing allocation policies should be read alongside the overarching requirements of this policy.

Historic Records

5.149 All development proposals should be based on a full understanding of the significance of heritage assets, both within the proposed development site and within the surrounding area. This should be established by reference to relevant and available sources of historic environment information. Heritage assets are depicted on the Policies Map, however applicants are advised to consult the Essex Historic Environmental Record held by Essex County Council as well as any records held by Historic England and other sources to ensure the most up to date records are reviewed before submitting an application. It is also advised that early engagement is sought with the Council's Historic Buildings Advisor through pre-application consultation.

5.150 The Council recognise that on occasion heritage assets are not always documented or fully understood and could be identified through the development process; for example revealed by local groups through the consultation process or during preliminary site investigations undertaken by an applicant. In these circumstances the Council expect a positive approach to ensure the significance of these non-designated heritage assets are appropriately conserved and enhanced.

Heritage Statement

5.151 All development proposals that are likely to have an impact on a heritage asset or its setting must be accompanied by a Heritage Statement that clearly describes the significance of both the asset and the setting as well as proportionately assesses how the proposal impacts upon it, in relation to its form, fabric, setting, architectural or historic relevance. The level of detail needed should be proportionate to the scale and nature of the proposal and the importance of the asset itself. A schedule of works should be included.

5.152 The Council advise that applicants seek advice from specialist historic environment consultants where necessary, to carry out appropriate assessments.

5.153 In respect of the loss of any asset the Council will require applicants to record the significance of any asset to be lost in a manner proportionate to its importance and the impact. The applicant should deposit such evidence to the Essex Historic Environment Record.

5.154 Listed buildings are defined under Section 1 of the Planning (Listed Buildings and Conservation Areas) Act 1990, as 'buildings of special architectural or historic interest'. The Secretary of State is required to compile or approve listed buildings for the guidance of local planning authorities. There are 512 listed buildings[35] within the borough, consisting of:

- 12 buildings of Grade I (buildings of exceptional interest)
- 27 buildings of Grade II* (particularly important buildings of more than special interest)
- 473 buildings of Grade II (buildings of special interest, which warrant every effort being made to preserve them).

[35] The current list for Brentwood was approved on 9 December 1994, following a comprehensive resurvey of buildings in the Borough, originally consisted of 512 listed buildings.

5.155 This policy addresses the statutory considerations of the Planning (Listed Buildings and Conservation Areas) Act 1990 which provides specific protection for buildings and areas of special architectural or historic interest as well as relevant polities within the NPPF.

5.156 Where there is evidence of deliberate neglect of, or damage to a heritage asset, the deteriorated state of the heritage asset will not be taken into account in any decision.

5.157 Works such as the demolition, alterations (both internal and external) or extensions that would affect a listed building's character will require listed building consent.

5.158 Proposals affecting listed buildings should refer directly to the statutory list of Buildings of Special Architectural or Historic Interest[36]. Under the Planning (Listed Buildings and Conservation Areas) Act 1990 owners have a responsibility to look after listed buildings in order to prevent deterioration and damage. The Council will intervene, where necessary, by issuing an Urgent Works or Repairs Notice.

5.159 National policy and guidance promotes the use/reuse of heritage assets for viable uses consistent with their conservation and the positive contribution that they can make towards economic vitality. Changes of use of a listed building need to be compatible with the building's character and should not have an adverse impact on its context. Proposals for the change of use of a listed building in the Green Belt will also be assessed against development in the Green Belt policies within this Plan.

5.160 Proposals will be required to take a practical approach towards the alteration of listed buildings to comply with the Equality Act 2010 and subsequent amendments, provided that proposed alterations and changes to access are sympathetic and ensure the building's special interest remains unharmed. Applicants should refer to the Historic England Easy Access to Historic Buildings (2015) as a basis for practical guidance.

5.161 The Council intends to compile a local list of buildings which contribute positively to the character of the area due to their townscape value and merit, type of construction, architectural quality or historic association. The Council will apply similar levels of preservation to its locally designated heritage assets and their settings in line with national policy and guidance to ensure a high standard of design for all new development affecting the character or setting of its built, natural and historic environment. Whether a building is locally listed will be a material consideration in determining planning applications in order to retain important original features and fabric, and control alteration or extension to maintain the character of the buildings in recognition of their contribution to local distinctiveness, sense of place, identity and character.

5.162 Conservation Areas are defined under Section 69 of the Planning (Listed Buildings and Conservation Areas) Act 1990, as 'Areas of Special Architectural or Historic Interest the character or appearance of which it is desirable to preserve or enhance'. With a rich and varied cultural heritage, Brentwood has 13 designated Conservation Areas within the borough. Conservation Areas are shown on the Brentwood Policies Map.

5.163 The Council will seek to promote high quality new development of exceptional design that makes a positive contribution to local character and respects the historic context.

[36] www.historicengland.org.uk

Development proposals in a Conservation Area should make reference to the relevant Conservation Area appraisal.

5.164 There will be a presumption against the demolition of buildings or other features that positively contribute to the character or appearance of a Conservation Area, in the absence of detailed and acceptable proposals for replacement development. Use of non-traditional materials, will not normally be permitted on, or in proximity to, listed buildings or in Conservation Areas. For advice on this matter, applicants should consult local expertise and refer to published guidance, such as Valuing Places: Good Practice in Conservation Areas by English Heritage (2011).

5.165 In order to ensure a high standard of design and materials, outline applications will not be accepted.

Local List

5.166 Locally listed buildings will be a material consideration in determining planning applications: the retention of important features and fabric and the impact of proposals upon the local significance and understanding of a locally listed building will be a material consideration.

5.167 There are a number of country lanes and byways which are of historic and landscape value, and which make an important contribution to the rural character of the borough. The Council will seek to prserve these lanes and byways as far as possible, including their trees, hedgerows, banks, ditches and verges, which contribute to their character, and by resisting development proposals which have a detrimental effect upon them.

Protected Lanes

5.168 The greater part of the road network in the Essex countryside derives from at least as far back as the medieval period. Much of it undoubtedly existed in Saxon times. These lanes are part of what was once an immense mileage of minor roads and track-ways connecting villages, hamlets and scattered farms and cottages. Many were used for agricultural purposes, linking settlements to arable fields, grazing on pasture, heaths and greens; and other resources such as woodland and coastal marsh.

5.169 Before metalled road, with wide verges and linear roadside green with ditches and interspersed with ponds for transporting, feeding and watering livestock on route to market. These lanes are an important part of the Essex landscape, providing insight into the development of a landscape and the relationship of features within it over time. They have considerable ecological value as habitats for plants and animals, serving as corridors for movement and dispersal for some species and acting as vital connections between other habitats; and promoting well-being.

5.170 The Protected Lanes in Brentwood are listed below:

National Street Gazetteer Name (NSG)	Location	Lane ID
Days Lane	Doddinghurst	BRWLANE1
Wenlocks Lane	Blackmore	BRWLANE2
Lincolns Lane	Coxtie Green	BRWLANE3
Hay Green Lane	Wyatt's Green	BRWLANE4
Mill Lane	Navestock Health	BRWLANE5
Sabines Road	Sabines Green	BRWLANE6
Dark Lane	Great Warley	BRWLANE8
Little Hyde Lane	Fryerning	BRWLANE10
Mill Green Road	Mill Green Common	BRWLANE11
Ivy Barns Lane	Mill Green Common	BRWLANE12
Ingatestone Road	Mill Green Common	BRWLANE13
Chivers Road	Stondon Massey	BRWLANE14

Figure 5.2: Protected Lanes in Brentwood

5.171 Recent assessment of the Protected Lanes[37] and update[38] in Brentwood has confirmed that these features remain and in the majority of instances, the designation for protection is recommended for retention. Two lanes, Back Lane and Sandpit Lane were identified by Essex County Council as no longer meeting the required criteria and have been removed whilst Chivers Road has been added as a Protected Lane[39].

5.172 Material increases in motorised traffic using a Protected Lane due to development proposals must be assessed and action/infrastructure to influence user behaviour and encourage more sustainable modes of transport, will be required. Any proposals that would have a materially adverse impact on the physical appearance of Protected Lanes or generate traffic of a type or amount inappropriate for the traditional landscape and nature conservation character of a Protected Lane, will not be permitted.

5.173 The Council would consider exploring options and partnerships for influencing user behaviour and applying intelligent and positive measures of highway management that will serve to encourage local journeys to be made on bicycle or foot, and for recreation, and reduce the impact of vehicles on the historic fabric of lanes, whilst maintaining their local character.

Mitigating Impacts

5.174 The heritage environment should be considered as an integral component of Brentwood's public realm and contribute positively to maintaining sustainable communities and must therefore, meaningfully inform the design of development. Any harm to, or loss of, the significance of a designated heritage asset (from its alteration or destruction, or from development within its setting), requires clear and convincing justification. Applicants are expected to demonstrate how the heritage assessment (as documented in the Heritage Statement) has appropriately informed and guided the design of the proposal to ensure they do not impact the architectural details and qualities of the asset. Proposals should be of the

[37] Brentwood Borough Protected Lane Assessment (2016) Essex County Council
[38] Brentwood Borough Protected Lane Assessment Update (Letter) (2018) Essex County Council
[39] Protected Lane Assessment, Chivers Road, Additional Lane (2020), Essex County Council

highest architectural and urban design quality, having regard to and respecting local character and other policies in this plan. Development proposals that appropriately preserve or help to better reveal and enhance heritage assets and their setting will be supported.

Heritage-led Regeneration

5.175 A Heritage at Risk programme has been implemented by Historic England. It protects and manages the historic environment so the number of 'at risk' historic places and sites across England is reduced. The Heritage At Risk Register identifies those sites that are most at risk of being lost as a result of neglect, decay or inappropriate development. Proposals which seek to bring such assets back into appropriate use and help revitalise neighbourhoods in accordance with national policy will be supported.

Archaeological Heritage

5.176 The historic environment of Brentwood has developed through a history of human activity that spans over 450,000 years. Much of the resource lies hidden beneath the ground in the form of highly sensitive and non-renewable archaeological deposits. Other elements such as the historic landscape, the pattern of field, farms, woods and historic settlements which characterise the borough are a highly visible record of millennia of agriculture, industry, settlement and commerce.

5.177 Brentwood has a large number of sites of archaeological importance that are worthy of preservation for the future. Essex Historic Environment record identifies 636 sites within the borough of known archaeological interest. These include isolated discoveries like Stone Age flint axe, below ground evidence of prehistoric, Roman, Saxon and medieval occupation and upstanding post medieval and modern structures. Of known sites, 12 are scheduled ancient monuments, maintained by the Secretary of State under Section 1 of the Ancient Monuments and Archaeological Areas Act 1979, ensuring ultimate responsibility for the preservation, treatment, repair and use of each monument.

5.178 For applications affecting a scheduled monument and its setting, early stage consultation with English Heritage will be required to gain scheduled monument consent. For non-statutory historic environment assets applicants should consult the Council and as appropriate, Essex County Council historic environment advisors, regarding the nature, setting and management of the borough's historic environment.

5.179 As a finite and non-renewable resource, archaeology can become highly fragile and vulnerable to damage or destruction. The Council will need to be satisfied by the applicant that the significance of the archaeological remains adopt a presumption against proposals which would harm the setting of archaeological remains of national or local importance, whether scheduled or not, are conserved.

5.180 In cases where development will impact upon sites of known archaeological interest or potential, the results of a field evaluation/assessment will be necessary prior to the determination of the application. Applicants will be required to arrange for an archaeological investigation setting out appropriate measures of protection, management or mitigation including excavations and recording prior to development.

06

Housing Provision

Housing

Housing Mix

6.1 It is important that new housing development addresses local needs and contributes to the creation of mixed and balanced communities. A core planning principle in the NPPF is that every effort should be made objectively to identify and then meet the housing needs of an area. This means providing sufficient good-quality housing of the right types, mix, sizes, and tenure in the right places, which will be attractive to and meet the identified needs of different groups in society, including families with children, first-time buyers, older people, people with disabilities, and people wishing to build their own homes. Well-designed housing should also be accessible and adaptable to meet people's changing needs and helping to sustain independent living.

6.2 The amount and distribution of housing to be delivered in the borough over the Plan period is established through Strategic Policy MG01 Spatial Strategy. Policy HP01 Housing Mix seeks to ensure that residential development proposals deliver housing in a way that contributes to the rebalancing of the housing stock to ensure it better reflects the identified needs and demands for housing of the existing and future communities of the borough.

STRATEGIC POLICY HP01: HOUSING MIX

1. All new residential development should deliver an inclusive, accessible environment throughout.

2. On residential development proposals of 10 or more (net) additional dwellings the Council will require:

    a. an appropriate mix of dwelling types, sizes and tenures to meet the identified housing needs in the borough as set out in the Council's most up to date housing need evidence to provide choice, and contribute towards the creation of sustainable, balanced and inclusive communities; and

    b. each dwelling to be constructed to meet requirement M4(2) accessible and adaptable dwellings, unless it is built in line with M4(3) wheelchair adaptable dwellings of the Building Regulations 2015, or subsequent government standard.

3. On developments of 60 or more (net) dwellings the Council will require all of the above, and:

    a. a minimum of 5% of new affordable dwellings should be built to meet requirement M4(3) wheelchair accessible dwellings of the Building Regulations 2015, or subsequent government standard.

4. On development sites of 100 or more dwellings the Council will require all of the above, and:

    a. a minimum of 5% self-build homes which can include custom housebuilding provided there is a need as justified within the Council's most up to date evidence; and

    b. provision for other forms of Specialist Accommodation taking account of local housing need in accordance with the criteria set out in Policy HP04 Specialist Accommodation.

5. Where a development site has been divided into parts, or is being delivered in phases, the area to be used for determining whether this policy applies will be the whole original site.

6. The inclusion of self-build and custom build homes and Specialist Residential Accommodation on smaller sites will also be encouraged.

6.3 The NPPF requires local planning authorities to plan for a mix of housing based on current and future demographic trends, market trends and the needs of different groups in the community, including, but not limited to, those who require affordable housing, families with

children, older people, people with disabilities, travellers, people who rent their homes and people wishing to commission or build their own homes. Across the borough, there is a need to rebalance the housing market to provide a range of housing that will meet the changing needs of communities.

6.4 The Council's Strategic Housing Market Assessment (SHMA) Part 2 (2016) provides a detailed assessment of the housing required to meet existing and future needs across the borough. Proposals should respond to other up-to-date and relevant local evidence where available, such as the Council's Housing Strategy.

6.5 The Council's latest SHMA indicates that the greatest need for Market housing is two-bedroom units, closely followed by a need for family housing consisting of three or more bedrooms. Figure 6.1 below will be used to inform negotiations between the Council and developers to determine the appropriate mix of housing. The final mix of housing/types will be subject to negotiation with the applicant.

Size of new Market housing required up to 2033	
Dwelling Size	**Indicative Mix**
One bedroom	3.8%
Two bedrooms	35.8%
Three bedrooms	30.2%
Four or more bedrooms	30.2%
Total	100%

Figure 6.1: Indicative Size Guide for Market Housing

6.6 Census data[40] indicates an above average proportion of the borough's households contain older persons, at 24.1% compared to 22.3% regionally and 20.5% nationally. The proportion of the borough's population living beyond 65 years of age is set to rise during the Plan period, from 14,564 residents in 2013 to 21,093 residents in 2033, a rise of 44.8%, meaning a significant proportion of projected households are likely to have a household representative aged 65 or over.

6.7 The government position is that older persons should remain at home rather than enter residential facilities (use class C2) where appropriate. This combination of factors shows the need for homes that are adapted and further adaptable for a less mobile population. It is

[40] As referenced within the Strategic Housing Market Assessment (SHMA) Part 2 (2016)

expected that all dwellings on major residential schemes achieve requirement M4(2) accessible and adaptable dwellings, or M4(3) wheelchair adaptable dwellings of the Building Regulations 2015.

6.8 Government research[41] shows that, based on English Partnerships figures from 2011-2012, nearly 30% of households have at least one person with a long-term illness and over 3% have one or more wheelchair user.

6.9 While nationally 3.3% of households have a wheelchair user, for households living in affordable housing this rises to 7.1%. The rates are also higher for older households; and given that the number of older person households in the borough is set to increase over the period to 2033, the Council seeks to ensure 5% of affordable housing development on proposals of 60 or more dwellings archives requirement M4(3) wheelchair accessible dwellings.

6.10 The development of self-build properties by individuals or community groups (including Community Land Trusts) can also contribute to meeting the need for additional housing within the district and provide a more diverse housing stock. Self-build plots are plots of land which are made available for individuals to design and build their own home whereas custom build plots are provided by site developers to the specification of individuals which may or may not follow a basic design pattern.

6.11 To assist in the delivery of a choice of accommodation, the provision of self and custom housebuilding plots is required to be made available on residential schemes of 100 dwellings or more. A figure of 5% of the total dwelling numbers shall be made available for sale as self or custom housebuilding plots whilst there is an identified need on the Council's Self-build and Custom Housebuilding Register. The Council will have regard to the information in its Self & Custom Housebuilding Register when negotiating the mix of plots to come forward as self or custom build and will secure this through S106 or other legal agreements. Self-build/custom build homes will not be considered as an alternative to, or replacement for, the affordable housing requirements set out in Policy HP05 Affordable Housing

6.12 Where a site has five or more self or custom build dwellings the Council may require these dwellings to be developed in accordance with an agreed design code. Where plots have been available at market value and marketed appropriately for at least three years and have not sold, the plot(s) may remain on the open market as self or custom build or be offered to the Council or a Housing Association before being built out by the developer.

6.13 The Council will also seek the provision of Specialist Accommodation on residential schemes of 100 dwellings or more, to ensure there will be sufficient housing to accommodate identified local need as set out in Policy HP04 Specialist Accommodation. The Council will have regard to the information in its AMR 'Specialist Accommodation Report' when negotiating the mix and type of units to come forward as Specialist Accommodation and will seek to secure this through S106 or other legal agreements.

6.14 Where an applicant considers that it is not feasible or viable to meet the requirements as set out in Policy HP01, the Council will expect this to be demonstrated with robust evidence and

[41] Guide to available disability data DCLG https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/416475/150323_Guide_to_disability_data___final_web_version.pdf

may negotiate a proportionate housing mix which is achievable, account will be taken of the nature, constraints, character and context of the site.

6.15 Conditions may be used to ensure particular housing types provided, remain available in perpetuity and by tenure.

6.16 The Essex Design Guide 2018 seeks to provide residential development which is flexible and adaptable throughout its lifetime. The Design Guide includes guidance on cross cutting themes, one of which is specifically in relation to the ageing population.

Protecting the Existing Housing Stock

POLICY HP02: PROTECTING THE EXISTING HOUSING STOCK

1. To ensure that housing supply is protected, the net loss of existing dwellings will be resisted. The Council will only support development proposals that would result in the net loss in the number of dwellings where one or more of the following criteria are met:

    a. the continued use of the building as a dwelling is undesirable due to proven environmental constraints; and

    b. the loss of the dwellings would be outweighed by the provision of an essential community service or another form of residential accommodation.

2. In justifying any change of use between residential use classes, proposals must demonstrate how they are responding to established housing need as demonstrated in the Council's most up-to-date housing need evidence.

6.17 As demonstrated in this Plan, there are substantial needs for additional housing in the borough. The Council's work to determine land supply has demonstrated that to meet this need the release of some of the Green Belt is necessary and justified. Taking these factors together, the Council considers that it is important to resist the net loss of existing dwellings.

Residential Density

POLICY HP03: RESIDENTIAL DENSITY

Proposals for new residential developments not allocated in the Plan:

a. should take a design led approach to density which ensures schemes are sympathetic to local character and make efficient use of land;

b. be expected to achieve a net density of at least 35 dwellings per hectare net or higher, unless the character of the surrounding area suggests that such densities would be inappropriate, or where other site constraints make such densities unachievable; and

c. be expected to achieve a higher density, generally above 65 dwellings per hectare net in the Town Centre and District Shopping Centres listed below Strategic Policy PC04 Retail Hierarchy of Designated Centres, or other locations with good public transport accessibility, subject to Strategic Policy BE14 Creating Successful Places.

6.18 Efficient land use is essential in a borough like Brentwood where land is scarce and enables new homes to be provided without encroaching on the countryside. Good design makes it appropriate to develop in a way that is sympathetic to local character, uses land efficiently and creates or maintains a high-quality living and working environment. The right density will depend on the scheme, dwelling mix, site characteristics and location.

6.19 Proposals for housing developments should promote an effective use of land in line with the NPPF. Policy HP03 Residential Density sets out the Council's expectations on the net density of sites in the borough, supporting development proposals that make efficient use of land and discouraging low density development to ensure optimal use of each site.

6.20 The Council considers it reasonable to expect proposals to achieve densities of at least 35 dwellings per hectare except where this would harm the special character of an area, have an adverse transport impact or cause harm to residential amenities. Densities of 65 dwellings to the hectare or more will generally be expected in locations well served by retail, commercial and community facilities and services, and/or locations with good public transport accessibility.

6.21 To determine how much land is required to meet housing requirements, consideration has been given to the number of homes a given area can sustainably accommodate based on site and location characteristics. Efficient land use is critical to the delivery of this Plan. Without it, there will be more pressure to release Green Belt to accommodate new

development or, alternatively, the number of new homes delivered will fall short of that planned and what would otherwise have been provided.

Specialist Accommodation

POLICY HP04: SPECIALIST ACCOMMODATION

1. The Council will grant permission for proposals which contribute to the delivery of Specialist Accommodation, provided that the development:
    a. meets demonstratable need;
    b. is readily accessible to public transport, shops, local services, community facilities and social networks and, where appropriate, employment and day centres; and
    c. would not result in the over concentration of any one type of accommodation.
2. Subject to viability, where accommodation falls within use class C3 an appropriate proportion of affordable housing in accordance with Policy HP05 Affordable Housing will be required with a mix of tenures to meet identified needs.
3. A condition may be imposed restricting occupation to persons requiring specialist accommodation where deemed necessary.
4. Where a need for Gypsy and Traveller pitches are identified by the Council, Policy HP10: Proposals for Gypsies, Travellers and Travelling Showpeople Windfall Sites would apply.

6.22 The NPPF requires local planning authorities to plan for a mix of housing based on current and future demographic trends, market trends and the needs of different groups in the community.

6.23 There are certain groups of people within the community that need specialist residential accommodation that caters for their specific needs. This form of accommodation includes, but is not limited to, housing for older people such as Independent Living schemes for the frail elderly, homes for those with disabilities and support needs, residential institutions and culturally appropriate accommodation for those Gypsies and Travellers or Travelling Showpeople who no longer exercise a nomadic lifestyle and where the Planning Policy for

6.30 A growing number of households in the borough cannot afford to buy or rent on the open market. House prices in Brentwood are among the highest in Essex. A shortage of affordable housing leads to overcrowding, poor health, inability to achieve a decent standard of living and personal aspirations such as living independently, having children, being part of family or social network of choice – all factors that contribute to the sustainability of neighbourhoods.

6.31 The provision of affordable housing to meet identified need is an important objective of the Local Plan. To assess this need, the Council, commissioned consultants to produce a Strategic Housing Market Assessment (SHMA) Part 2, which was published in June 2016, and uses the national planning practice guidance to calculate the level of affordable housing need. This assessment identified that the annual level of need for affordable housing in the borough is 107 households per year.

POLICY HP05: AFFORDABLE HOUSING

1. The Council will require the provision of 35% of the total number of residential units to be provided and maintained as affordable housing within all new residential development sites on proposals of 10 or more (net) units.

2. In considering the suitability of affordable housing, the Council will require that:

    a. the tenure split be made up of 86% Affordable/Social Rent and 14% as other forms of affordable housing (this includes starter homes, intermediate homes and shared ownership and all other forms of affordable housing as described by national guidance or legislation) or regard to the most up to date housing evidence;

    b. the affordable housing be designed in such a way as to be seamlessly integrated to that of market housing elements of a scheme (in terms of appearance, build quality and materials) and distributed throughout the development so as to avoid the over concentration in one area; and

    c. the type, mix, size and cost of affordable homes will meet the identified housing need as reported by the Council's most up-to-date housing evidence.

3. In seeking affordable housing provision, the Council will have regard to scheme viability; only where robust viability evidence demonstrates that the full amount of affordable housing cannot be delivered, the Council will negotiate a level of on-site affordable housing that can be delivered taking into account the mix of unit size, type and tenure and any grant subsidy received.

4. The Council will only accept off-site provision, or an appropriatefinancial contribution in lieu of on-site provision where it can be robustly demonstrated that on-site provision is not possible and that, in the individual case and to the

satisfaction of the Council, the objective of creating mixed and balanced communities can be effectively and equally met through either off-site provision or an appropriate financial contribution in lieu or a combination of the two.

5. Where a site has been sub-divided or is not being developed to its full potential so as to fall under the affordable housing threshold, the Council will seek a level of affordable housing to reflect the provision that would have been achieved on the site as a whole had it come forward as a single scheme for the allocated or identified site.

6. Planning obligations will be used to ensure that the affordable housing will remain at an affordable price for future eligible households, or for the subsidy to be recycled to alternative affordable housing provision.

7. The requirement to provide affordable housing will apply to all residential development falling under use class C3 with the exception of Gypsy & Traveller Pitches or Travelling Showman Plots.

6.32 Chapter 5 of the NPPF sets out that in delivering a sufficient supply of homes, local planning authorities should (amongst other things, where they have identified that affordable housing is needed) set policies for meeting this need, specifying the type of affordable housing required, and expect it to be met on-site unless off-site provision or a financial contribution of broadly equivalent value can be robustly justified and the agreed approach contributes to the objective of creating mixed and balanced communities.

6.33 There is a significant need for affordable housing in the borough as evidenced in the Council's SHMA which supports an affordable housing target of 35% on major developments.

6.34 The local plan viability assessment demonstrates that the thresholds of affordable housing contributions identified in the Local Plan are achievable and the cumulative impact of policies in the local Plan will not put development at risk. The use of further viability assessments at the decision-making stage should not be necessary. It is up to the applicant to demonstrate whether particular circumstances relevant to the characteristics of the site and the proposed development justify the need for a viability assessment at the application stage.

6.35 Where an applicant formally requests the Council to consider a reduced level of affordable housing, it will need to demonstrate that it is not possible to meet the full quota of affordable housing without prejudicing the delivery of housing on the site. It will also need to demonstrate to the satisfaction of the Council that, in the individual case, the objective of creating mixed and balanced communities can be effectively and equally met through either off-site provision or an appropriate financial contribution in lieu or a combination of the two. To this end, and in demonstrating the above, a full viability assessment would need to be

submitted with a planning application which is based upon, and refers to, the Brentwood Local Plan Viability Assessment. Such an assessment should include evidence of what has changed since the adoption of the Plan which has impacted on viability and should reflect the government's recommended approach to defining key inputs as set out in National Planning Guidance.

6.36 The Council's SHMA indicates that within the affordable housing sector there is a need for 86% affordable/social rent. Figure 6.2 below will be used to inform negotiations between the Council and developers to determine the appropriate tenure and mix of affordable housing.

Size & Tenure of all affordable housing required up to 2033						
Tenure	**% Split**	**Indicative Size**				
		One bedroom	Two bedrooms	Three bedrooms	Four/+ bedrooms	Total Size
Affordable rent / Social rent	86%	31%	24%	19%	26%	100%
Other forms of affordable housing	14%	28%	36%	24%	12%	100%
Total Tenure	**100%**					

Figure 6.2: Indicative Size Guide for Affordable Housing

6.37 Whilst the Council's starting point in any affordable housing negotiations is that a scheme is viable at the percentages and tenure splits set out within Policy HP05, the policy recognises that there may be sites on which the provision of affordable housing to the percentages or tenure splits set out, would render a development unviable or would prejudice the realisation of other planning objectives that need to be given priority.

6.38 In these circumstances, the applicant will be required to provide a level of on-site affordable provision which can be viably delivered. In doing so, the percentage of on-site provision not met may be made up from financial contributions in lieu of the on-site requirement subject to viability. The Council will normally take into account exceptional site costs and the existing use value of the site but would not consider the price paid for the site to be a relevant factor as this should have taken account of policy requirements. The Council will take an 'open book' approach to negotiation and may require viability assessments to be scrutinised by independent consultants at cost to the developer.

6.39 Only where it can be demonstrated that providing any affordable housing on-site is not viable or feasible will the Council consider accepting financial contributions in lieu of on-site provision.

6.40 The Council encourages applicants to work with registered providers and to engage with them and the Council's housing department at an early stage in the planning process, further guidance on early engagement and preferred partner registered providers is provided in the Housing Strategy.

Standards for New Housing

POLICY HP06: STANDARDS FOR NEW HOUSING

Internal Residential Space

1. All new build housing will achieve appropriate internal space through compliance with the nationally-described space standard as summarised in Figure 6.3 or as may be superseded.

External Residential Space

2. New residential units will be expected to have direct access to an area of private and/or communal amenity space. The form of amenity space will be dependent on the form of housing and could be provided in a variety of ways, such as a private garden, roof garden, communal garden, courtyard balcony, or ground-level patio with defensible space from public access. In providing appropriate amenity space, development proposals should be designed to provide amenity space of a shape, size and location to allow effective and practical use of and level access to the space by residents.

Internal Space Standards

6.41 The government's Housing Standards Review 2015 published internal space standards which local authorities could apply to new build residential development using planning policy. The council requires the use of these standards for new build development as set out in Policy HP06 and supports these standards for all new residential development.

6.42 The provision of sufficient space within new homes is an important element in improving the quality of life and well-being of Brentwood residents and new dwellings should provide sufficient space for basic daily activities and needs. The need for minimum internal space standards in the Borough is reported in the Council's AMR.

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6.43 In order to ensure that homes meet the needs of local residents, regardless of their income level, it is important that internal space standards are improved alongside the overall housing mix. New homes created through residential conversions and homes created by changes of use from non-residential land uses should seek to meet or exceed the standards as far as it is practicable to do so.

6.44 To meet the needs of occupiers, all new residential development should be built in accordance with the nationally described space standard. The standard requires that:

a. A dwelling provides at least the Gross Internal Area (GIA) and built-in storage area set out in Figure 6.3

b. A dwelling with two or more bedspaces has at least one double (or twin) bedroom

c. In order to provide one bedspace, a single bedroom has a floor area of at least 7.5 sqm and is at least 2.15 m wide

d. In order to provide two bedspaces, a double (or twin bedroom) has a floor area of at least 11.5 sqm

e. One double (or twin bedroom) is at least 2.75 m wide and every other double (or twin) bedroom is at least 2.55 m wide

f. Any area with a headroom of less than 1.5m is not counted within the GIA unless used solely for storage (if the area under the stairs is to be used for storage, assume a general floor area of 1 sqm within the GIA)

g. Any other area that is used solely for storage and has a headroom of 900-1500 mm (such as under eaves) is counted at 50% of its floor area, and any area lower than 900 mm is not counted at all

h. A built-in wardrobe counts towards the GIA and bedroom floor area requirements, but should not reduce the effective width of the room below the minimum widths set out above. The built-in area in excess of 0.72 sqm in a double bedroom and 0.36 sqm in a single bedroom counts towards the built-in storage requirement

i. The minimum floor to ceiling height is 2.3 m for at least 75% of the GIA.

Minimum gross internal floor areas of storage (square metres)					
Number of bedrooms	Number of bedspaces	1-storey dwellings	2-storey dwellings	3-storey dwellings	Built-in storage
Studio	1 person	39(37)	N/A	N/A	1.0
1 Bedroom	2 person	50	58		1.5

2 Bedroom	3 person	61	70		2.0
	4 person	70	79		
3 Bedroom	4 person	74	84	90	2.5
	5 person	86	93	99	
	6 person	95	102	108	
4 Bedroom	5 person	90	97	103	3.0
	6 person	99	106	112	
	7 person	108	115	121	
	8 person	117	124	130	
5 Bedroom	6 person	103	110	116	3.5
	7 person	112	119	125	
	8 person	121	128	134	
6 Bedroom	7 person	116	123	129	4.0
	8 person	125	132	138	

Figure 6.3: Nationally Described Space Standard

External Residential Space

6.45 External amenity space can make an important contribution in improving the quality of life and well-being of Brentwood residents as well as supporting and enhancing local biodiversity. Gardens, in particular, are an important environmental resource and are a component of Brentwood's greenery character. They form part of an area's development pattern, providing a setting for buildings, which in turn informs the prevailing privacy and amenity enjoyed by residents. They provide a semi-natural habitat for local wildlife and corridors for the movement of wildlife through the urban environment. Collectively, they help to mitigate fluvial and surface water flooding in the more built-up parts of the borough.

6.46 The NPPF sets out the need to secure high-quality design and a good standard of amenity for all existing and future occupants of land and buildings.

6.47 External amenity space should be sufficient to accommodate:

- a table and chairs suitable for the size of dwelling;
- where relevant, provision of a garden shed for general storage (including bicycles if garage provision or cycle storage to the frontage of the dwelling is not possible);
- space for refuse and recycling bins;
- an area to dry washing;
- circulation space; and
- an area for children to play in.

6.48 External residential space would not include car parking or turning areas. Suitable arrangements for access to refuse and recycling bins should be made to prevent bins/bags being transported through dwellings.

6.49 One-bedroom dwellings would not be expected to provide space for children to play, due to the lower likelihood of children occupying these units. Dwellings with more than one bedroom would need to take space for children to play into account.

6.50 Where it is appropriate and viable to do so, developments with flats will need to provide high-quality shared amenity areas on site to meet the needs of residents, including play space for children, in addition to private amenity space and cycle storage.

6.51 Applicants are also encouraged to consider external residential space size specifications as set out by the most up to date Essex Design Guide:

a. New development on sites larger than 0.1 hectares or at densities above 50 dwellings per hectare should provide at least 25 sqm of private external space for each home;

b. Exceptionally, apartments adjacent to and overlooking a park or other large public space of high amenity value could be provided with a smaller amount of communal space. In this instance, apartments should also have balconies with a floor area of at least 5 sqm;

c. At least 60% of the private communal space should receive direct sunlight for a minimum of four hours a day in June;

d. A gross floor area of 5 sqm per balcony should be provided for houses or apartments with more than one bedroom if private external space size specifications cannot be met.

6.52 Applicants should refer to best practice and guidance on achieving quality design for all new residential development, as set out in the Essex Design Guide.

04

Managing Growth

Delivering the Spatial Strategy

4.1 This chapter sets out two Strategic Policies and a number of supporting cross-cutting development management policies. Strategic Policy MG01 Spatial Strategy is the overarching strategic policy for the Local Plan to achieve the borough's Spatial Strategy and vision. It sets out the quantum and distribution of growth as described in Chapter 3. Strategic Policy MG02 Green Belt is also a key policy that informs the appropriate distribution of growth, given the predominance of Green Belt in the Borough.

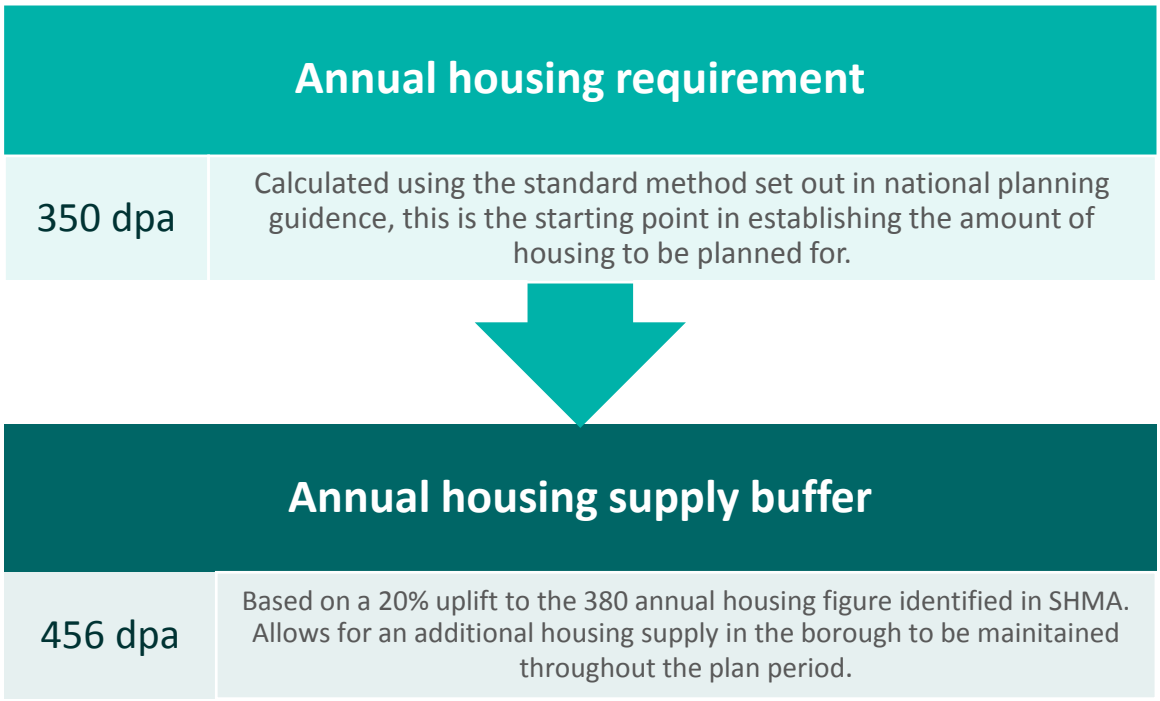


Figure 4.1: Annual housing requirement and supply buffer

STRATEGIC POLICY MG01: SPATIAL STRATEGY

Quantum of Development

1. The Council will work positively and proactively with development industry and wider stakeholders to enable the development of the allocated sites identified on the Policies Map in order to meet the borough's housing and employment needs and targets. To facilitate a significant increase in the delivery of new homes as well as jobs to promote sustainable communities, provision is made for:

    a. 7,752 new residential dwellings (net) to be built in the borough over the Plan period 2016-2033 at an annual average rate of 300 dwellings per year to 2023/24, followed by 400 dwellings per year to 2029/30 and then 984 dwellings per year to 2032/33;
    b. 13 permanent pitches to accommodate Gypsy and Traveller accommodation needs, distributed across the borough as set out in Policy HP07;
    c. about 46.64 ha of new employment land, 1,604 square metres (net) of comparison retail floorspace and 4,438 square metres (net) of

convenience floorspace, to enable the creation of at least 5,000 additional jobs.

Growth Distribution

2. The majority of new development is directed to the borough's two strategic transit growth corridors, as illustrated in the Key Diagram, ensuring the benefits resulting from their proximity to existing sustainable transport infrastructure. This strategy has required the release of land from the green belt. The geographic distribution and pattern of growth is planned as follows:

    a. Central Brentwood Growth Corridor comprising mainly brownfield infill and urban extensions. Three strategic residential-led, mixed-use sites in this location are allocated;

    b. South Brentwood Growth Corridor comprising largely of employment provision, brownfield redevelopment and a new Garden Village settlement. Two strategic residential-led, mixed-use development sites in this location are allocated;

    c. Limited growth is planned at suitable sites in two northern villages of Kelvedon Hatch and Blackmore;

    d. The housing requirements for designated neighbourhood plan areas in the borough are outlined in the table of Figure 4.2.

Sequential Land Use

4.2 The spatial strategy informs the allocation of sites for development. This considers each location in terms of a sequential land use test, in line with guidance and best practice, and should be a key consideration in determining applications. It prioritises growth based on brownfield land and land in urban areas first; and only then brownfield land in Green Belt areas where deemed appropriate according to policies in the Plan.

4.3 A range of economic evidence has informed the employment land and job growth need, including the Brentwood Economic Futures Report (2018) and Strategic Housing Market Assessment (2018).

Growth in Designated Neighbourhood Planning Areas

4.4 Brentwood currently has three designated neighbourhood plan areas covering parish council areas as outlined on the Council's Neighbourhood Planning webpages. Housing requirements in the designated neighbourhood planning areas are set out in the table in Figure 4.2 below.

Parish/Designated Neighbourhood Plan Areas	Date of Designation	Housing Requirements	Site Allocations
West Horndon CP	Designated November 2014	2530	R01, R02
Ingatestone and Fryerning CP	Designated October 2017	57	R22
Doddinghurst CP	Designated December 2012	0	None

Figure 4.2: Housing Requirements in Neighbourhood Planning Parish Areas

Green Belt and Rural Development

Green Belt Local Context

4.5 London Metropolitan Green Belt was established by the Town and Country Planning Act 1974 to control the outward spread of London into surrounding counties such as Essex. This designation has provided an important protection to the borough's countryside. The Council strongly supports the continued preservation of the Metropolitan Green Belt. With Brentwood borough being the sixth highest Green Belt area in England, this significantly limits land available for development.

4.6 However, given Brentwood's proximity to London and good connectivity, there is huge demand and pressure for development. The Council has had to make some difficult, but informed decisions around the alternation of the Green Belt boundary, in line with national planning policy. Through the Green Belt review process and alongside the Sustainability Appraisal process, exceptional circumstances were established to release of a number of sites to meet housing, employment and Gypsy and Traveller needs, as described in Policy MG01 Spatial Strategy. The Policies Map illustrates the Green Belt boundary as established by this Local Plan, with defensible boundaries around the allocation sites.

STRATEGIC POLICY MG02: GREEN BELT

A. The Metropolitan Green Belt within Brentwood Borough (as defined in the Brentwood Policies Map) will be preserved from inappropriate development so that it continues to maintain its openness and serve its key functions. Planning

4.18 Larger villages in the borough are served by a local shopping parade and a primary school. They generally have limited, often shared, community and health facilities, local jobs and a variable bus service.

4.19 Brownfield redevelopment opportunities will be encouraged to meet local needs and policies in this Plan will help to bring forward nearby redevelopment of brownfield sites in the Green Belt where appropriate. Minimal amendments are proposed to the Green Belt boundaries surrounding larger villages in order to retain the character of the borough in line with the spatial strategy.

4.20 Remote smaller villages and hamlets, some within the Green Belt. These settlements have limited local services and facilities and poor public transport links, reliant on other settlements nearby in many cases. Development in these locations will be encouraged only in brownfield locations, steered by the policies in the Plan

Health Impacts

4.21 Local planning policy has a crucial role to play in ensuring that the opportunities exist for people to be able to make healthier life choices and addressing health inequalities (as per the role of health and well-being in plan-making 2017, plan-making guidance 2018 and the NPPF). The policies within the Brentwood Local Development Plan use both local and national evidence, strategy and policy with the aim to create and support strong, vibrant, sustainable and healthy communities. These will be delivered by promoting and facilitating healthy living, and creating environments which offer opportunities for healthy choices across generations. The health and well-being of communities must begin with the planning process, and it is agreed that if a community has access to well-designed places, access to appropriate health and community services and facilities set out above, health and well-being should be positively influenced.

POLICY MG04: HEALTH IMPACT ASSESSMENTS (HIAs)

A. To ensure new development is designed to promote good health, a Health Impact Assessment, will be required for residential proposals of 50 or more units (or less than 50 units at the discretion of the planning authority where the number of units could propose a significant impact on the community and infrastructure) and non-residential developments of 1,000m^2, or more, and hot food takeaways that are not within a designated town, district or local centre and are within 400 metres of a school entrance. The Health Impact Assessment will be prepared in accordance with the advice and best practice as published by Public Health England and locally through the EPOA HIA Guidance Note, using the most up to date guidance. The purpose of the

Health Impact Assessment is to identify opportunities of positive health impacts and potential negative impacts and how they might be mitigated.

B. Where significant impacts are identified, planning permission will be refused unless reasonable mitigation or planning controls can be secured.

4.22 The NPPF acknowledges that the planning system can play an important role in facilitating social interaction and creating healthy, inclusive communities. Local planning authorities (LPAs) are expected to use their planning powers to ensure that health and well-being inequalities are reduced and mitigated where appropriate, to ensure positive social, economic, and environmental benefits are achieved. Brentwood Borough Council is committed to ensuring all new developments promote healthier and inclusive environments. This includes regeneration proposals. The design of the built environments and use of the natural environments play a key role in ensuring that health inequalities are not exacerbated and can support people to live healthier lives. The following issues impact on the physical, social, and mental health and well-being of communities and should be addressed in accordance with policies within this Plan:

i. the location, density and mix of land use;

ii. street layout and connectivity;

iii. access to public services, employment, local fresh food, education, leisure and recreation activities, and other community services;

iv. safety and security;

v. open and green space;

vi. affordable and energy efficient housing;

vii. air quality and noise;

viii. extreme weather events and climate change;

ix. community interaction; and

x. transport.

4.23 Health and well-being inequalities have been recognised as having a significant impact on communities. The government has clearly signalled its commitment to promoting Health Impact Assessment since 2003 with the publication on Tackling Health Inequalities by the London Department of Health, followed by Choosing Health White Paper (2004), the Department of Health Guidance on Planning for NHS staff, and the inclusion of Health and Well-being requirements as set out in the NPPF.

4.24 In response to the government's priorities placed on health and well-being, the Essex Planning Officers Association (EPOA) published a guidance note on Health Impact

Assessments (2008) which set out targets for all local authorities to ensure that their Local Development Frameworks (or equivalent development plan documents) contain a policy requiring HIA for relevant planning applications. The EPOA Guidance Note was update in 2019; once published, Public Health England (PHE) also published further guidance on Health Impact Assessments in spatial planning (2020)[5] which provides information on the process for undertaking an HIA and additional resources which may be helpful to applicants required to prepare an HIA as part of their planning application. Developers should refer to the most up to date guidance to ensure that health and well-being impacts have been fully considered as part of the proposal.

4.25 The updated Essex Design Guide (EDG) includes the principles of health and wellbeing and a common theme embedded throughout the document. The EDG encourages all developments to employ the principles of Building Regulations Part M4 Category 2 (Accessible and Adaptable Dwelling) so as to promote independent living. The provision of access to open spaces, natural environments and informal and formal recreation opportunities contributes significantly to prevention of ill health. Transport corridors should be well-established to encourage cycling and walking as safer, more active alternatives to the car for local journeys.

4.26 PHE's guidance Using the Planning System to Promote Healthy Weight Environments (February 2020) suggests that limiting the availability of takeaways within walking distance of schools can contribute to tackling the rising levels of obesity and other health impacts such as cardiovascular disease. 400 metres has been considered a reasonable walking distance and is outlined within the Urban Design Compendium 2 and CIHT Guidelines for providing journeys on foot.

4.27 PHE's Obesity Profile illustrates that where there are concentrations of hot food takeaways within Brentwood Borough, there is an increase in the number of children who are overweight and obese. The Borough's current obesity rates are approximate 14% which is below the National average of 20%. However, in areas where there is a concentration of hot food takeaways, the average overweight and obesity rates increase to 15-24%, which is higher than the National average.

4.28 Each application will be considered on its own merits and the 400m zone must be considered in the context of the local topography and context of the individual application. There are mitigating factors that can be considered, for example the potential for natural or man-made barriers that limit accessibility from schools, even within the 400m direct line exclusion zone.

4.29 The joint Essex health and wellbeing strategy 2018-2022 is supported by partners including district councils and health. The priorities within this are:

i. improving mental health and wellbeing;

ii. addressing obesity, improving diet and increasing physical activity;

[5] Public Health England. Health Impact Assessment in spatial planning. A guide for local authority public health and planning teams (2020). https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/929230/HIA_in_Planning_Guide_Sept2020.pdf

iii. influencing conditions and behaviours linked to health inequalities; and

iv. enabling and supporting people with long-term conditions and disabilities.

4.30 Developers will be expected to contact the Council at pre-application stage to complete the Healthy Communities Checklist (as part of the validation checklist), to enable joint discussions to take place on the likely health and well-being impacts and environmental impacts of proposals. This is an opportunity to strengthen the process of spatial planning through partnership working, community engagement, evidence sharing and coordination.

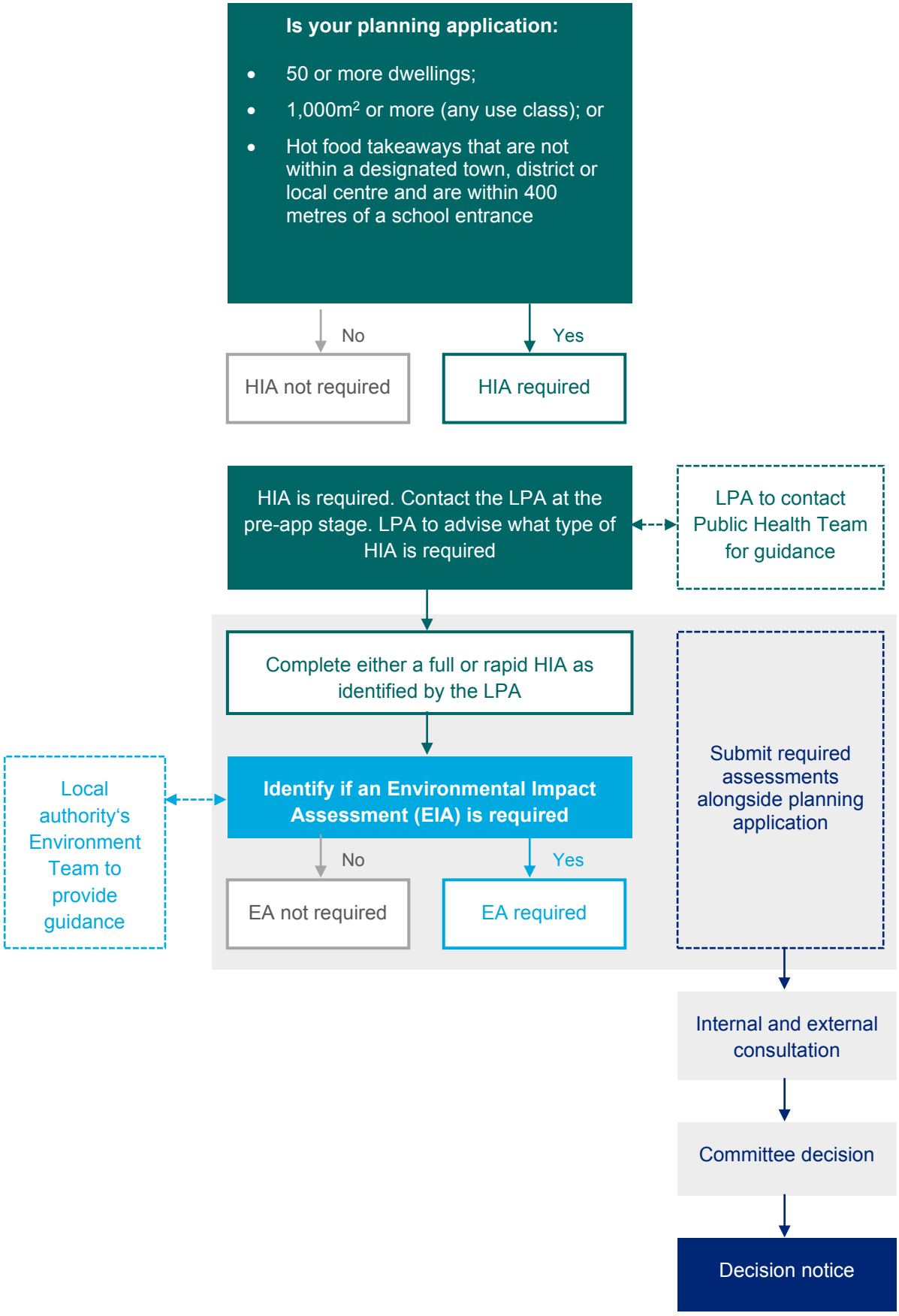


Figure 4.3: How to assess if a planning application requires to undertake an HIA and the steps involved

POLICY MG05: DEVELOPER CONTRIBUTIONS

1. All new development should be supported by, and have good access to, all necessary infrastructure. Permission will only be granted if it can be demonstrated that there is sufficient appropriate infrastructure capacity to support the development or that such capacity will be delivered in a timely and, where appropriate, phased manner by the proposal.

2. Where a development proposal requires additional infrastructure capacity, to be deemed acceptable, mitigation measures must be agreed with the local planning authority and the appropriate infrastructure provider. Such measures may include (not exclusively):

    a. financial contributions towards new or expanded facilities and the maintenance thereof;

    b. on-site provision of new facilities;

    c. off-site capacity improvement works; and/or

    d. the provision of land.

3. Developers and land owners must work positively with the Council, neighbouring authorities and other infrastructure providers throughout the planning process to ensure that the cumulative impact of development is considered and then mitigated, at the appropriate time, in line with their published policies and guidance.

4. Applicants proposing new development will be expected to make direct provision or contribute towards the delivery of relevant infrastructure as required by the development either alone or cumulatively with other developments, as set out in the Infrastructure Delivery Plan and other policies in this Plan, where such contributions are compliant with national policy and the legal tests. Where necessary, developers will be required to:

    a. enter into Section 106 (S106) agreements to make provisions to mitigate the impacts of the development where necessary or appropriate. Section 106 will remain the appropriate mechanism for securing land and works along with financial contributions where a sum for the necessary infrastructure is not secured via CIL; and/or

    b. make a proportionate contribution on a retrospective basis towards such infrastructure as may have been forward-funded from other sources where the provision of that infrastructure is necessary to facilitate and/or mitigate the impacts of their development (including the cumulative impacts of planned development),

5. For the purposes of this policy the widest reasonable definition of infrastructure and infrastructure providers will be applied. Exemplar types of infrastructure are provided in the glossary appended to this Plan.

6. Exceptions to this policy will only be considered if:

    a. it is proven that the benefits of the development proceeding without full mitigation outweigh the collective harm;

    b. a fully transparent open book Viability Assessment has proven that the full mitigation cannot be afforded, allowing only the minimum level of developer profit and land owner receipt necessary for the development to proceed. The viability assessment may be subject to an independent scrutiny by appointed experts, at the applicant's cost and will be required to be updated upon completion of the development through a planning obligation;

    c. a full and thorough investigation has been undertaken to find innovative solutions to issues and all possible steps have been taken to minimise the residual level of harm; and

    d. enter into planning obligations to provide for appropriate additional mitigation and/or contributions (as the case may be) in the event that viability improves prior to completion of the development.

4.31 The spatial vision and strategic objectives emphasise the importance of managing growth and shaping change sustainably. Planning for appropriate and adequate infrastructure is at the heart of sustainable development. Provision of appropriate and timely strategic infrastructure will be central to the continuing prosperity, attractiveness and sustainability of Brentwood. Plan-led growth provides the opportunity to address infrastructure needs, maximise the efficient use of existing infrastructure capacities and explore opportunities for new sustainable infrastructure.

4.32 In addition, the Council has prepared an Infrastructure Delivery Plan (IDP) to inform the Local Plan, this sits alongside the Local Plan and identifies the main items of infrastructure needed to mitigate the cumulative impacts of and support planned development; the site allocation policies also identify key pieces of site-specific infrastructure needed to support the development. New development will be expected to deliver or contribute to the necessary infrastructure requirements of the development as identified by the Council's IDP and site specific requirements, where such contributions are compliant with national policy and the legal tests. The Council will seek contributions from developers to fund the necessary infrastructure requirements through the use of planning condition and/or planning obligation and/or financial contributions through Community Infrastructure Levy (CIL) charges in accordance with the Community Infrastructure Regulations 2019.

4.33 The Council will work collaboratively with appropriate infrastructure providers, our partners and developers to facilitate the timely delivery of the infrastructure necessary to support the level of growth required.

4.34 The IDP Part B (Schedule) identifies the types of infrastructure required to support the anticipated growth in the borough and includes a summary of the currently identified infrastructure projects and their phasing, costing, delivery mechanism, priority ranking and relevant site allocations.

4.35 The IDP will be updated in consultation with both the internal and external stakeholders such as other service areas and infrastructure providers.

4.36 In negotiating planning obligations, the Council will also take into account strategic infrastructure (category 1 items in the IDP). The Council will use planning conditions or legal agreements to facilitate the provision of strategic infrastructure. Where necessary this will involve suitable phasing of development and forward funding of its supporting infrastructure. In addition to developer funding, where necessary, the Council will collaborate with its partners to lobby central Government and funding partners for additional funding sources for strategic infrastructure projects.

4.37 Early delivery of certain strategic and necessary infrastructure (category 1 and category 2 items in the IDP) in advance of all contributions having been collected may be required to support the level of growth planned. It will therefore be necessary to obtain funding from alternative sources and to collect developers' contributions retrospectively for these projects. In those instances, the Council and its partners including relevant landowners/developers will consider forward-funding wholly or partly to deliver critical infrastructure items. Therefore, in order to appropriately recover such forward-funding, when planning applications for development which will be enabled by and/or benefit from such infrastructure do come forward, the Council may seek retrospective planning obligation contributions from all relevant development, at the appropriate contribution rate, even if those applications are not made until after the relevant infrastructure has been completed and/or fully or partially funded. Where an item of infrastructure has been forward funded or provided by a relevant landowner/developer, the retrospectively collected planning contributions may be used to reimburse to such landowner/developer. As the final costs of the relevant item of infrastructure may not be known at the time, planning obligations requiring a contribution towards that infrastructure may also, where appropriate, contain a mechanism for review once the relevant item(s) of infrastructure has been fully paid for and constructed so as to secure payment of the appropriate level of contributions to cover the costs of the infrastructure. The CIL Regulations prohibit borrowing against future CIL receipts, so this method of forward-funding only applies to planning obligations.

4.38 Applicants should refer to Essex County Council's Developers' Guide to Infrastructure Contributions which sets out ECC's standards for the receipt of relevant infrastructure funding.

4.39 The Council will take into account financial viability to ensure that the cumulative impact of planning policy, standards and infrastructure requirements do not render the sites and development identified in the Local Plan unviable and therefore undeliverable.

4.40 This policy must be read in conjunction with Policy NE01.

4.41 The Council intends to progress the introduction of the Community Infrastructure Levy (CIL) as soon as possible after the Local Plan Examination. CIL is a charge, used to fund borough wide and local infrastructure projects for the benefit of local communities. The CIL Charging Schedule is subject to independent Examination. CIL is payable upon the granting of planning consent. This enables the Council to raise funds from developers and provide some certainty 'up front' about how much money developers will be expected to contribute.

Monitoring and Delivery

Local Plan Review Requirements

4.42 The NPPF (2021) states that the preparation and review of all policies should be underpinned by relevant and up-to-date evidence, and that this evidence is adequate and proportionate, taking into account relevant market signals. The NPPF (2021, paragraph 33) also states that reviews should be completed no later than five years from the adoption date of the plan, especially to take into account changing circumstances affecting the area, or any relevant changes in national policy.

4.43 The Council recognises that continuous 'horizon scanning' is necessary to maintain a long-term view of the relevance of the policies, in light of the fast-paced technological advances of the built environment sectors and market efficiency in delivering planned development. This includes joint working on initiatives such as the South Essex Joint Strategic Plan. This is in addition to the day-to-day monitoring of the strategic objectives and policy implementation to reflect on how effective the Plan is in delivering and maintaining a sufficient supply of housing to meet needs.

4.44 Therefore, we will monitor the implementation of policies and proposals of the Local Plan using key indicators and targets set out in the Monitoring Framework (Appendix 3). The Council are committed to undertaking an early update of the Local Plan to ensure it looks ahead over a minimum 15-year period from adoption. Such a review may also be required to address the implications of the national standardised approach to calculating local housing need, when adopted.

POLICY MG06: LOCAL PLAN REVIEW AND UPDATE

The Council will bring forward a partial update of the Plan with the objective of meeting the full Objectively Assessed Housing Needs. The review will commence immediately upon the adoption of this Plan with submission of the review for examination within 28 months. Specific matters to be addressed by the update

Protecting and Enhancing Natural Heritage

STRATEGIC POLICY NE01: PROTECTING AND ENHANCING THE NATURAL ENVIRONMENT

1. The Council will require development proposals to use natural resources prudently and protect and enhance the quality of the natural environment. All proposals should, wherever possible, incorporate measures to secure a net gain in biodiversity, protect and enhance the network of habitats, species and sites (both statutory and non-statutory) and avoid negative impacts on biodiversity and geodiversity. Compensatory measures will only be considered if it is not possible fully to mitigate any impacts.

2. When determining planning applications, the council will apply the principles relevant to habitats and biodiversity as set out in National Planning Policy.

International Designated Sites

3. Where a proposed development is likely to have an adverse impact on European Designated Site (whether individually or in combination with other plans or proposals) permission will not be granted unless there is due compliance with the requirements of the Habitats Regulations.

4. New residential development within the Essex RAMS and Epping Forest SAC Zones of Influence will be required to provide appropriate on-site measures for the avoidance of, and/or reduction in, recreational disturbance on European Designated Sites through the incorporation of recreational opportunities, including the provision of green space and footpaths in the proposals. Proposals will be required to follow the mitigation hierarchy by seeking to avoid creating recreational impacts first and foremost, with mitigation measures considered separately to avoidance.

Nationally Designated Sites

5. Development proposals within or outside a SSSI, likely to have an adverse effect on a SSSI (either individually or in combination with other developments), will not be permitted unless, exceptionally, the benefits of the proposed development clearly outweigh both the adverse impacts on the features of the site that make it of national importance and any impacts on the wider network of SSSIs.

Sites of Local Importance

6. Development proposals that are likely adversely to affect locally designated sites, including their functional status within any identified ecological network, will only be permitted where the applicant can demonstrate that:

    a. the ecological coherence of the site and any local ecological network is maintained; and

    b. it can be demonstrated that the benefits of the development clearly outweigh the loss.

8.13 All stages of development must be considered when assessing the impact and cumulative impact on wildlife sites both within and in proximity to the borough of Brentwood.

8.14 The Council acknowledges the sensitive biodiversity sites just beyond the borough boundary, including Basildon Meadows SSSI, Norsey Wood SSSI and Epping Forest SSSI and Special Area of Conservation. Proposals likely to have an adverse effect on these neighbouring sites will be assessed per in accordance with Strategic Policy NE01 Protecting and Enhancing the Natural Environment.

8.15 Where there is a confirmed presence, or reasonable likelihood, of a legally protected species or priority species on an application site, the applicant will be required to demonstrate that adverse impacts upon the species have been avoided, and where they cannot be avoided adequately mitigated. Mitigation must conform to the requirements of relevant legislation and Natural England Standing Advice. Where impacts cannot be adequately mitigated, the proposal will not be permitted.

8.16 The Council will take a precautionary approach where insufficient information is provided about avoidance, management, mitigation and compensation measures and refuse such planning applications. The Council will secure management, mitigation and compensation measures through planning conditions/obligations where necessary.

8.17 Where Priority Habitats are likely to be adversely impacted by the proposal, the developer must demonstrate that every effort has been made to avoid adverse impacts. Mitigation and compensation measures will only be acceptable where it has been demonstrated impacts cannot be reasonably avoided in the first place. Impacts that cannot be avoided are to be mitigated onsite. Where residual impacts remain, offsite compensation will be required so that there is no net loss in quantity and quality of Priority habitat in the borough of Brentwood.

8.18 The Council supports the Essex Wildlife Trust Living Landscape's vision to 'restore, recreate and connect wildlife habitats'. Within each Living Landscape, opportunities for the preservation, restoration and recreation of priority habitats, ecological networks and populations of priority species will be supported in order to conserve and enhance strategic wildlife corridors and habitats in Essex. Development proposals that would deliver these

opportunities will in principle be supported, subject to other policies within this Plan. Development resulting in a significant adverse impact on the ecological function of these Living Landscapes will be refused.

8.19 In addition to the statutory protections and obligations for designated sites, proposals must also demonstrate how they are responding to:

a. the Essex Wildlife Trust Living Landscapes vision; and

b. the Thames Chase Plan.

Essex Coast RAMS

8.20 Development in the borough has the potential to increase the recreational pressures and disturbance on existing European level sensitive habitats such as the Essex Estuaries Special Area of Conservation (SAC), the Crouch and Roach Estuaries Special Protection Areas (SPA), and the Epping Forest Special Area of Conservation.

8.21 Recreational disturbance has been further considered in an Appropriate Assessment which has identified the need to prepare a Recreational disturbance Avoidance and Mitigation Strategy (RAMS) for these locations to deliver the mitigation necessary to avoid significant adverse effects from 'in-combination' impacts of residential development that is anticipated within the zone of influence.

8.22 Following consultation with Natural England, a Recreational Disturbance Avoidance and Mitigation Strategy (RAMS) has been prepared and adopted to include all coastal European sites. The strategy identifies where recreational disturbance is happening and the main recreational uses causing the disturbance. Development that is likely to have a significant effect on European sites will be required to contribute towards the implementation of the mitigation. It is considered that development in this zone of influence will be required to pay for the implementation of mitigation measures to protect the interest features of European designated sites along the Essex Coast which include the Essex Estuaries Special Area of Conservation; the Crouch and Roach Estuaries Special Protection Area, and the Colne and Blackwater Estuaries Special Protection Areas, and Ramsar sites. The appropriate mitigation mechanisms are identified in the RAMS. The Zones of Influence affecting Brentwood are shown on the Policies Map.

8.23 Any residential development within the Zone of Influence of the Essex Coast RAMS is likely to affect the integrity of these European sites. The developer will be required to either contribute towards mitigation measures identified in the RAMS or, identify and implement bespoke mitigation measures at the Essex Coastal Habitats sites to ensure compliance with the Habitat Regulations.

Epping Forest RAMS

8.24 A similar assessment process is being carried out for the Epping Forest Special Area of Conservation involving the local planning authorities that have been identified as having the potential for impact by their geographical proximity to Epping Forest. The detailed evidence

base has now been prepared and has identified the new residential development Zones of Influence (ZOI) of these internationally important protected biodiversity sites.

8.25 Prior to the adoption of a Supplementary Planning Document, or similar, in respect of the Epping Forest SAC, development in the Zones of Influence will be required to make an appropriate assessment of the in combination impact of the development and identify suitable mitigation proposals, in line with Natural England advice. Areas within Brentwood Borough fall just inside this ZOI; the Council will however, carefully consider the impacts, if any, of development that falls adjacent to this ZOI.

Green and Blue Infrastructure

8.26 Green and Blue Infrastructure (GBI) is a network of multi-functional natural or semi-natural networks of green (soil covered or vegetated) and blue (water covered) spaces and corridors, in either an urban or rural setting, that connects, maintains and enhances ecosystem services. GBI should thread through and surround the built environment and connect the urban area to its wider rural hinterland. It is capable of delivering a wide range of environmental and quality of life benefits for local communities by providing recreational or cultural experiences. It can also help support a number of strategic objectives across policy areas, such as promoting public health and wellbeing, mitigating and adapting to climate change (heat risk, flood risk, sustainable drainage), improving water and air quality, as well as conserving habitats and contributing to biodiversity net-gain. Figure 8.1 defines the different types of GBI. They include those found in Brentwood, but also additional types that could be delivered as part of new development.

8.27 In Brentwood, GBI includes open space, woodlands, wildlife habitat, parks, commons, villages and town greens, nature reserves, recreational sports facilities, cemeteries, allotments, gardens, waterways and bodies of water, registered parks and gardens. Figure 8.1 sets out the GBI typology which is based upon the Green Infrastructure Strategy[59], Sport, Leisure and Open Space Assessment[60], Natural England's Green Infrastructure Guidance[61].

8.28 A well connected GBI network will play a crucial role in maintaining the Borough's distinctive 'Borough of Villages' character. The Council will take a strategic approach to maintaining and enhancing networks of GBI, ensuring a variety of managed, multi-functional open spaces, coherent ecological green corridors, water courses and water bodies to promote a resilient and sustainable built environment, in line with the Council's Green Infrastructure Strategy (2015). The Council will work with statutory bodies, and wider stakeholders, including developers to conserve, enhance and maintain the natural environment.

8.29 Open spaces take many forms and all are an integral component of the GBI network, forming key destinations. The designated Urban Open Spaces, as depicted on the Policies

[59] Groundwork (2015) Brentwood Green Infrastructure Strategy

[60] PLC (2016) Sport, Leisure and Open Space Assessment Final Report

[61] Natural England (2009) Green Infrastructure Guidance

Map, represent green spaces in urban settlements that provide an important multi-functional local resource to residents and therefore, are to be protected. They are made up of different types of open spaces, including parks, sports grounds and playing fields (including playing fields forming part of an education establishment), woodlands, and amenity green space. However, Brentwood has direct access, via the Public Rights of Way network, to extensive publicly accessible parks, including Country Parks such as Hutton, South Weald and Thorndon within the surrounding countryside also identified on the Policies Map. There will be a presumption against the development of open spaces which provide a significant amenity resource.

GBI Typologies	GBI sub-types
Urban Open Spaces	Designated green spaces in existing settlement (urban) areas, of various typologies that are to be protected. NB. These were previously partly identified by the 'Protected Open Space' designation in the replacement Local Plan 2005.
Parks and Gardens	Country Parks, Borough parks and Recreation Grounds, Registered Parks and Gardens.
Ecological assets and natural and semi-natural greenspaces (urban / rural)	Special Sites of Scientific Interest (SSSI), Local Nature Reserves (LNR), Local Wildlife Sites (LoWS), Woodlands, Geological Assets, Thames Chase Forest.
Green Corridors	Hedgerows, amenity grasslands/greenspace or green verges along major road corridors and major rail corridors, rights of way, and Protected Lanes.
Blue corridors	Main rivers (e.g. Rivers Roding, Ingrebourne, Wid and Mardyke), large ordinary/ non-main river watercourses, major tributaries, wetland.
Sports and Recreation Grounds	Play pitches that are green/permeable in nature such as: tennis courts, bowling greens, sports pitches, golf courses, school and other institutional playing fields, and other outdoor sports areas. Green formal/ informal recreation areas.
Allotments	Statutory and Non-statutory allotments; community gardens.
Cemeteries and churchyards	Public and privately-owned facilities.

Landscapes and accessible urban fringe countryside	Ancient Landscapes, fringe countryside.
Garden Land	Private back gardens, private amenity green space on estates or private communal gardens that are entirely to the rear or within the curtilage of a dwelling or dwellings, as originally designed
Other GI	Green walls, green roofs, estate greenspace, etc

Figure 8.1: Brentwood Green and Blue Infrastructure Typology

STRATEGIC POLICY NE02: GREEN AND BLUE INFRASTRUCTURE

1. Brentwood's network of green and blue infrastructure (GBI) will be protected, enhanced and managed to provide a multi-functional, high quality open space resource, capable of delivering opportunities for recreation, health and wellbeing, ecological connectivity, biodiversity net-gain as well as wider ecosystem services for climate change adaptation.

2. New development is expected, where possible and appropriate, to maximise opportunities to enhance or restore existing GBI provision and/or create new provision on site that connects to the wider GBI network. Its design and management should also respect and enhance the character and distinctiveness of the local area.

3. Developments on sites containing or are adjacent to a water course or water body (Blue Infrastructure) are required to ensure there is no adverse impact on the functioning or water quality of the Blue Infrastructure. Proposals that maximise opportunities to enhance or restore Blue Infrastructure and incorporate these features into the public realm of the development will be supported. An adequate undeveloped buffer zone should be applied as necessary to mitigate flood risk, in line with Policy NE09 and/or support sustainable drainage, in line with Policy BE05.

4. Proposals should provide appropriate specification and maintenance plans for the proposed green and blue infrastructure throughout the life of the development.

8.30 This policy is in line with the NPPF, as well as the government's latest environment plan: A Green Future: Our 25 Year Plan to Improve the Environment which sets out a vision for

base has now been prepared and has identified the new residential development Zones of Influence (ZOI) of these internationally important protected biodiversity sites.

8.25 Prior to the adoption of a Supplementary Planning Document, or similar, in respect of the Epping Forest SAC, development in the Zones of Influence will be required to make an appropriate assessment of the in combination impact of the development and identify suitable mitigation proposals, in line with Natural England advice. Areas within Brentwood Borough fall just inside this ZOI; the Council will however, carefully consider the impacts, if any, of development that falls adjacent to this ZOI.

Green and Blue Infrastructure

8.26 Green and Blue Infrastructure (GBI) is a network of multi-functional natural or semi-natural networks of green (soil covered or vegetated) and blue (water covered) spaces and corridors, in either an urban or rural setting, that connects, maintains and enhances ecosystem services. GBI should thread through and surround the built environment and connect the urban area to its wider rural hinterland. It is capable of delivering a wide range of environmental and quality of life benefits for local communities by providing recreational or cultural experiences. It can also help support a number of strategic objectives across policy areas, such as promoting public health and wellbeing, mitigating and adapting to climate change (heat risk, flood risk, sustainable drainage), improving water and air quality, as well as conserving habitats and contributing to biodiversity net-gain. Figure 8.1 defines the different types of GBI. They include those found in Brentwood, but also additional types that could be delivered as part of new development.

8.27 In Brentwood, GBI includes open space, woodlands, wildlife habitat, parks, commons, villages and town greens, nature reserves, recreational sports facilities, cemeteries, allotments, gardens, waterways and bodies of water, registered parks and gardens. Figure 8.1 sets out the GBI typology which is based upon the Green Infrastructure Strategy[59], Sport, Leisure and Open Space Assessment[60], Natural England's Green Infrastructure Guidance[61].

8.28 A well connected GBI network will play a crucial role in maintaining the Borough's distinctive 'Borough of Villages' character. The Council will take a strategic approach to maintaining and enhancing networks of GBI, ensuring a variety of managed, multi-functional open spaces, coherent ecological green corridors, water courses and water bodies to promote a resilient and sustainable built environment, in line with the Council's Green Infrastructure Strategy (2015). The Council will work with statutory bodies, and wider stakeholders, including developers to conserve, enhance and maintain the natural environment.

8.29 Open spaces take many forms and all are an integral component of the GBI network, forming key destinations. The designated Urban Open Spaces, as depicted on the Policies

[59] Groundwork (2015) Brentwood Green Infrastructure Strategy

[60] PLC (2016) Sport, Leisure and Open Space Assessment Final Report

[61] Natural England (2009) Green Infrastructure Guidance

Map, represent green spaces in urban settlements that provide an important multi-functional local resource to residents and therefore, are to be protected. They are made up of different types of open spaces, including parks, sports grounds and playing fields (including playing fields forming part of an education establishment), woodlands, and amenity green space. However, Brentwood has direct access, via the Public Rights of Way network, to extensive publicly accessible parks, including Country Parks such as Hutton, South Weald and Thorndon within the surrounding countryside also identified on the Policies Map. There will be a presumption against the development of open spaces which provide a significant amenity resource.

GBI Typologies	GBI sub-types
Urban Open Spaces	Designated green spaces in existing settlement (urban) areas, of various typologies that are to be protected. NB. These were previously partly identified by the 'Protected Open Space' designation in the replacement Local Plan 2005.
Parks and Gardens	Country Parks, Borough parks and Recreation Grounds, Registered Parks and Gardens.
Ecological assets and natural and semi-natural greenspaces (urban / rural)	Special Sites of Scientific Interest (SSSI), Local Nature Reserves (LNR), Local Wildlife Sites (LoWS), Woodlands, Geological Assets, Thames Chase Forest.
Green Corridors	Hedgerows, amenity grasslands/greenspace or green verges along major road corridors and major rail corridors, rights of way, and Protected Lanes.
Blue corridors	Main rivers (e.g. Rivers Roding, Ingrebourne, Wid and Mardyke), large ordinary/ non-main river watercourses, major tributaries, wetland.
Sports and Recreation Grounds	Play pitches that are green/permeable in nature such as: tennis courts, bowling greens, sports pitches, golf courses, school and other institutional playing fields, and other outdoor sports areas. Green formal/ informal recreation areas.
Allotments	Statutory and Non-statutory allotments; community gardens.
Cemeteries and churchyards	Public and privately-owned facilities.

Landscapes and accessible urban fringe countryside	Ancient Landscapes, fringe countryside.
Garden Land	Private back gardens, private amenity green space on estates or private communal gardens that are entirely to the rear or within the curtilage of a dwelling or dwellings, as originally designed
Other GI	Green walls, green roofs, estate greenspace, etc

Figure 8.1: Brentwood Green and Blue Infrastructure Typology

STRATEGIC POLICY NE02: GREEN AND BLUE INFRASTRUCTURE

1. Brentwood's network of green and blue infrastructure (GBI) will be protected, enhanced and managed to provide a multi-functional, high quality open space resource, capable of delivering opportunities for recreation, health and wellbeing, ecological connectivity, biodiversity net-gain as well as wider ecosystem services for climate change adaptation.

2. New development is expected, where possible and appropriate, to maximise opportunities to enhance or restore existing GBI provision and/or create new provision on site that connects to the wider GBI network. Its design and management should also respect and enhance the character and distinctiveness of the local area.

3. Developments on sites containing or are adjacent to a water course or water body (Blue Infrastructure) are required to ensure there is no adverse impact on the functioning or water quality of the Blue Infrastructure. Proposals that maximise opportunities to enhance or restore Blue Infrastructure and incorporate these features into the public realm of the development will be supported. An adequate undeveloped buffer zone should be applied as necessary to mitigate flood risk, in line with Policy NE09 and/or support sustainable drainage, in line with Policy BE05.

4. Proposals should provide appropriate specification and maintenance plans for the proposed green and blue infrastructure throughout the life of the development.

8.30 This policy is in line with the NPPF, as well as the government's latest environment plan: A Green Future: Our 25 Year Plan to Improve the Environment which sets out a vision for

England's environment post-Brexit. The 25 Year Environment Plan stresses the importance of good-quality green and blue infrastructure (GBI) and commits to creating a 'national framework of green infrastructure standards, ensuring that new developments include accessible green spaces and that any area with little or no green space can be improved for the benefit of the community'. This policy seeks to achieve achieve well managed, high quality multi-functional Green and Blue Infrastructure to ensure opportunities are maximised for recreation, health and wellbeing, net gain for biodiversity as well as help achieve additional benefits for air quality and climate adaptation. High quality green and blue infrastructure should be built into the design proposals and/or masterplans of new development, wherever possible.

8.31 It is vital that the right infrastructure is in place to support future growth in the borough, and this includes GBI. There is a need to better link formal and informal open spaces in the borough to improve their wider use and value, as highlighted by the Brentwood Green Infrastructure Strategy (2015). Existing GBI should be protected and enhanced and where opportunities arise, e.g. in conjunction with new development, additional provision made.

8.32 There is a growing and compelling body of evidence substantiating the potential for GBI to contribute to the economic, social and environmental well-being of individuals and society; for example, access to the countryside, sport and recreation facilities can promote active and healthy lifestyles through the enhancement of walking and cycling. Strategic scale and more local GBI can make a vital contribution to quality of place and health outcomes if properly integrated into the design and delivery of new development.

8.33 It is widely acknowledged that GBI and open space has a major role to play in mitigating against and adapting to climate change, for example, urban cooling, encouraging sustainable travel choices, flood alleviation and supporting habitats. Through the provision of GBI the policy can help overcome habitat fragmentation and improve the ability of the natural environment to adapt to climate change and habitat loss by improving ecological connectivity.

8.34 Landscape, parks and open space often have heritage interest, and can play a key role in enhancing and conserving the historic environment. It can be used to improve the setting of heritage assets and to improve access to it. Likewise, heritage assets can help contribute to the quality of green spaces by helping to create a sense of place and a tangible link with local history. Opportunities can be taken to link GBI networks into already existing landscapes or green spaces in towns or existing historic spaces such as church yards, town paths, verges etc. as well as larger designed landscapes to improve the setting of and access to historic buildings or historic townscape. Maintenance of GBI networks and spaces should also be considered so that they continue to serve as high quality places which remain beneficial in the long term.

8.35 Brentwood rivers and their valleys form an attractive and important ecological, leisure and recreation resource. The rivers are valued by residents and used as corridors of movement by people and wildlife. They also contain floodplains that provide flood storage capacity. The River Wid is located within the Anglian River Basin District and the Roding, Beam and Ingrebourne catchment and Mar Dyke lie within the Thames River Basin District. They contribute to the objectives of the Water Framework Directive, the Thames and Anglian River Basin Management Plan.

8.36 According to the Brentwood Water Cycle Study (2018), watercourses in the study area are either of Poor or Moderate Status; therefore, new development proposals need to ensure construction does not result in deterioration and where necessary, provide protection, enhancement and buffering of watercourses. This includes the provision of ecological buffer strips and corridors, native tree planting and the new wetland areas to help manage flood risk and reduce diffuse pollution whilst connecting people to nature. This could also include de-culverting, removal of redundant structures, alien species removal where appropriate.

8.37 According to the TCPA's guidance Planning for Green and Prosperous Places , as time goes by, GBI usually becomes increasingly valuable, but only if it is well maintained. This guidance also emphasises on the importance of maintaining GBI. Therefore, when planning GBI, the following should be considered from the earliest stage:

a. revenue funding: to pay for the care of the GBI in perpetuity;

b. capital funding: to pay for creating the GBI; and

c. the design of the GBI: which will affect the cost of maintaining it as well as the cost of creating it.

8.38 Proposals that provide appropriate GBI which is well integrated with the existing and new development and with the surrounding area will be supported. In progressing an allocation, strategic consideration should be given to additional mitigation measures, for example planning for the provision of 'off-site' compensatory habitats to address likely residual impacts upon Priority Habitats and Species, and long-term financial support to land managers of nearby green and blue infrastructure that may be subject to significant additional recreational pressure.

8.39 The strategic allocation of Dunton Hills Garden Village is located between three living landscape areas; other strategic allocations in the south of the borough, such as the Enterprise Park and West Horndon Industrial Estate redevelopment are also likely to have cumulative impacts on the landscape. However, they also present significant opportunities to establish a strategic framework that deliver a positive contribution to the local ecological network. The quantity, quality, accessibility and distribution of GBI across the area will be considered in site policies in Chapter 9 and development masterplan frameworks.

8.40 Development should seek to deliver green and blue infrastructure network in the borough. The strategic planning, implementation and management of GBI requires a co-ordinated approach from a multi-disciplinary, cross-organisational team of partners, for example, National Highways, Essex County Council, Natural England, Thames Chase Forest, Essex Wildlife Trust, the Council's public health team, as well as voluntary groups.

8.41 This policy should be read in conjunction with Policy BE05 Sustainable Drainage, Policy NE01 Protecting and Enhancing the Natural Environment, Policy NE03 Trees, Woodlands and Hedgerows, and Policy NE09 Flood Risk.

POLICY NE03: TREES, WOODLANDS, HEDGEROWS

1. Development proposals that would result in the deterioration or loss of irreplaceable ancient woodland and ancient and veteran trees will not be permitted other than in wholly exceptional circumstances and only if the proposals include a suitable compensation strategy. Applicants will need to demonstrate the efficacy of the strategy by reference to the value of the habitats that will be lost or harmed and provide an appropriate implementation and maintenance programme to underpin the strategy the performance of which will be subject of a condition and/or planning obligation, as appropriate.

2. In all other cases, proposals should, so far as possible and practicable, seek to retain existing trees, woodlands and hedgerows where they make a positive contribution to the local landscape and/or biodiversity or which have significant amenity value. Wherever possible and appropriate, landscaping schemes should take account of and incorporate these existing features in the scheme and where any loss is unavoidable, incorporate measures to compensate for their loss.

8.42 Advice is available to woodland owners from the Essex Farming and Wildlife Advisory Group, Essex County Council, Thames Chase Project Team or the Forestry Commission as to the most appropriate management of their sites. Woodland management must comply with the UK Forestry Standard and follow practices laid down in the Forestry Commission's Environmental Guidelines. In any new woodland planting scheme, the Council will seek the planting of tree and shrub species suited to the sites and aims of the scheme. Where conservation is the primary objective, there will be a presumption in favour of native species. The Forestry Commission is the Statutory Authority with powers to provide grant aid and issue Felling Licences. The Forestry Commission is also charged with the administration of the Environmental Impact Assessment (Forestry) Regulations (1999).

8.43 Trees and hedgerows are protected in the Town and Country Planning Act 1990, the Tree Regulations 2012 and Hedgerow Regulations 1997. The Council understands that the contribution that trees, either as woodland or individual specimens and hedgerows, make to the landscape is significant. In particular, the range of benefits for wildlife and people they provide.

8.44 Trees, woodlands, hedges and hedgerows provide important habitats for a range of species, provide shelter, help reduce noise and atmospheric pollution and also store carbon dioxide, helping to mitigate against climate change. They add to the character and quality of the local environment, can have historic value (e.g. ancient woodlands) and can offer recreation opportunities supporting health and well-being.

8.45 Trees, woodlands, hedges and hedgerows, wherever appropriate, should be incorporated within a landscape scheme. This can assist in integrating the scheme into the wider local environment by providing some mature, established landscape elements. When this cannot

be achieved, or it is known that trees are being lost to disease, mitigation or replacement compensatory measures will be required to ensure no loss to the overall value to the environment. These should be secured by condition or through a S106 Agreement.

8.46 Some specific trees or groups of trees are of particular amenity value, such that their removal would have a significant impact upon the local environment and its enjoyment by the public. Where they are potentially under threat, the Council will seek to retain and protect them, either through planning conditions or through Tree Preservation Orders (TPO).

8.47 A hedge or hedgerows is generally found within a settlement and often has an amenity or ornamental role; a hedgerow is more commonly found in a rural setting, although some old hedgerows remain within settlements and often provide field boundaries and may comprise a range of native species. They make an important contribution to the character of an area and may be historically and occasionally archaeological important. They also contribute significantly to biodiversity. Therefore, like trees, hedgerows should be conserved for their amenity, biodiversity and historic value. Development that is likely to impact hedgerows must be subjected to an assessment against the criteria of the Hedgerow Regulations 1997.

8.48 If a hedgerow is deemed to be important under the Hedgerow Regulations, development proposals must demonstrate that adverse impacts upon the Important Hedgerow will be avoided, and impacts that cannot be avoided are mitigated on-site.

8.49 In considering development proposals, the Council will normally expect the retention and beneficial management of any existing hedgerow; where a hedgerow is to be removed, the Council will, where appropriate, require its replacement with native species, either within or neighbouring sites, as part of its mitigation strategy, or demonstrate how it will contribute to biodiversity net-gain through other appropriate habitat creation.

8.50 In granting planning permission for new development, where significant hedgerows are to be retained, the Council will ensure that these hedgerows are given appropriate protection during the building works, through the use of planning conditions.

POLICY NE04: THAMES CHASE COMMUNITY FOREST

Development proposals which fall within the Thames Chase Community Forest Arear should not prejudice the implementation, aims and objectives of the Thames Chase Plan.

8.51 The Thames Chase Community Forest covers 40 square miles of landscape in East London and South West Essex. It is one of 10 national community forests across England established in 1990 to actively regenerate the landscape, protecting, improving and expanding the woodland character of the Community Forest for the benefit of local people

and wildlife Management is led by the Thames Chase Trust[62] in accordance with the Thames Chase Plan[63].

8.52 The Council supports the aims of the Thames Chase Plan, being:

a. to conserve, improve and expand the woodland character of the Community Forest;

b. to sustain the natural integrity of the Community Forest's air, land and water including wildlife;

c. to integrate climate change adaption and mitigation responses into the developing Community Forest;

d. to use the Community Forest to improve local health and well-being, volunteering, learning and employment; and

e. to enable effective partnership working from national to local level to maximise the impact of available resources.

8.53 The Thames Chase Plan provides a green infrastructure framework, to support and guide applications in enhancing the local environment, through landscaping, conservation works and upgrading of footpaths or bridleways. Such benefits are welcome, provided uses are consistent with Green Belt policy.

8.54 In 2016, following an award from the Heritage Lottery Fund, a wider partnership of organisations was set up with a stronger emphasis on area-based project delivery that translates forest wide ambition into tangible, quantifiable initiatives on the ground. This Land of the Fanns Partnership includes a number of national and local organisations, including Brentwood Borough Council, who are working towards the Landscape Conservation Action Plan (LCAP)[64]. Development proposals falling within the Thames Chase Community Forest area are strongly encouraged to consider the Thames Chase Community Forest aims and objectives outlined in these plans when devising their landscape schemes and green infrastructure proposals.

Open Space Needs and Adopted Standards

POLICY NE05: OPEN SPACE AND RECREATIONAL FACILITIES

1. All open spaces, including the designated Urban Open Spaces, as identified will be protected and where necessary enhanced to ensure access to a

[62] The Thames Chase Trust https://www.thameschase.org.uk/about-thames-chase/the-thames-chase-trust.
[63] Thames Chase Plan 2014 https://www.thameschase.org.uk/uploads/TCP_Full.pdf
[64] Land of the Fanns Landscape Conservation Action Plan (LCAP) 2016 - https://www.landofthefanns.org/our-partnership/about-the-scheme/

network of high quality provision and opportunities for sport, play and recreation within the borough. The loss of open spaces and any ancillary facilities, such as sports, play and recreation provision, will not be permitted unless it can be demonstrated that:

a. an assessment has been undertaken which clearly shows the provision and the function it performs is surplus to requirements; or

b. the loss resulting from the proposed development would be replaced by equivalent or better provision in terms of quantity and quality in a suitable, accessible location within the local catchment area; or

c. the development is for alternative sports and recreational provision, the benefits of which clearly outweigh the loss.

2. New development is required to maximise opportunities to incorporate new publicly accessible, high quality and multi-functional open space and/or, where appropriate, enhance existing provision that will serve the new and existing community, through improved connections, biodiversity net-gain and high quality sport, play and recreational amenities.

3. The amount and type of provision required will be determined according to the Council's identified needs, as set out in its Open Space and Play Pitch Strategy and adopted open space standards; with regard to children's play space, the Council will seek proposals which meet the Fields in Trust minimum standards (see Figure 8.3).

4. Where it can be clearly demonstrated that proposals are not able to incorporate new provision or enhance existing provision to serve the new community, then a commuted sum may be requested in line with Policy MG05 Developer Contributions where such contributions will provide alternative or enhanced and conveniently accessible off-site open space provision.

5. Proposals for the inclusion or enhancement of supporting and ancillary uses and facilities on open space, such as sport, play and other supporting recreational provision, should meet the following criteria:

a. the proposed facilities help improve the quality of the open space and promote inclusive access to a wide range of users and recreational interests;

b. are demonstrably ancillary to the use of open space and its primary function, e.g. play/sports fields;

c. help to contribute to both the character and amenity of the area and are appropriate and proportionate to the function and nature of the open space;

d. do not have a detrimental impact on the environmental function of the open space.

6. Maintenance plans should be submitted at planning application stage for all new facilities to ensure their long-term quality and management.

8.55 Brentwood's existing sport, leisure, public and private open spaces are important valued assets serving communities and visitors.

8.56 Access to good quality open space is essential for health and well-being. The ability to access local open space across the borough varies with a lack of provision in some areas. Provision within new development is therefore particularly important in areas where a deficiency has been identified or where new development would give rise to a deficiency.

8.57 The Council's Open Space, Play Pitch and Leisure Assessments provide an overview of the existing provision across the borough, as well as known deficiencies. All major development proposals should investigate and maximise opportunities to enhance open space, play, sport and recreation facilities where possible and appropriate, particularly in areas of deficiency in quantity and quality. New development can help to enhance provision even where it is not feasible to deliver new public open space on site. This could include improving access, through public realm enhancements, to existing nearby facilities or alternatively, contributions will be sought where appropriate.

8.58 All proposals, where appropriate, will be required to comply with the Council's identified needs and open space standards as set out in Figure 8.2 or any subsequent update, to inform the design of the proposals and planning application process. These take account of the recommendations in open space and sports facilities evidence, i.e. Brentwood Play Pitch Strategy (2018), Brentwood Open Space Strategy (2008-2018), the Leisure Strategy and Play Strategy (2018). With regards to children's play space, the Council will seek proposals which meet the Fields in Trust minimum standards as set out in Figure 8.3.

Outdoor Sport	3.15 ha per 1,000 population
Children's Playing Space	Between 0.13 – 0.17 ha per 1,000 population
Allotments and Community Gardens	0.18 per ha per 1,000 population

Figure 8.2: Open Space Standards

Local Area for Play (LAP)	Characteristics: The LAP is a small area of open space specifically designated and primarily laid out for very young children to play close to where they live. Aimed at children up to the age of 6.
	Walking distance: 100 m Minimum activity zone: 100 sqm Minimum buffer zone: 5 m
Local Equipped Area for Play (LEAP)	Characteristics: The LEAP is an area of open space specifically designated and laid out with features including equipment for children who are beginning to go out and play independently close to where they live.
	Walking distance: 400 m Minimum activity zone: 400 sqm Minimum buffer zone: 20 m
Neighbourhood Equipped Area for Play (NEAP)	Characteristics: The NEAP is an area of open space specifically designated, laid out and equipped mainly for older children but also with play opportunities for younger children.
	Walking distance: 1,000 m Minimum activity zone: 1,000 sqm comprising an area for play equipment and structures and a hard surfaced area of at least 465 sqm – the minimum needed to play five-a-side football) Minimum buffer zone: 30 m

Figure 8.3: Fields in Trust Children's Play Space Standards

POLICY NE06: ALLOTMENTS AND COMMUNITY FOOD GROWING SPACE

1. The provision of allotment space should, where possible and appropriate, be an integral part of the green and blue infrastructure provision in residential development.

2. Provision of areas for personal and community gardening and food growing will be favourably considered.

Promoting a Clean and Safe Environment

STRATEGIC POLICY NE08: AIR QUALITY

1. Development is required to meet national air quality standards and identify opportunities to improve air quality or mitigate local exceedances and impacts to acceptable legal and safe levels. Development proposals must demonstrate that they will not:

    a. Compromise the achievement of compliance targets within Air Quality Management Areas (AQMAs);

    b. Create new exceedance areas; and

    c. Create unacceptable risk of high levels of exposure to poor air quality, particularly where development is near to, or promotes land uses to be used by those particularly vulnerable to poor air quality (such as children and older adults).

2. Development proposals should be designed to minimise exposure to existing poor air quality and make appropriate provisions to improve local air quality conditions through design solutions and measures to the outdoor and indoor environment. Particular attention should be given to the positioning, layout and design of proposals for new build developments and community infrastructure (indoor and outdoor) that are likely to be used by large volumes of people on a daily basis, especially by vulnerable groups. Community infrastructure should, where possible incorporate appropriate buffer zones to prevent or minimise exposure to air pollution sources.

3. An Air Quality Impact Assessment is required as part of any planning application for:

    a. major developments;

    b. employment led developments;

    c. developments which will require substantial earthworks or demolition;

    d. developments which include community infrastructure including leisure, education and health facilities or open space (including child play space);

e. new build developments in areas along busy or congested road and rail lines where residents will be exposed to poor air quality;

f. developments which propose the use of Combined Heat and Power, biomass boilers or similar solutions that might impact air quality; and

g. new developments within AQMAs.

4. Development proposals should have regard to their individual and cumulative impacts on air quality. Proposals that do not meet the requirements of (A) and (B) above will be resisted unless appropriate measures are implemented to ensure adverse impacts can be mitigated to an acceptable level. Mitigation should be provided onsite unless it can be demonstrated that it is inappropriate and that off-site provision will deliver equivalent or wider benefits.

Air Quality in Brentwood

8.70 Transport generated emissions are the main source of poor air quality in the borough. Air quality relates to both particulate and gaseous pollution, including fumes, odours, dust and unsafe levels of Carbon Dioxide, Nitrogen Dioxide and other pollutants in the atmosphere which can impact environmental amenity for people and wildlife. This policy aims to address existing poor air quality and ensure new development does not contribute to the worsening of air quality across the borough, but instead contributes to improving air quality through design and other mitigation measures.

8.71 The Council will ensure that all development plays its part in securing 'clean growth', in line with Government's Clean Air Strategy (2019)[65]. As a minimum, development must not create further deterioration of existing poor air quality or lead to new exceedances of legal air quality standards or compromise achievement of compliance in those areas currently in exceedance, as currently stipulated by the Air Quality Standards Regulations 2010[66]. Development proposals should also reduce the population's exposure to poor air quality, particularly for those groups who are most vulnerable to its impacts such as children and young people and older people.

Air Quality Management Areas (AQMAs)

8.72 Exceedances of legal air quality standards are currently as provided by the Air Quality Standards Regulations (2010). Brentwood currently has three declared Air Quality Management Areas (AQMA) were exceedances have been previously recorded:

a. AQMA No. 2: M25/Brook Street Roundabout;

[65] https://www.gov.uk/government/publications/clean-air-strategy-2019
[66] https://www.legislation.gov.uk/uksi/2010/1001/contents/made

b. AQMA No. 4: A12/ Warescot Road/Hurstwood Avenue/Ongar Road;

c. AQMA No. 7: A128/A1023 Junction (Wilson's Corner).

8.73 AQMAs can be found on the Council's website. Ongoing monitoring will continue and the AQMA areas will be adjusted and reported to DEFRA accordingly. Monitoring data of air pollution in these AQMAs since 2015 has shown that the air quality standard for Nitrogen Dioxide has been met. However, as these three AQMAs remain potentially problematic, they remain in place for now. The designated AQMAs are illustrated on the policies map and declared on the DEFRA website3; these will be subject to periodic review and updating. Development should have regard to the Council's Air Quality Action Plan[67].

Air Quality Assessments

8.74 An appropriate and proportionate assessment of air quality must be included with any application that may adversely affect local air quality or be significantly affected by existing poor air quality levels. It is important that applicants consider the need for any assessment before any application is submitted.

8.75 Air Quality Assessments (AQA) must follow best practice guidance and should include the following as a minimum:

a. must address the impacts arising during construction and operation/occupation of the development;

b. assessments should take into account the individual and wider cumulative impacts on the proposed development, consistent with national policy;

c. where an AQA indicates a potential negative impact on air quality, the AQA should identify implementable measures that will minimise or mitigate impacts from the development;

d. an AQA with full dispersion modelling is required for all proposed Biomass and CHP boilers and this must demonstrate that the impact on nearby receptors is minimal.

8.76 Development that involves significant demolition, construction or earthworks will be required to assess the risk of impacts according to the latest best practice guidance, such as the Institute of Air Quality Management's (IAQM) 'Air Quality Monitoring in the Vicinity of Demolition and Construction Sites' (2018)[68]. Applicants should also refer to further guidance, such as the Considerate Contractor Advice Note[69] on the Council webpages.

[67] Air Quality Action Plan (2008), or any update of this http://aqma.defra.gov.uk/action-plans/BBC%20AQAP%202008.pdf
[68] https://iaqm.co.uk/guidance/
[69] https://document.brentwood.gov.uk/pdf/pdf_1185.pdf

Mitigating Poor Air Quality

8.77 Tackling poor air quality requires a multi-dimensional approach to help achieve the objective of improving air quality across Brentwood. Therefore, this policy should be read in conjunction with all other policies that together also address poor air quality impacts, including, but not limited to: BE09: Sustainable Means of Travel And Walkable Streets, BE10: Sustainable Passenger Transport, BE11: Electric And Low Emission Vehicles, BE12: Mitigating The Transport Impacts Of Development; NE02 Green and Blue Infrastructure.

8.78 While focus is often on outdoor air quality, it is important that design proposals demonstrate how ventilation in buildings can be designed to prevent or reduce the health impacts of poor indoor air quality, whilst maintaining adequate energy and thermal performance as required by Strategic Policy BE01: Carbon Reduction and Renewable Energy. This is especially important for developments adjacent to key transport infrastructure where emissions are higher. Applicants are advised to look at best practice guidance on how to achieve safe indoor air quality in new developments, such as NICE 2020 guidance 'Indoor Air Quality at Home'[70].

8.79 Appropriate measures are often cross-cutting and involve different actions across the different aspects of the development's design proposals. Such measures should be proportionate to the scale of development and should include: sustainable transport considerations, such as reducing vehicular traffic levels, encouraging sustainable movement patterns; sustainable building design to reduce emissions throughout the lifetime of the building, or reducing emissions from associated plant equipment; improving or greening the public realm.

8.80 Developments comprising new or enhanced community infrastructure, such as schools, should consider how they can include appropriate safe 'Buffer Zones', such as low traffic zones or traffic exclusion zones, to eliminate or reduce exposure. Implementation of these would require joint working between the Council, Essex County Council as the Lead Local Education Authority and Highways Authority, and relevant schools.

STRATEGIC POLICY NE09: FLOOD RISK

1. New development will be required to avoid areas of flood risk by applying the Sequential and, where necessary, the Exception Tests in accordance with national policy and guidance.

2. A site specific Flood Risk Assessment must assess all sources of flooding. It should demonstrate how flood risk will be managed over the development's lifetime, taking climate change into account. A site specific FRA is required, in

[70] https://www.nice.org.uk/guidance/ng149/chapter/Recommendations#prioritising-indoor-air-quality-in-local-strategy-or-plans

Mitigating Poor Air Quality

8.77 Tackling poor air quality requires a multi-dimensional approach to help achieve the objective of improving air quality across Brentwood. Therefore, this policy should be read in conjunction with all other policies that together also address poor air quality impacts, including, but not limited to: BE09: Sustainable Means of Travel And Walkable Streets, BE10: Sustainable Passenger Transport, BE11: Electric And Low Emission Vehicles, BE12: Mitigating The Transport Impacts Of Development; NE02 Green and Blue Infrastructure.

8.78 While focus is often on outdoor air quality, it is important that design proposals demonstrate how ventilation in buildings can be designed to prevent or reduce the health impacts of poor indoor air quality, whilst maintaining adequate energy and thermal performance as required by Strategic Policy BE01: Carbon Reduction and Renewable Energy. This is especially important for developments adjacent to key transport infrastructure where emissions are higher. Applicants are advised to look at best practice guidance on how to achieve safe indoor air quality in new developments, such as NICE 2020 guidance 'Indoor Air Quality at Home'[70].

8.79 Appropriate measures are often cross-cutting and involve different actions across the different aspects of the development's design proposals. Such measures should be proportionate to the scale of development and should include: sustainable transport considerations, such as reducing vehicular traffic levels, encouraging sustainable movement patterns; sustainable building design to reduce emissions throughout the lifetime of the building, or reducing emissions from associated plant equipment; improving or greening the public realm.

8.80 Developments comprising new or enhanced community infrastructure, such as schools, should consider how they can include appropriate safe 'Buffer Zones', such as low traffic zones or traffic exclusion zones, to eliminate or reduce exposure. Implementation of these would require joint working between the Council, Essex County Council as the Lead Local Education Authority and Highways Authority, and relevant schools.

STRATEGIC POLICY NE09: FLOOD RISK

1. New development will be required to avoid areas of flood risk by applying the Sequential and, where necessary, the Exception Tests in accordance with national policy and guidance.

2. A site specific Flood Risk Assessment must assess all sources of flooding. It should demonstrate how flood risk will be managed over the development's lifetime, taking climate change into account. A site specific FRA is required, in

[70] https://www.nice.org.uk/guidance/ng149/chapter/Recommendations#prioritising-indoor-air-quality-in-local-strategy-or-plans

accordance with national policy guidance, for the following types of development:

a. all new development greater than 1 ha in size in Flood Zone 1;

b. all development within a Critical Drainage Area;

c. all new development (including minor development and change of use) in flood zones 2 and 3;

d. new development or a change of use to a more vulnerable class which may be subject to other sources of flooding.

3. Where proposals satisfy the Sequential and Exception Tests design proposals should ensure that:

a. the most vulnerable land uses are located in areas within the site that are at lowest risk of flooding;

b. development will be safe for its lifetime taking account of the vulnerability of its users,

c. flood risk will not increase elsewhere;

d. development would not constrain the natural function of the flood plain, either by impeding flow or reducing storage capacity;

e. development is constructed so as to remain operational even at times of flood through resistant and resilient design;

f. appropriate mitigation measures are incorporated to address any residual flood risk safely, including safe access and egress for all likely users of the development;

g. where necessary incorporate flood resistant and flood resilient design measures such that, in the event of a flood, the development could be quickly brought back into use without significant refurbishment;

h. incorporate sustainable drainage systems in line with Policy BE05 Sustainable Drainage, unless there is clear evidence that this would be inappropriate;

i. where possible, the development will reduce flood risk overall.

j. safe access and escape routes are included where appropriate, as part of an agreed Emergency Response Plan, where required.

4. Where the site is additionally located within a Critical Drainage Area (CDA), development should minimise and mitigate surface water runoff in line with Policy BE05 Sustainable Drainage.

8.81 This policy should be read in conjunction with Policy BE05 Sustainable Drainage, Strategic Policy NE02 Green and Blue Infrastructure and Policy BE02 Water Efficiency and Management.

Flood Risk Data and Assessment

8.82 In 2020, Essex County Council produced an updated Surface Water Management Plans for the borough identifying an area specific action plan for each CDA. This must be taken into account by development proposals falling within each CDA. Applicants should also follow the guidance and recommendations set out in Strategic Flood Risk Assessment (SFRA 2018)1 which was undertaken to assess the risk of flooding in Brentwood to inform development of the Local Plan.

8.83 In line with the NPPF and associated Government guidance, a sequential approach will be applied when deciding on the location of new development to ensure that development is directed to those areas of the Borough, and locations within sites, that are at the lowest risk of flooding. The applicant must demonstrate the appropriateness of proposed uses within the different respective flood zones having regard to the Sequential and Exception Tests. Development proposals should be informed by site specific Flood Risk Assessments submitted by applicants. Assessments are required to take into account the long-term impact of climate change. The latest standing advice on climate change allowances published by the EA should be referred and form the basis of any assessment.

8.84 Flood zones 2 and 3, and Critical Drainage Areas (CDA) (as defined by the 2018 modelling updates) are illustrated on the Policies map, using the latest available data. Applicants should consult the Environment Agency (EA) and Essex County Council as the Lead Local Flood Authority (LLFA) to establish whether the data has since been updated. All proposals will be assessed against the latest available information.

Extent of Flood Risk in Brentwood

8.85 Fluvial flood risk in Brentwood is not extensive and is largely limited to areas in very close proximity to local watercourses. Risk of flooding from surface water presents a more extensive zone of risk than the fluvial flood zones. This is because the fluvial flood zones in Brentwood are relatively narrow owing to the ‘headwater’ nature of most of the watercourses. Incidences of fluvial (river) flooding are recorded along the eastern boundary of the River Wid from Stondon Hall Brook, and the River Roding to the north of the borough. Areas at risk of surface water flooding are mainly rural and include low lying areas south of

the A127 west and east of West Horndon. The most likely mechanism for surface water runoff generation is when heavy rainfall exceeds the capacity of the local drainage network and of the ground to infiltrate water; therefore surface treatments in new development are equally important in avoiding localised flooding. Therefore, Policy BE05 Sustainable Drainage must also be taken into account alongside flood risk. The feasibility of infiltration on site will need to be determined through a site-specific drainage assessment that forms part of the Drainage Strategy. Brentwood's Surface Water Management Plan (SWMP 2015, updated 2020) and Strategic Flood Risk Assessment (SFRA 2018) provide additional information on other sources of flood risk and potential mitigation measures.

Flood Management and Mitigation

8.86 Developers are encouraged to refer to the Environment Agency's Flood Risk Standing Advice for planning applicants. Early pre-application engagement with Brentwood Borough Council, Essex County Council as the Lead Local Flood Authority, the Environment Agency and the relevant water utility company (i.e. Thames Water or Anglian), is strongly advised.

8.87 It is important that development does not increase flood risk to people, properties and infrastructure. All proposals should proactively seek to minimise and mitigate risk wherever possible, especially in areas with identified risk from flooding. Applicants will be expected to consider risk from all sources of flooding using appropriate up to date information. All development proposals should also take into consideration the impacts of climate change over the lifetime or the development.

8.88 The SFRA recommends that 'Functional Floodplain' status is applied to all of Flood Zone 3 extent in the Borough (as described in Section 4.4), with the exception of the areas for which the EA hold detailed modelled data (Rivers Wid and Mardyke). All areas of Flood Zone 3 should have the Flood Zone 3b planning restrictions applied, as per Table D.2 in Appendix D of the SFRA. The EA would object to any new development in functional floodplain (Flood Zone 3b). Development should be located in areas suitable to the vulnerability level of the proposed uses, in accordance with the exceptions test. For any proposed water-compatible uses within a functional floodplain, the applicant must demonstrate that development is designed and constructed to:

a. remain operational and safe for users in times of flood;

b. result in no net loss of floodplain storage;

c. not impede water flows and not increase flood risk elsewhere.

8.89 Compatible development will be assessed in accordance with national planning policy guidance for flood risk vulnerability and flood zone 'compatibility' tables.

8.90 Where the Sequential and Exception Tests are satisfied, the Council expects that proposals fully investigate opportunities to avoid, reduce, manage and mitigate flood risk through the site's layout and design. Residual risk must be fully assessed and addressed by incorporating flood resistant design (e.g. constructed to prevent water from entering the building and damaging its fabric) and resilient design measures (e.g. impact is minimised,

ensuring the building's structural integrity is maintained and that drying and cleaning can be facilitated).

8.91 All development proposals in areas at risk of flooding will need to submit a site specific Flood Risk Assessment (FRA), commensurate with the scale of the flood risk and recognising all likely sources of flooding - surface water, ground water and watercourse flood risk. Sites within a Critical Drainage Area are also required to submit a Drainage Strategy in line with Policy BE05 Sustainable Drainage.

POLICY NE10: CONTAMINATED LAND AND HAZARDOUS SUBSTANCES

Contaminated Land

1. Planning permission will only be granted for development on, or near to land which is suspected to be contaminated, where the Council is satisfied that:

    a. any risks, including to human health and the environment, can be adequately addressed in order to make the development safe; and ;

    b. there will be no adverse impact on the environment and quality of local groundwater or quality of surface water.

2. Proposed development on or near known or potentially contaminated land will be required to submit a Phase 1 Preliminary Risk Assessment to identify the level and type of risk and, where necessary:

    a. undertake a Phase 2 Intrusive Site Investigation to provide a detailed assessment of contamination and risks to all receptors;

    b. prepare a Remediation Statement providing details of a remediation scheme appropriate to the individual site; and

    c. submit a Validation Report prior to the construction of the development.

Hazardous Substances and Installations

3. Development proposals involving the use, movement or storage of hazardous substances will only be permitted within designated employment areas as identified on the Policies Map and only if proposals can demonstrate that appropriate safeguards are in place to ensure there is no unacceptable risk to human health, safety and the environment.

4. Development of a site in the vicinity of a hazardous installation, will only be permitted where it is demonstrated that development will not constitute an unacceptable risk to human health, safety and the environment. Depending on individual site circumstances proposals may be required to be accompanied by

how to nominate an asset are available to view in the Council's information database, DataShare[55].

7.76 This policy should be read in conjunction with Policy MG05 Developer Contributions and Policy BE15 Planning for Inclusive Communities.

POLICY PC11: EDUCATION FACILITIES

1. The change of use or re-development of existing or proposed educational establishments and/or their grounds for alternative purposes will not be permitted unless:

    a. it can be clearly demonstrated that the use of the site is genuinely redundant for educational purposes and no other alternative educational or community use can be found for the site in question; or

    b. satisfactory alternative and improved facilities will be provided; or

    c. in the case of playing fields or open space associated with educational establishments, any proposals that involve their loss or change in use will be subject to Policy NE05.

2. Where there is a demonstrable need for new educational facilities, planning permission will be granted for appropriate and well-designed proposals which broadly meet the criteria for new education facilities set out in the ECC's Developers' Guide to Infrastructure Contributions.

3. Developments that generate a need for additional education facilities should make appropriate provision for their timely delivery as part of the development or through financial contributions if appropriate and in accordance with ECC's Developers' Guide to Infrastructure Contributions.

4. New educational establishments should plan and design their playing fields and sports facilities to be used for community use when not required for their own use, provided always that any such use must not detract from the safety of pupils or their learning environment.

7.77 Further information regarding requirements for educational facilities over the Plan period is detailed in the Council's Infrastructure Delivery Plan. This policy should be read in conjunction with Policy MG05 Developer Contributions and Policy NE05 Open Space and

[55] http://opendata.brentwood.gov.uk/

Recreational Facilities, as well as infrastructure requirements set out under site-specific policies in Chapter 9. Applicants should engage with the Local Education Authority at the earliest opportunity and work cooperatively to ensure educational requirements are identified early on and are delivered at the appropriate time in line with the phasing of development.

7.78 Education in this section relates to early years and childcare, primary, secondary and further education provision for all children and young people, including those with special educational needs and/or disabilities, and where residential elements may form part of the provision. Higher education and other types of education such as language schools are not included in this policy.

7.79 New and established schools and their related educational facilities, including playing field and sports facilities, make a major contribution to community use and provide essential support to increased housing growth. Education providers and institutional users will be encouraged to improve facilities and make efficient use of their assets and landholdings. Where feasible, providers will be encouraged to share their assets with the wider community to improve health and social well-being, subject to site specific context and wider impacts.

7.80 Easy access to good quality educational provision is important for supporting economic growth, developing strong sustainable communities, promoting economic prosperity and sustaining quality of life. It is therefore appropriate for new residential development to contribute towards the cost of education provision, either towards the expansion of existing facilities, or, in some cases, towards the funding of a new school, through planning obligations and the Community Infrastructure Levy (CIL) as appropriate.

7.81 Essex County Council (ECC) as the Local Education Authority has the responsibility for early years and childcare and school place planning. Through this process, ECC identifies the need for school places and identifies surpluses or deficits through a 10 Year Plan for School Places currently covering the period 2019-2028. Whether the change of use or redevelopment of independent schools would be considered surplus to educational requirements will be considered on a case by case basis.

7.82 The Council will continue to work with ECC to determine what additional education facilities and local education services will be needed as a result of planned future development. The Council will seek contributions from developers to fund required infrastructure, in line with Policy SP04 Developer Contribution.

7.83 Regard should be given as to how teachers, parents and pupils will access the nearest primary and secondary school and encourage sustainable travel to and from the school. Development should seek to ensure that children and young people can walk or cycle to school safely on designated safe routes through new developments in line with Policy BE09 Sustainable Means of Travel and Walkable Streets, and Policy BE10 Sustainable Passenger Transport. Such routes should be planned from the outset of development and not retrofitted into a scheme's design.

Early years and childcare

7.84 The Council, as advised by ECC, will seek new early years and childcare facilities preferably co-located with new primary schools, where appropriate, and which will be funded through developer contributions. Sufficient early years and childcare provision also needs to be considered alongside other essential services and infrastructure. It may prove necessary to

locate new early years and childcare facilities close to major new employment locations, where demand is identified.

Primary and secondary schools

7.85 The NPPF stresses the importance on ensuring sufficient and choice of school places to meet existing and future needs. Where growth is to be located, it will be essential to ensure the delivery of education facilities is undertaken in a timely and phased manner. Additional school places can be provided either by the expansion of existing schools/ academies or the opening of new “free schools” or academies. However, existing primary schools, especially in the Brentwood urban area are generally close to capacity, with limited space on site to expand, but there is generally a high level of capacity at secondary schools.

7.86 Whilst faith schools and academies may have sufficient site area to expand this would need the agreement of the Anglican Diocese of Chelmsford/Roman Catholic Diocese of Brentwood or the academy trusts responsible for these schools/ academies. This is particularly relevant as a significant proportion of schools/ academies located within the borough are faith schools.

7.87 When considering the housing applications, the interests of schools will be taken on board. This is likely to involve reserving suitable sites for new schools on strategic allocation. Developers should refer to the required site areas set out in the ECC’s Developers’ Guide Education Supplement.

9.97 Development of this site will need to sustain and, where opportunities arise, enhance the Scheduled former parish church and churchyard of St Nicholas, the Grade II* listed Registered Park and Garden of Thorndon Hall, and Thorndon Park Conservation Area and their settings.

9.98 The development will be required to provide appropriate landscaping and buffers to preserve the amenity of adjoining residential properties. Buffers will also be required along sensitive boundaries adjoining the railway line.

9.99 As the site is located within a Critical Drainage Area early consultation with the Lead Local Flood Authority (Essex County Council) will be required to determine appropriate mitigation which should be incorporated into the overall design of the scheme.

Land North of Shenfield, Shenfield

POLICY R03: LAND NORTH OF SHENFIELD

Land north of Shenfield, known as Officer's Meadow and surrounding land is allocated for residential-led mixed-use development.

1. Amount and Type of Development

Development should provide:

a. around 825 new homes;

b. around 2.1 hectares of land for a co-located primary school and early years and childcare nursery;

c. around 60 bed residential care home or an appropriate mix of specialist accommodation to meet identified needs, in accordance with policy HP04;

d. 5% self-build and custom build across the entire allocation area; and

e. around 2ha of land for employment purposes which may include light industrial, offices, research and development (within class E) or other sui generis employment uses which are compatible with the residential development.

2. Development Principles

Development should:

a. be accompanied by a comprehensive masterplan and phasing strategy to inform detailed proposals as they come forward;

b. be of a design quality and layout that reflects its key gateway location, particularly on land near to Junction 12, A12;

c. provide vehicular access via Chelmsford Road (A1023) and Alexander Lane;

d. allow if possible for the diversion of Alexander Lane to create a quiet lane for pedestrians and cyclists, with the provision for new and improved route through the development site linking to Chelmsford Road;

e. enhance walking, cycling and public transport services with Shenfield station and local services and facilities in the wider area, including Brentwood Town Centre;

f. provide well-connected internal road layouts which allow for good accessibility;

g. provide new multi-functional green infrastructure including public open space in accordance with Policies NE02 and NE05;

h. maintain and enhance Public Rights of Way within the site and to the wider area;

i. protect and where appropriate enhance the Local Wildlife Site (Arnold's Wood).

j. provide for appropriate landscaping and buffers along sensitive boundaries adjoining the A12 and railway line.

k. maintain the same amount of existing playing field provision on site or, where this cannot be achieved, provide replacement playing fields (including supporting ancillary facilities) of equivalent or better provision in terms of quantity and quality in a suitable location prior to commencement of development on the playing field. Any replacement playing field provision should not prejudice Shenfield High School or the community from meeting their playing pitch needs; and

l. be designed to ensure a coherent functional relationship with the existing development, which should be well integrated into the layout of the overall masterplan.

3. Infrastructure Requirements

Proposals should

a. provide pedestrian and cycle crossing points across Chelmsford Road (A1023) where appropriate;

b. provide an improved bus service;

c. as the site is located within a Critical Drainage Area, development should minimise and mitigate surface water runoff in line with Policy BE05 Sustainable Drainage.

4. Infrastructure Contributions

Applicants will also be required to make necessary financial contributions via planning obligations towards:

a. off-site highway infrastructure improvements as may be reasonably required by National Highways and Essex County Council in accordance with policies MG05 and BE08 (the planning obligation will determine the level and timing of payments for these purposes);

b. 'quiet way' cycle routes connecting transfer hubs to schools in Brentwood Town Centre.

9.100 This policy does not apply to the existing properties that existed prior to the adoption of the Plan.

9.101 This site is situated to the north of Shenfield with the A12 adjoining the northern boundary and railway line to the east. The site will provide for around 825 homes, anticipated to be delivered between 2023/24 and 2030/31. This will deliver a high quality sustainable new development that maximises opportunities for travel by sustainable modes. It will provide a mix of size and type of homes including affordable, self-build and custom build, appropriately accessible and adaptable housing, as well as other types of specialist housing in accordance with the Council's policy requirements.

9.102 As the allocation comprises a number of parcels which could be brought forwards at different times it is important that consideration is given to how the site will develop holistically. As individual parcels are brought forwards any masterplan will need to appropriately consider and reflect what is being proposed elsewhere on the site. This is particularly important in ensuring that collective requirements for infrastructure provision are considered and delivered appropriately.

9.103 Given the scale of development, a wide range of new community services and facilities including a new co-located primary school and early years and childcare nursery, open space and play facilities are required. These services and facilities should be of an appropriate scale to serve the new communities and located where they will be easily accessible by walking, cycling and public transport.

9.104 The scale of development in this location will require a new primary school with co-located early years and childcare nursery located on 2.1ha of land. A comprehensive approach will be necessary to deliver this early on in the development.

9.105 The development will take its main vehicular access from Chelmsford Road (A1023) and will be expected to adequately mitigate its likely impacts on the performance of the local and strategic road network.

9.106 Opportunities for sustainable transport modes should be maximised to create neighbourhoods where alternative forms of transport to the private car (waking, cycling and public transport) are prioritised. New and enhanced pedestrian and cycle connections will be expected to be provided within the site and to the wider area. As parts of the site are separated by Chelmsford Road (A1023) pedestrian and cycle crossings need to be provided where appropriate to allow for safe connection between the two areas. Opportunities to improve and enhance pedestrian and cycle connectivity with Shenfield station, local services and shops should also be explored.

9.107 The development will be required to provide appropriate habitat mitigation and creation, and appropriate buffers to the Local Wildlife Site (Arnold's Wood). The site falls within the Shenfield CDA and is at potential risk of flooding from surface water as show on the EAs Risk of Flooding From Surface Water Maps. Any development within this area should be directed away from areas of existing flooding and where possible should try to have a positive impact on existing areas of flood risk downstream of the development. Early Engagement with the LLFA in this area is critical to ensure that existing and potential flood risk is properly managed.

Ford Headquarters and Council Depot, Warley

POLICY R04: FORD HEADQUARTERS AND COUNCIL DEPOT

The Ford Headquarters and Council Depot, Warley is allocated for residential-led mixed use development.

1. Amount and Type of Development

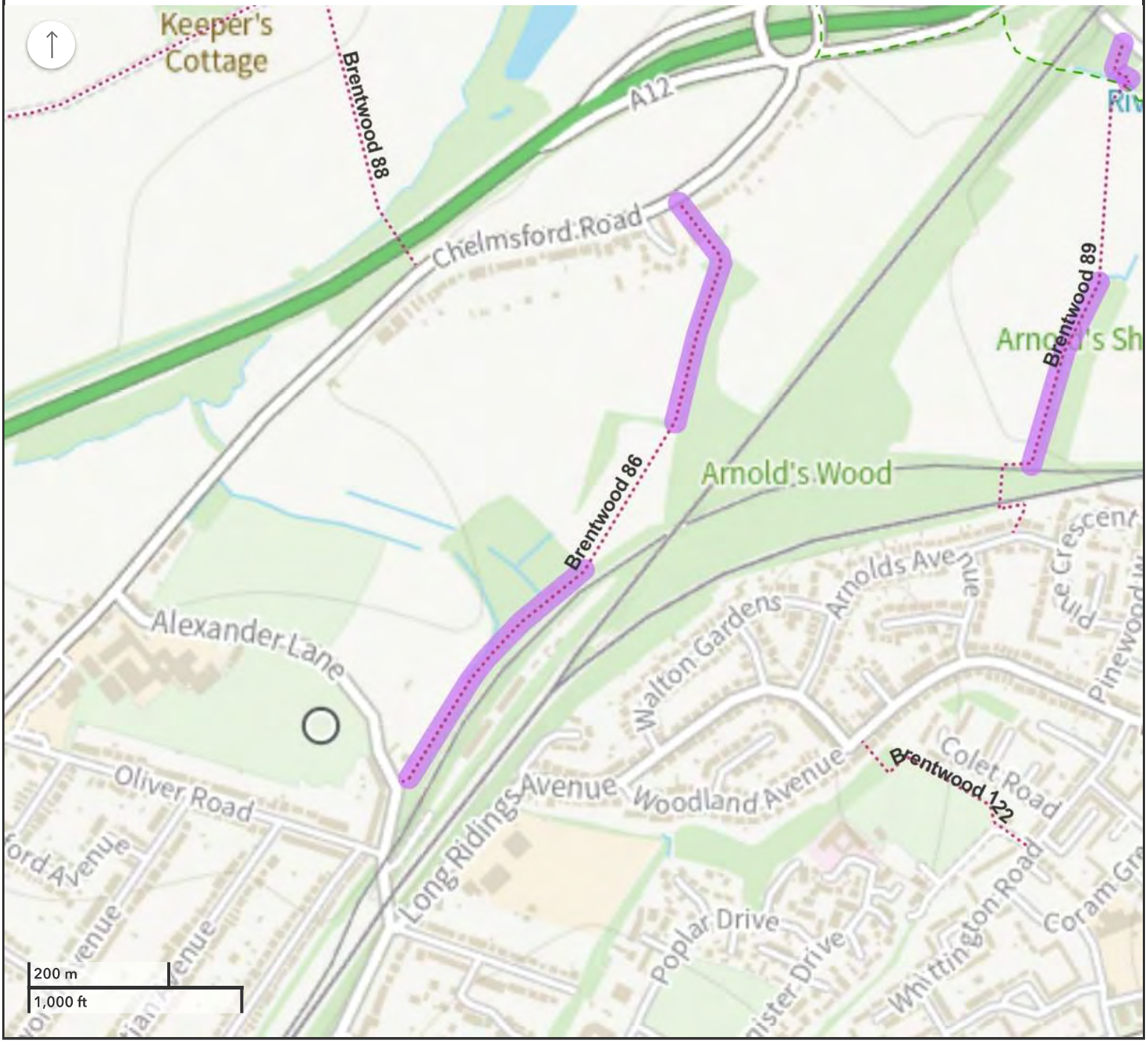
Development should provide:

a. 133 new homes;

b. around 60 bed residential care home or an appropriate mix of specialist accommodation to meet identified needs, in accordance with policy HP04.

c. 5% self-build and custom build housing across the entire allocation area; and

PRoW Interactive Map



Essex County Boundary

PRoW Network

Footpath — Bridleway — Byway — Restricted Byway

Temporary / Seasonal Diversions

ClosurePeriod

Active Diversion

PRoW Traffic Regulation Orders

ClosurePeriod

Active Prohibition — Future Prohibition

Essex Parishes

Cutting Schedule

Essex Highways — Community schemes

Search result

Alexander Lane

TREE PRESERVATION ORDERS

To Follow

Screening opinion

To Follow

Date: 18 November 2024

Our Reference:24/00062/NONDET

Dear Sir/Madam

Town & Country Planning Act 1990 (As Amended) – Planning Non determination of a Planning Application

Address of site to which the appeal relates: Land North Of Shenfield, Alexander Lane, Shenfield, Essex, ,
Proposed development: Hybrid planning application for 344 units including 35% affordable housing, safeguarded land for a 2FE primary school and early years facility, public open space and associated landscaping, drainage and highways infrastructure.
Appellant's name: Sirs
Appeal reference number: APP/H1515/W/24/3353271
Appeal starting date: 11th November 2024

I am requested by the Planning Inspectorate to inform you of an appeal which has been lodged under the provision of the above Act, against the failure of the Council to determine the above planning application within the statutory time period.

The appellant's Grounds of Appeal can be viewed at www.brentwood.gov.uk (View a planning application, view planning applications, selecting appeals and searching on the reference number 24/00062/NONDET). Information on Planning Appeals including advice on how you may take part can be found here Taking part in a planning, listed building or enforcement appeal - GOV.UK (www.gov.uk)

The Planning Inspectorate has determined that a Planning Inspector will conduct a Public Inquiry into this appeal at the Town Hall, Ingrave Road, Brentwood, Essex. We will notify you at a later date of the date and time of the Public Inquiry.

Representations that have previously been made to Brentwood Borough Council on the original planning application will be provided to the Planning Inspectorate by the Council. This Notice gives you the opportunity to express your views on the proposal in writing direct to the Planning Inspectorate or to add to views already expressed to the Council. Representations should, be submitted via the Casework Portal https://acp.planninginspectorate.gov.uk/ or if you do not have internet access or cannot submit on line, then send comments via post to The Planning Inspectorate, Room 3/09, Eagle Wing, Temple Quay House, 2 The Square, Temple Quay, Bristol, BS1 6PN. Third party representations via email are not accepted. Your representations must reach the

Planning Inspectorate by **23rd December 2024**. You should quote reference APP/H1515/W/24/3353271 . You may also attend thePublic Inquiry and at the Inspector's discretion give your views personally. Please refer to the Planning Portal for guidance on taking part. **Please note that representations received via email relating to the appeal by the Planning Inspector and the Council will not be taken into consideration.**

Please note that the Planning Inspectorate requests three copies of any written representations you make and these will be disclosed to the parties to the appeal. Any representations received will not be acknowledged by the Planning Inspectorate. However, the Planning Inspectorate will ensure that letters received by the deadline are passed to the Inspector dealing with the appeal(s). A Copy of the decision will be published here https://acp.planninginspectorate.gov.uk/ and searching by the appeal case number(s) using the 7 digit number at the end: APP/H1515/W/24/3353271 .

Yours faithfully

Miss T Balcombe
Senior Administration – Planning

Brentwood Borough Council, Town Hall, Ingrave Road, Brentwood, Essex CM15 8AY
tel 01277 312 500 **www.brentwood.gov.uk**

CIRCULATION LIST

TOWN & COUNTRY PLANNING ACT 1990

Section 78(i) Appeal By Sirs

Appeal Reference No: 24/00062/NONDET

Inspectorate Reference No: APP/H1515/W/24/3353271

Development Management Reference No: 23/01164/FUL

The Owner/Occupier

183 Chelmsford Road Shenfield Essex CM15 8SA
179 Chelmsford Road Shenfield Brentwood Essex CM15 8SA
Norna 185A Chelmsford Road Shenfield Brentwood Essex CM15 8SA
175 Chelmsford Road Shenfield Brentwood Essex CM15 8SA
177 Chelmsford Road Shenfield Brentwood Essex CM15 8SA
173 Chelmsford Road Shenfield Brentwood Essex CM15 8SA
171 Chelmsford Road Shenfield Brentwood Essex CM15 8SA
169 Chelmsford Road Shenfield Brentwood Essex CM15 8SA
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195 Chelmsford Road Shenfield Brentwood Essex CM15 8SA
193 Chelmsford Road Shenfield Brentwood Essex CM15 8SA
187 Chelmsford Road Shenfield Brentwood Essex CM15 8SA
187A Chelmsford Road Shenfield Brentwood Essex CM15 8SA
219 Chelmsford Road Shenfield Brentwood Essex CM15 8SA
217 Chelmsford Road Shenfield Brentwood Essex CM15 8SA
209 Chelmsford Road Shenfield Brentwood Essex CM15 8SA
199 Chelmsford Road Shenfield Brentwood Essex CM15 8SA
215 Chelmsford Road Shenfield Brentwood Essex CM15 8SA
213 Chelmsford Road Shenfield Brentwood Essex CM15 8SA
211 Chelmsford Road Shenfield Brentwood Essex CM15 8SA
231 Chelmsford Road Shenfield Brentwood Essex CM15 8SA
Farm Cottage Alexander Lane Shenfield Brentwood Essex CM15 8QE
167 Chelmsford Road Shenfield Essex CM15 8SA
11 Crossways Shenfield Essex CM158QX
9 Fen Close Shenfield Essex CM15 8SB
93 Chelmsford Road Shenfield Essex CM15 8QP
9 Rochford Avenue Shenfield Essex CM15 8QN
57 Oliver Road Shenfield Essex CM15 8PX
1 St Marys Avenue Shenfield Brentwood Essex CM15 8PY
81 Chelmsford Road Shenfield Essex CM15 8QP
22 Sebastian Avenue Shenfield Brentwood Essex CM15 8PN
4 Sebastian Avenue Shenfield Brentwood Essex CM15 8PN
2 Mount Pleasant Cottages Alexander Lane Shenfield Brentwood Essex CM15 8RX
163A Chelmsford Road Shenfield Brentwood Essex CM15 8RU
163 Chelmsford Road Shenfield Brentwood Essex CM15 8RU
161 Chelmsford Road Shenfield Brentwood Essex CM15 8RU

159 Chelmsford Road Shenfield Brentwood Essex CM15 8RU
155 Chelmsford Road Shenfield Brentwood Essex CM15 8RU
153 Chelmsford Road Shenfield Brentwood Essex CM15 8RU
183 Chelmsford Road Shenfield Brentwood Essex CM15 8SA
185 Chelmsford Road Shenfield Brentwood Essex CM15 8SA
181 Chelmsford Road Shenfield Brentwood Essex CM15 8SA
Elm Cottage 110 Chelmsford Road Shenfield Brentwood Essex CM15 8RN
80 Oliver Road Shenfield Brentwood Essex CM15 8PZ
66 Oliver Road Shenfield Brentwood Essex CM15 8PX
74 Kilworth Avenue Shenfield Brentwood Essex CM15 8PT
72 Kilworth Avenue Shenfield Brentwood Essex CM15 8PT
54 Oliver Road Shenfield Brentwood Essex CM15 8PX
58 Oliver Road Shenfield Brentwood Essex CM15 8PX
68 Oliver Road Shenfield Brentwood Essex CM15 8PX
62 Oliver Road Shenfield Brentwood Essex CM15 8PX
70 Oliver Road Shenfield Brentwood Essex CM15 8PX
74 Oliver Road Shenfield Brentwood Essex CM15 8PZ
25 St Marys Avenue Shenfield Brentwood Essex CM15 8PY
8 St Marys Avenue Shenfield Brentwood Essex CM15 8PY
19 St Marys Avenue Shenfield Brentwood Essex CM15 8PY
21 St Marys Avenue Shenfield Brentwood Essex CM15 8PY
10 St Marys Avenue Shenfield Brentwood Essex CM15 8PY
27 St Marys Avenue Shenfield Brentwood Essex CM15 8PY
23 St Marys Avenue Shenfield Brentwood Essex CM15 8PY
78 Oliver Road Shenfield Brentwood Essex CM15 8PZ
76 Oliver Road Shenfield Brentwood Essex CM15 8PZ
72 Oliver Road Shenfield Brentwood Essex CM15 8PZ
109 Chelmsford Road Shenfield Brentwood Essex CM15 8QL
2 Rochford Avenue Shenfield Brentwood Essex CM15 8QN
The Barn 146 Chelmsford Road Shenfield Brentwood Essex CM15 8RT
122 Chelmsford Road Shenfield Brentwood Essex CM15 8RN
96 Chelmsford Road Shenfield Brentwood Essex CM15 8RL
113 Chelmsford Road Shenfield Brentwood Essex CM15 8QL
The Rose Chelmsford Road Shenfield Brentwood Essex CM15 8RN
128 Chelmsford Road Shenfield Brentwood Essex CM15 8RN
123 Chelmsford Road Shenfield Brentwood Essex CM15 8QL
118 Chelmsford Road Shenfield Brentwood Essex CM15 8RN
114 Chelmsford Road Shenfield Brentwood Essex CM15 8RN
111 Chelmsford Road Shenfield Brentwood Essex CM15 8QL
6 St Marys Avenue Shenfield Brentwood Essex CM15 8PY
126 Chelmsford Road Shenfield Brentwood Essex CM15 8RN
119 Chelmsford Road Shenfield Brentwood Essex CM15 8QL
Flat The Rose Chelmsford Road Shenfield Brentwood Essex CM15 8RN
132 Chelmsford Road Shenfield Brentwood Essex CM15 8RN
130 Chelmsford Road Shenfield Brentwood Essex CM15 8RN
129 Chelmsford Road Shenfield Brentwood Essex CM15 8QL
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117 Chelmsford Road Shenfield Brentwood Essex CM15 8QL
116 Chelmsford Road Shenfield Brentwood Essex CM15 8RN
115 Chelmsford Road Shenfield Brentwood Essex CM15 8QL
112 Chelmsford Road Shenfield Brentwood Essex CM15 8RN
110A Chelmsford Road Shenfield Brentwood Essex CM15 8RN
108 Chelmsford Road Shenfield Brentwood Essex CM15 8RN

82 Oliver Road Shenfield Brentwood Essex CM15 8PZ
Shenfield C C S Alexander Lane Shenfield Brentwood Essex CM15 8RY
147D Chelmsford Road Shenfield Brentwood Essex CM15 8RU
Shenfield High School Alexander Lane Shenfield Brentwood Essex CM15 8RY
Shenfield Sports Centre Oliver Road Shenfield Brentwood Essex CM15 8PX
147A Chelmsford Road Shenfield Brentwood Essex CM15 8RU
147C Chelmsford Road Shenfield Brentwood Essex CM15 8RU
147B Chelmsford Road Shenfield Brentwood Essex CM15 8RU
Sharrow Alexander Lane Shenfield Brentwood Essex CM15 8QE
Oak Croft Alexander Lane Shenfield Brentwood Essex CM15 8QE
Leclarely Alexander Lane Shenfield Brentwood Essex CM15 8QE
High Banks Alexander Lane Shenfield Brentwood Essex CM15 8QE
Alverstone Alexander Lane Shenfield Brentwood Essex CM15 8QE
Melville Alexander Lane Shenfield Brentwood Essex CM15 8QE
Maryland Alexander Lane Shenfield Brentwood Essex CM15 8QE
Mainard Alexander Lane Shenfield Brentwood Essex CM15 8QE
Greenbanks Alexander Lane Shenfield Brentwood Essex CM15 8QE
1 Oliver Road Shenfield Brentwood Essex CM15 8QD
15 Oliver Road Shenfield Brentwood Essex CM15 8QD
11 Oliver Road Shenfield Brentwood Essex CM15 8QD
5 Oliver Road Shenfield Brentwood Essex CM15 8QD
19 Oliver Road Shenfield Brentwood Essex CM15 8QD
17 Oliver Road Shenfield Brentwood Essex CM15 8QD
9 Oliver Road Shenfield Brentwood Essex CM15 8QD
7 Oliver Road Shenfield Brentwood Essex CM15 8QD
3 Oliver Road Shenfield Brentwood Essex CM15 8QD
37 Oliver Road Shenfield Brentwood Essex CM15 8QA
35 Oliver Road Shenfield Brentwood Essex CM15 8QA
27 Oliver Road Shenfield Brentwood Essex CM15 8QA
21 Oliver Road Shenfield Brentwood Essex CM15 8QA
29 Oliver Road Shenfield Brentwood Essex CM15 8QA
33 Oliver Road Shenfield Brentwood Essex CM15 8QA
31 Oliver Road Shenfield Brentwood Essex CM15 8QA
25 Oliver Road Shenfield Brentwood Essex CM15 8QA
23 Oliver Road Shenfield Brentwood Essex CM15 8QA
53 Oliver Road Shenfield Brentwood Essex CM15 8PX
47 Oliver Road Shenfield Brentwood Essex CM15 8QA
43 Oliver Road Shenfield Brentwood Essex CM15 8QA
41 Oliver Road Shenfield Brentwood Essex CM15 8QA
Upper Flat 51 Oliver Road Shenfield Brentwood Essex CM15 8QA
Lower Flat 51 Oliver Road Shenfield Brentwood Essex CM15 8QA
55 Oliver Road Shenfield Brentwood Essex CM15 8PX
49 Oliver Road Shenfield Brentwood Essex CM15 8QA
45 Oliver Road Shenfield Brentwood Essex CM15 8QA
39 Oliver Road Shenfield Brentwood Essex CM15 8QA
65 Oliver Road Shenfield Brentwood Essex CM15 8PX
73 Oliver Road Shenfield Brentwood Essex CM15 8PX
57 Oliver Road Shenfield Brentwood Essex CM15 8PX
59 Oliver Road Shenfield Brentwood Essex CM15 8PX
71 Oliver Road Shenfield Brentwood Essex CM15 8PX
69 Oliver Road Shenfield Brentwood Essex CM15 8PX
67 Oliver Road Shenfield Brentwood Essex CM15 8PX
63 Oliver Road Shenfield Brentwood Essex CM15 8PX
61 Oliver Road Shenfield Brentwood Essex CM15 8PX
87 Oliver Road Shenfield Brentwood Essex CM15 8PX
83 Oliver Road Shenfield Brentwood Essex CM15 8PX
79 Oliver Road Shenfield Brentwood Essex CM15 8PX

75 Oliver Road Shenfield Brentwood Essex CM15 8PX
91 Oliver Road Shenfield Brentwood Essex CM15 8PX
93 Oliver Road Shenfield Brentwood Essex CM15 8PX
89 Oliver Road Shenfield Brentwood Essex CM15 8PX
85 Oliver Road Shenfield Brentwood Essex CM15 8PX
81 Oliver Road Shenfield Brentwood Essex CM15 8PX
77 Oliver Road Shenfield Brentwood Essex CM15 8PX
Flat White Gates Alexander Lane Shenfield Brentwood Essex CM15 8QF
Mast Ea Cellnet Site Tq 61800 9560 0 Alexander Lane Shenfield Brentwood Essex CM15 8QF
The White Gates Alexander Lane Shenfield Brentwood Essex CM15 8QF
4 Lordship Close Hutton Brentwood Essex CM13 2QY
171 Chelmsford Road Shenfield Brentwood Essex CM15 8SA
173 Chelmsford Road Shenfield Brentwood Essex CM15 8SA
169 Chelmsford Road Shenfield Brentwood Essex CM15 8SA
Reynosa Heronway Hutton Brentwood Essex CM13 2LX
2 The Courtyard Alexander Lane Shenfield Brentwood Essex CM15 8QE
1 The Courtyard Alexander Lane Shenfield Brentwood Essex CM15 8QE
Farm Cottage Alexander Lane Shenfield Brentwood Essex CM15 8QE
Alexander House Alexander Lane Shenfield Brentwood Essex CM15 8QE
Fron Cottage Alexander Lane Shenfield Brentwood Essex CM15 8QE
Alexander House Annexe Alexander House Alexander Lane Shenfield Brentwood Essex CM15 8QE
Hawthorn Cottage 151 Chelmsford Road Shenfield Brentwood Essex CM15 8RU
149 Chelmsford Road Shenfield Brentwood Essex CM15 8RU
School House Alexander Lane Shenfield Brentwood Essex CM15 8RX
5 Mount Pleasant Cottages Alexander Lane Shenfield Brentwood Essex CM15 8RX
4 Mount Pleasant Cottages Alexander Lane Shenfield Brentwood Essex CM15 8RX
165 Chelmsford Road Shenfield Brentwood Essex CM15 8RU
6 Mount Pleasant Cottages Alexander Lane Shenfield Brentwood Essex CM15 8RX
3 Mount Pleasant Cottages Alexander Lane Shenfield Brentwood Essex CM15 8RX
157 Chelmsford Road Shenfield Brentwood Essex CM15 8RU
207 Chelmsford Road Shenfield Brentwood Essex CM15 8SA
205 Chelmsford Road Shenfield Brentwood Essex CM15 8SA
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203 Chelmsford Road Shenfield Brentwood Essex CM15 8SA
7 Fen Close Shenfield Brentwood Essex CM15 8SB
6 Fen Close Shenfield Brentwood Essex CM15 8SB
5 Fen Close Shenfield Brentwood Essex CM15 8SB
10 Fen Close Shenfield Brentwood Essex CM15 8SB
237 Chelmsford Road Shenfield Brentwood Essex CM15 8SA
227 Chelmsford Road Shenfield Brentwood Essex CM15 8SA
221 Chelmsford Road Shenfield Brentwood Essex CM15 8SA
235 Chelmsford Road Shenfield Brentwood Essex CM15 8SA
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233 Chelmsford Road Shenfield Brentwood Essex CM15 8SA
8 Fen Close Shenfield Brentwood Essex CM15 8SB
9 Fen Close Shenfield Brentwood Essex CM15 8SB
249 Chelmsford Road Shenfield Brentwood Essex CM15 8SD
2 Fen Close Shenfield Brentwood Essex CM15 8SB
4 Fen Close Shenfield Brentwood Essex CM15 8SB
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1 Fen Close Shenfield Brentwood Essex CM15 8SB
267 Chelmsford Road Shenfield Brentwood Essex CM15 8SD

265 Chelmsford Road Shenfield Brentwood Essex CM15 8SD
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Brentwood Connect 295 Chelmsford Road Shenfield Brentwood Essex CM15 8SD
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275 Chelmsford Road Shenfield Brentwood Essex CM15 8SD
297 Chelmsford Road Shenfield Brentwood Essex CM15 8SD
293 Chelmsford Road Shenfield Brentwood Essex CM15 8SD
96 Hunter Avenue Shenfield Brentwood Essex CM15 8PG
81 Sebastian Avenue Shenfield Brentwood Essex CM15 8PP
67 Kilworth Avenue Shenfield Brentwood Essex CM15 8PT
79 Kilworth Avenue Shenfield Brentwood Essex CM15 8PT
85 Sebastian Avenue Shenfield Brentwood Essex CM15 8PP
77 Kilworth Avenue Shenfield Brentwood Essex CM15 8PT
101 Sebastian Avenue Shenfield Brentwood Essex CM15 8PP
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90 Sebastian Avenue Shenfield Brentwood Essex CM15 8PP
87 Sebastian Avenue Shenfield Brentwood Essex CM15 8PP
84 Sebastian Avenue Shenfield Brentwood Essex CM15 8PP
78 Sebastian Avenue Shenfield Brentwood Essex CM15 8PP
75 Kilworth Avenue Shenfield Brentwood Essex CM15 8PT
46 Oliver Road Shenfield Brentwood Essex CM15 8QA
18 Oliver Road Shenfield Brentwood Essex CM15 8QD
32 Oliver Road Shenfield Brentwood Essex CM15 8QA
26 Oliver Road Shenfield Brentwood Essex CM15 8QA
16 Oliver Road Shenfield Brentwood Essex CM15 8QD
94 Sebastian Avenue Shenfield Brentwood Essex CM15 8PP
50 Oliver Road Shenfield Brentwood Essex CM15 8QA
36 Oliver Road Shenfield Brentwood Essex CM15 8QA
22 Oliver Road Shenfield Brentwood Essex CM15 8QD
48 Oliver Road Shenfield Brentwood Essex CM15 8QA
44 Oliver Road Shenfield Brentwood Essex CM15 8QA
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38 Oliver Road Shenfield Brentwood Essex CM15 8QA

34 Oliver Road Shenfield Brentwood Essex CM15 8QA
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24 Oliver Road Shenfield Brentwood Essex CM15 8QD
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14 Oliver Road Shenfield Brentwood Essex CM15 8QD
106 Hunter Avenue Shenfield Brentwood Essex CM15 8PG
104 Hunter Avenue Shenfield Brentwood Essex CM15 8PG
102 Hunter Avenue Shenfield Brentwood Essex CM15 8PG
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118 Hunter Avenue Shenfield Brentwood Essex CM15 8PG
112 Hunter Avenue Shenfield Brentwood Essex CM15 8PG
133 Hunter Avenue Shenfield Brentwood Essex CM15 8PG
173 Chelmsford Road Shenfiield CM15 8SA
129 Hunter Avenue Shenfield Brentwood Essex CM15 8PG
125 Hunter Avenue Shenfield Brentwood Essex CM15 8PG
8 Oliver Road Shenfield Brentwood Essex CM15 8QD
124 Hunter Avenue Shenfield Brentwood Essex CM15 8PG
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119 Hunter Avenue Shenfield Brentwood Essex CM15 8PG
12 Oliver Road Shenfield Brentwood Essex CM15 8QD
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135 Hunter Avenue Shenfield Brentwood Essex CM15 8PG
131 Hunter Avenue Shenfield Brentwood Essex CM15 8PG
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83 Sebastian Avenue Shenfield Brentwood Essex CM15 8PP
82 Sebastian Avenue Shenfield Brentwood Essex CM15 8PP
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73 Kilworth Avenue Shenfield Brentwood Essex CM15 8PT
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14 Rochford Avenue Shenfield Brentwood Essex CM15 8QN
5 St Marys Avenue Shenfield Brentwood Essex CM15 8PY

1 St Marys Avenue Shenfield Brentwood Essex CM15 8PY
3 St Marys Avenue Shenfield Brentwood Essex CM15 8PY
4 Rochford Avenue Shenfield Brentwood Essex CM15 8QN
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12 Rochford Avenue Shenfield Brentwood Essex CM15 8QN
11 St Marys Avenue Shenfield Brentwood Essex CM15 8PY
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48 Rochford Avenue Shenfield Brentwood Essex CM15 8QW
44 Rochford Avenue Shenfield Brentwood Essex CM15 8QW
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66 Kilworth Avenue Shenfield Brentwood Essex CM15 8PT
64 Kilworth Avenue Shenfield Brentwood Essex CM15 8PT
Conifers 38 Rochford Avenue Shenfield Brentwood Essex CM15 8QW
42 Rochford Avenue Shenfield Brentwood Essex CM15 8QW
34 Rochford Avenue Shenfield Brentwood Essex CM15 8QW
68 Kilworth Avenue Shenfield Brentwood Essex CM15 8PT
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40 Rochford Avenue Shenfield Brentwood Essex CM15 8QW
32 Rochford Avenue Shenfield Brentwood Essex CM15 8QW
70 Kilworth Avenue Shenfield Brentwood Essex CM15 8PT
56A Oliver Road Shenfield Brentwood Essex CM15 8PX
60 Oliver Road Shenfield Brentwood Essex CM15 8PX
64 Oliver Road Shenfield Brentwood Essex CM15 8PX
Old Ways End 56 Oliver Road Shenfield Brentwood Essex CM15 8PX

Councillors

Cllr Nicky Cuthbert
Cllr David Worsfold
Cllr Thomas Heard

Also To:

Legal Services Manager
Cllr Mynott
Cllr M Cuthbert