Development Control
Gloucester City Council
PO Box 3252, Gloucester, GL1 9FW
01452 396396
development.control@gloucester.gov.uk
www.gloucester.gov.uk/planning

Application for Planning Permission.
Town and Country Planning Act 1990

Publication of applications on planning authority websites.

Please note that the information provided on this application form and in supporting documents may be published on the Authority's website. If you require any further clarification, please contact the Authority's planning department.

1. Site Address

Number	
Suffix	
Property name	Access Park, (Former Interbrew Site)
Address line 1	Eastern Avenue
Address line 2	
Address line 3	
Town/city	Gloucester
Postcode	GL4 6SW

Description of site location must be completed if postcode is not known:

Easting (x)	384967
Northing (y)	217938

Description

2. Applicant Details

Title	Mr
First name	Tom
Surname	Maltby
Company name	Venus Logistics PropCo Ltd
Address line 1	22, Grenville Street
Address line 2	
Address line 3	
Town/city	St. 2 Helier
Country	Jersey

2. Applicant Details

Postcode	JE4 8PX

Are you an agent acting on behalf of the applicant? (•) Yes ( ) No

Primary number	
Secondary number	
Fax number	
Email address	

3. Agent Details

Title	Mr
First name	Roland
Surname	Lee
Company name	Hale Architecture Limited
Address line 1	22c Leathermarket Street
Address line 2	
Address line 3	
Town/city	London
Country	
Postcode	SE1 3HP
Primary number	
Secondary number	
Fax number	
Email	

4. Site Area

What is the measurement of the site area? (numeric characters only).	5.31
Unit	Hectares

5. Description of the Proposal

Please note in regard to:
• Fire Statements - From 1 August 2021, planning applications for buildings of over 18 metres (or 7 stories) tall containing more than one dwelling will require a 'Fire Statement' for the application to be considered valid. There are some exemptions. View government planning guidance on fire statements or access the fire statement template and guidance.
• Permission In Principle - If you are applying for Technical Details Consent on a site that has been granted Permission In Principle, please include the relevant details in the description below.
• Public Service Infrastructure - From 1 August 2021, applications for certain public service infrastructure developments will be eligible for faster determination timeframes. See help for further details or view government planning guidance on determination periods.

Description

Please describe details of the proposed development or works including any change of use.

Development of site to create fourteen industrial units having E(g) (iii), B2 & B8 uses with ancillary offices, plus trade counter uses for Units 9 to 14, car parking, service areas and soft landscaping along with highways works to Chancel Close.

5. Description of the Proposal

Has the work or change of use already started? ○ Yes ◉ No

6. Existing Use

Please describe the current use of the site

Industrial

Is the site currently vacant? ◉ Yes ○ No

If Yes, please describe the last use of the site

Industrial - used by Interbrew

When did this use end (if known)? DD/MM/YYYY

Does the proposal involve any of the following? If Yes, you will need to submit an appropriate contamination assessment with your application.

Land which is known to be contaminated ○ Yes ◉ No

Land where contamination is suspected for all or part of the site ○ Yes ◉ No

A proposed use that would be particularly vulnerable to the presence of contamination ○ Yes ◉ No

7. Materials

Does the proposed development require any materials to be used externally? ◉ Yes ○ No

Please provide a description of existing and proposed materials and finishes to be used externally (including type, colour and name for each material):

Walls	
Description of existing materials and finishes (optional):	N/A
Description of proposed materials and finishes:	Profiled metal built up cladding

Roof	
Description of existing materials and finishes (optional):	N/A
Description of proposed materials and finishes:	Profiled metal built up cladding

Windows	
Description of existing materials and finishes (optional):	N/A
Description of proposed materials and finishes:	Double glazed aluminium windows

Doors	
Description of existing materials and finishes (optional):	N?A
Description of proposed materials and finishes:	Double glazed aluminium doors to entrances. Steel roller doors to warehouse elements

Boundary treatments (e.g. fences, walls)

7. Materials

Description of existing materials and finishes (optional):	Part palisade fencing
Description of proposed materials and finishes:	Part palisade fencing

Vehicle access and hard standing	
Description of existing materials and finishes (optional):	N/A
Description of proposed materials and finishes:	Tarmac to car parking areas and site access roads. Concrete service areas for HGVs & LGVs

Lighting	
Description of existing materials and finishes (optional):	N/A
Description of proposed materials and finishes:	External lighting to car parking and service areas via spotlights attached to buildings

Are you supplying additional information on submitted plans, drawings or a design and access statement? ◉ Yes ○ No

If Yes, please state references for the plans, drawings and/or design and access statement

Hale architecture drawings Ref 21078- PL1001-00/ PL1002-00/ PL1003-04/ PL1004-01/ PL1005-01/ PL1006-01 / PL1201-01/ PL1202-01/ PL1205-01/ PL1206-01/ PL1011-01/ PL1012-01 /PL1013-01/ PL1014-02/ PL1021-01/ PL1022-01/ PL1023-01/ PL1024-02/ PL1031-01/ PL1032-02/ PL1033-01/ PL1034-02/ PL1041-01/ PL1043-01/ PL1044-03/ PL1091-03/ PL1093-001/PL1094-03
Hale Design & Access Statement, planning statement and cover letter
Consultants specialist Reports as follows:-
-Ground Investigation Report by WSP ref 70020138-R03 dated April 2018
-Flood Risk Assessment & Drainage Strategy by IL Consult ref 21-038 , dated 24.11.2021
-Ecology Assessment incl BNG calculations by Clarkson & Woods ref 7777 , dated 03/12/2021
-Soft Landscape proposals by BEA Landscape drawing ref 21-135-P-03A
-Tree Survey Report By BEA Landscape ref 21135/EH/TR001 , dated 19th November 2021
-Tree survey plan by BEA Landscape ref 21-135-P-01
-Tree Constraints Plan by BEA Landscape ref 21-135-P-02
-Acoustic Assessment by Hoare Lea, rev03 , dated 03 December 2021
-Air Quality Assessment by Hoare Lea
-Transport Statement by DTA 23390-01, dated 8th December 2021
-Travel Plan by DTA ref 23390-02, dated 8th December 2021
-Energy Strategy by ESC, ref ESC 1794 dated 14/12/2021
-Archaeology Statement by BSA Heritage, ref BSA 2152_1a, dated December 2021
-BREEAM Pre-Assessment 2018 by ESC, Rev B, dated 21/10/2021

8. Pedestrian and Vehicle Access, Roads and Rights of Way

Is a new or altered vehicular access proposed to or from the public highway? ◉ Yes ○ No

Is a new or altered pedestrian access proposed to or from the public highway? ◉ Yes ○ No

Are there any new public roads to be provided within the site? ○ Yes ◉ No

Are there any new public rights of way to be provided within or adjacent to the site? ○ Yes ◉ No

Do the proposals require any diversions/extinguishments and/or creation of rights of way? ○ Yes ◉ No

If you answered Yes to any of the above questions, please show details on your plans/drawings and state their reference numbers

Refer to drawings submitted by David Tucker Associates (DTA)

9. Vehicle Parking

Does the site have any existing vehicle/cycle parking spaces or will the proposed development add/remove any parking spaces? ◉ Yes ○ No

Please provide information on the existing and proposed number of on-site parking spaces

9. Vehicle Parking

Type of vehicle	Existing number of spaces	Total proposed (including spaces retained)	Difference in spaces
Cars	0	197	197
Light goods vehicles / public carrier vehicles	0	11	11
Motorcycles	0	21	21
Disability spaces	0	25	25
Cycle spaces	0	74	74

10. Trees and Hedges

Are there trees or hedges on the proposed development site? ◉ Yes ○ No

And/or: Are there trees or hedges on land adjacent to the proposed development site that could influence the development or might be important as part of the local landscape character? ◉ Yes ○ No

If Yes to either or both of the above, you may need to provide a full tree survey, at the discretion of your local planning authority. If a tree survey is required, this and the accompanying plan should be submitted alongside your application. Your local planning authority should make clear on its website what the survey should contain, in accordance with the current 'BS5837: Trees in relation to design, demolition and construction - Recommendations'.

11. Assessment of Flood Risk

Is the site within an area at risk of flooding? (Check the location on the Government's Flood map for planning. You should also refer to national standing advice and your local planning authority requirements for information as necessary.) ○ Yes ◉ No

If Yes, you will need to submit a Flood Risk Assessment to consider the risk to the proposed site.

Is your proposal within 20 metres of a watercourse (e.g. river, stream or beck)? ○ Yes ◉ No

Will the proposal increase the flood risk elsewhere? ○ Yes ◉ No

How will surface water be disposed of?

☐ Sustainable drainage system

☐ Existing water course

☐ Soakaway

☑ Main sewer

☐ Pond/lake

12. Biodiversity and Geological Conservation

Is there a reasonable likelihood of the following being affected adversely or conserved and enhanced within the application site, or on land adjacent to or near the application site?

To assist in answering this question correctly, please refer to the help text which provides guidance on determining if any important biodiversity or geological conservation features may be present or nearby; and whether they are likely to be affected by the proposals.

a) Protected and priority species:

○ Yes, on the development site
○ Yes, on land adjacent to or near the proposed development
◉ No

b) Designated sites, important habitats or other biodiversity features:

12. Biodiversity and Geological Conservation

- ○ Yes, on the development site
- ○ Yes, on land adjacent to or near the proposed development
- ◉ No

c) Features of geological conservation importance:

- ○ Yes, on the development site
- ○ Yes, on land adjacent to or near the proposed development
- ◉ No

13. Foul Sewage

Please state how foul sewage is to be disposed of:

- ☑ Mains Sewer
- ☐ Septic Tank
- ☐ Package Treatment plant
- ☐ Cess Pit
- ☐ Other
- ☐ Unknown

Are you proposing to connect to the existing drainage system? ◉ Yes ○ No ○ Unknown

If Yes, please include the details of the existing system on the application drawings. Please state the plan(s)/drawing(s) references.

Refer to IL Consult Drainage Strategy Plan

14. Waste Storage and Collection

Do the plans incorporate areas to store and aid the collection of waste? ◉ Yes ○ No

If Yes, please provide details:

Refer to Hale site layout plan 21078/PL1003-03

Have arrangements been made for the separate storage and collection of recyclable waste? ◉ Yes ○ No

If Yes, please provide details:

Recyclable waste will be located in refuse areas

15. Trade Effluent

Does the proposal involve the need to dispose of trade effluents or trade waste? ○ Yes ◉ No

16. Residential/Dwelling Units

Please note: This question has been updated to include the latest information requirements specified by government.
Applications created before 23 May 2020 will not have been updated, please read the 'Help' to see details of how to workaround this issue.

Does your proposal include the gain, loss or change of use of residential units? ○ Yes ◉ No

17. All Types of Development: Non-Residential Floorspace

Does your proposal involve the loss, gain or change of use of non-residential floorspace?
Note that 'non-residential' in this context covers all uses except Use Class C3 Dwellinghouses. ◉ Yes ○ No

Please add details of the Use Classes and floorspace.

Following changes to Use Classes on 1 September 2020: The list includes the now revoked Use Classes A1-5, B1, and D1-2 that should not be used in most cases. Also, the list does not include the newly introduced Use Classes E and F1-2. To provide details in relation to these or any 'Sui Generis' use, select 'Other' and specify the use where prompted. Multiple 'Other' options can be added to cover each individual use. View further information on Use Classes.

17. All Types of Development: Non-Residential Floorspace

Use Class	Existing gross internal floorspace (square metres)	Gross internal floorspace to be lost by change of use or demolition (square metres)	Total gross new internal floorspace proposed (including changes of use) (square metres)	Net additional gross internal floorspace following development (square metres)
Other Industrial uses E(g)(iii), B2 & B8	0	0	23333	23333
Total	0	0	23333	23333

Loss or gain of rooms

For hotels, residential institutions and hostels please additionally indicate the loss or gain of rooms:

18. Employment

Are there any existing employees on the site or will the proposed development increase or decrease the number of employees? ◉ Yes ○ No

Existing Employees

Please complete the following information regarding existing employees:

Full-time	0
Part-time	0
Total full-time equivalent	0.00

Proposed Employees

If known, please complete the following information regarding proposed employees:

Full-time	200
Part-time	
Total full-time equivalent	200.00

19. Hours of Opening

Are Hours of Opening relevant to this proposal? ◉ Yes ○ No

Please add details of the of the Use Classes and hours of opening for each non-residential use proposed.

Following changes to Use Classes on 1 September 2020: The list includes the now revoked Use Classes A1-5, B1, and D1-2 that should not be used in most cases. Also, the list does not include the newly introduced Use Classes E and F1-2. To provide details in relation to these or any 'Sui Generis' use, select 'Other' and specify the use where prompted. Multiple 'Other' options can be added to cover each individual use. View further information on Use Classes.

If you do not know the hours of opening, select the Use Class and tick 'Unknown' in the popup box.

Use	Monday to Friday	Saturday	Sunday and Bank Holidays	Unknown
Other Industrial E(g)(iii), B2 & B8 uses	Start Time: End Time:	Start Time: End Time:	Start Time: End Time:	X

20. Industrial or Commercial Processes and Machinery

Does this proposal involve the carrying out of industrial or commercial activities and processes? ◉ Yes ○ No

Please describe the activities and processes which would be carried out on the site and the end products including plant, ventilation or air conditioning. Please include the type of machinery which may be installed on site:

20. Industrial or Commercial Processes and Machinery

Not known as proposals are speculative at present

Is the proposal for a waste management development? ○ Yes ◉ No

If this is a landfill application you will need to provide further information before your application can be determined. Your waste planning authority should make it clear what information it requires on its website

21. Hazardous Substances

Does the proposal involve the use or storage of any hazardous substances? ○ Yes ◉ No

22. Site Visit

Can the site be seen from a public road, public footpath, bridleway or other public land? ◉ Yes ○ No

If the planning authority needs to make an appointment to carry out a site visit, whom should they contact?

- ◉ The agent
- ○ The applicant
- ○ Other person

23. Pre-application Advice

Has assistance or prior advice been sought from the local authority about this application? ○ Yes ◉ No

24. Authority Employee/Member

With respect to the Authority, is the applicant and/or agent one of the following:
(a) a member of staff
(b) an elected member
(c) related to a member of staff
(d) related to an elected member

It is an important principle of decision-making that the process is open and transparent. ○ Yes ◉ No

For the purposes of this question, "related to" means related, by birth or otherwise, closely enough that a fair-minded and informed observer, having considered the facts, would conclude that there was bias on the part of the decision-maker in the Local Planning Authority.

Do any of the above statements apply?

25. Ownership Certificates and Agricultural Land Declaration

CERTIFICATE OF OWNERSHIP - CERTIFICATE A - Town and Country Planning (Development Management Procedure) (England) Order 2015 Certificate under Article 14

I certify/The applicant certifies that on the day 21 days before the date of this application nobody except myself/the applicant was the owner* of any part of the land or building to which the application relates, and that none of the land to which the application relates is, or is part of, an agricultural holding**

*** 'owner' is a person with a freehold interest or leasehold interest with at least 7 years left to run. ** 'agricultural holding' has the meaning given by reference to the definition of 'agricultural tenant' in section 65(8) of the Act.**

NOTE: You should sign Certificate B, C or D, as appropriate, if you are the sole owner of the land or building to which the application relates but the land is, or is part of, an agricultural holding.

Person role

- ○ The applicant
- ◉ The agent

Title	Mr
First name	Roland
Surname	Lee
Declaration date (DD/MM/YYYY)	15/12/2021

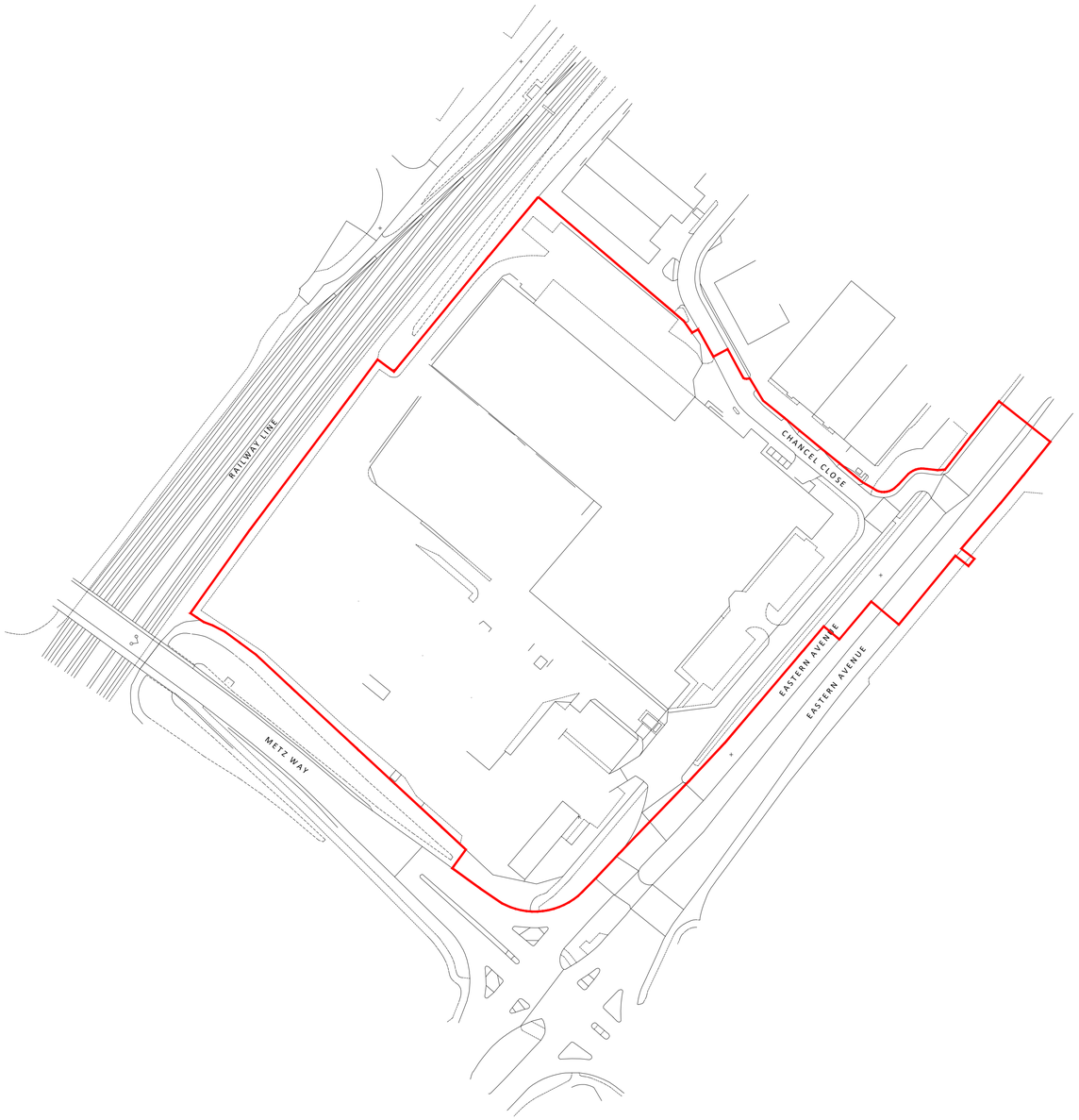
25. Ownership Certificates and Agricultural Land Declaration

☑ Declaration made

26. Declaration

I/we hereby apply for planning permission/consent as described in this form and the accompanying plans/drawings and additional information. I/we confirm that, to the best of my/our knowledge, any facts stated are true and accurate and any opinions given are the genuine opinions of the person(s) giving them. ☑

Date (cannot be pre-application)	15/12/2021



Disclaimer:
Information Subject to Measured Survey

Notes:

KEY

PLANNING APPLICATION SITE BOUNDARY
(Approx 53,142 m² / 13.13 acres)

N

0 10 20 50m
Scale bar - 1:1250m

Rev:	Notes:	Date:	Dwn:	Iss:
00	Planning Issue	30.11.21	HT	HA
DR	DR Issue	17.11.21	HT	HA

Suitability Code:

Client:
CANMOOR

hale
ARCHITECTURE
22c Leathermarket Street, London, SE1 3HP

Project:
Access Park, Gloucester

Drawing Title:
Site Location Plan

Project No:	Scale @ A1 / A3	Revision:
21078	1:1250 / 1:2500	00

Drawing No:
21078-PL1001

RAILWAY LINE

METZ WAY

UNIT 2

UNIT 1

Ridge Line

6°

8°

45m

S/S

CHANCEL CLOSE

UNIT 3

37m

UNIT 4 UNIT 5 UNIT 6 UNIT 7 UNIT 8

15m

7.3m

12.5m

UNIT 9 UNIT 10 UNIT 11 UNIT 12 UNIT 13 UNIT 14

VISIBILITY SPLAY EASEMENT

RELEVANT ADOPTED HIGHWAY LAND BOUNDARY

EASTERN AVENUE

RELEVANT ADOPTED HIGHWAY LAND BOUNDARY UNDER S247/248

EASTERN AVENUE

Disclaimer:
Information Subject to Measured Survey

Notes:

KEY

- PLANNING APPLICATION SITE BOUNDARY (Approx 53,142 m² / 13.13 acres)
- RELEVANT ADOPTED HIGHWAY LAND AND BOUNDARY (WITHIN OWNERSHIP)
- VISIBILITY SPLAY EASEMENT
- RELEVANT BOUNDARY UNDER S247/248

AREA SCHEDULE(GIA)

UNIT 1 (GIA)	**70,200 ft²**
Warehouse (Incl. office Undercroft)	64,600 ft²
Office (FF Only)	2,700 ft²
Office (SF Only)	2,900 ft²
Car parking spaces	*44*
UNIT 2 (GIA)	**93,530 ft²**
Warehouse (Incl. office Undercroft)	86,450 ft²
Office (FF Only)	3,430 ft²
Office (SF Only)	3,650 ft²
Car parking spaces	*79*
UNIT 3 (GIA)	**40,150 ft²**
Warehouse (Incl. office Undercroft)	36,375 ft²
Office (FF Only)	3,775 ft²
Car parking spaces	*31*
UNIT 4 (GIA)	**6,100 ft²**
Warehouse (Incl. office Undercroft)	5,050 ft²
Office (FF Only)	1,050 ft²
Car parking spaces	*6*
UNIT 5 (GIA)	**5,170 ft²**
Warehouse (Incl. office Undercroft)	4,330 ft²
Office (FF Only)	840 ft²
Car parking spaces	*5*
UNIT 6 (GIA)	**3,660 ft²**
Warehouse (Incl. office Undercroft)	3,160 ft²
Office (FF Only)	500 ft²
Car parking spaces	*3*
UNIT 7 (GIA)	**4,620 ft²**
Warehouse (Incl. office Undercroft)	3,900 ft²
Office (FF Only)	720 ft²
Car parking spaces	*4*
UNIT 8 (GIA)	**6,290 ft²**
Warehouse (Incl. office Undercroft)	5,195 ft²
Office (FF Only)	1,095 ft²
Car parking spaces	*6*
UNIT 9 (GIA)	**2,875 ft²**
Warehouse (Incl. office Undercroft)	2,875 ft²
Car parking spaces	*3*
UNIT 10 (GIA)	**3,915 ft²**
Warehouse (Incl. office Undercroft)	3,915 ft²
Car parking spaces	*3*
UNIT 11 (GIA)	**3,925 ft²**
Warehouse (Incl. office Undercroft)	3,925 ft²
Car parking spaces	*3*
UNIT 12 (GIA)	**3,925 ft²**
Warehouse (Incl. office Undercroft)	3,925 ft²
Car parking spaces	*3*
UNIT 13 (GIA)	**3,915 ft²**
Warehouse (Incl. office Undercroft)	3,915 ft²
Car parking spaces	*3*
UNIT 14 (GIA)	**2,875 ft²**
Warehouse (Incl. office Undercroft)	2,875 ft²
Car parking spaces	*3*
TOTAL GIA	251,150ft²
Total Car Parking	*196*

N

0 5 10 15 20 25

Rev:	Notes:	Date:	Dwn:	Iss:
01	Site plan updated	14.12.21	HT	HA
00	Unit 9 to 14 areas amedned	30.11.21	HT	HA
DR	DR Issue	17.11.21	ZG	HA

Suitability Code:

Client: CANMOOR

hale
ARCHITECTURE
22c Leathermarket Street, London, SE1 3HP

Project: Access Park, Gloucester

Drawing Title: Site Block Plan

Project No: 21078

Scale @ A1 / A3: 1:500 / 1:1000

Revision: 01

Drawing No: 21078-PL1004

RAILWAY LINE

METZ WAY

METZ WAY A4302

EASTERN AVENUE A38

EASTERN AVENUE

CHANCEL CLOSE

ACCESS PARK, EASTERN WAY, CHANCEL CLOSE, GLOUCESTER

HALE ARCHITECTURE

Disclaimer:
Information Subject to Measured Survey
The topographical information shown is based on the topographical survey by Ellam Surveys, Dwg no. 8362_2D/1, dated.Nov21

Notes:

KEY

PLANNING APPLICATION SITE BOUNDARY
(Approx 53,142 m² / 13.13 acres)

N

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Scale bar - 1:500m

Rev:	Notes:	Date:	Dwn:	Iss:
00	Planning Issue	30.11.21	HT	HA
DR	DR Issue	17.11.21	HT	HA

Suitability Code:

Client:
CANMOOR

hale
ARCHITECTURE
22c Leathermarket Street, London, SE1 3HP

Project:
Access Park, Gloucester

Drawing Title:
Existing Site Plan

Project No:	Scale @ A1 / A3	Revision:
21078	1:500 / 1:1000	00

Drawing No:
21078-PL1002

RAILWAY LINE

METZ WAY

UNIT 2
93,530ft²

UNIT 1
70,200ft²

45m

UNIT 3
40,150ft²

37m

UNIT 4
6,100ft²

UNIT 5
5,170ft²

UNIT 6
3,660ft²

UNIT 7
4,620ft²

UNIT 8
6,290ft²

15m

7.3m

12.5m

UNIT 9
2,875ft²

UNIT 10
3,915ft²

UNIT 11
3,925ft²

UNIT 12
3,925ft²

UNIT13
3,915ft²

UNIT 14
2,875ft²

CHANNEL CLOSE

VISIBILITY SPLAY EASEMENT

RELEVANT ADOPTED HIGHWAY LAND BOUNDARY

EASTERN AVENUE

RELEVANT ADOPTED HIGHWAY LAND BOUNDARY UNDER S247/248

EASTERN AVENUE

KEY

- (R) Recycling & Refuse
- (SS) Substation
- (1) Cycle Storage (Sheffield Stands)
- (2) Motorbike Parking Bay
- Unit Entrance
- Proposed Fence Line - 2.4m high Paladin
- Existing Fence Line
- Unit Office Area

Disclaimer:
Information Subject to Measured Survey

Notes:

KEY

- PLANNING APPLICATION SITE BOUNDARY (Approx 53,142 m² / 13.13 acres)
- RELEVANT ADOPTED HIGHWAY LAND AND BOUNDARY (WITHIN OWNERSHIP)
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Warehouse (Incl. office Undercroft)	2,875 ft²
Car parking spaces	*3*
TOTAL GIA	251,150ft²
Total Car Parking	*196*

N

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Scale bar - 1:500m

Rev:	Notes:	Date:	Dwn:	Iss:
04	Amendments to unit cores	12.12.21	HT	HA
03	Update U9 to 14	30.11.21	HT	HA
02	Unit GA, U1&2 move for trees, U4to8 pavement, Unit 3 pavement	23.11.21	HT	HA
01	Update to Unit 2	15.11.21	HT	HA
00	Site access updated	15.11.21	HT	HA
DR	DR Issue	04.11.21	HT	HA

Suitability Code:

Client:
CANMOOR

hale
ARCHITECTURE
22c Leathermarket Street, London, SE1 3HP

Project:
Access Park, Gloucester

Drawing Title:
Proposed Site Plan

Project No: 21078
Scale @ A1 / A3: 1:500 / 1:1000
Revision: 04

Drawing No: 21078-PL1003

hale
architecture : design management

22c Leathermarket Street
London
SE1 3HP

Access Park Gloucester/3.1/01

Development Control
4th floor Herbert Warehouse
The Docks
Gloucester
GL1 2EQ

13 December 2021

Dear Sirs/Madam

Access Park (Former Interbrew Site), Eastern Avenue, Gloucester GL4 6SW - planning application for fourteen industrial buildings with E(g) (iii), B2 & B8 uses plus alternative trade counter uses for Units 9 to 14, ref PP-10440761

We are pleased to confirm that a detailed planning application for the above site for fourteen speculative industrial buildings having E(g) (iii), B2 & B8 uses with a total gross internal floor area of 23,333m2 (251,150ft^2 GIA) has been submitted on line via the Planning Portal and that the fee of £60,947 has also been paid by bank transfer by the applicant, Venus Logistics PropCo Ltd, to the Council along with a CD covering all the planning submission including this cover letter.

The site is located off Eastern Avenue/Metz Way, Gloucester and is allocated for employment use.

This site, which is 5.31 hectares, and has been vacant since 2017 with the old buildings being demolished earlier this year. The proposals are for fourteen speculative industrial buildings with itinerant car and bicycle & motorbike parking, service areas and soft landscaping.

We note there will be no CIL payments due in connection with this application. A completed CIL form has been submitted with the application on the planning portal.

The planning application, which has been submitted on line, includes a set of Hale Architects drawings as follows:-
21078- PL1001-00/ PL1002-00/ PL1003-04/ PL1004-01/ PL1005-01/ PL1006-01 / PL1201-01/ PL1202-01/ PL1205-01/ PL1206-01/ PL1011-01/ PL1012-01 /PL1013-01/ PL1014-02/ PL1021-01/ PL1022-01/ PL1023-01/ PL1024-02/ PL1031-01/ PL1032-02/ PL1033-01/ PL1034-02/ PL1041-01/ PL1043-01/ PL1044-03/ PL1091-03/ PL1093-001/PL1094-03

In addition a Design & Access Statement and Planning Statement, by Hale, and the following Supplemental Reports and drawings are also included in the submission:-

- Ground Investigation Report by WSP ref 70020138-R03 dated April 2018
- Flood Risk Assessment & Drainage Strategy by IL Consult ref 21-038 , dated 24.11.2021
- Ecology Assessment incl BNG calculations by Clarkson & Woods ref 7777 , dated 03/12/2021
- Soft Landscape proposals by BEA Landscape drawing ref 21-135-P-03A
- Tree Survey Report By BEA Landscape ref 21135/EH/TR001 , dated 19th November 2021
- Tree survey plan by BEA Landscape ref 21-135-P-01
- Tree Constraints Plan by BEA Landscape ref 21-135-P-02
- Acoustic Assessment by Hoare Lea, rev03 , dated 03 December 2021

hale
architecture : design management

22c Leathermarket Street
London
SE1 3HP

- Air Quality Assessment by Hoare Lea
- Transport Statement by DTA 23390-01, dated 8th December 2021
- Travel Plan by DTA ref 23390-02, dated 8th December 2021
- Energy Strategy by ESC, ref ESC 1794 dated 14/12/2021
- Archaeology Statement by BSA Heritage, ref BSA 2152_1a, dated December 2021
- BREEAM Pre-Assessment 2018 by ESC, Rev B, dated 21/10/2021

This application represents the replacement of a vacant industrial site with high quality speculative industrial development and is part of the continuing regeneration of the area.

We trust that this information is sufficient to enable the application to be registered and progressed and look forward to discussing this submission in more detail with you in due course.

Yours faithfully

[redacted]

Michael J Graham

Associate Director
for and on behalf of hale architecture limited

[redacted]

hale architecture ltd

Reg No: 8348413
Pochards House Barnards Yard
Saffron Walden
Essex
CB11 4EB

1.0 | INTRODUCTION



Site Location

1.0 Introduction

The Design and Access Statement has been set out to assist in the understanding of the design/planning drawings and supporting material submitted as part of this full planning application for the site at Access Park, Gloucester.

The total site area of the site is 53,142m2 / 5.31ha

The current scheme comprises the development of 14 industrial warehouse units with E(g)(iii), B2 and B8 uses and ancillary offices, car parking, service areas & soft landscaping.

E(g)(iii) – Light Industry
B2 - General Industry
B8 - Wholesale warehouse, distribution centre & repositories.

The Design and Access Statement addresses the design considerations and processes in arriving at the scheme layout and design.

N

ECOLOGICAL IMPACT ASSESSMENT

ACCESS PARK, METZ WAY, GLOUCESTER

carried out by

CLARKSON & WOODS
ECOLOGICAL CONSULTANTS

commissioned by

HALE ARCHITECTURE

on behalf of

CANMOOR

DECEMBER 2021

ECOLOGICAL IMPACT ASSESSMENT

ACCESS PARK – METZ WAY, GLOUCESTER

CONTENTS

EXECUTIVE SUMMARY **2**

1 INTRODUCTION **4**
1.2 Report Aims 4
1.3 Site Description Summary 4
1.4 Development Proposals 6
1.5 Quality Assurance 6

2 BASELINE CONDITIONS **8**
2.1 Introduction 8
2.2 Evaluation Methodology 8
2.3 Desk Study 8
2.4 Habitat Survey 10
2.5 Protected Species Survey and Species of Conservation Concern 15
2.6 Summary of Ecological Importance 19

3 ASSESSMENT OF EFFECTS **20**
3.1 Methodology 20
3.2 Summary of Development Proposals 20
3.3 Generic Measures 20
3.4 Designated Sites 21
3.5 Habitats 21
3.6 Protected Species and Species of Conservation Concern 21
3.7 Biodiversity Impact Assessment 26

4 CONCLUSIONS **28**

APPENDIX A: WILDLIFE LEGISLATION & SPECIES INFORMATION **29**

APPENDIX B: RESULTS OF BIODIVERSITY IMPACT ASSESSMENT **32**

Project title:	Access Park		
Document title:	Ecological Impact Assessment	Project number:	7777
Client:	Hale Architecture on behalf of Canmoor	Author:	James Sweetman/Rebecca Sandey
Version 1	Final Report	Issued on:	03/12/2021
Quality Assurance	Checked by:	Approved by:	
	Mike Hockey	Polly Luscombe	
	[redacted]	[redacted]	

The information, data and advice which has been prepared and provided is true, and has been prepared and provided in accordance with the Chartered Institute of Ecology and Environmental Management's (CIEEM) Code of Professional Conduct. We confirm that the opinions expressed are our true and professional bona fide opinions. This report and its contents remain the property of Clarkson and Woods Ltd. until payment has been made in full.

EXECUTIVE SUMMARY

Clarkson & Woods Ltd. was commissioned by Hale Architecture on behalf of Canmoor to carry out an ecological survey of an existing industrial site known as 'Access Park', Metz Way / Chancel Close, Gloucester, GL4 3BS (central grid ref SO84926 17899); hereafter 'the Site'.

This report has been prepared to inform a full planning application for the Site. Development proposals comprise the construction of 14 warehouse units with corresponding car parking; with all buildings on the Site having previously been demolished. A small amount of soft landscaping will also be provided.

An extended Phase 1 habitat survey was undertaken on 3rd November 2021 by an experienced ecologist. The habitats predominantly comprised hardstanding, with narrow corridors of dense scrub; tall ruderal vegetation with localised patches of rough grassland; and ornamental shrubs largely restricted to the Site periphery. A row of semi-mature and mature trees was present adjacent to the south-western boundary of the Site.

The Site was predominately hardstanding; however discrete areas of trees, dense scrub and shrubs provide opportunities for nesting/foraging birds and foraging bats, and may act as habitat corridors for reptiles. The areas of tall ruderals and rough grass also provide suitable foraging/ sheltering habitat for birds, bats and widespread reptile species.

Trees and scrub to be retained within the development will be protected during construction with appropriate fencing and root protection zones.

Removal of suitable reptile habitat must be carried out under a precautionary approach, between April and October inclusive, to avoid impacts to torpid reptiles over winter. Habitat clearance will be phased and conducted under an Ecological Watching Brief, with a final destructive search. Any reptiles encountered will be safely relocated to retained habitat adjacent to the railway line.

The removal of suitable bird nesting habitat should be undertaken between September and February inclusive to avoid the bird nesting. Otherwise, habitat clearance must be preceded by a check for nesting birds by a suitably qualified ecologist no more than 48 hours prior to works being undertaken. Where a thorough visual inspection is prohibited by dense vegetation, clearance will need to take place under an Ecological Watching Brief.

During Site clearance and construction, measures will be implemented to avoid harm to hedgehogs.

Five bird boxes shall be provided to mitigate for the loss of nesting opportunities resulting from habitat clearance.

Habitats along the north-western railway corridor will be retained and widened where possible with native scrub planting, as well as areas of additional wildflower grassland seeded along both the north-eastern and south-western boundaries and a new native species-rich hedgerow at the north of the Site. Along with ornamental shrub planting, these new habitats will compensate for the loss of cleared areas of vegetation.

Invasive/non-native plants (cotoneaster and buddleia) will be removed to prevent spreading and possible regrowth.

Further ecological enhancements for the development include the installation of two bat and seven bird boxes on retained mature trees, and the creation of a reptile hibernaculum in the north-western corner of the Site.

A sensitive lighting scheme will be prepared to minimise artificial light spill. The scheme will seek to maintain a dark vegetated corridor adjacent to the north-western and south-western boundaries, allowing bats to continue to forage and commute through the Site.

A Landscape and Ecological Management Plan (LEMP) will be prepared to detail appropriate mitigation, compensation, enhancement, management and monitoring measures during the operational phase.

In order to inform the BREEAM assessment for the Site, a Biodiversity Impact Assessment score has been calculated using the BREEAM NC 2018 Change in Ecological Value Calculator (LE04 v3.0). According to the calculator, the 'Post Development % of Pre Development' was 106% for non-linear habitats (6% net gain); incorporating additional native scrub and wildflower grassland planting into landscape plans, and managing for wildlife by leaving certain areas unmown. Planting of a new native, species-rich hedgerow in the north of the Site will provide 159 linear Biodiversity Units.

1 INTRODUCTION

1.1.1 Clarkson and Woods Ltd. was commissioned by Hale Architecture to carry out an Ecological Impact Assessment at Access Park, Metz Way, Gloucester, GL4 3BS, hereafter referred to as 'the Site'.

1.1.2 This Impact Assessment discusses the likely effects of the Proposed Development on the ecology of the Site using information collected during an Extended Phase 1 Habitats Survey carried out by Clarkson and Woods on 03/11/2021.

1.1.3 The assessment has been prepared by James Sweetman, an ecologist with 15+ years' experience and holder of survey licences for bats, dormouse, great crested newt and barn owl. The report has been subject to a two-stage quality assurance review by appropriately experienced senior consultants who are members of CIEEM.

1.1.4 Unless the client indicates to the contrary, information on the presence of species collected during the surveys will be passed to the county biological records centre in order to augment their records for the area. This is in line with the CIEEM code of professional conduct[1].

1.1.5 If no action or development of the Site takes place within twelve months of the date of this report, then the findings of the assessment and supporting surveys should be reviewed. An update of the surveys and/or assessment may be required. Only those species considered likely to be present or where suitable habitat was identified are discussed in the report and therefore assessments for otter *Lutra lutra*, water vole *Arvicola amphibius*¸ great crested newt *Triturus cristatus* and dormouse *Muscardinus avellanarius* are not covered.

1.2 Report Aims

1.2.1 The aims of this report are:

- To establish, as far as possible, the baseline ecological conditions existing on Site at the time of survey and to identify any likely future changes in the baseline conditions up to the point of commencement.
- To determine likely significant effects resulting from the proposals upon the ecological features identified within the assessment.
- To assess whether the proposals are likely to be in accordance with relevant nature conservation legislation and planning policies.
- To identify how mitigation or compensation measures will be secured, maintained and monitored.
- To identify ecological enhancements to be carried out and how they will be implemented, maintained and monitored.

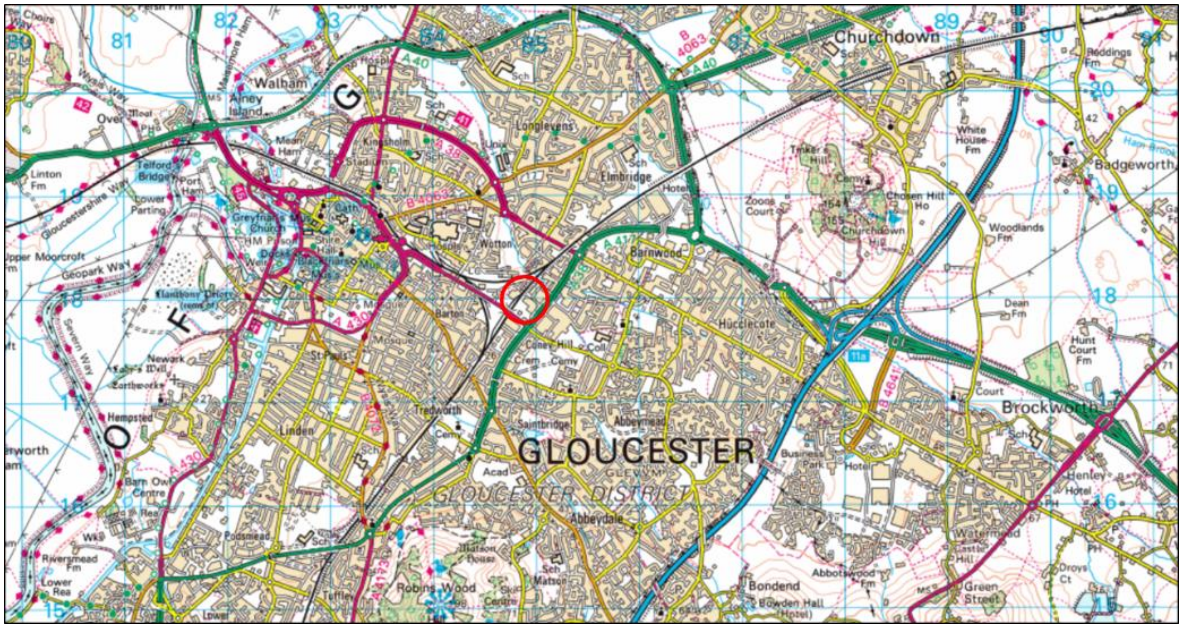
1.3 Site Description Summary

1.3.1 The Site is approximately 6.0 hectares (ha) in size and is located approximately 1.25km east of Gloucester city centre, and set within a largely industrial/urban landscape.

1.3.2 The Site comprised predominantly concrete and tarmac hardstanding, with large rubble piles following the demolition of all buildings previously present within the Site boundary. Vegetation within the Site comprised linear corridors of dense scrub and tall ruderals, with localised patches of rough grassland, limited mainly to the north-western, south-western and south-eastern Site boundaries. A line of mature trees bordered the western boundary of the plot. The Site is surrounded by other industrial estates and retail parks to the east, south and west, with a railway line forming the north-western Site boundary.

1.3.3 The approximate centre of the Site was at Ordnance Survey Grid Reference SO849178, and the location of the Site is shown in Figure 1 below. An aerial photo of the Site and surrounding area is provided in Figure 2.

[1] Code of Professional Conduct. CIEEM, January 2019.


Churchdown
Walham
Longlevens
Elmbridge
Badgeworth
Barnwood
Hucclecote
Brockworth
GLOUCESTER
GLOUCESTER DISTRICT
Linden
Abbeydale
Bondend
Robins Wood
Hempsted
Newark
Podsmead
Riversmead
Lower Rea
Abbotswood
Green Street
Henley
Hunt Court
Dean
Woodlands
White House
Chosen Hill
Telford Bridge
Greyfriars
Watton
Tredworth
Saintbridge
Abbeymead
Barn Owl Centre
Matson
Geopark Way
Severn Way
Gloucestershire Way
Upper Moorcroft
Linton
Ainey Island
Meadham
Longlevens
Elmbridge
Zoons Court
Churchdown Hill
Reddings
Dean
Hunt Court
Castle Hill
Droys Ct
Bowden Hall (Hotel)
Business Park
Hotel
Court
Acad
Cemy
Crem
Coll
Sch
Mosq
Cemy
Matson House
Matson Centre
Wks
Lower Parting
Upper Parting
Telford Bridge
Greyfriars Church
Earthworks
Barn Owl Centre
Riversmead Fm
Lower Rea
Podsmead
Robins Wood
Abbotswood Fm
Bowden Hall (Hotel)
Hunt Court Fm
Dean Fm
Woodlands Fm
White House Fm
Reddings Fm
Chosen Hill Ho
Churchdown Hill
Zoons Court
Elmbridge
Longlevens
Ainey Island
Meadham
Linton Fm
Upper Moorcroft
Geopark Way
Severn Way
Gloucestershire Way
Lower Parting
Telford Bridge
Greyfriars Church
Watton
Barnwood
Tredworth
Saintbridge
Abbeymead
Hucclecote
Linden
Newark
Hempsted
Earthworks
Barn Owl Centre
Riversmead Fm
Lower Rea
Podsmead
Robins Wood
Matson
Abbeydale
Bondend
Abbotswood Fm
Green Street
Henley
Hotel
Castle Hill
Droys Ct
Business Park
Hotel
Court
Acad
Cemy
Crem
Coll
Sch
Mosq
Matson House
Matson Centre
Wks
Lower Parting
Upper Parting
A40
A40
A430
A38
A417
A4173
A4173
B4063
B4073
B4073
B4073

1.4 Development Proposals

1.4.1 The proposed works comprise the construction of 14 warehouse units as well as corresponding car parking areas and access roads, with all existing buildings on Site having previously been demolished. A small area of soft landscaping is proposed. Figure 3 shows the final development proposals.

1.4.2 The majority of the linear scrub, tall ruderal and rough grassland habitat (as well as ornamental shrubs) along the south-eastern Site boundary will be removed, as will the narrow linear corridors of tall ruderal vegetation currently within the central hardstanding area. The area of linear scrub and tall ruderal habitat along the north-western and south-western boundaries will be partly retained, with small areas of dense scrub will be removed along the north-western boundary in order for a new hedgerow to be planted, and areas of ruderal vegetation along the south-western boundary will be removed and seeded with wildflower seed. Non-native planting such as buddleia will also be removed from these boundaries, and they will be planted instead with native scrub species in order to create biodiversity-friendly buffers around the Site.

1.4.3 Any changes to the development layout and landscaping made subsequent to publication of this report should be issued to Clarkson and Woods Ltd. for review. Ecological impacts and mitigation opportunities may be affected by any such changes.

1.5 Quality Assurance

1.5.1 All ecologists employed by Clarkson and Woods are members or pending members of the Chartered Institute of Ecology and Environmental Management (CIEEM) and follow the Institute's Code of Professional Conduct[2] when undertaking ecological work.

1.5.2 The competence of all field surveyors has been assessed by Clarkson and Woods with respect to the CIEEM Competencies for Species Survey (CSS)[3].

1.5.3 This report has been prepared in accordance with the relevant British Standard: *BS42020: 2013 – Biodiversity: Code of Practice for Planning and Development*[4]. It has been prepared by an experienced ecologist who is a member of CIEEM. The report has also been subject to a two-stage quality assurance review by appropriately experienced ecologists who are members of CIEEM.

[2] CIEEM (2013). *Code of Professional Conduct*. www.cieem.net/professional-conduct.
[3] CIEEM (2013). *Competencies for Species Survey (CSS)*. www.cieem.net/competencies-for-species-survey-css-
[4] The British Standards Institution (2013*). BS42020: 2013 – Biodiversity: Code of Practice for Planning and Development*. BSI Standards Ltd.

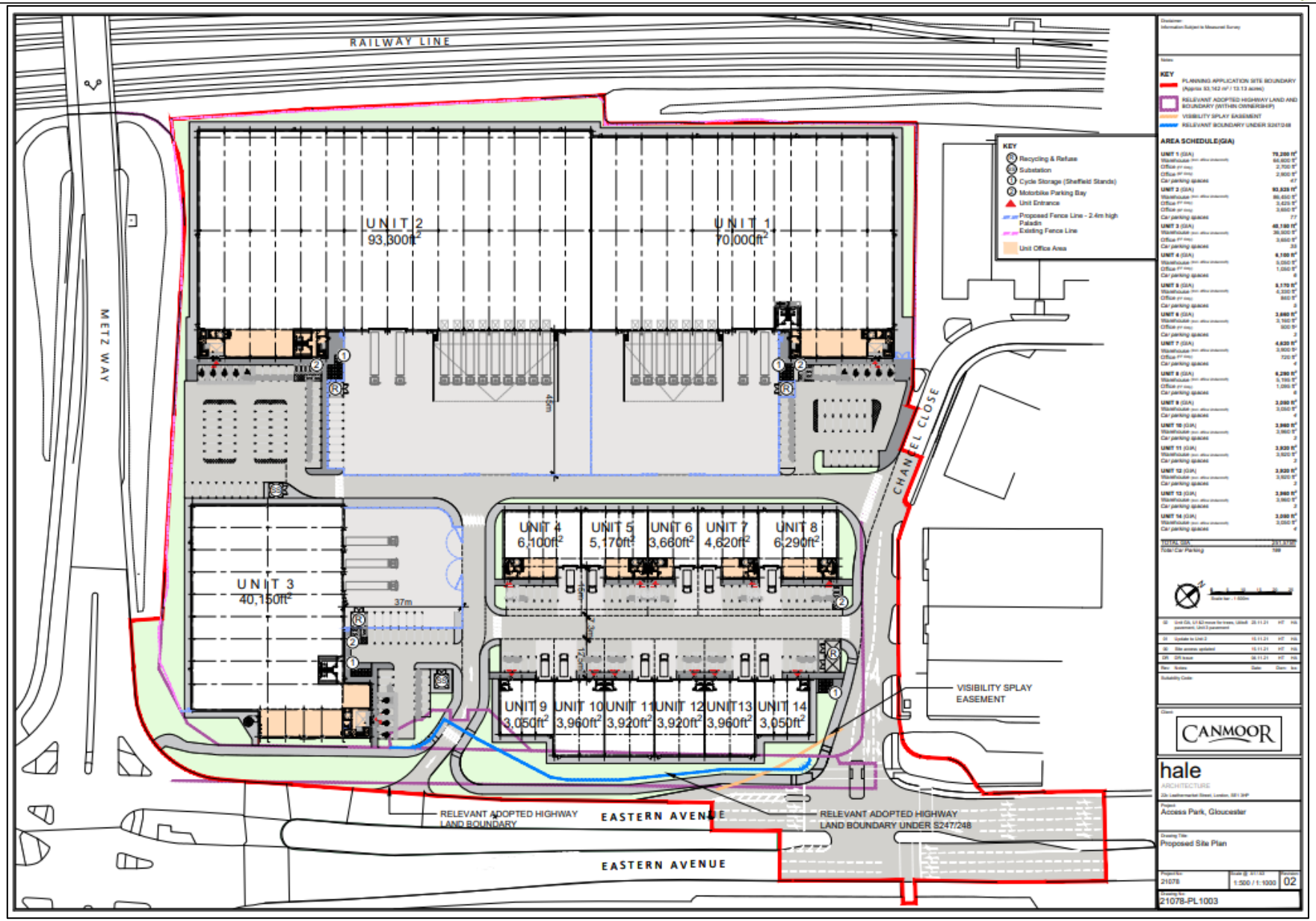


Figure 3: Proposed Site Plan

2 BASELINE CONDITIONS

2.1 Introduction

2.1.1 This section sets out the results of the Desk Study and ecological field surveys along with an evaluation of their relative importance, in order to inform the Impact Assessment. The methodologies associated with the baseline assessment are summarised with each ecological feature's subheading below.

2.1.2 The specific surveys carried out were chosen on the basis of the likelihood, in our considered opinion, of each protected species or Species of Conservation Concern being present on or within the vicinity of the Site. This is informed by the Site's geographic location and the habitat types present on and around the Site. No species-specific baseline surveys were undertaken.

2.1.3 Details of the legislative protection afforded to those protected species which have been identified as occurring or potentially occurring on the Site are given in Appendix A. Species of Conservation Concern are defined as those appearing in any of the following; Priority Habitats and Species under Section 41 of the Natural Environment and Rural Communities Act (2006); red or amber-listed birds within the British Trust for Ornithology's Birds of Conservation Concern (2021); and any specific local conservation priority species such as those listed in Red Data Books.

2.2 Evaluation Methodology

2.2.1 Each recorded ecological feature, whether it is a species, a habitat or a site designated for nature conservation, is described in turn in this section to provide the pre-development baseline conditions on Site. Subsequently, an evaluation of each feature's 'ecological importance' is made. The evaluation of ecological importance is informed by the criteria provided within the CIEEM Guidelines for Ecological Impact Assessment (2018)[5].

2.2.2 With due consideration to the criteria, each feature is classified on a geographical scale of ascending importance as follows; Negligible, Site, Local, District, County, National and International. The chosen geographic level of importance is considered that which best represents the scale at which the loss of the Site's area or population of the feature would have the greatest impact. Where sufficient survey information not available to determine the importance of a species or habitat present on the Site, the importance of the receptor is marked as 'uncertain' and based upon the professional judgement of the author together with available relevant desk study information.

2.2.3 Once importance has been determined for each feature, those of Local importance or above will be considered to be Important Ecological Features (IEFs). Non-IEFs will typically not be considered further within the impact assessment. However, where a feature does not qualify as an IEF but is afforded specific legal protection or coverage under a particular legislation or planning policy it will also be assessed in order to ensure the scheme's legal and policy compliance.

2.3 Desk Study

Methodology

2.3.1 Statutory designated sites for nature conservation were identified using the Natural England/DEFRA web-based MAGIC map database (www.MAGIC.gov.uk). International-level sites such as Special Areas of Conservation (SACs) and Special Protection Areas (SPAs) within 5km from the Site were searched for. National-level sites such as National Nature Reserves (NNRs) and Sites of Special Scientific Interest (SSSIs) within 2km of the Site were searched for.

2.3.2 The Gloucestershire Centre for Environmental Records (GCER) was consulted for records of protected species and species of conservation concern within 2km of the Site. GCER was also asked to provide details of locally-designated and non-statutory sites for nature conservation within 1km of the Site.

[5] *CIEEM (2018) Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, Coastal and Marine.* Chartered Institute of Ecology and Environmental Management. www.cieem.net

2.3.3 Clarkson and Woods' own database of ecological records derived from past survey work was also consulted for further locally-relevant data.

2.3.4 The Natural England/DEFRA web-based MAGIC map database was also consulted for records of European Protected Species (EPS) licences issued for mitigation projects concerning EPS within 2km of the Site.

2.3.5 The Draft Gloucester City Plan (2016-2031) and Joint Core Strategy for Gloucester, Cheltenham and Tewkesbury 2011-2031 (Adopted December 2017) were consulted for details of planning policies relevant to designated sites, protected species and habitats, and general ecological and environmental protection.

2.3.6 The Gloucestershire Local Biodiversity Action Plan (BAP) was consulted for information on conservation priority species and habitats which may require further consideration and weight within Ecological Impact Assessments.

2.3.7 Ordnance Survey maps (1:25,000) and aerial images of the Site were examined online (bing.com/maps and maps.google.co.uk) to allow a better understanding of the context of the Site and its connections to potentially important habitats, known species records and protected sites.

Limitations

2.3.8 No specific limitations to the desk study were encountered.

2.3.9 The data presented within this report constitutes a summary of the data obtained from the local records centre. Should additional detail be required on any of the records described within this report Clarkson and Woods Ltd. should be contacted.

2.3.10 It should be noted that the data obtained from within the search area will not constitute a complete record of habitats and species present within the search area. It is therefore possible that protected species may occur within the vicinity of the proposed development site that have not been identified within the desk study.

Desk Study Findings

Designated Sites

Statutory Designated Sites

2.3.11 No statutory designated sites for nature conservation were identified within the desk study.

Local and Non-statutory Designated Sites

2.3.12 One local non-statutory designated site for nature conservation was identified within the desk study. This was Barnwood Arboretum & Park Local Wildlife Site (LWS), located~0.8km east of the Site and designated for its species-rich woodland and rough grassland habitats. This LWS is of **Local** importance.

Local BAP

2.3.13 None of the Local BAP Habitats or Species are applicable to this Site.

Planning Policy

2.3.14 The following policy from the Joint Core Strategy for Gloucester, Cheltenham and Tewkesbury (2011-2031, Adopted December 2017) is relevant to the Site:

Policy SD9: Biodiversity and Geodiversity

1. The biodiversity and geological resource of the JCS area will be protected and enhanced in order to establish and reinforce ecological networks that are resilient to current and future pressures. Improved community access will be encouraged so far as is compatible with the conservation of special features and interests

2. This will be achieved by:

i. Ensuring that European Protected Species and National Protected Species are safeguarded in accordance with the law;

ii. Conserving and enhancing biodiversity and geodiversity on internationally, nationally and locally designated sites, and other assets of demonstrable value where these make a contribution to the wider network, thus ensuring that new development both within and surrounding such sites has no unacceptable adverse impacts;

iii. Encouraging new development to contribute positively to biodiversity and geodiversity whilst linking with wider networks of green infrastructure. For example, by incorporating habitat features into the design to assist in the creation and enhancement of wildlife corridors and ecological stepping stones between sites;

iv. Encouraging the creation, restoration and beneficial management of priority landscapes, priority habitats and populations of priority species. For example, by securing improvements to Strategic Nature Areas (as set out on the Gloucestershire Nature Map) and Nature Improvement Areas.

3. Any development that has the potential to have a likely significant effect on an international site will be subject to a Habitats Regulations Assessment

4. Within nationally designated sites, development will not be permitted unless it is necessary for appropriate on-site management measures, and proposals can demonstrate that there will be no adverse impacts on the notified special interest features of the site

5. Development within locally-designated sites will not be permitted where it would have an adverse impact on the registered interest features or criteria for which the site was listed, and harm cannot be avoided or satisfactorily mitigated

6. Harm to the biodiversity or geodiversity of an undesignated site or asset should be avoided where possible. Where there is a risk of harm as a consequence of development, this should be mitigated by integrating enhancements into the scheme that are appropriate to the location and satisfactory to the Local Planning Authority. If harm cannot be mitigated on-site then, exceptionally, compensatory enhancements off-site may be acceptable.

2.3.15 The following policy from the Draft Gloucester City Plan (2016-2031) is relevant to the Site:

Policy F2: Biodiversity

Small scale piecemeal erosion of background biodiversity is to be resisted, applications for small scale development will be judged as a component of a wider system and applications will need to show how biodiversity interests will be taken account of and mitigated against.

2.4 Habitat Survey

Habitat Survey Methodology

2.4.1 A habitat survey was carried out based on standard field methodology set out in the *Handbook for Phase 1 Habitat Survey* (2010 edition)[6]. The survey was completed by James Sweetman. The surveyor has over 15 years' experience undertaking ecological surveys and has a BSc in relevant subjects. James holds a licence for the survey of bats (Natural England Level 2 Reg. No. 2021-51575-CLS-CLS), dormouse (NE Level 2 Reg. No. 2016-26772-CLS-CLS), great crested newt (NE Level 1 Reg No. 2021-52622-CLS-CLS) and barn owl (Reg. No. CL29/00121).

2.4.2 Botanical names follow Stace (1997)[7] for higher plants and Edwards (1999)[8] for bryophytes.

2.4.3 The results of the Phase 1 Habitats Survey are included in map form on Figure 4. Habitats are mapped following the codes and conventions described within the Phase 1 Habitat Survey Handbook and Target Notes (Table 1) are used to describe habitats not readily conforming to recognised types and evidence of, or potential for, protected species and species of conservation concern. Photographs of the Site are provided below.

[6] Nature Conservancy Council. (1990 - 2010 edition). *Handbook for Phase 1 Habitat Survey – A Technique for Environmental Audit*, Joint Nature Conservation Committee
[7] Stace, C. (1997). *New Flora of the British Isles Second Edition*. Cambridge University Press
[8] Edwards, S.R. (1999). *English Names for British Bryophytes*. BBS, Cardiff

Habitat Assessment Limitations

2.4.4 Although the survey was conducted in early November, which is outside the optimal time for a Phase 1 habitat survey (April to October inclusive), it was possible to adequately classify and assess the nature conservation value of the habitats present. Although particular groups of species such as flowering herbs and spring ephemerals may have been under-recorded or missed, considering the habitats recorded on the Site, any noteworthy species were unlikely to have been missed. An extensive species list was not collected but species characteristic of the recorded habitats were recorded.

Dense Scrub

Field Survey Results

2.4.5 Dense scrub was present along the north-western and south-western boundaries of the Site (see Photograph 1), and also occurred as localised patches along the southern Site boundary. Along the northern railway boundary the following woody species were present; hawthorn *Crataegus monogyna*, elder *Sambucus nigra*, buddleia *Buddleia davidii*, dog-rose *Rosa canina*, field maple *Acer campestre* and dogwood *Cornus sanguinea*. Bramble *Rubus fruticosus* agg. was also abundant (Target Note 1). Along the south-western boundary of the Site, the 3 metre wide linear strip of scrub habitat was dominated by bramble and buddleia. The southern corner of the Site was dominated by a dense thicket of broad-leaved oleaster *Elaeagnus macrophylla*.



Photograph 1: Dense scrub along the northern boundary adjacent to the railway

Evaluation

2.4.6 The dense scrub on Site is considered to be of **Site** importance.

Hardstanding

Field Survey Results

2.4.7 The Site comprised extensive hardstanding, including large areas of gravel, remains of concrete building foundations, and a disused tarmac car park. This area comprised approximately 95% of the Site's surface area, and has limited/no intrinsic value to biodiversity.

2.4.8 A number of rubble piles were present within the south-west corner of the Site (see Photograph 2) and these are thought to be due to the recent demolition works carried out to remove the previously existing building in the north-east of the Site.



Photograph 2: Rubble piles present in the south-west corner of Site

Evaluation

2.4.9 The hardstanding across the Site was considered to be of **Negligible** importance.

Trees

Field Survey Results

2.4.10 Immediately adjacent to the south-western Site boundary, a row of mature maiden-stemmed hornbeam *Carpinus betula*, American sycamore *Platanus occidentalis* formed the dominant tree species, with a localised area of silver birch *Betula pendula*; occasional field maple, elder, hazel *Corylus avellana* and one individual crab apple cultivar *Malus sp.* are also present as understorey species. Photograph 3 shows the trees along the south-western boundary.



Photograph 3: Line of trees along the western Site boundary

Evaluation

2.4.11 Due to a dominance of introduced species, the trees on Site were considered to be of **Site** importance.

Tall Ruderal Vegetation

Field Survey Results

2.4.12 Narrow (1-3 metre wide) corridors of tall ruderal vegetation were identified within the Site (see Photograph 4). The majority of this habitat was present along the north-western and south-western boundaries, where it contained localised patches of rough grassland and scrub as well. Narrow strips of tall ruderal were also present within the large hardstanding area towards the centre of the Site.

2.4.13 The following species were recorded within these areas: common nettle *Urtica dioica*, red clover *Trifolium pratense*, white clover *Trifolium repens*, ribwort plantain *Plantago lanceolata*, broadleaf plantain *Plantago major*, cranesbill sp. *Geranium sp.*, herb Robert *G. robertianum*, ivy *Hedera helix*, purple toadflax *Linaria purpurea*, common ragwort *Senecio jacobaea L*, narrow-leaved ragwort *Senecio inaequidens*, common horsetail *Equisetum arvense*, white dead-nettle *Lamium album*, wild cherry *Prunus avium* saplings, spear

thistle *Cirsium vulgare*, field thistle *C. arvense*, common yarrow *Achillea millefolium*, dandelion sp. *Taraxacum officinale agg.*, cock's-foot grass *Dactylis glomerata*, meadow fescue *Festuca pratensis*, bristly oxtongue *Helminthotheca echioides*, broad-leaved dock *Rumex obtusifolius*, ox-eye daisy *Leucanthemum vulgare*, buddleia, old-man's beard *Clematis vitalba*, *Forsythia* sp., field maple, bindweed sp. *Convolvulus sp.*, common burdock *Arctium minus*, great mullein *Verbascum Thapsus*, black locust tree *Robinia pseudoacacia*, white-leaved rock rose *Cistus albidus*, *Viburnum* sp., nightshade sp. *Solanum sp.* and European aspen *Populus tremula* saplings.



Photograph 4: Strips of ruderal vegetation along the southern Site boundary

Evaluation

2.4.14 The tall ruderal habitats on Site are considered to be of **Site** importance.

Amenity & Poor Semi-improved Grassland

Field Survey Results

2.4.15 Narrow (1-3 metre wide) strips of amenity and poor semi-improved grassland were present in the south-east of the Site. In places this blended with tall ruderal and/ or scrub habitats.

2.4.16 Grassland species included: cock's-foot grass, meadow fescue, red clover, white clover, ribwort plantain, broadleaf plantain, cranesbill sp., herb Robert, common yarrow, dandelion, bristly oxtongue, broad-leaved dock and ox-eye daisy.

Evaluation

2.4.17 The grassland habitats on Site are considered to be of **Site** importance.

Introduced Shrub

Field Survey Results

2.4.18 Small patches of ornamental shrub planting within the Site, comprising non-native species, were limited to the south-eastern boundary.

Evaluation

2.4.19 The limited amount of ornamental shrub habitat on Site was considered to be of **Negligible** importance.

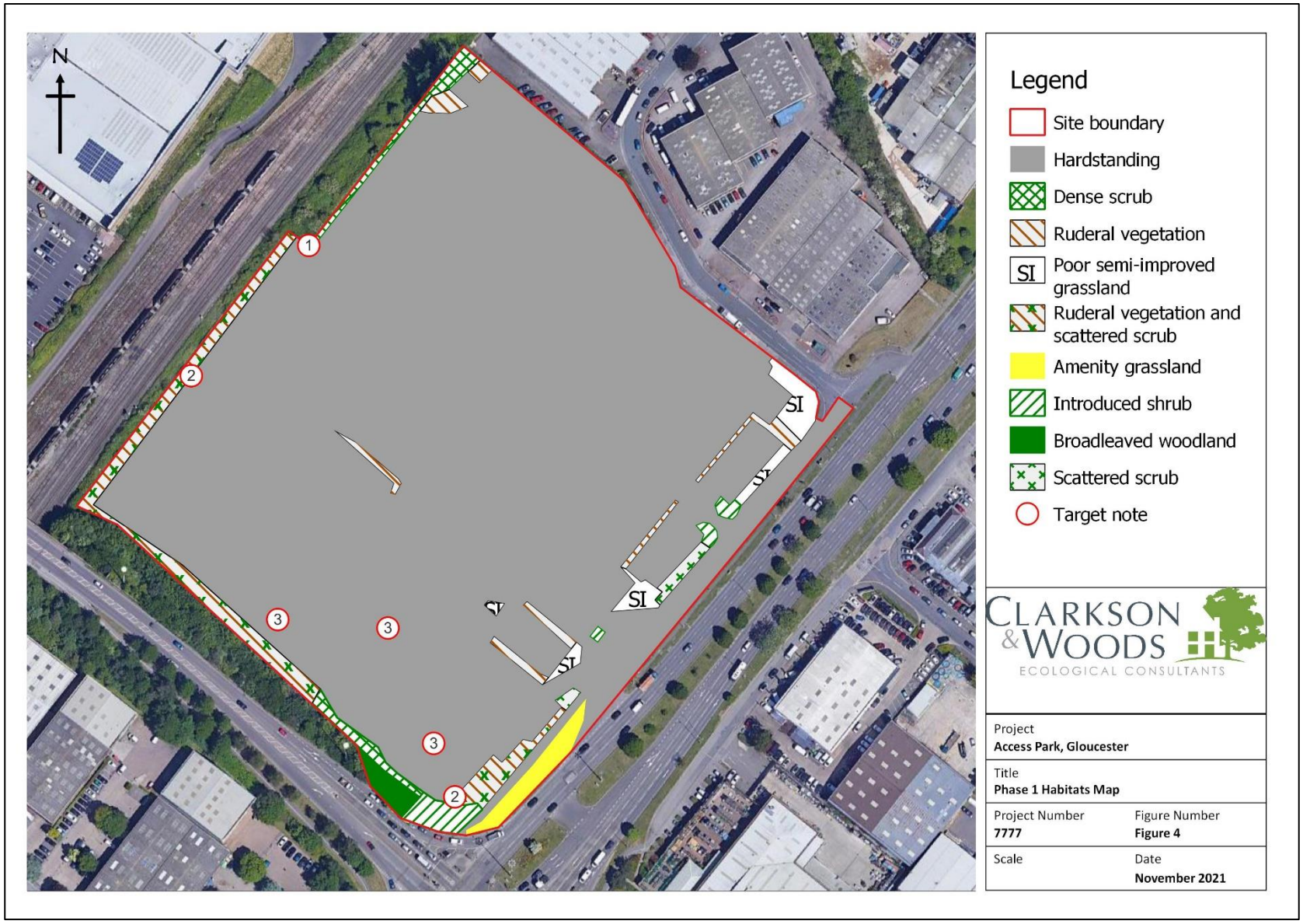


Figure 4: Phase 1 Habitats Map

Table 1: Target Notes

No.	Description
1	Dense scrub along the north-western boundary with potential for reptiles and nesting birds
2	Ruderal vegetation and scattered scrub offering potential reptile habitat
3	Approximate locations of several recently created rubble piles

2.5 Protected Species Survey and Species of Conservation Concern

Bats

Methodology

2.5.1 The assessment of the suitability of the Site for foraging and roosting bats was based on current guidance set out by the Bat Conservation Trust[9].

2.5.2 *Buildings:* No buildings (or other structures) were present within the Site boundary.

2.5.3 *Trees:* an inspection of trees on Site was carried out from the ground, using binoculars, to record any potential roosting features (PRFs) signs of use of the tree by bat species. Features such as frost cracks, rot cavities, flush cuts, split or decaying limbs (including hazard beams), loose bark and dense plates of ivy were inspected and recorded. Any signs of staining (from urine or fur rubbing) and scratch marks below potential access points were noted, and a search was made for droppings underneath these features.

2.5.4 *Habitat:* the habitats within the Site were appraised for their suitability for use by foraging and commuting bats. Vegetated linear features are typically important for many species to navigate around the landscape, while the presence of other habitats may increase a site's foraging resource value to bats. The potential for noise or lighting disturbance which may affect commuting links was also recorded.

Limitations

2.5.5 Not all features in trees suitable for use by bats are visible from the ground and there can be no external evidence of use of features by bats; consequently, it is only possible to make a best effort when carrying out such a survey.

2.5.6 A targeted bat roost potential (BRP) survey to identify potential roosting features (PRFs) was not possible on every tree along the western boundary of the Site, due to restricted access caused by the installation of Heras fencing and the amount of dense scrub growing under the canopies of some trees, making a visual inspection difficult. However, this is not a significant limitation as all mature trees along the western boundary are to be retained and untouched within the development.

Desk Study Information

2.5.7 No Natural England bat mitigation licences have been granted within 2km of the Site, and no other in-house records exist for bats in the immediate area surrounding the Site.

2.5.8 GCER returned several records of bats within 2km of the Site within the last 31 years, and these are summarised in Table 2 below.

[9] Collins, J. (ed) (2016) Bat Surveys for Professional Ecologists: Good Practice Guidelines (3rd edn). The Bat Conservation Trust, London. ISBN-13 978-1-872745-96-1.

Table 2: Bat Species Recorded within 2km of the Site Since 1990

Common Name	Scientific Name	Details
Common pipistrelle	*Pipistrellus pipistrellus*	6 individual records between 2007 and 2018
Soprano pipistrelle	*Pipistrellus pygmaeus*	1 individual record in 2005
Pipistrelle species	*Pipistrellus sp.*	4 individual records in 1993
Noctule	*Nyctalus noctule*	1 individual record in 2019
Serotine	*Eptesicus serotinus*	1 individual record in 2007
Whiskered	*Myotis mystacinus*	1 individual record in 1990
Daubenton's	*Myotis daubentonii*	1 individual record in 2019
Bechstein's	*Myotis bechsteinii*	1 individual record in 1993
Myotis species	*Myotis sp.*	2 individual records between 1990 and 2007
Brown long-eared	*Plecotus auritus*	2 individual records between 1992 and 2020

Field Survey Results

Trees

2.5.9 All of the trees and bushes surveyed on the boundaries of the Site were considered to have 'Negligible' potential to support roosting bats, as they were immature specimens and no PRFs were observed during the survey.

Habitat

2.5.10 The majority of the Site offered negligible habitat for foraging bats due to it being mainly comprised of hardstanding. Access Park is situated in an urban landscape, surrounded by other industrial estates and retail parks – providing a paucity of suitable foraging habitat in the immediate vicinity of Site.

2.5.11 However, the north-western boundary of the Site is adjacent to a railway line, providing habitat connectivity for foraging and commuting bats due to the presence of vegetated rail-side habitat. Common species of bats are therefore likely to forage along the Site to some extent, especially along the tree line on the south-western boundary. It is likely however, that the habitat around the Site is mostly well-lit during the night due to its situation within an industrial estate.

Evaluation

2.5.12 Roosting bats are considered unlikely to be present due to a lack of PRFs within the Site. Foraging and commuting bats are likely to utilise the railway corridor. Overall, bats on Site are considered to be of **Local** importance.

Reptiles

Methods

2.5.13 Features on Site were assessed for their potential to provide suitable habitats for use by reptile species. These include rough, tussocky grassland, scrub, disturbed land or refugia such as wood piles and rubble. Where present, suitable existing refugia were inspected for sheltering reptiles, and the ground was scanned whilst walking to look for basking species.

Limitations

2.5.14 The Site visit, which was completed in early November, is outside the optimum survey season for reptiles.

Desk Study Information

2.5.15 The GCER data search returned 20 individual records of slow-worm *Anguis fragilis* within the last 26 years, and 1 individual record of grass snake *Natrix helvetica* within the last 3 years; all have been recorded within a 2km radius of the Site, with the closest slow worm record being approximately 700m south of the Site.

Field Survey Results

2.5.16 Although no signs of reptiles were noted within the survey, and much of the Site itself was considered unsuitable for reptiles due to the abundance of hardstanding, the linear habitat corridors comprising scrub, tall ruderal and rough grassland present along the north-western and south-western Site boundaries had the potential to support widespread reptile species such as slow-worm and viviparous lizard *Zootoca vivipara* (Target Note 2).

2.5.17 The numerous rubble piles may provide suitable sheltering/ hibernation habitat.

2.5.18 The presence of the adjacent railway line increases the likelihood of reptile presence as railways are known to offer good habitat for reptiles.

Evaluation

2.5.19 If present, reptiles are considered to be of **Local** importance.

Birds

Methodology

2.5.20 Suitable vegetation (namely scrub and trees) were surveyed for signs of use by nesting birds, and any birds seen or heard during the survey were noted. The Site's potential to support bird species of particular conservation concern (i.e. Schedule 1, NERC S41 and Red List species) was assessed, taking into consideration the bird species assemblage observed during the survey, the habitats present on and around the Site, the context of the Site in the wider landscape and the results of the desk study.

Limitations

2.5.21 The Site visit, which was completed in early November, is outside the bird nesting season (March-August inclusive).

2.5.22 The majority of the scrub habitat present on Site was too dense to adequately inspect for disused nests.

Desk Study Information

2.5.23 The GCER data search returned 67 BTO red and amber listed birds species within 2km of the Site within the last 24 years (1997–2019); including bullfinch *Pyrrhula pyrrhula*, dunnock *Prunella modularis*, yellow wagtail *Motacilla flava*, grey wagtail *Motacilla cinerea*, hawfinch *Coccothraustes coccothraustes*, house sparrow *Passer domesticus*, song thrush *Turdus philomelos*, wood warbler *Phylloscopus sibilatrix,* starling *Sturnus vulgaris* and swift *Apus apus*.

Field Survey Results

2.5.24 Areas of dense scrub (comprising both native and non-native species) were concluded to provide highly suitable bird nesting habitat (Target Note 1), although no nests (active or inactive) were noted. Bird species recorded on Site during the survey were the amber listed dunnock, as well as European robin *Erithacus rubecula* and blackbird *Turdus merula*. These were incidental sightings, not the result of a targeted bird survey.

2.5.25 The Site itself does not offer much in the way of foraging and nesting habitat for the majority of the notable species recorded by the desk study.

Evaluation

2.5.26 Birds are considered to be of **Site** importance.

Hedgehog

Desk Study Information

2.5.27 The PTES BIG Hedgehog Map revealed at least 10 records of hedgehog within a 1km radius of the Site boundary, with the closest being ~0.4km west.

Field Survey Results

2.5.28 Areas of dense scrub, shrubs and ruderals may support sheltering hedgehog, and the grassland and ruderal areas may be used for foraging.

Evaluation

2.5.29 If present, hedgehog are considered to be of **Site** importance.

Other Species

2.5.30 No evidence of other protected or notable species was observed, nor are they deemed likely to be present.

2.6 Summary of Ecological Importance

2.6.1 Table 3 below gives all the identified ecological features on Site and their individual assessment of importance. Those coloured green are considered to be Important Ecological Features and will form the basis of the Assessment of Effects in Section 3. Those coloured yellow will be included on the basis of their specific legal protection or applicable planning policies.

Table 3: Summary of Ecological Importance

Feature	Importance
Designated Sites	
Barnwood Arboretum & Park LWS	Local
Habitats	
Dense Scrub	Site
Hardstanding	Negligible
Trees	Site
Tall Ruderal	Site
Amenity & SI Grassland	Site
Ornamental Shrub	Site
Species	
Bats	Local
Reptiles	Local
Birds	Site
Hedgehog	Site

3 ASSESSMENT OF EFFECTS

3.1 Methodology

3.1.1 Continuing from the valuation of Important Ecological Features (IEFs), this section lists each IEF in turn together with a characterisation of any potential impacts upon them likely to arise from the proposals. This takes into consideration any measures inherent to the designed scheme which seek to avoid such impacts altogether. Next, any agreed mitigation measures chosen to reduce likely impacts are then set out, along with the mechanism(s) through which these would be secured.

3.1.2 Residual effects, being those effects which would likely still arise despite any avoidance measures or agreed mitigation efforts, are subsequently discussed. Residual effects are determined to be either significant or not significant and any significant residual effects are given a geographical scale at which they might be felt. This assessment methodology is in accordance with that set out in the CIEEM Guidelines for Ecological Impact Assessment, 2018.

3.1.3 Where residual effects are identified compensatory measures may be proposed to make up for the loss or permanent damage to an IEF, as far as possible. Monitoring or management schemes which may be necessary to ensure the long-term achievement of all intended mitigation and compensation are discussed.

3.1.4 Where potential for cumulative impacts upon IEFs in association with other proposed or ongoing local development are identified these are described as appropriate for the affected IEF. The Zone of Influence for each IEF, together with their level of ecological importance will be of relevance when considering the scope of a cumulative impact assessment.

3.1.5 Ecological enhancement measures to be incorporated into the development are suggested in line with the National Planning Policy Framework.

3.2 Summary of Development Proposals

3.2.1 The proposed development is shown in Figure 3 and refers to the area known as Access Park. The development will involve the construction of 14 warehouse units (two large units of 70,000ft^2 and 93,300ft^2, one medium size unit of 40,150ft^2, and 11 smaller units with footprints ranging from 3,050ft^2 and 6,100ft^2) with corresponding car parking, with all buildings on Site having previously been demolished. The buildings will cover a gross internal area of 251,130ft^2 (23,330m^2).

3.2.2 Plans also include the removal of the linear scrub, tall ruderal and rough grassland habitats (as well as the ornamental shrub) along the southern Site boundary, and the narrow strips of tall ruderal vegetation within the central hard-standing area.

3.2.3 The ruderal and scrub habitats along the north western boundary, as well as the trees along the south western boundary will be retained.

3.2.4 New grassland and wildflower seeding will take place along most of the Site boundaries, as well as native scrub screen planting along the north-west and south-west boundaries to enhance the scrub and trees already present within and adjacent to the Site. Additionally, several areas of ornamental shrub and tree planting will take place across the Site, and finally a new native, species-rich hedgerow will be planted at the northern end of the Site.

3.3 Generic Measures

3.3.1 A Landscape and Ecological Management Plan (LEMP) will also be prepared for the operational Site. This will cover how retained habitats and newly planted areas will be managed in the long-term, so as to maximise their biodiversity value and achieve the objectives of ecological mitigation and compensation. The LEMP will also set out any measures necessary to ensure protected species are appropriately accommodated within the operational Site, as well as ongoing monitoring/ maintenance of proposed ecological enhancements.

3.4 Designated Sites

Barnwood Arboretum & Park LWS

Potential Impacts

3.4.1 The proposed development is a relatively small-scale development in the context of the local landscape, and will be situated on land previously occupied by buildings. It is therefore considered highly unlikely that the proposed development will have any impacts, either directly or indirectly, on the LWS.

3.5 Habitats

3.5.1 The habitats within the Site were noted to be of lower (Site level or below) conservation importance. The majority of the native scrub will be retained within the north-western and south-western vegetated corridors.

3.5.2 It is acknowledged that there are a variety of habitats on Site which could be considered to constitute open mosaic habitat on previously developed land, which is a priority habitat. This includes the areas of hardstanding, recently disturbed ground, encroaching scrub and ruderal vegetation. However, on closer examination it is seen that rather than forming a mosaic, these different habitats have formed distinct blocks, primarily along the boundaries, with only commonly encountered species found. The Site has the potential to develop into an open mosaic habitat if left unmanaged for longer, which would be of high value for invertebrates, however it is considered that, at present, the poor quality of the habitats present on Site do not currently meet the criteria for this priority habitat.

Potential Impacts

3.5.3 Habitat losses will primarily comprise hardstanding, as well as a narrow corridor of scrub, tall ruderal, rough grassland and ornamental shrub along the south-eastern and south-western boundaries.

Mitigation, Compensation, Enhancement and Monitoring

3.5.4 Retained habitats may be damaged or degraded during construction by machinery and personnel or through storage of materials within root zones. Mitigation, Compensation, Enhancement and Monitoring

3.5.5 Scrub growing along the northern boundary is already quite diverse, but will benefit from having the non-native buddleia removed. Along the south-western boundary of the Site, the 3 metre wide linear strip of scrub habitat is dominated by bramble and buddleia. This habitat will be improved by removing the buddleia and replanting with native alternatives; localised areas of bramble will also be cut back, to facilitate establishment of any new native planting.

3.5.6 By replacing non-native Oleaster shrub (southern corner of Site) with a native scrub species (with a similar dense growth form) elsewhere on Site, this will ensure no net loss of dense scrub habitat, and will count towards the Site's biodiversity net gain.

3.5.7 The non-native Cotoneaster will also be removed from the southern boundary of Site either by mechanical or chemical methods of control. The loss of this shrub will be mitigated by the native scrub planting which will take place along the north-western and south-western boundaries.

3.5.8 During habitat clearance and construction, appropriate fencing, such as Heras fencing, will be installed to protect retained scrub and tree habitats, in line with British Standard 5837: 2012 'Trees in relation to design, demolition and construction'. The fencing will be installed to provide a minimum 1m offset from the vegetation or shall be based on the root protection zone as determined by the arboricultural survey (whichever is greater).

Residual Effects

3.5.9 If the above mitigation measures are adhered to, it is anticipated that there will be no negative residual effects on habitats within the Site due to the proposed development.

3.6 Protected Species and Species of Conservation Concern

Bats

3.6.1 No evidence of roosting bats was recorded. Habitat corridors at the Site peripheries may support foraging and commuting bats.

Potential Impacts

3.6.2 The removal of scrub and ruderal habitat along the south-eastern Site boundary, as well as the small loss of scrub and non-native vegetation along sections of the north-western (railway) boundary may lead to a small loss of available foraging habitat.

3.6.3 There are no current plans to remove any trees along the south-western Site boundary. However, if any of these trees are to be removed/ pruned as part of the development they will require further survey effort, as there is potential for some of the un-surveyed trees to contain bat roosts. Works to trees containing roosts could constitute an offence.

3.6.4 It is likely that there will be additional security lighting within the new development, which may have an adverse impact on bats foraging/ commuting within or adjacent to the Site.

Mitigation, Compensation, Enhancement and Monitoring

3.6.5 The loss of a narrow corridor of scrub/tall ruderal and rough grassland habitat along the south-eastern boundary will be mitigated with the additional soft landscaping proposed within the Site, consisting of supplementary planting of native scrub species running along the north-western and south-western boundaries of the Site (to replace the non-native buddleia) as well as incorporating diverse flowering lawn and wildflower grassland into landscape plans, and managing for wildlife by leaving certain areas unmown. A new, native species-rich hedgerow will also provide a linear feature at the north of the Site, which will provide commuting and foraging habitat. This will also enhance the Site for bats. Maintenance and monitoring of these areas will be outlined within the LEMP.

3.6.6 In order to enhance the Site for roosting bats, a number of durable woodcrete bat boxes should be installed on suitable trees retained along the north-western and south-western Site boundaries. A minimum of two crevice roosting boxes, such as Schwegler 2F general purpose bat boxes. Suggested positions for these and monitoring requirements will be outlined within the LEMP.

3.6.7 It is recommended that any proposed external lighting within the Site is designed to avoid spill or glare into the retained habitats along the north-western and south-western boundaries of the Site. As the Site is due to be operational at any time of day and throughout the year, it is likely that night-time lighting will be necessary. While it is unlikely that large numbers, or particularly rare species are present within the vicinity, the functioning of the areas surrounding the Site as commuting corridors and foraging habitats for nocturnal wildlife should be adequately considered under local and national policy. The eventual lighting scheme will adhere to the following principles, in line with 'Bats and Artificial Lighting in the UK, Bats and Built Environment Series' (Bat Conservation Trust and Institution of Lighting Professionals, August 2018) and other current best practice guidance[10]:

- The design must use only the minimum number of lights required;
- Lighting should only be active at time when it is actually needed, for example the safe movement of pedestrians and vehicles around an outdoor workspace in the hours of darkness. As the facility is to be operational at all times of day, consideration as to how this should be achieved will be necessary;
- Security systems should be based around infrared technology as a preference. Alternatively, security lighting can be activated by motion-sensitive equipment set to short (3000K) LED lamps, which reduce blue light pollution, must be used where possible;
- Bollard lights, which retain darkness above and can be triggered by human movement installed with a timer, should be considered;
- A baffle, shield or hood must be used to avoid illuminating at a wider angle to reduce light spill beyond target areas; and
- No upward lighting will be used. All luminaires should have no upward light output.

3.6.8 Specifications and advice may require updating on receipt of the detailed lighting design which is currently pending. It is understood at this time that all lighting installed within the yards will be installed with PIR sensors and will not be on throughout the night.

[10] https://www.theilp.org.uk/documents/guidance-note-8-bats-and-artificial-lighting

Residual Effects

3.6.9 If the above mitigation measures are adhered to, it is not anticipated that there will be any negative residual effects on bats.

Reptiles

3.6.10 The Site contained peripheral habitat corridors which offer suitable reptile habitat, and these vegetated areas are connected to the railway verge adjoining the north-western boundary of the Site. Reptiles are likely to be present within the railway habitat, and therefore may disperse throughout suitable connected habitats on Site.

Potential Impacts

3.6.11 Vegetation clearance and soil stripping (notably of the linear scrub/ruderal/rough grassland habitats identified along the south-eastern boundary) has the potential to injure or kill any reptiles that are present. This will also result in a net loss of suitable reptile habitat, if left unmitigated.

Mitigation, Compensation and Enhancement

3.6.12 Reptile surveys are not considered necessary on the Site, given the limited area of suitable habitat that is to be lost. However, a precautionary methodology will be implemented during construction.

3.6.13 Retained habitats will be protected during the construction phase of the development, with the erection of Heras or similar fencing in order to avoid damage and debris within these areas.

3.6.14 Clearance of any suitable habitat (scrub, grassland and ruderals) will be phased, initially cutting vegetation down to 150mm above ground and then down to ground-level following an inspection by the Ecological Clerk of Works (ECoW). All vegetation below 150mm must be cleared between April and October inclusive, to avoid impacts on torpid reptiles. Habitat above 150mm can be cleared at any time of year, but must be mindful of the constraints posed by nesting birds (see below).

3.6.15 Following clearance of these habitats to ground-level, a final destructive search shall be carried out using an excavator equipped with a toothed bucket. This will take place under an Ecological Watching Brief by the ECoW. The destructive search will also encompass any rubble piles in proximity to these habitats. The isolated habitats within the centre of the Site are not considered suitable for reptiles and will therefore not require a destructive search. Any reptiles encountered will be safely moved (by a suitably experienced ecologist) to the retained and improved habitat adjacent to the railway line, to facilitate their dispersal into the wider landscape.

3.6.16 Suitable habitat along the railway corridor will be retained, and buddleia will be removed along this corridor (as well as the south-western Site boundary) to allow space for supplementary planting of native scrub species.

3.6.17 Landscaping within the Site includes areas of wildflower grassland which will be kept long and managed to allow wildflowers to seed throughout the summer along the south-western boundary and adjacent to the newly planted hedgerow at the north of the site and this will help to mitigate for the loss of rough grassland and ruderal vegetation currently present within the Site.

3.6.18 A reptile hibernaculum will be created in the north-western corner of the Site to mitigate for the loss of reptile habitat and to enhance hibernation potential within the Site.

Residual Effects

3.6.19 Should the above mitigation measures be adhered to, it is not expected that the proposed development will result in any adverse effects on reptiles using the habitats on Site.

Birds

3.6.20 The habitats on Site were highly suitably for a number of bird species to nest. Although the Phase 1 survey did not identify any bird nests within the vegetation, dunnock, robin and blackbird were all observed within the Site boundary, and any/all of these species could potentially nest on Site during the breeding season.

Potential Impacts

3.6.21 The removal of scrub habitats and ornamental shrubs within the Site boundary will result in a loss of available nesting habitat for birds. This will also amount to a reduction in available foraging habitat on Site as well. All works to trees, shrubs and scrub on Site have the potential to disrupt nesting birds and destroy active nests, if carried out within the nesting bird season.

Mitigation, Compensation and Enhancement

3.6.22 The removal of any areas of scrub and ornamental shrub habitat, as well as any pruning or removal of trees, should be undertaken outside of the bird nesting season (the nesting season being March to August inclusive). This will avoid the potential for nesting birds being adversely affected by clearance works. If clearance works are undertaken within the months of March to August, this must be preceded by a check for nesting birds by a suitably qualified ecologist no more than 48 hours prior to works being undertaken. In some instances, an ecologist will need to be present during the clearance work, in the event the scrub is too dense, and the central areas cannot be visually inspected in advance.

3.6.23 Species such as woodpigeon can breed any time of year if weather conditions are mild enough, and even if the core bird nesting season is avoided, a pre-inspection by an ecologist is advisable prior to the commencement of any tree removal, although it is understood that no trees are to be removed within the proposed development.

3.6.24 Any habitat clearance must be mindful of the constraints posed by reptiles (see above).

3.6.25 Due to the small reduction in foraging habitat, new native scrub species have been included within the soft landscaping planting plan, as well as native grass and flower mixes being sown within areas of retained habitat to compensate for the loss. The addition of a species-rich hedgerow will provide a novel habitat which wasn't previously available on Site. This will provide additional cover, nesting and foraging opportunities.

3.6.26 It is recommended that five artificial bird nesting boxes are incorporated to mitigate for the loss of nesting habitats provided by areas of scrub that will be removed as part of the proposed development. In addition, a further two boxes shall be installed as an enhancement measure (7 no. boxes in total). All boxes will be durable woodcrete nest boxes and will be attached to suitable mature trees within or surrounding the Site, as well as on the new proposed buildings. These must be installed at a height in excess of 2m above ground level. Recommended boxes include Schwegler nest boxes which are suitable for a number of small, common bird species. Suggested positions for these and monitoring requirements will be outlined within the LEMP.

Residual Effects

3.6.27 Should the above mitigation measures be adhered to, it is not expected that the proposed development will result in any adverse effects on birds using the habitats on Site.

Hedgehogs

3.6.28 The habitats on Site provide suitable habitat for sheltering and foraging hedgehog and local records indicate their presence nearby.

Potential Impacts

3.6.29 The removal of scrub, shrubs and grassland within the Site boundary will result in a loss of available sheltering and foraging habitat for hedgehogs.

3.6.30 Habitat clearance may also disturb, kill or injure sheltering hedgehogs.

3.6.31 During construction, hedgehogs could be injured by falling into open trenches or excavations.

Mitigation, Compensation and Enhancement

3.6.32 Habitat clearance will follow the methodology detailed for reptiles, which will mitigate for hedgehogs as well.

3.6.33 Any open excavations will be covered overnight or a rough-sawn plank or earth ramp left to provide hedgehogs with a means of escape.

Residual Effects

3.6.34 Should the above mitigation measures be adhered to, it is not expected that the proposed development will result in any adverse effects on hedgehogs.

3.7 Biodiversity Impact Assessment

3.7.1 In line with NPPF planning guidance and also to inform the BREEAM assessment for the Site, a Biodiversity Impact Assessment (BIA) score has been calculated for the Site using DEFRA's *BREEAM NC 2018 Change in Ecological Value Calculator (LE04 v3.0)*. This metric was used to calculate the biodiversity value of linear and non-linear habitat within the application site both before and after development, and was used as a proxy measure to determine if the development is likely to result in an on-site biodiversity ness loss of gain. The guideline document *BREEAM NC 2018 Ecology Calculation Methodology (GN36 v0.0*) was followed to carry out the assessment.

3.7.2 The calculations revealed that the 'Post Development % of Pre Development' was 106% for non-linear habitat (6% net gain), which corresponds to a result of 'Significant Net Gain' within the BREEAM criteria.

3.7.3 Landscaping plans for the Site include new native scrub planting within existing north-western and south-western boundaries, along with sowing species-rich meadow seed mixes using Emorsgate mixes EL1 'Flowering Lawn Mixture' and EH1 'Hedgerow Mixture'. Assuming that additional areas of ornamental shrubs are implemented and wildflower grassland and native scrub screening planting takes place as per Figure 5 overleaf, this will improve the existing habitats on Site and will result in the net gain result specified above.

3.7.4 Additionally a new native, species-rich hedgerow (approximately 160m in length) will be planted as per Figure 5 along the northern boundary, and this has not been included in the above calculations as it is classes as a linear feature. Due to there being no prior existing hedgerows within the Site, the calculations within the BREEAM NC 2018 Metric will not calculate a net loss or gain percentage. The hedgerow however is due to create 159.75 Linear (Foliage) Biodiversity Units, confirming that the proposed scheme is likely to result in a significant net gain in biodiversity due to the creation of this hedgerow.

3.7.5 It should be noted that these calculations are based on the Planting Plan supplied by BEA Landscape Design Ltd in November 2021 (see Figure 5), and any updates to the plans should be reflected within the above calculations.

The completed BIA Summary Sheets are provided in Appendix B.

PLANNING NOTES (SOFT LANDSCAPE):

1. SOILS: Subgrade / subsoil to be prepared in accordance with BS 8601:2013 and BS 4428:1989 and scarified or ripped to 300mm depth (excluding root protection areas of retained trees refer to Tree Protection Plan) prior to spreading topsoil to alleviate compaction and promote drainage. Imported and as saved topsoil to be in accordance with BS 3882: 2015 'Multipurpose Grade' with minimum soil organic matter contents 1% greater than the minima value (or as approved). Imported topsoil (and 'as saved' if requested) is to be laboratory tested to BS 3882:2015 and ameliorated as required to meet the required characteristics as detailed within Table 1 of BS 3882:2015 specification. Wildflower areas to be unimproved topsoil or low fertility topsoil to BS 3882:2015. Grass areas to be a minimum depth of 150mm, Shrub beds, hedges and climbing plants 450mm depth. Any weed / grass growth to be sprayed out with appropriate herbicide at least 10 days prior to cultivation. All areas to be cultivated to a minimum depth of 150mm removing weeds and rubbish / stones greater than 20mm in size. Incorporate proprietary non peat compost to BSI PAS 100 to 50mm depth evenly worked into soil during cultivation.

N.B Proposed services (electric, water, gas etc) in landscape areas should be installed as a minimum below the required topsoil depths and clearly identified in accordance with service / utility requirements.

2. BUILDING FOUNDATION DESIGN: All tree and shrub planting proposals are to be referred to by the structural engineer during building foundation design.

3. PLANT STOCK: Unless agreed otherwise all trees and shrubs are to be of UK provenance where plants have been propagated and/or grown on for a minimum of 5 years in the UK for trees and 2 years for shrubs. All plants are to comply with the requirements of all current British Standards including BS3936 'Specifications for Nursery Stock' and BS8545 'Trees from nursery to independence in the landscape' and be supplied in accordance with the Plant Schedule. Should planting be required outside of the planting season (November - March) any bare root or rootballed stock specified is to be replaced with containerised stock to an appropriate or similar specification to the approval of the landscape architect prior to ordering.

4. EXISTING TREES: Where trees are to be retained they should be subject to a full arboricultural inspection to assess condition and safety. Retained trees shall be protected from damage by erection of 2.3m weldmesh fencing on a scaffold framework in accordance BS 5837:2012 Figure 2. These barriers shall be maintained in position and in good condition until works are complete. Fencing to be located in accordance with Table D.1 at a radius of 12 times the stem diameter (single stem trees) or based on the combined stem diameter for multistem trees (trees with more than one stem arising below 1.5m above ground level) refer to Clause 4.6. Further precautions are to be taken as detailed within BS 5837:2012 6.2.4.

5. TREE SURGERY / REMOVAL: Tree surgery and tree removal to be carried out by an Arboricultural Association approved Tree surgeon in accordance with BS 3998:2010. Arisings to be removed to a licensed tip.

6. TREE PLANTING: All trees to be in accordance with BS 3936, BS8545 and The National Plant Specification – 'Rootballed Trees' recommendations. Trees to be planted in accordance with BS 4428:1989, double staked (10-12cm - 14-16cm girth trees) and tied with webbing loops in prepared pits. Tree pits in open field / un-compacted ground conditions or shrub beds to be 1000mm x 1000mm (at least 75mm greater than that of the root system) with pit depth to be based on the planting depth of the tree (distance from root flare to underside of rootball) in accordance with BS 8545:2012. Topsoils and subsoils to be excavated and stored separately for reuse. Tree pit to be backfilled with stored subsoil and topsoil at depths to replicate the existing soil horizons. Topsoil to be mixed enriched with 40L of peat free tree planting compost. Root balls to be encircled by Root Rain Metro or similar irrigation pipe. Well water after planting. The base of trees to planted in grass areas are to be covered with 75mm amenity grade bark mulch such as Melcourt 'Amenity' Bark Mulch (or similar approved by the landscape architect) to 1.0 metre diameter and kept weed free.

Generally all trees are to be planted as shown ensuring a minimum of 5 metres from buildings and 3 metres from drainage or services. In locations close to footpaths and roadways linear root barriers Greenblue Urban, ReRoot or similar are to be installed in accordance with manufacturers instructions. Where proposed tree locations conflict with services, trees are to be relocated in accordance with the appropriate utilities guidance notes subject to client / local authority approval. Proprietary root barrier Greenblue Urban, ReRoot or similar to be installed in accordance with manufacturers instructions where relocation is not considered appropriate.

7. SHRUB PLANTING: plants to be in accordance with BS 3936 and handled in accordance with NPS 'Handling & Establishment' guidelines and planted in accordance with BS 4428:1989. Nursery stock supplier to be approved by the Landscape Architect. All shrubs to have a minimum of three breaks, except Hedera with a minimum of two. Well water plants immediately after planting and prior to spreading of mulch. Planting areas to be covered with 75mm depth amenity grade bark mulch such as Melcourt 'Ornamental Bark Mulch' (or similar approved by the landscape architect) and kept weed free.

8. HEDGE PLANTING: plants to be in accordance with BS 3936 and handled in accordance with the NPS 'Handling & Establishment' guidelines and planted in accordance with BS 4428:1989. Hedge plants to be pit planted in double staggered rows 350mm apart at 450mm centres (or as scheduled). In mixed species hedges; shrub species to be planted randomly throughout the length of hedge. Well water plants immediately after planting and prior to spreading of mulch. Planted areas to be covered with 75mm depth bark mulch and kept weed free. Where necessary plants to be protected from rabbits with rabbit fence and / or individual rabbit mesh guards securely staked. Unless otherwise indicated on the drawing it is assumed that all hedges are to be maintained at a maximum height of 1.5m for the purposes of the NHBC guidelines.

9. NATIVE SHRUB PLANTING: plants to be in accordance with BS 3936 and planted in accordance with BS 4428:1989. Transplants to be planted at 1 metre centres (or as scheduled) in random groupings of 3-5 and 7-10 shrub species depending on numbers of plants. Transplants to be root dipped with Algimure prior to planting. Planted areas to be kept weed free and protected from rabbits, with rabbit fence and / or individual mesh tree guards securely fixed to timber stake(s).

10. SEEDING: grass areas to be seeded in accordance with BS 4428:1989 during March, April or September. Prior to cultivation topsoil is to be free from perennial weeds, reasonably dry and workable and graded to remove all minor hollows or ridges and levelled as required with any debris or stones greater than 20mm diameter removed. Topsoil to be cultivated to full depth with top 25mm reduced to a fine tilth. Pre-seed fertiliser to be applied in accordance with manufacturers instructions. Lightly rake areas after sowing then roll with a lightweight roller. Seed to be Germinal Seeds mix A19 'All Purpose Landscaping' sown at 35g/m2, including:

- 30% CORAIL (Slender Creeping Red Fescue)
- 25% RAISA (Chewings Fescue)
- 20% ABERELF (Perennial Ryegrass)
- 20% CADIX (Perennial Ryegrass)
- 5% HIGHLAND (Browntop Bent)

10. WILDFLOWER SEEDING: grass areas to be seeded in accordance with BS 4428:1989 during March, April or September. Unimproved or low fertility topsoil to be imported, cultivated and leveled to remove all minor hollows or ridges as required with any debris or stones greater than 20mm diameter removed to provide a fine weed free tilth . Do not apply fertiliser. Weeds to be eradicated by herbicide or repeated cultivation prior to sowing. Lightly rake areas after sowing and keep well watered. Areas to be kept free from unwanted plants and mown every 6 - 8 weeks during establishment year removing arisings. In subsequent years cut in early spring and autumn after setting seed (in accordance with manufacturers recommendations) removing arisings. A minimum 1.5 metre close mown margin is to be maintained abutting buildings and hard surfacing (i.e road, car park and footpath edges). Seed mixes to be supplied by Emorsgate Seeds and include the following sown in accordance with suppliers recommendations.

EH1 'Hedgerow mix' to woodland edges (sown at 4g/m2).
FL1 'Flowering Lawn Mixture' (sown at 4g/m2).

11. MAINTENANCE: To be carried out at approximately monthly intervals during the defects liability / rectification period to include the following:

a. Eradicate weeds by hand or appropriate chemical means.
b. Cut out dead or / and damaged stock or branches, prune as required.
c. Ensure all shrubs and trees are firmed in, securely staked and tied with guards where applicable.
d. Collect litter, sweep and tidy site.
e. Apply suitable non-residual herbicides, pesticides and water as required.
f. Carry out mowing to grass areas when attained 100mm, cut to 35mm (50mm for shaded areas) approximately 2 week intervals during the growing season.
f. Carry out mowing to wildflower areas as per Emorsgate Seeds Ltd aftercare First year & Established sward guidance, 2 -3 cuts a year.
g. Carry out mowing of wildflower area margins 1.5 - 2.0m wide when attained 200mm (approximately monthly during the growing season) where abutting buildings or hard surfacing (i.e road, car park or footpath edges).
h. Shrub planting within visibility splays to be maintained in accordance with current highways design guidelines.
i. Native shrub planting to be maintained free from perennial weeds, self set shrub and tree species.
j. At final visit apply granular fertiliser to all planted areas and top up bark mulch depth to 75mm.

12. WATERING: all plant material (including turf) to be watered in dry periods until established during April through to September with a fine rose until the water penetrates the topsoil to at least 5cm depth and achieves field capacity. Frequency of watering regime to de determined by weather conditions, soil conditions and underlying geology, all plant beds to be watered to ensure soil is consistently moist to promote successful establishment. As a guide only it is suggested that during hot, dry periods, plants are to be watered every six to ten days. For individual trees it is suggested that 18 watering visits per year are carried out commencing late March (prior to budburst) and utilising a minimum of 50 litres of water per tree. Soil probe to be used to determine soil saturation to full depth of root ball.

TYPICAL TREE PIT DETAIL (SHRUB BED AREAS):

1.0 SOILS: subsoil / topsoil to be excavated to form tree pit, depth to be based on the planting depth of the tree (distance from root flare to underside of rootball), with soils retained and placed separately for backfilling pit .

2.0 TOPSOIL: multi-purpose imported or as dug topsoil to 450mm depth for shrub planting areas.

3.0 ROOT BALL / BARE ROOTS: tree pits sizes to be at least 75mm wider than the tree root system or rootball.

4.0 IRRIGATION: RR3A RootRain Metro irrigation system with plastic cap and fixing bracket. Secure to stake with 50mm galvanised nail. Ensure cap finishes slightly above finished surface level

5.0 MULCH LAYER: finished with Melcourt amenity grade bark mulch to a minimum depth of 75mm.

6.0 STAKES: softwood timber rounds, peeled chestnut, larch or oak, free from projections and large or edge knots and with pointed lower end; 75mm diameter, 2000mm height. 600mm above ground.

7.0 TIES: tree held to stakes with 35mm flexible webbing and 40mm spacer sleeves fixed to stake with galvanized dout nails.



LEGEND: SOFT LANDSCAPING

- GROUND COVER: evergreen & decidous shrub ground cover planting with specimen shrubs.
- NATIVE HEDGE: native species shrub hedge as detailed.
- SPECIMEN SHRUBS: specimen shrub planting as detailed.
- GRASS: amenity grass to road frontages, existing grass areas to be made good with A19 seed as specified.
- WILDFLOWER MEADOW AREAS: to be seeded Emorsgate wildflower seed mix EH 1 or EL1 refer to notes.
- NATIVE SHRUB PLANTING: native shrub planting mix as detailed.
- TREE PLANTING: standard tree planting tree canopy spread illustrated at 25 years growth.
- EXISTING TREES: to be retained in accordance with BS 5837 'Trees in relation to Construction' 2012.
- TREES TO BE REMOVED

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Refer any query to office of origination.

amendments:

(-) (00/00/0000) (.....) (-)

cdm 2015: designers residual risk information

In addition to the risks & hazards normally associated with the type of work detailed on this drawing the following residual risks should be noted:

Construction:

Standard Soft Landscape Works Only. No Additional Identifiable Risks.
1. The proximity of adjacent pavements, estate roads, dual carriageway & car parking.
2. The proximity of adjacent buildings and buried associated services.

Maintenance:

Standard Soft Landscape Works Only. No Additional Identifiable Risks.
1. The proximity of adjacent pavements, estate roads, dual carriageway & car parking.
2. The proximity of adjacent buildings and buried associated services.

It is assumed that works will be carried out by competent contractor working, where appropriate to an approved method statement.

Plant Schedule

Trees

No.	Species Name	Specification	Girth	Height	Density
3 -	Amelanchier lamarckii 'Robin Hill'	3x .Extra Heavy Standard .Clear Stem 175-200 .5 brks .RB .PG	11/14-16cm	425-600cm	Counted
3 -	Betula pendula	3x .Extra Heavy Standard .Clear Stem 175-200 .5 brks .RB .PG	11/14-16cm	400-450cm	Counted
6 -	Sorbus aria	3x .Extra Heavy Standard .Clear Stem 175-200 .5 brks .RB .PG	11/14-16cm	400-450cm	Counted
9 -	Sorbus aucuparia	3x .Extra Heavy Standard .Clear Stem 175-200 .5 brks .RB .PG	11/14-16cm	400-450cm	Counted

Hedging

No.	Species Name	Specification	Girth	Diameter	Height	Pot Size	Density
46 -	Cornus sanguinea	1+1 .Transplant .Branched .2 brks .B			40-60cm		0.35Ctr Double Staggered at 0.45m offset
91 -	Corylus avellana	1+2 .Transplant .Branched .3 brks			60-80cm		0.35Ctr Double Staggered at 0.45m offset
455 -	Crataegus monogyna	1+1 .Transplant .B			60-80cm		0.35Ctr Double Staggered at 0.45m offset
91 -	Prunus spinosa	1+1 .Transplant .Branched .2 brks .B			60-80cm		0.35Ctr Double Staggered at 0.45m offset
91 -	Rosa pimpinellifolia	1+1 .Transplant .Branched .3 brks .B			40-60cm		0.35Ctr Double Staggered at 0.45m offset
46 -	Sambucus nigra	1+1 .Transplant .Branched .3 brks .B			60-80cm		0.35Ctr Double Staggered at 0.45m offset
91 -	Viburnum opulus	1+2 .Transplant .Branched .3 brks .B			60-80cm		0.35Ctr Double Staggered at 0.45m offset

Shrubs

No.	Species Name	Specification	Diameter	Height	Pot Size	Density
62 -	Berberis thunbergii 'Atropurpurea'	Branched .5 brks .C .PG 8		30-40cm	3L	2/m²
172 -	Brachyglottis 'Sunshine'	Branched .4 brks .C .PG 8		30-40cm	3L	3/m²
44 -	Ceanothus 'Blue Mound'	Branched .5 brks .C .PG 8	30-40cm		3L	3/m²
9 -	Cornus alba 'Siberica Variegata' (*)	Branched .5 brks .C .PG 7		80-100cm	10L	Counted
108 -	Cornus sanguinea	1+1 .Transplant .Branched .2 brks .B		40-60cm		1/m²
108 -	Corylus avellana	1+2 .Transplant .Branched .3 brks		60-80cm		1/m²
87 -	Cotoneaster conspicuus 'Decorus'	Branched .3 brks .C .PG 8 / PG 13		30-40cm	3L	3/m²
108 -	Crataegus monogyna	1+1 .Transplant .B		60-80cm		1/m²
282 -	Escallonia 'Apple Blossom' (*)	Bushy .4 brks .C .PG 9		40-60cm	3L	3/m²
37 -	Euonymus europaeus	1+2 .Transplant .Branched .5 brks .B		60-80cm		1/m²
182 -	Hebe 'Mrs Winder'	Bushy .5 brks .C .PG 9		30-40cm	3L	3/m²
55 -	Hebe 'Sutherlandii'	Bushy .5 brks .C .PG 9	20-30cm		3L	4/m²
233 -	Hebe rakaiensis	Bushy .5 brks .C .PG 9	20-30cm		3L	3/m²
235 -	Hypericum 'Hidcote'	Bushy .5 brks .C .PG 8		30-40cm	3L	3/m²
62 -	Hypericum x moserianum	Bushy .7 brks .C .PG 8		30-40cm	3L	4/m²
73 -	Ilex aquifolium	Leader With Laterals		40-60cm	3L	1/m²
26 -	Lavandula angustifolia 'Hidcote'	Bushy .9 brks .C .PG 10		30-40cm	7.5L	2/m²
73 -	Ligustrum vulgare (*)	0/2 .Cutting .Branched .3 brks .B		60-80cm		1/m²
79 -	Mahonia aquifolium 'Apollo'	Branched .2 brks .C .PG 8		20-30cm	3L	4/m²
515 -	Prunus laurocerasus 'Otto Luyken' (*)	Bushy .5 brks .C .PG 8		40-60cm	5-7.5L	3/m²
144 -	Pyracantha coccinea 'Red Cushion' (*)	Bushy .5 brks .C .PG 1	30-40cm		3L	3/m²
37 -	Rosa canina (*)	1+1 .Transplant .Branched .3 brks .B		40-60cm		1/m²
37 -	Sambucus nigra	1+1 .Transplant .Branched .3 brks .B		60-80cm		1/m²
95 -	Spiraea japonica 'Anthony Waterer'	Branched .6 brks .C .PG 6		30-40cm	3L	3/m²
73 -	Viburnum lanata	1+2 .Transplant .Branched .3 brks		60-80cm		1/m²
73 -	Viburnum opulus	1+2 .Transplant .Branched .3 brks .B		60-80cm		1/m²
67 -	Viburnum tinus 'Eve Price' (*)	Bushy .5 brks .C .PG 1		30-40cm	5L	2/m²

bea landscape design ltd

client: CANMOOR

project: ACCESS PARK, GLOUCESTER

title: PLANTING PLAN

status: PLANNING

date:	drawn:	number:
NOV'21	E.C.H	21-135-P-03
scale@A0:	checked:	revision:
1:500	T.G-W	(-)

Landscape Institute Registered Practice

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Figure 5: Post Development Planting Plan

4 CONCLUSIONS

4.1.1 The proposed development has the potential to result in adverse impacts upon a number of ecological features ranging from **Local** to **Site** importance. However, avoidance, mitigation and compensation measures have been proposed to ensure that these adverse impacts are reduced as far as possible. Furthermore, new habitat creation and enhancement is proposed which will deliver a net gain for biodiversity, as quantified by the BREEAM NC 2018 Change in Ecological Value Calculator. Additional enhancement measures are also included in line with the NPPF.

4.1.2 These measures include:

- Retention of the north-western vegetated railway corridor;
- Protection of retained habitats during construction;
- Removal of non-native/invasive buddleia and cotoneaster;
- Sensitive working methods during site clearance and construction to avoid impacts on reptiles, nesting birds and hedgehogs;
- New native tree, shrub and species-rich grassland planting: providing a range of habitats for different species;
- A sensitive lighting strategy which preserves a dark corridor around the north-western and south-western boundaries; and
- Provision of a range of bat and bird boxes and a reptile hibernaculum as enhancements.

4.1.3 A LEMP will be produced which will detail relevant enhancement, management and monitoring measures.

4.1.4 Assuming the successful implementation of the measures described above, the proposed development can be considered in line with planning policy SD9: Biodiversity and Geodiversity, due to the quantifiable net gain in biodiversity the scheme is due to provide, as well as the enhancements for biodiversity which will be installed.

APPENDIX A: WILDLIFE LEGISLATION & SPECIES INFORMATION

BATS

All 17 species of bat known to breed in England and Wales, and their roost sites, are protected under the Conservation of Habitats and Species Regulations 2017, known as the 'Habitats Regulations'. This makes it an offence to deliberately kill or injure a bat, or to deliberately disturb a bat such that its ability to hibernate, breed or rear young, or such that the species' distribution, were significantly affected. It is also an offence to damage or destroy any breeding site or resting place. Intentional or reckless disturbance of bats in their resting places, and damage to or obstruction of resting places are also offences under the Wildlife and Countryside Act 1981 (as amended). Under UK law a bat roost is "any structure or place which any wild [bat]...uses for shelter or protection". As bats tend to reuse the same roosts, legal opinion is that the roost is protected whether or not the bats are present at the time. Penalties for offences against bats or their roosts include fines of up to £5,000 and/or up to six months in prison.

As a result, development works which are likely to involve the loss of or alteration to roost sites, or which could result in killing of or injury to bats, need to take place under licence. Works which could disturb bats may also be licensable, though this needs to be assessed on a case by case basis, as bats' sensitivity to disturbance varies depending on normal background levels, and the definition of disturbance offences under the Habitats Regulations is complex. In practice this means that works involving modification or loss of roosts (typically in buildings, trees or underground sites) or significant disturbance to bats in roosts are likely to be licensable.

Licences can be obtained from Natural England or the Welsh Government to permit works that would otherwise be illegal, provided it can be demonstrated that the proposed works are needed to protect public health or safety, or for other reasons of overriding public interest including social and economic reasons. It is also necessary to demonstrate that there is no satisfactory alternative to the proposed works, and that the conservation status of bats in the area will be maintained. Appropriate mitigation and post-construction monitoring are therefore a requirement of all licences.

AMPHIBIANS

Great Britain supports seven native amphibian species. The four most widespread species; smooth and palmate newts, common frog, and common toad, receive partial protection under the Wildlife and Countryside Act 1981 (as amended) which prohibits sale, barter, exchange, transporting for sale and advertising to sell or to buy. The great crested newt, pool frog and natterjack toad are also fully protected in England and Wales under the Conservation of Habitats and Species Regulations 2017. Penalties for offences against amphibian species include fines of up to £5,000 and/or up to six months in prison.

Four amphibian species (great crested newt, pool frog, common toad, natterjack toad) are listed as priority species under the UK Biodiversity Action Plan, and are therefore considered to be Species of Principal Importance in England and Wales (excluding the pool frog, which does not occur in Wales) under the Natural Environment and Rural Communities (NERC) Act 2006. All public bodies including local and regional authorities have a duty under this legislation to have regard for the conservation of biodiversity.

REPTILES

All six native reptile species receive protection under the Wildlife and Countryside Act 1981 (as amended). The four more common species (common lizard *Zootoca vivipara*, slow-worm *Anguis fragilis*, adder *Vipera berus* and grass snake *Natrix natrix*) receive partial protection which makes it an offence to intentionally kill or injure a reptile. The two other reptile species (smooth snake *Coronella austriaca* and sand lizard *Lacerta agilis*), both of which are rare with very restricted UK ranges receive full protection under the Conservation of Habitats and Species Regulations 2017. Penalties for offences against reptile species include fines of up to £5,000 and/or up to six months in prison.

Works such as site clearance or topsoil stripping which could result in killing or injury of reptiles could be considered result in an offence unless measures are taken to minimise the risk of this occurring. Any inadvertent impacts on common reptile species despite these mitigation measures being in place would be considered an 'incidental result of an otherwise lawful operation' which 'could not reasonably have been avoided' and therefore not an offence. Works which could affect smooth snakes or sand lizards, or their habitats, would need to take place under licence from Natural England or Natural Resources Wales. However sites supporting smooth snakes or sand lizards are very rarely affected by development proposals.

In practice, mitigation for impacts of development on common reptiles generally comprise one or more of the following techniques: displacement, in which reptiles are encouraged to move to suitable retained habitat by changing the management of areas affected by development; exclusion, where reptile-resistant fencing is provided between a development site and suitable retained habitat allowing reptiles to be trapped from the development footprint and released elsewhere on the site; and translocation, where animals are trapped from a development site and released on another suitable site nearby. Reptile mitigation proposals, particularly those involving translocation of animals, should be agreed in advance with the local planning authority.

BIRDS

All British birds, their nests and eggs (with certain exceptions) are protected under the Wildlife & Countryside Act 1981 (as amended) which makes it an offence to: intentionally kill, injure or take a wild bird; intentionally take, damage or destroy nests which are in use or being built; intentionally take or destroy birds' eggs; or possess live or dead wild birds or eggs. A number of species receive additional protection through inclusion on Schedule 1 of the Wildlife and Countryside Act; for these it is also an offence to intentionally or recklessly disturb birds while nest building, or at a nest containing eggs or young, or to disturb the dependant young of such a bird. Penalties for offences against bird species include fines of up to £5,000 and/or up to six months in prison.

General licences for control of some bird species are issued by Natural England and Natural Resources Wales in order to prevent damage or disease, or to preserve public health or public safety, but it is not possible to obtain a licence for control of birds or removal of eggs/nests for development purposes. Consequently if nesting birds are present on a development site when works are programmed to start it is usually necessary to delay works, at least in the areas supporting nests, until any chicks have fledged and left the nest. It is usually possible, once chicks have hatched, for an experienced ecologist to predict approximately when they are likely to fledge, in order to inform programming of works on site.

PLANNING POLICY IN RELATION TO BIODIVERSITY - ENGLAND

The National Planning Policy Framework (NPPF), was published in March 2012 and revised in July 2021. Additional guidance can be found online at http://planningguidance.planningportal.gov.uk/blog/guidance/. The NPPF simplifies and collates a number of previous planning documents and outlines the government's objective towards biodiversity.

The NPPF identifies ways in which the planning system should contribute to and enhance the natural and local environment (Paragraph 174), including:

- (a) protecting and enhancing valued landscapes, sites of biodiversity or geological value and soils (in a manner commensurate with their statutory status or identified quality in the development plan);
- (b) recognising the intrinsic character and beauty of the countryside, and the wider benefits from natural capital and ecosystem services – including the economic and other benefits of the best and most versatile agricultural land, and of trees and woodland;
- (d) minimising impacts on and providing net gains for biodiversity, including by establishing coherent ecological networks that are more resilient to current and future pressures;
- (e) preventing new and existing development from contributing to, being put at unacceptable risk from, or being adversely affected by, unacceptable levels of soil, air, water or noise pollution or land instability. Development should, wherever possible, help to improve local environmental conditions such as air and water quality, taking into account relevant information such as river basin management plans; and
- (f) remediating and mitigating despoiled, degraded, derelict, contaminated and unstable land, where appropriate. protecting and enhancing valued landscapes, geological conservation interests and soils;

It also emphasises the importance of conserving biodiversity and areas covered by landscape designations (Paragraph 176):

Great weight should be given to conserving landscape and scenic beauty in National Parks, the Broads and Areas of Outstanding Natural Beauty, which have the highest status of protection in relation to landscape and scenic beauty. The conservation of wildlife and cultural heritage are important considerations in all these areas, and should be given great weight in National Parks and the Broads. The scale and extent of development within all these designated areas should be limited, while development within their setting should be sensitively located and designed to avoid or minimise adverse impacts on the designated areas.

When determining planning applications, the NPPF states that local planning authorities should aim to conserve and enhance biodiversity (Paragraph 175) by applying principles including:

- (a) if significant harm to biodiversity resulting from a development cannot be avoided (through locating on an alternative site with less harmful impacts), adequately mitigated, or, as a last resort, compensated for, then planning permission should be refused;
- (b) development on land within or outside a Site of Special Scientific Interest, and which is likely to have an adverse effect on it (either individually or in combination with other developments), should not normally be permitted. The only exception is where the benefits of the development in the location proposed clearly outweigh both its likely impact on the features of the site that make it of special scientific interest, and any broader impacts on the national network of Sites of Special Scientific Interest;
- (c) development resulting in the loss or deterioration of irreplaceable habitats (such as ancient woodland and ancient or veteran trees) should be refused, unless there are wholly exceptional reasons[6] and a suitable compensation strategy exists; and
- (d) development whose primary objective is to conserve or enhance biodiversity should be supported; while opportunities to improve biodiversity in and around developments should be integrated as part of their design, especially where this can secure measurable net gains for biodiversity or enhance public access to nature where this is appropriate..

The following should be given the same protection as habitats sites:

- (a) potential Special Protection Areas and possible Special Areas of Conservation;
- (b) listed or proposed Ramsar sites7; and
- (c) sites identified, or required, as compensatory measures for adverse effects on habitats sites, potential Special Protection Areas, possible Special Areas of Conservation, and listed or proposed Ramsar sites.

There is a general presumption in favour of sustainable development within the NPPF. It is noted in Paragraph 182 that this presumption does not apply where the plan or project is likely to have a significant effect on a habitat site (either alone or in combination with other plans or projects), unless an appropriate assessment has concluded that the plan or project will not adversely affect the integrity of the habitats site.

The Natural Environment and Rural Communities Act (2006) states that a public authority must, "in exercising its functions, have regard, so far as is consistent with the proper exercise of those functions, to the purpose of conserving biodiversity; Conserving biodiversity includes, in relation to a living organism or type of habitat, restoring or enhancing a population or habitat". DEFRA issued further guidance on implementation of this act in the document; Guidance for Local Authorities on Implementing the Biodiversity Duty (May 2007), which notes that "Conserving biodiversity includes restoring and enhancing species populations and habitats, as well as protecting them".

ECOLOGICAL ENHANCEMENTS

The Natural Environment and Rural Communities Act (2006) states that a public authority must, "in exercising its functions, have regard, so far as is consistent with the proper exercise of those functions, to the purpose of conserving biodiversity; Conserving biodiversity includes, in relation to a living organism or type of habitat, restoring or enhancing a population or habitat". DEFRA issued further guidance on implementation of this act in the document; Guidance for Local Authorities on Implementing the Biodiversity Duty (May 2007), which notes that "Conserving biodiversity can include restoring or enhancing a population or habitat"".

In England, the National Planning Policy Framework (NPPF), issued in July 2021, states that the planning system should contribute to "*minimising impacts on and providing net gains for biodiversity, including by establishing coherent ecological networks that are more resilient to current and future pressures;*. It also states that "*opportunities to incorporate biodiversity in and around developments should be encouraged, especially where this can secure measurable net gains for biodiversity*".

UK BIODIVERSITY ACTION PLANS

The UK Biodiversity Action Plan (UK BAP) 2011 is a policy first published in 1994 to protect biodiversity and stems from the 1992 Rio Biodiversity Earth Summit. The policy is continuously revised to combine new and existing conservation initiatives to conserve and enhance species and habitats, promote public awareness and contribute to international conservation efforts. Each plan details the status, threats and unique conservation strategies for the species or habitat concerned, to encourage spread and promote population numbers.

Species or habitats identified as priorities under the UK Biodiversity Action Plan receive some status in the planning process through their identification as Species/Habitats of Principal Importance in England and Wales, under the Natural Environment and Rural Communities (NERC) Act 2006 (as amended).

Current planning guidance in England, the National Planning Policy Framework, does not specifically refer to Species or Habitats of Principal Importance, though it includes guidance for conservation of biodiversity in general. Supplementary guidance is available online at http://planningguidance.planningportal.gov.uk/blog/guidance/ and this guidance indicates that it is '*useful to consider*' the potential effects of a development on the habitats or species on the Natural Environment and Rural Communities Act 2006 section 41 list.

APPENDIX B: RESULTS OF BIODIVERSITY IMPACT ASSESSMENT

Summary Results

BREEAM, CEEQUAL & HQM Change in Ecolgical Value Calculator

BREEAM UK delivered by bre | HOME QUALITY MARK delivered by bre | CEEQUAL delivered by bre

NB: All assessment details below must be completed before result will be given		
1 Site Name	Access Park, Gloucester	
2 Development Footprint Area	48033.3	
3 Unit of Area	Square Metres	Note: Must be applied consistenlly throughout the assessment
4 Have statutory obligations been met?	Yes	
5 Is Area Based Habitat Pre Development Biodiversity Unit score 0?	No	
6 If 6 is "Yes", what percentage of Development Footprint does habitat created cover?	Not Applicable	
7 Are any Linear (Watercourse) Habitats present Pre Development?	No	
8 If yes, are all habitats present in "Good" condition Pre Development and remain untouched throughout development?	N/A	Note: If 7 and 8 are both "Yes", or 7 is "No" then Linear (Watercourse) habitats can be filtered out for the purpose of credit award
9 Can Linear (Watercourse) Habitats be filtered out?	Yes	Check this cell before selecting from the drop down menu, 10, below.
10 If applicable, should Linear (Watercourse) Habitats be filtered out?	Yes	Note: No should only be selected where new habitat is created and reward is sought for this creation. It is automatically filtered if none of the specified habitat is present Pre or Post Development.
11 Are any Linear (Foliage) Habitats present Pre Development?	No	
12 If yes, are all habitats present in "Good" condition Pre Development and remain untouched throught development?	N/A	Note: If 11 and 12 are both "Yes", or 11 is "No" then Linear (Watercourse) habitats can be filtered out for the purpose of credit award
13 Can Linear (Foliage) Habitats be filtered out?	Yes	Check this cell before selecting from the drop down menu, 14, below.
14 If applicable, should Linear (Foliage) Habitats be filtered out?	Yes	Note: No should only be selected where new habitat is created and reward is sought for this creation. It is automatically filtered if none of the specified habitat is present Pre or Post Development

	Area Based Habitats	Linear (Watercourse) Habitats	Linear (Foliage) Habitats
Pre Development	19132	0	0
Post Development	20373	0	159.75
Post Development % of Pre Development	106%	Filtered for purpose of credit award	Filtered for purpose of credit award

Total Post Development % of Pre Development (Lowest Score)	*106%*	*Net Gain*

Cells that are white with a black border require the user to input information, either by selecting from the available options or entering the required data.

Cells that are light grey (with/without black border) contain information for the user and/or automated calculation. They do not require the user to input or select data.

Area Based Results

BREEAM, CEEQUAL & HQM Change in Ecological Value Calculator

BREEAM UK delivered by bre | HOME QUALITY MARK delivered by bre | CEEQUAL delivered by bre

Example					
Parcel Number	**Habitat Type**	**Distinctiveness**	**Condition**	**Area (ha or m²)**	**Biodiversity Units**
1	*B1.1*	*High*	*Moderate*	*15*	*180*

Area Based Habitat Pre Development

Parcel Number	Habitat Type	Distinctiveness	Condition	Area (ha or m²)	Biodiversity Units
1	J1.2 Amenity grassland	Low	Poor	433.1	866.2
2	A1.1.1 BL woodland	Medium	Moderate	223.3	1786.4
3	A2.1 dense scrub	Medium	Moderate	521.3	4170.4
4	J3 Hardstanding	Hard Standing or Building	Hard Standing or Building	43444	0
5	J1.4 Introd shrub	Low	Poor	422.7	845.4
6	J1.3 Ruderal veg	Low	Poor	601	1202
7	J1.3 Ruderals and scrub	Low	Moderate	1522.3	6089.2
8	B6 Poor SI grassland	Low	Moderate	688.1	2752.4
9	A2.2 Scattered scrub	Medium	Moderate	177.5	1420
					0
					0
					0
					0
					0
					0
					0
					0
					0
					0
					0
					0
					0
					0
					0
					0
					0
					0
Total				48033.3	19132

Area Based Habitat Lost

Parcel Number	Habitat Type	Distinctiveness	Condition	Area (ha or m²)	Biodiversity Units
1	J1.2	Low	Poor	433.1	866.2
4	J3	Hard Standing or Building	Hard Standing or Building	43444	0
6	J1.3	Low	Poor	601	1202
8	B6	Low	Moderate	688.1	2752.4
9	A2.2	Medium	Moderate	177.5	1420
					0
					0
3	A2.1	Medium	Moderate	315.8	2526.4
5	J1.4	Low	Poor	120.5	241
7	J1.3	Low	Moderate	1081	4324
					0
					0
					0
					0
					0
					0
					0
					0
					0
					0
					0
					0
					0
					0
					0
					0
Total				46861	13332

Area Based Habitat Created								
Parcel Number	Habitat Type	Distinctiveness	Condition	Area (ha or m²)	Delivery Risk	Temporal Risk	Spatial Risk	Biodiversity Units
10	J1.2 Amenity grassland	Low	Poor	1507.3	Low	2	Within 500m of the area of loss or in same ecological network	2803
11	J3.6 Building	Hard Standing or Building	Hard Standing or Building	22171.4	Low	0	Within 500m of the area of loss or in same ecological network	0
12	J3 Hardstanding	Hard Standing or Building	Hard Standing or Building	20966	Low	0	Within 500m of the area of loss or in same ecological network	0
13	A2.1 Native screen scrub	Medium	Moderate	556.5	Low	5	of the area of loss or in same ecolo	3739
14	J1.3 Introduced shrub	Low	Moderate	775.3	Low	1	of the area of loss or in same ecolo	3008
15	B2.2 SI wildflower grassland	Medium	Moderate	884.5	Low	10	of the area of loss or in same ecolo	5023
								0
								0
								0
								0
								0
								0
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								0
								0
								0
								0
								0
								0
								0
								0
								0
								0
								0
								0
								0
Total				46861				14573

Total Post Development Area Biodiversity Units					
Pre Development Area Biodiversity Units	Area Based Units Lost	Area Based Units (Creation)	Area Based Units (Enhancement)	Total Post Development Area Biodiversity Units	Biodiversity Unit Score
19132	13332	14573	0	20373	106%

Linear Based Results

Linear (Foliage) Based Habitat Created or Enhanced

Parcel Number	Habitat Type	Length (m)	Biodiversity Units
1	1.1: Native, species-rich hedge	159.75	159.75
			0
			0
			0
			0
			0
			0
			0
			0
			0
			0
			0
			0
			0
			0
			0
			0
			0
			0
			0
			0
			0
			0
			0
			0
			0
Total		159.75	159.75

Total Post Development Linear (Foliage) Biodiversity Units

Pre Development Linear (Foliage) Biodiversity Units	Linear (Foliage) Units Lost	Linear (Foliage) Units Created and/or Enhanced	Total Post Development Linear (Foliage) Biodiversity Units	Biodiversity Unit Score
0	0	159.75	159.75	Filtered for purpose of credit award

CLARKSON & WOODS



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ENERGY STATEMENT

ACCESS PARK, GLOUCESTER

CANMOOR

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Issue date: 14/12/2021

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ENERGY STATEMENT

ACCESS PARK, GLOUCESTER
CANMOOR

OUR PROJECT REF: ESC1794

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REV	DATE	ISSUED BY
R1	14 December 2021	James Tickle

CONTENTS

EXECUTIVE SUMMARY 3
INTRODUCTION 4
CONTEXT 4
SITE LOCATION 4
PROPOSED DEVELOPMENT 5
POLICY AND LEGISLATION 6
NATIONAL 6
LOCAL 7
DEVELOPMENT AIMS 8
ENERGY CONSUMPTION OBJECTIVES 9
ENERGY 10
APPROVED DOCUMENT L2A (2013), BUILDING REGULATIONS 11
LOW & ZERO CARBON TECHNOLOGY STUDY 12
AVAILABLE TECHNOLOGIES 12
APPROPRIATE TECHNOLOGIES 17
EXCLUDED TECHNOLOGIES 17
SUMMARY 19
CONCLUSION 20

EXECUTIVE SUMMARY

The Energy Statement supports the detailed planning application for the construction of the 14No new industrial buildings at Access Park, Gloucester.

Assessment was required to assess the buildings' compliance with Building Regulations L2 and Gloucester JCS 2017-2031.

The Policy sets out a number of ways in which development should be designed and constructed from an energy and sustainability point of view.

The policy does not prescribe a % of energy to be generated by LZC technology. However, there is a clear policy expectation that some form LZC solution should be incorporated into new development schemes, unless unviable, to contribute to the overall carbon reduction target in policy reducing the city's carbon footprint.

The current proposal is for a 10% renewables contribution (regulated energy at PC) via Photovoltaics.

INTRODUCTION

CONTEXT

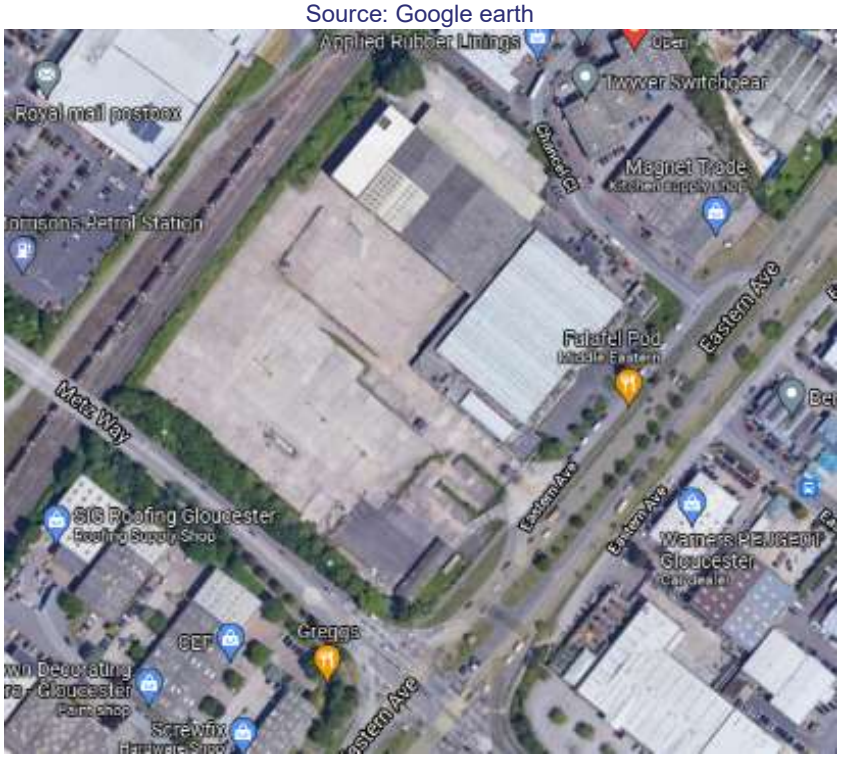
Sustainable development has been defined as development that meets the needs of the present generation without compromising the ability of future generations to meet their own needs. The Energy consumption of the building is a key part of this.

The Proposed Development aims to mitigate any negative impacts it might have on the environment whilst maximising efficiencies and opportunities to deliver an intrinsically sustainable building.

SITE LOCATION

The proposed development is 14No Industrial buildings at Access Park, Gloucester.

Source: Google earth



PROPOSED DEVELOPMENT

The proposed development shall be comprised of:

- Unit 1 – 70,200 Sqft warehouse unit with 5600 Sqft Office.
- Unit 2 – 93,525 Sqft warehouse unit with 7075 Sqft Office.
- Unit 3 – 40,150 Sqft warehouse unit with 3650 Sqft Office.
- Unit 4 - 6100 Sqft warehouse unit with 1050 Sqft Office.
- Unit 5 - 5170 Sqft warehouse unit with 840 Sqft Office.
- Unit 6 - 3660 Sqft warehouse unit with 500 Sqft Office.
- Unit 7 - 4620 Sqft warehouse unit with 720 Sqft Office.
- Unit 8 - 6290 Sqft warehouse unit with 1095 Sqft Office.
- Unit 9 - 3050 Sqft warehouse unit.
- Unit 10 - 3960 Sqft warehouse unit.
- Unit 11 - 3920 Sqft warehouse unit.
- Unit 12 - 3920 Sqft warehouse unit.
- Unit 13 - 3960 Sqft warehouse unit.
- Unit 14 - 3050 Sqft warehouse unit.



Source: Proposed Site Plan (Hale)

POLICY AND LEGISLATION

NATIONAL

NATIONAL PLANNING POLICY FRAMEWORK

The National Planning Policy Framework (NPPF) was introduced in March 2012 and was revised on 24th July 2018. The NPPF sets out the Government's planning policies for England and how these are to be applied. The framework must be considered when granting planning permission for any new development.

The purpose of the planning system and the NPPF is to help achieve sustainable development by meeting the needs of the present without compromising the ability of future generations to meet their own needs. The NPPF divides sustainable development into three objectives which are both independent and mutually supportive:

- Economic
- Social
- Environmental

These objectives should be delivered though the application and implementation of the NPPF policies. The NPPF aims to drive sustainable development and has been established on the basis of **presumption in favour of a sustainable development.**

CLIMATE CHANGE ACT 2008

The Climate Change Act 2008 was published on 26th November 2008 to:

- Set a target for the reduction of greenhouse gas emissions by 2050.
- Provide a system of carbon budgeting.
- Establish a Committee on Climate Change.
- Establish trading schemes to limit greenhouse gas emissions and encourage activities to reduce of remove greenhouse gases from the atmosphere.
- Reduce domestic waste and encourage recycling.

The Act outlines a target to reduce net UK carbon account by at least 80% by 2050, over the 1990 baseline.

TOWN AND COUNTRY PLANNING ACT 1990

The Town and Country Planning Act was published on 24th May 1990 and consolidates several elements relating to town and country planning.

ENERGY ACT 2013

The Energy Act received Royal Assent on 18th December 2013 and makes provision to:

- Set a decarbonisation target.
- Review the electricity market and encourage low carbon electricity generation or secure supply.
- Establish the Office of Nuclear Regulation.

- Protect the government pipe-line and storage system'
- Ensure domestic supplies of gas and electricity and regulation for consumers.
- Establish energy licencing categories.
- Establish principles for offshore transmission of electricity during a commissioning period.
- Review the integration of smoke and carbon monoxide alarms.

PLANNING AND ENERGY ACT 2008

The Act was adopted on 13th November 2008 and enables local planning authorities to set requirements for energy use and energy efficiency in local plans.

BUILDING REGULATIONS

The Building Regulations set out statutory standards developments are to meet. These standards cover measures including energy efficiency, water efficiency, sanitation, fire safety, sound resistance and ventilation.

Part L of the Building Regulations relates to the conservation of fuel and power. Part L covers energy efficiency and sets out the maximum carbon dioxide occupied buildings are to emit. The current 2013 edition came into effect on 6th April 2014.

LOCAL

GLOUCESTER JCS 2017-2031

The Plan sets out a vision and a strategy for the sustainable growth of the City for the period up to 2031. It sets out a framework to guide growth across Corby, in particular addressing the challenges related to climate change, quality of life, delivery of infrastructure, creation of an inclusive economy.

Policy SD3 sets out a number of ways in which development should be designed and constructed.

The policy does not prescribe a % of energy to be generated by LZC technology. However, there is a clear policy expectation that some form LZC solution should be incorporated into new development schemes, unless unviable, to contribute to the overall carbon reduction.

DEVELOPMENT AIMS

Following a review of the policies and legislation, the new development aims to:

- Meet the challenges of climate change.
- Prevent and minimise pollution.
- Reduce energy use and greenhouse emissions.
- Supporting the use and development of low carbon technologies.

ENERGY CONSUMPTION OBJECTIVES

Climate change is perhaps the most significant global sustainability issue as it directly impacts all others. Variability in the climate system occurs naturally, however human activity since pre-industrial times has accelerated change.

There has been an unequivocal warming on the global climate system with unprecedented temperature rises since the mid-1950s. Both the atmosphere and oceans have warmed resulting in:

- Rise in the global mean sea level.
- Ocean acidification.
- Altered precipitation levels - wet areas becoming wetter and dry areas becoming drier.
- Increased extremity and frequency of weather and multi-hazard events.
- Changes to ocean salinity.
- Significant ice loss from glaciers, ice sheets and sea ice.
- Reduced snowfall and snow cover.
- Increased permafrost temperatures.

More than half of the observed increase in global average surface temperature from 1951 to 2010 has been caused by the anthropogenic increase in greenhouse gas concentrations and other anthropogenic influence, largely caused by fossil fuel combustion.

In the UK, communities are becoming increasingly vulnerable to climate change which has resulted in a drive for sustainable development. Having reviewed the policies and consequently established the targets to achieve a sustainable development, the following objectives have been established:

There are a number of policies within the Local Plan that require the Proposed Development to be inherently sustainable, including:

- Local Plan Policy SD3

Following a review of these policies, several energy objectives have been established:

ENERGY

Demand for energy and fuel continues to increase and is driven by increases in urbanisation, globalisation and population growth. However, global awareness of the impact of fossil fuel combustion on climate change and the rise in energy costs is driving the need for alternative fuel sources which do not release greenhouse gases into the earth's atmosphere.

Fossil Fuels are not only one of the major global sources of greenhouse gases but are also finite sources of energy. There has been an increase in demand for renewable energy sources and more efficient technologies following recognition of the need to drive down energy use.

In order to demonstrate compliance with *Building Regulations* and *Local Plan Policy* the Proposed Development will follow the following energy hierarchy:

REDUCE ENERGY DEMAND

The Proposed Development is designed with an enhanced building fabric so that the building's thermal performance is improved. Improved u-values and a low air permeability result in fewer heat and air losses and a reduced need for heating and cooling thereby reducing energy use.

REDUCE ENERGY USE

Energy usage will be reduced through the specification of energy efficient equipment, including LED lighting, efficient heating and cooling systems and automatic controls. The end user will be encouraged to use efficient equipment including energy labelled white goods and office equipment.

USE RENEWABLE OR LOW CARBON TECHNOLOGIES

In accordance with *Local Plan Policy*, low or zero carbon forms of energy generation will be incorporated where practical. The Proposed Development will be designed to include provision for photovoltaic panels and thermal collectors on the roof to provide heating and power.

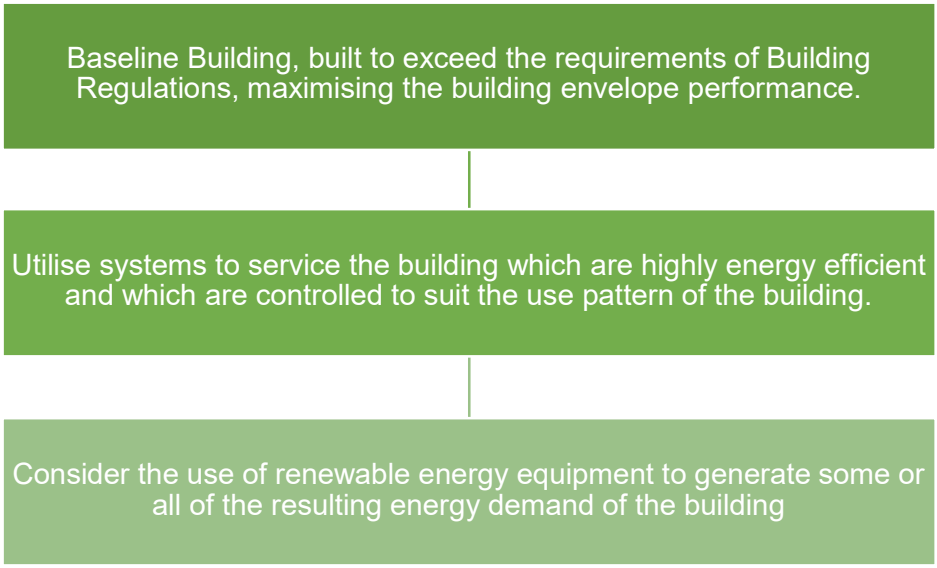
AIR POLLUTION

The following air pollution measures have been specified:

- Low NOx emission heating and hot water systems.
- Low VOC content products, including paints, varnishes & adhesives.
- Efficient refrigerant-using systems.

APPROVED DOCUMENT L2A (2013), BUILDING REGULATIONS

The current building regulations are concerned with 3 key criteria:



1. The amount of carbon dioxide emitted from a building per annum. The amount of carbon dioxide emitted is calculated by an approved Energy Assessor, using approved software tools. Within the approved software, the Energy Assessor creates a virtual building model which is compared against a “Notional Building”. The Notional Building is generated automatically within the accredited software and mimics the physical size, shape, orientation, location, and layout of the virtual model. In order to pass the Criterion One assessment for compliance with ADL2A 2013, the carbon emission of the virtual building must be equal to, or less than, the carbon dioxide emission of the notional building.
2. The performance of the building fabric to ensure that reasonable provision is made to limit heat gains and heat losses. This assesses building fabric U-values and building air permeability to ensure that minimum standards prescribed by the Building Regulations are met. M&E building services must also meet minimum energy efficiency standards.
3. The effect of solar gains during the period of April to September, whether air conditioning is installed or not. The intention is to reduce the need for air conditioning or reduced the installed capacity of air conditioning if present. Again, the virtual building model is compared to a notional building. The model must have a solar heat gain less than or equal to the notional building benchmark.

The principle of the building design is to use as little energy as possible and utilise low or zero carbon energy sources to deliver some of that energy.

This methodology needs a structured and analytical approach to understanding the overall value of each element of design. The first two steps, those of making the building envelope energy efficient and then utilising equipment to service the building which is also very energy efficient, are well proven. However, the results from implementing renewables are variable as many of the technologies are dependent on the variables of weather and of building usage.

LOW & ZERO CARBON TECHNOLOGY STUDY

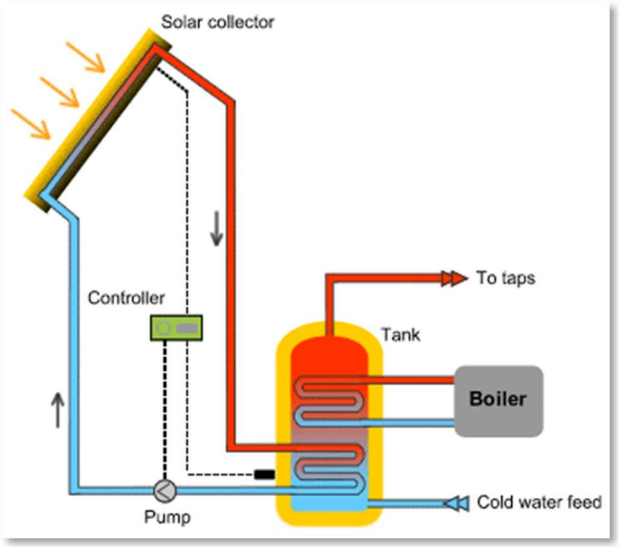
AVAILABLE TECHNOLOGIES

SOLAR HOT WATER

Description

Solar water heating systems use energy from the sun to heat water. A fluid within the wall/roof mounted panel is heated by the sun. The fluid is then used to heat water.

There are two types of collectors available: Flat plate & Evacuated tube



Advantages

Government Renewable Heat Incentive payments. Relies on a natural source (the sun).

Low maintenance.

Disadvantages

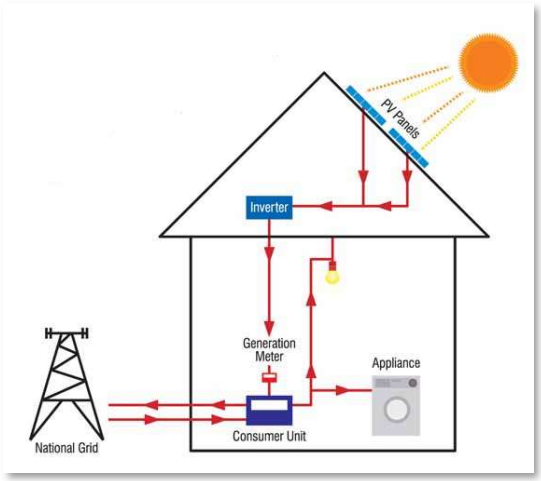
Panels ideally need to face South and at an incline of 30º to the horizontal.

The system must be unshaded.

PHOTOVOLTAICS (PV)

Description

Photovoltaic (PV) systems convert energy from the sun into electricity through semi-conductor cells, connected together in mounted modules.



Advantages

Panels can be incorporated into the building. Feed in Tariff payments.

Relies on a natural source (the sun).

Low maintenance. Silent in operation. No emissions.

Disadvantages

PV panels ideally need to face South and at an incline of 30º to the horizontal.

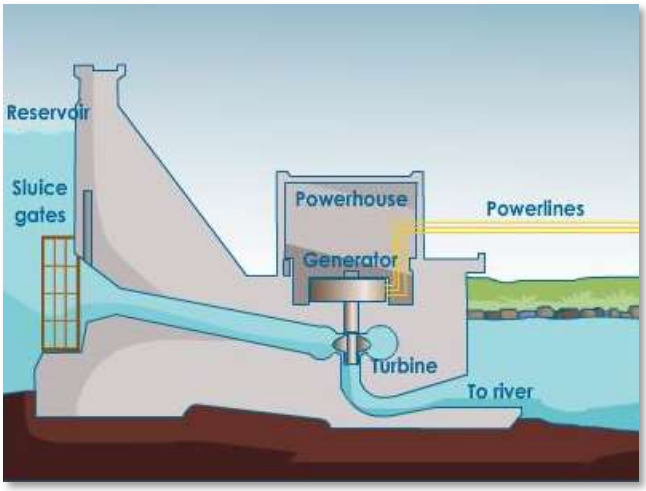
The system must be unshaded.

Amount of energy generated is dependent upon the daylight availability.

HYDRO POWER

Description

Hydro power is the process of using river water to generate electricity. Water is used to drive a turbine to generate electricity.



Advantages

Government Feed in Tariff payments.

Surplus energy can be sold to the grid.

Low running and maintenance costs.

Disadvantages

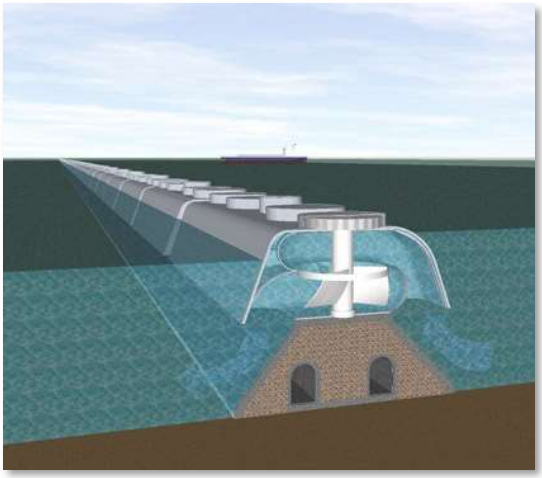
Installation is expensive.

Very site specific – need an adequate water supply all year round.

TIDAL & WAVE POWER

Description

Tidal/wave power is the process of using tidal waves to generate electricity. Water is used to drive a turbine to generate electricity.



Advantages

Government Feed in Tariff payments.

Surplus energy can be sold to the grid.

Low running and maintenance costs.

The tide moves a huge amount of water each day and has the potential to produce a lot of energy.

Disadvantages

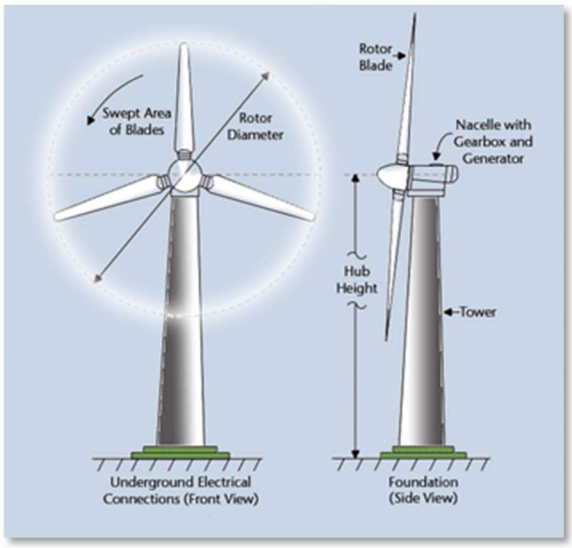
Installation is expensive.

Very site specific – requires a tidal location.

WIND TURBINES

Description

Wind turbines harness the power of the wind to generate electricity through a vertical or horizontal axis propeller which harnesses the kinetic energy in wind and converts it to electrical power through a generator. Requires an average wind speed greater than 5m/s according to CIBSE TM 38. (Refer to https://www.rensmart.com/Maps to find the average wind speed for the site.)



Advantages

Wind is free.

Surplus energy can be sold to the grid.

Extremely beneficial in exposed or coastal sites.

Disadvantages

Highly dependent on the speed of the wind at the site of the turbine.

Wind speed is dependent upon location within the UK and nearby obstructions.

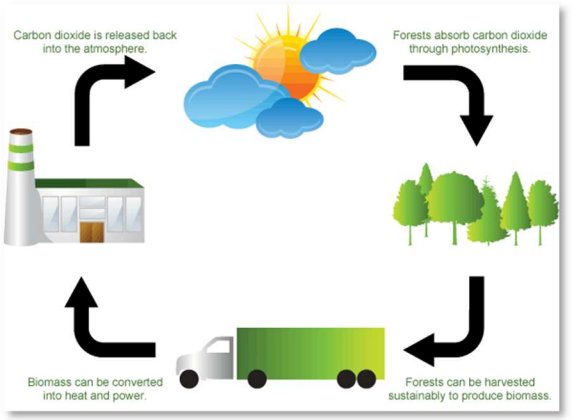
Very visible. High noise levels.

Creates a flickering shadow.

BIOMASS

Description

Wood is burned to provide heat to either a single room, a central heating system or to heat water.



Advantages

May be eligible for Renewable Heat Incentives.

Affordable fuel.

Disadvantages

Wood is renewable but trees take a longer time to grow than to burn.

CO2 emitted when wood is burned.

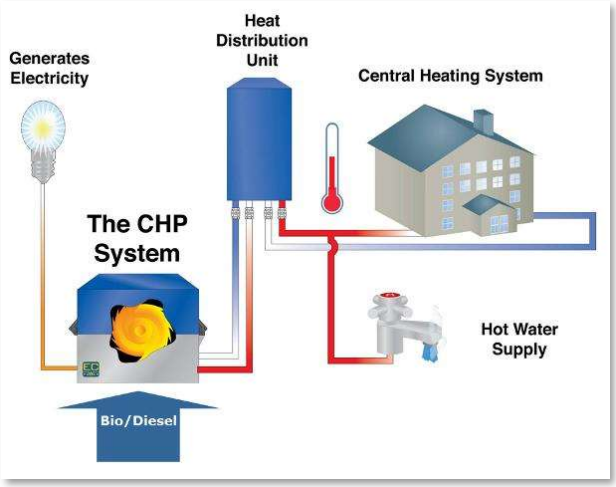
Requires regular deliveries of wood pellets.

The chimney must be carefully considered as it is generally significantly taller than the building.

COMBINED HEAT AND POWER (CHP)

Description

A CHP system generates heat and electricity simultaneously through an internal combustion engine that drives an electrical alternator.



Advantages

Electricity generated as a by-product of heat.

Can burn a variety of fuels, such as natural gas, diesel oil, or biofuels such as bioethanol.

Feed in Tariff payments.

Easy installation.

Cheap maintenance costs.

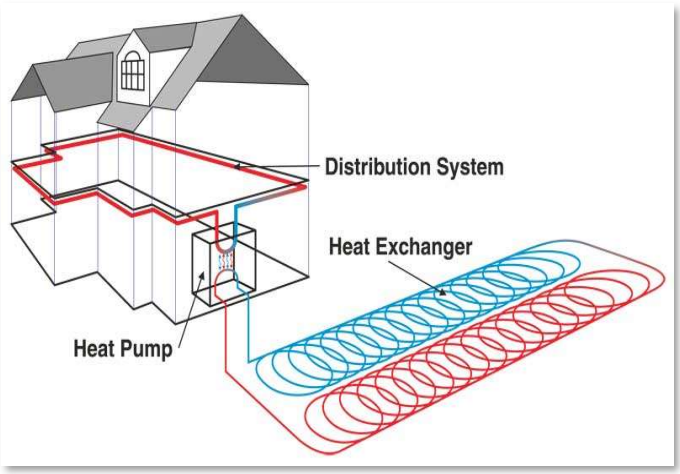
Disadvantages

Typically powered by mains gas or LPG.

GROUND SOURCE HEAT PUMPS

Description

Ground source heat pumps extract heat from the ground via pipes buried in the ground. The pipes contain a fluid which is heated, this heat can then be used for heating or hot water.



Advantages

Government Renewable Heat Incentive payments.

Can be used throughout the entire year as the ground remains at a consistent temperature.

Disadvantages

The ground must be suitable for digging a trench or boreholes.

Require regular maintenance.

Initial installation can be expensive.

WATER SOURCE HEAT PUMPS

Description

Water source heat pumps absorb heat from a water source which can then be used for heating or hot water.



Advantages

Government Renewable Heat Incentive payments.

High rate of heat transfer.

Disadvantages

Require regular maintenance.

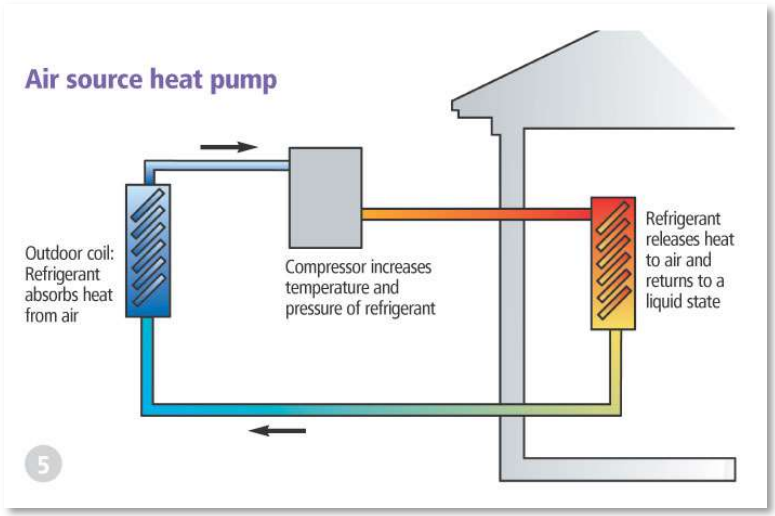
The ground must be suitable for digging a trench or boreholes.

Site specific as it requires an adequate water source.

AIR SOURCE HEAT PUMPS

Description

Air source heat pumps absorb heat from the outside air which can then be used for heating or hot water.



Advantages

Government Renewable Heat Incentive payments.

Relatively low capital costs.

Disadvantages

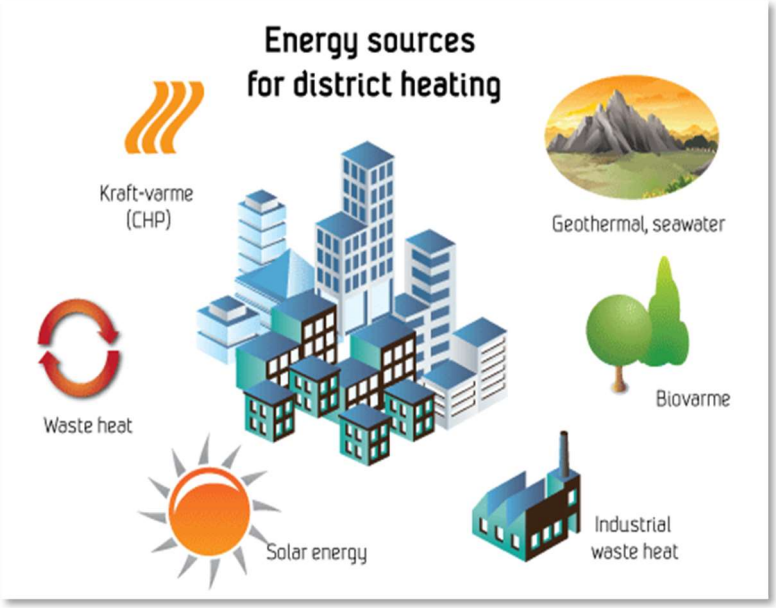
Require regular maintenance.

Requires additional plant space.

COMMUNITY/DISTRICT HEATING

Description

A centralised heating network supplies heat from a central source to businesses/homes through a network of pipes carrying hot water.



Advantages

Cost-effective.

Government funding often available.

Disadvantages

Expensive installation.

Often requires existing network to allow a connection.

APPROPRIATE TECHNOLOGIES

The breakdown below summarises the technologies which could be considered feasible for use on this development:

APPROPRIATE LZC TECHNOLOGY INFORMATION

Photovoltaics (PV)

The building has large roof spaces available for installation. Should a building not achieve compliance with Building Regulation's ADL2A then implementing this technology is highly recommended.

Carbon Emissions associated with Electrical usage within the building will be reduced due to on site generation.

EXCLUDED TECHNOLOGIES

A number of technologies have been excluded due to location or resource availability; these have been summarised in the table below:

EXCLUDED LZC TECHNOLOGY INFORMATION

Hydro Power

There is no suitable water source to allow for a hydroelectric power installation.

Tidal & Wave Power

There is no suitable water source to allow for a tidal or wave power installation.

Ground Source Heat Pumps

Ground source heat pumps can be suitable for this development; however, capital cost will be greater than air source heat pumps. As the price difference between electricity and gas fuel can sometimes be a factor of three, payback will potentially be very long.

Solar Thermal Collectors

The nature of the building will benefit from the efficient generation of hot water. The usage profile of a warehouse is generally high-water usage.

Water Source Heat Pumps

There is no suitable water source to enable the installation of a water source heat pump system.

Wind Turbines

The average wind speed shown in RenSMART's wind map show it is generally below or equal to 5.0 m/s. Wind turbines require average wind speeds greater than 5.0 m/s to generate meaningful amount of energy.

Biomass

The buildings are speculative and assumed to have no industrial space heating and/or cooling applied. However, spare ducts shall be provided within site for future connections onto any future decentralised energy networks

Combined Heat and Power

The buildings are speculative and assumed to have no industrial space heating and/or cooling applied. However, spare ducts shall be provided within site for future connections onto any future decentralised energy networks.

Community / District Heating

The buildings are speculative and assumed to have no industrial space heating and/or cooling applied for this report. However, spare ducts shall be provided within site for future connections onto any nearby district heating network.

SUMMARY

The development aims to mitigate any negative impacts it might have on the environment and minimise and consequential risks whilst maximising efficiencies and opportunities to deliver an intrinsically sustainable building.

The Proposed Development has established the following aims:

- Meet the challenges of climate change.
- Conserve and enhance the natural environment.
- Prevent and minimise pollution.
- Reduce energy use and greenhouse emissions.

Energy consumption reduction objectives have been established to meet the long term aims and include actions throughout the planning, design, construction and operation phases of the development.

The objectives will be delivered through the implementation of:

- The policies established in SD3.
- Approved Document Part L2a of the Building Regulations (2013).

Photovoltaics will be introduced to provide onsite generation of electricity to offset approximately 10% of the regulated electricity use of the building (at Practical Completion).

CONCLUSION

Sustainable development aims to meet the needs of the present without compromising the ability of future generations to meet their own needs.

The Proposed Development aims to mitigate negative impacts and target opportunities relating to the environment. The development has been designed to incorporate several sustainability measures to address the aims and objectives established so that an intrinsically sustainable building is delivered.

With any new building there will be unavoidable negative impacts resulting from energy use however the planning, design, construction and operation of the Proposed Development has been and will be managed so that the effect is minimised and mitigated where possible.

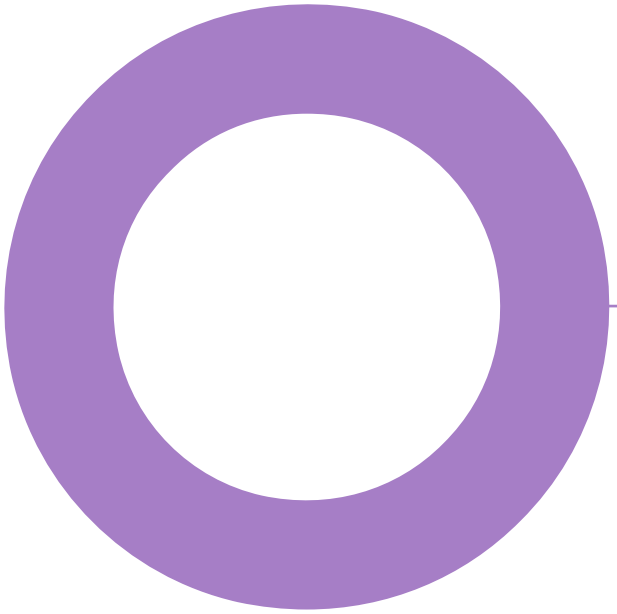
Photovoltaics will be introduced to provide onsite generation of electricity to offset approximately 10% of the regulated electricity use of the building (at Practical Completion).

HOARE LEA

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ACOUSTICS

REPORT ON EXISTING NOISE CLIMATE
PROPOSED INDUSTRIAL DEVELOPMENT
REVISION 2 – 03 DECEMBER 2021



Audit sheet.

Rev.	Date	Description of change / purpose of issue	Prepared	Reviewed	Authorised
0	13/11/2021	Draft report	AM		
1	18/11/2021	Issued report	AM	DM	DM
2	03/12/2021	Updated site plan	AM	AM	DM

This document has been prepared for Canmoor only and solely for the purposes expressly defined herein. We owe no duty of care to any third parties in respect of its content. Therefore, unless expressly agreed by us in signed writing, we hereby exclude all liability to third parties, including liability for negligence, save only for liabilities that cannot be so excluded by operation of applicable law. The consequences of climate change and the effects of future changes in climatic conditions cannot be accurately predicted. This report has been based solely on the specific design assumptions and criteria stated herein.

Project number: 10/13537
Document reference: Access Park, Gloucester REP-10-13657-AM-20211113-Environmental Noise Report-Rev 2.DOCX

Contents.

Audit sheet.	**2**
1. Introduction.	**4**
2. Site Description.	**5**
3. Development Proposals.	**6**
4. Basis of Assessment.	**7**
4.1 National Planning Policy Framework.	7
4.2 Noise Policy Statement for England.	7
4.3 Planning Practice Guidance.	8
4.4 BS 8233: 2014.	9
4.5 BS 4142: 2014.	9
5. Measurements.	**11**
6. Results.	**12**
6.1 Position L1 (East)	12
6.2 Position L2 (West)	13
7. Calculations.	**15**
7.1 Noise break-out from the buildings.	15
7.2 HGV Impact.	16
7.3 Mechanical Services plant.	17
8. Discussion.	**18**
8.1 Existing Noise Climate.	18
8.2 BS8233 Assessment.	18
8.3 BS4142 Assessment.	18
9. Recommendations.	**19**
10. Conclusions.	**20**
Appendix 1 – Proposed Site Layout.	**21**
Appendix 2 – Measured Sound Pressure Levels.	**22**
Appendix 3 – Glossary of Terms.	**29**
Appendix 4 – List of measurement equipment.	**30**

1. Introduction.

Hoare Lea Acoustics has been instructed to carry out a noise impact assessment for a proposed new warehouse/manufacturing facility on existing industrial land located at Access Park off Eastern Avenue, Gloucester. The new development will comprise three large buildings and two smaller buildings sub-divided into 11 smaller units, each with associated car parking and service yard.

This report reviews typical operational noise levels for warehouse/manufacturing facilities and assesses these with respect to the existing noise climate at the nearest residential properties. Recommendations for noise control measures are provided where appropriate.

2. Site Description.

The development site lies within an existing industrial district off Eastern Avenue, approximately 1km to the east of Gloucester City centre. The site is mostly unoccupied with existing buildings on the north eastern half of the site which will be demolished as part of the redevelopment.

The A38 Eastern Avenue dual carriageway lies to the south east of the site and provides a principal traffic route between the A417 and M5 motorway to the north through the Gloucester conurbation to the south where it re-connects with the motorway. Traffic flows on this road tend to be fast flowing with a high level of HGV movement.

On the far side of Eastern Avenue is a business park with a number of commercial, retail and industrial units off Eastbrook Road. To the north of these units are existing dwellings on York Road.

To the north, the site adjoins Chancel Close with further commercial and industrial units beyond.

To the south, the site adjoins Metz Way which provides a principal traffic route into the city centre from the A38. Across Metz Way to the south are further commercial and industrial units.

To the west, the site is the Gloucester to Swindon and Birmingham railway which carries scheduled inter-city and cross-country services. The railway lies on-grade with the development site, passing under Metz Road to the south. Beyond the railway to the west is a large Morrisons supermarket with a further section of railway beyond this.

The nearest dwellings to the site lie to the north east on York Road at a distance of approximately 130m from the edge of the site.

An aerial view of the site and surroundings is shown below.



3. Development Proposals.

It is proposed that all existing buildings be demolished and the site be cleared to enable redevelopment to provide new buildings as follows:

Unit1 – 70,000 ft^2 – 6no dock levellers and 1no level access door

Unit 2 – 93,300 ft^2 – 9no dock levellers and 2no level access doors

Unit 3 – 40,150 ft^2 – 3no level access doors

Units 4-8 – 3,760 ft^2 to 6,110 ft^2 – 5no level access doors

Units 9-14 – 3,050 ft^2 to 3,920 ft^2 – 6no level access doors

Units 1-3 will be aligned along the western and southern site boundaries whilst units 4-14 will be located at the north east corner of the site adjacent to Eastern Avenue and Chancel Close.

Access to the site will be from Eastern Avenue via Chancel Close to the north east of the site which leads to each of the service yards and car parking areas.

The proposed site layout is shown in Appendix 1.

4. Basis of Assessment.

4.1 National Planning Policy Framework.

The National Planning Policy Framework (NPPF): July 2021 sets out the Government's planning policies for England and how these are expected to be applied. The document seeks to encourage sustainable development subject to all relevant factors.

Section 11: 'Making effective use of land' advises that planning policy and decisions should promote effective use of land making as much use as is possible of brownfield sites.

Section 15: 'Conserving and enhancing the natural environment', paragraph 174, states the following:

'*Planning policies and decisions should contribute to and enhance the natural and local environment by:*

- *preventing new and existing development from contributing to, being put at unacceptable risk from, or being adversely affected by, unacceptable levels of soil, air, water or noise pollution or land instability'.*

Furthermore, paragraph 183 states that:

'Planning policies and decisions should also ensure that new development is appropriate for its location taking into account the likely effects (including cumulative effects) of pollution on health, living conditions and the natural environment, as well as the potential sensitivity of the site or the wider area to impacts that could arise from the development. In doing so they should:

- *mitigate and reduce to a minimum potential adverse impacts resulting from noise from new development – and avoid noise giving rise to significant adverse impacts on health and the quality of life;*
- *identify and protect tranquil areas which have remained relatively undisturbed by noise and are prized for their recreational and amenity value for this reason'*

Paragraph 188, additionally, states *'The focus of planning policies and decisions should be on whether proposed development is acceptable use of land rather than control of processes or emissions (where these are subject to separate pollution control regimes)'.*

NPPF also makes reference to the DEFRA Noise Policy Statement for England (NPSfE) 2010.

4.2 Noise Policy Statement for England.

The NPSfE is intended to apply to all forms of noise other than that which occurs in the workplace and includes environmental noise and neighbourhood noise in all forms.

NPSfE advises that the impact of noise should be assessed on the basis of adverse and significant adverse effect but does not provide any specific guidance on assessment methods or limit sound levels. Moreover, the document advises that it is not possible to have '*a single objective noise-based measure…that is applicable to all sources of noise in all situations'.* It further advises that the sound level at which an adverse effect occurs is *'likely to be different for different noise sources, for different receptors and at different times'.*

Paragraphs 2.20 and 2.22 of NPSE introduce the concepts summarised in the table below which can be applied when considering the significance of noise impacts, as defined by the World Health Organization.

Effect Level	Description
No Observed Effect Level (NOEL)	This is the noise level below which no effect can be detected. Below this level, there is no detectable effect on health and quality of life due to the noise.
Lowest Observed Adverse Effect Level (LOAEL)	This is the level above which adverse effects on health and quality of life can be detected.
Significant Observed Adverse Effect Level (SOAEL)	This is the level above which significant adverse effects on health and quality of life occur.

It is noted that NPSfE also advises that the general principle that increases in ambient noise should be 'minimised', needs to be considered in context for each site and, in this regard, states:

'Of course, taken in isolation and to a literal extreme, noise minimisation would mean no noise at all. In reality, although it has not always been stated, the aim has tended to be to minimise noise as far as is reasonably practical… the application of the NPSfE should enable noise to be considered alongside other relevant issues and not to be considered in isolation. In the past, the wider benefits of a particular…development or other activity may not have been given adequate weight when assessing the noise implications'.

Noise Policy Statement for England (NPSE) (Department for Environment, Food & Rural Affairs, 2010) advises that noise impacts should be assessed on the basis of adverse and significant adverse effect but does not provide any specific guidance on assessment methods or numerical noise limits.

4.3 Planning Practice Guidance.

Online Planning Practice Guidance (PPG) (Ministry of Housing, Communities & Local Government, 2019) has been published to provide greater details in relation to the relevance of noise to the planning process following the introduction of NPPF and NPSE.

This guidance states, under the heading *'How can noise impacts be determined'*, that the following should be considered by local authorities:

- *'whether or not a significant adverse effect is occurring or likely to occur;*
- *whether or not an adverse effect is occurring or likely to occur; and*
- *whether or not a good standard of amenity can be achieved.'*

In line with NPSE, this includes identifying where noise exposure is above or below the significant observed adverse effect level and the lowest observed adverse effect level for a given situation during the operation of the Proposed Development.

Further guidance on each of the various observed effect levels set out in NPSE is provided in the table contained within the section headed *'How can it be established whether noise is likely to be a concern?'* which is reproduced below.

Perception	Example of outcomes	Increasing effect level	Action
Not present	No effect	No Observed Effect	No specific measures required
No Observed Adverse Effect Level			
Present and not intrusive	Noise can be heard, but does not cause any change in behaviour, attitude or other physiological response. Can slightly affect the acoustic character of the area but not such that there is a change in the quality of life.	No Observed Adverse Effect	No specific measures required
Lowest Observed Adverse Effect Level			
Present and intrusive	Noise can be heard and causes small changes in behaviour, attitude or other physiological response, e.g. turning up volume of television; speaking more loudly; where there is no alternative ventilation, having to close windows for some of the time because of the noise. Potential for some reported sleep disturbance. Affects the acoustic character of the area such that there is a small actual or perceived change in the quality of life.	Observed Adverse Effect	Mitigate and reduce to a minimum
Significant Observed Adverse Effect Level			

Perception	Example of outcomes	Increasing effect level	Action
Present and disruptive	The noise causes a material change in behaviour, attitude, or other physiological response, e.g. avoiding certain activities during periods of intrusion; where there is no alternative ventilation, having to keep windows closed most of the time because of noise. Potential for sleep disturbance resulting in difficulty in getting to sleep, premature awakening and difficulty in getting back to sleep. Quality of life diminished due to change in acoustic character of the area.	Significant Observed Adverse Effect Level	Avoid
Present and very disruptive	Extensive and regular changes in behaviour, attitude or other physiological response and/or an inability to mitigate effect of noise leading to psychological stress, e.g. regular sleep deprivation/awakening; loss of appetite, significant, medically definable harm, e.g. auditory and non-auditory.	Unacceptable Adverse Effect	Prevent

It is important to note that no specific noise parameters or target noise levels are defined in the text.

In the absence of specific guidance for the assessment of environmental noise within NPPF, NPSfE and PPG, it is considered appropriate to base assessment on a combination of current British Standards, national guidance and local planning policy.

4.4 BS 8233: 2014.

BS 8233:2014 'Guidance on sound insulation and noise reduction for buildings' is the current British Standard providing guidance for acoustic requirements within buildings. It is expected that the proposed new development would need to achieve the BS 8233 criteria at the nearest dwellings.

The BS 8233 internal design criteria for new dwellings are as follows:

Activity	Location	07:00 to 23:00	23:00 to 07:00
Resting	Living Rooms	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 $L_{Aeq,8hour}$

BS 8233 Section G1 advises that, where windows are open for ventilation, then sound reduction is limited to 15dB. The Standard does, however acknowledge that additional sound reduction will result from room effect. Available site test data for a furnished room indicates that the typical sound reduction from outside to inside is approximately 20dB for mid frequencies when windows are open 100mm.

For gardens and terraces, BS8233 states that it is desirable that the steady noise level does not exceed $L_{Aeq,T}$ 50 dB whilst a level of $L_{Aeq,T}$ 55 dB would be acceptable in noisier environments.

4.5 BS 4142: 2014.

BS4142:2014 'Methods for rating and assessing industrial and commercial sound' is the current British Standard providing guidance for assessment of noise impact from industrial and commercial sites. In general, the likelihood of adverse impact for a particular noise is dependent upon factors including the margin by which it exceeds the background noise level, the character of the noise and its occurrence. The Standard recommends the determination of the Rating Level of the specific source and advises a correction factor of between +3dB and +9dB if the sound has a tonal quality, is intermittent or impulsive or has any other distinct characteristics which would make it more noticeable.

The degree of impact is assessed by comparing the measured background level with the Rating Level. Where the Rating Level exceeds the background, the level of impact increases as shown below:

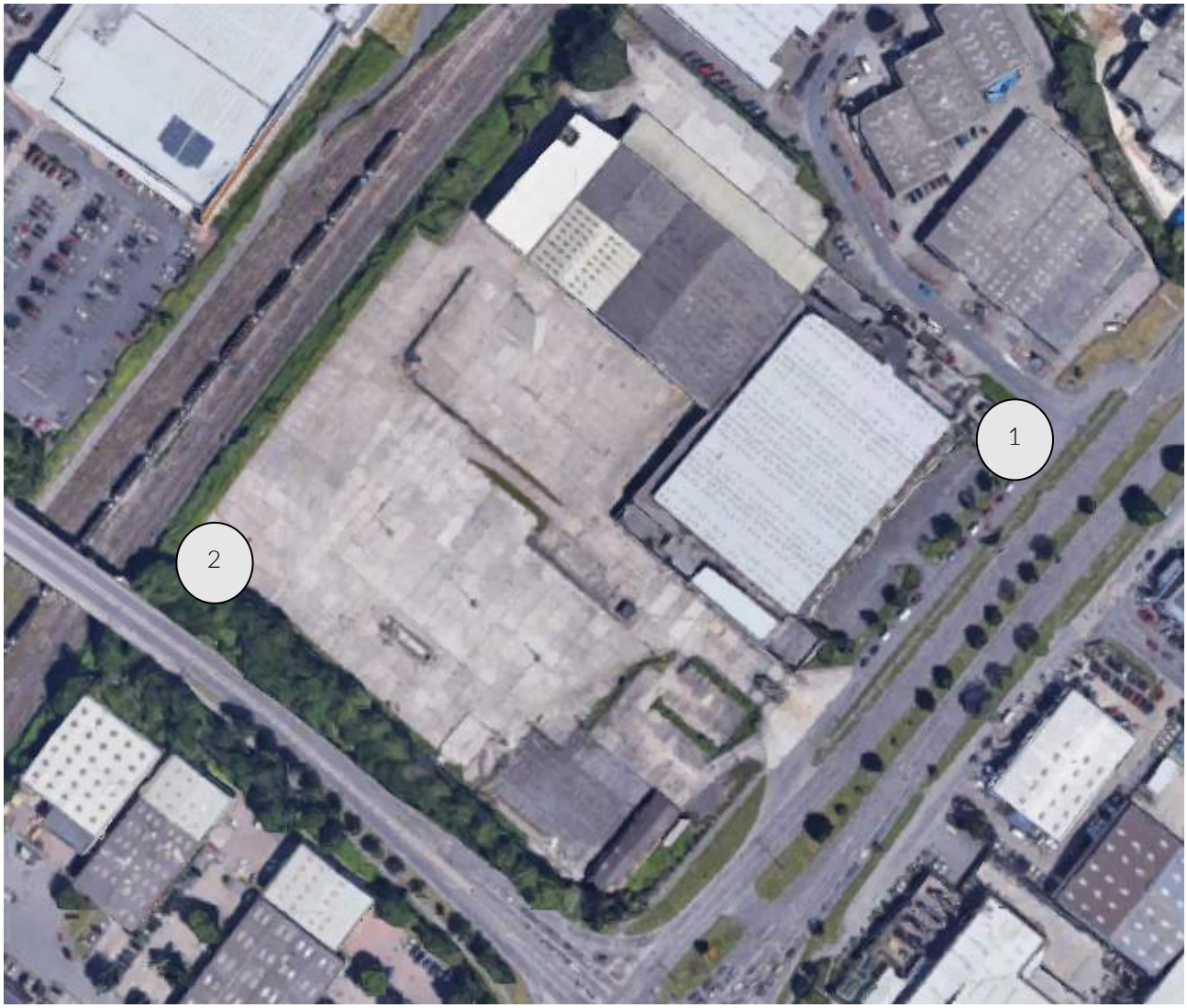
Comparison with background	Assessment
+0 dB or below measured background	Low impact
+ 5 dB	Adverse impact
+ 10 dB or more above measured background	Significant adverse impact

It should be noted that the assessment method applies to free-field external sound levels.

5. Measurements.

Sound level measurements were undertaken at the site over the period Thursday 11th to Monday 15th November 2021 to determine the diurnal noise climate. It is considered that the lowest background sound levels will occur at the weekend.

Levels were recorded continuously in 15-minute samples at two positions – L1 and L2 – as indicated below.



Measurements were made to determine the equivalent continuous sound level, L_{Aeq}, the short duration level L_{Amax} and also the percentiles L_{A10} and L_{A90}.

Weather conditions over the survey period were predominantly dry. Wind speeds over the course of the survey were sufficiently low for environmental noise monitoring.

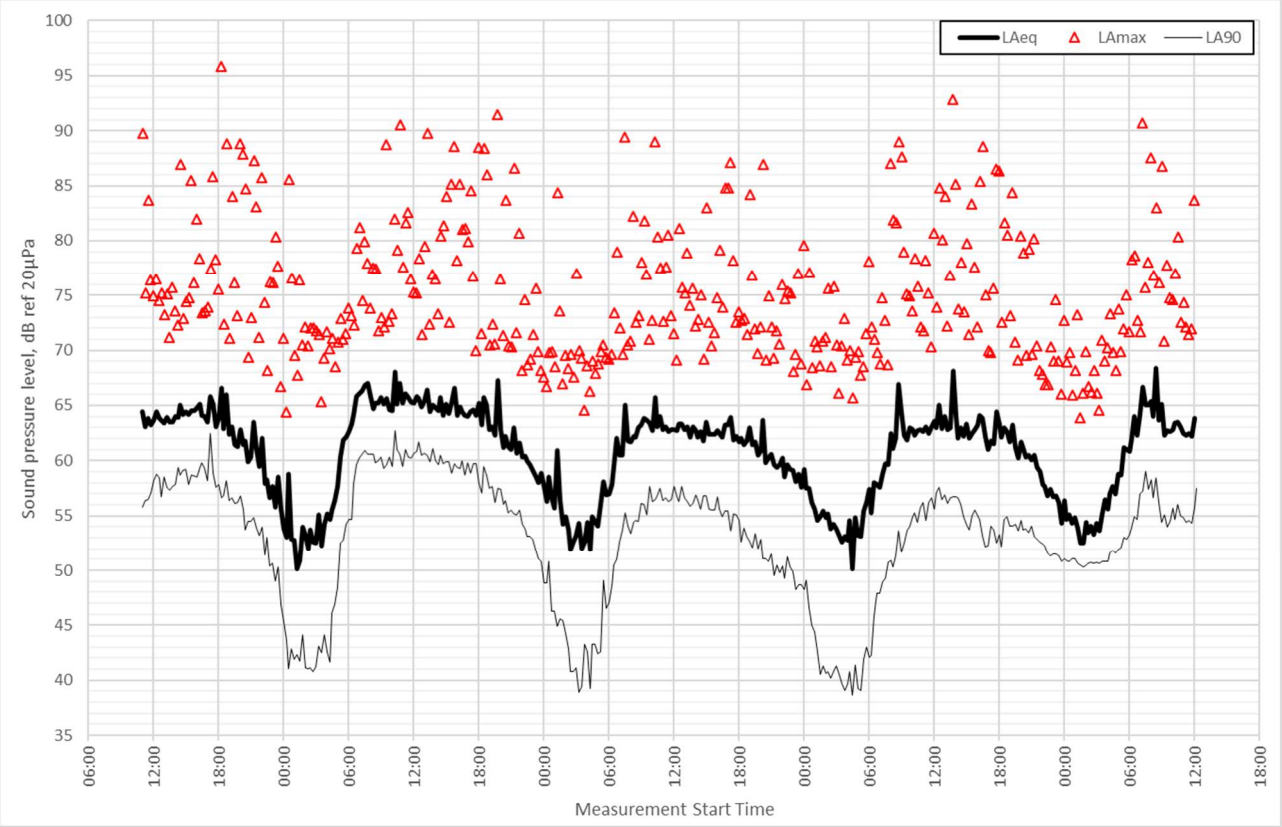
All measurements were made with calibrated, precision grade sound level meters in accordance with BS EN 60651 and BS 7445:1993. Details of the equipment used are provided in Appendix 5 – List of Measurement Equipment. All equipment was calibration-checked before and after the survey with no significant drift observed.

6. Results.

The results of all diurnal site measurements are tabulated in Appendix 2. Levels are shown as hourly values derived from the measured 15-minute sample results.

6.1 Position L1 (East)

The measured levels are shown graphically below.



The following table summarises the average sound levels at the measurement position.

Period	L_{Aeq}, dB	L_{Amax}, dB	L_{A90}, dB
Thursday (11:00 – 23:00)	63.5	76 – 96	52.2
Thursday night	58.5	72 – 86	41.0
Friday	64.8	75 – 92	53.6
Friday night	56.9	69 – 84	40.7
Saturday	62.4	72 – 89	50.3
Saturday night	56.0	70 – 80	40.1
Sunday	62.5	70 – 93	49.2
Sunday night	57.8	70 – 79	50.6
Monday (07:00 – 12:00)	64.2	74 - 91	54.5

The mean daytime ambient noise level was $L_{Aeq,16hr}$ 63.5dB.

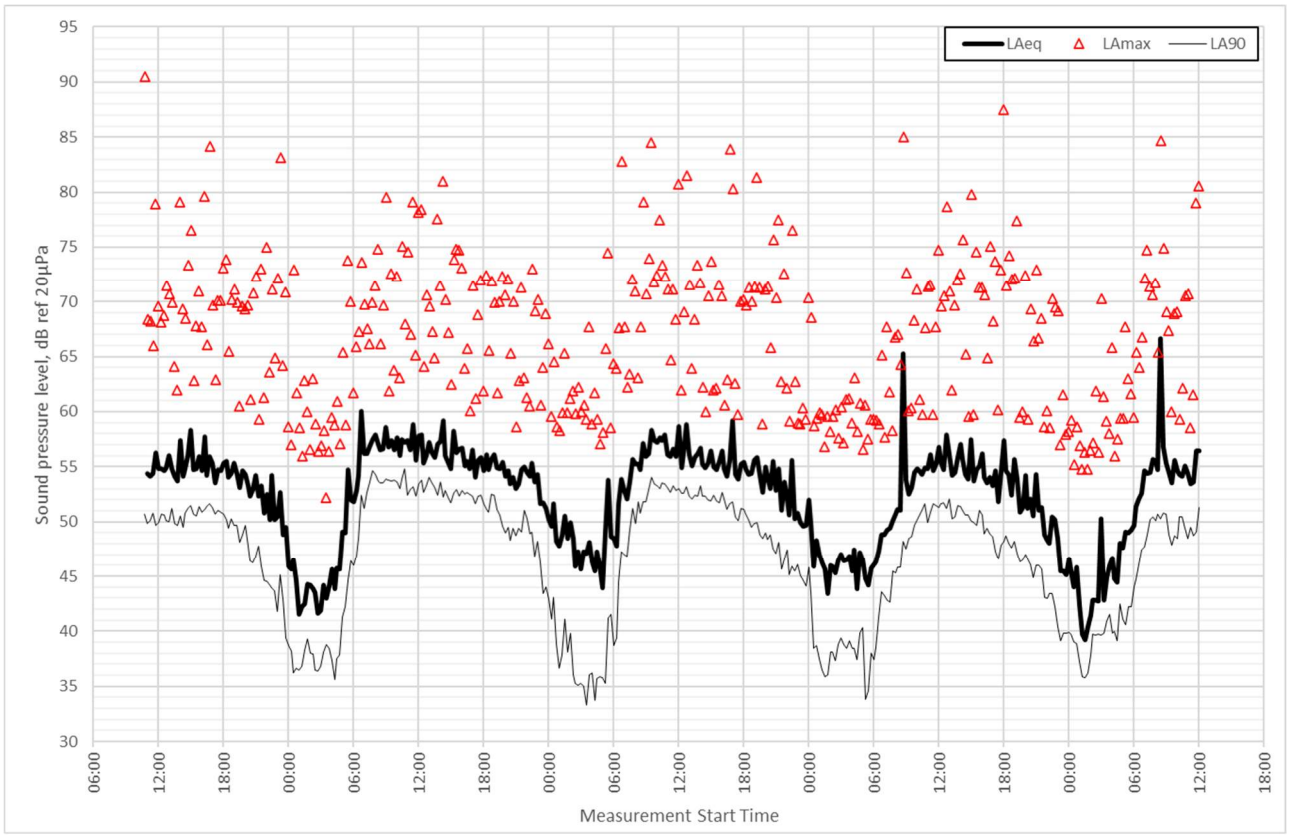
The mean night time ambient noise level was $L_{Aeq,8hr}$ 57.4dB.

The typical lowest background sound level was $L_{A90,1hour}$ 52dB during the day and $L_{A90,15\text{-}min}$ 41dB during the night.

It is considered that sound levels at Position L1 are representative of those at the nearest dwellings to the site located across Eastern Avenue at the junction with York Road.

6.2 Position L2 (West)

The measured levels are shown graphically below.



The following table summarises the average sound levels at the measurement position.

Period	L_{Aeq}, dB	L_{Amax}, dB	L_{A90}, dB
Thursday (11:00 – 23:00)	54.7	70 - 84	44.1
Thursday night	50.0	58 - 83	37.1
Friday	56.2	70 81	48.8
Friday night	49.7	62 – 83	34.9
Saturday	55.6	71 – 85	46.0
Saturday night	47.4	60 – 70	36.5
Sunday	54.8	68 – 88	43.0
Sunday night	47.2	57 – 70	36.3
Monday (07:00 – 12:00)	57.2	69 - 85	49.0

The mean daytime ambient noise level was $L_{Aeq,16hr}$ 55.6dB.

The mean night time ambient noise level was $L_{Aeq,8hr}$ 48.8dB.

The typical lowest background sound level was $L_{A90,1hour}$ 46dB during the day and $L_{A90,15\text{-}min}$ 36dB during the night.

7. Calculations.

7.1 Noise break-out from the buildings.

Sound transfer to outside from activity within each of the buildings will be determined by the sound reduction provided by the building fabric and by the distance between the building and the receptor. The nearest dwelling across Eastern Avenue is approximately 130 metres from the north eastern corner of Unit 14. It is expected that noise break-out from Units 1 to 8 will be significantly lower as a result of increased distance and the screening provided by Units 9 to 14.

It is understood that the main building fabric will be constructed from steel frame with an outer cladding. As a worst case, it is assumed that the outer cladding will be composite thermal panels with a minimum manufacturer's rated sound reduction of R_w 27/mean 25dB(A).

Archive data from measurement exercises carried out in several large manufacturing workshops indicate reasonably consistent levels in the range L_{Aeq} 75-77dB with an overall mean level of $L_{Aeq,1hr}$ 76dB and highest maximum levels in the range L_{Amax} 90-95dB. These levels are quite loud and would require shouted conversation for communication between two individuals 1m apart. For warehouse operations, a recent measurement exercise within an existing warehouse facility indicated that, over a one hour period in an active section of the warehouse, typical sound levels were in the range $L_{Aeq,5\text{-}min}$ 50-64dB with an overall mean level of $L_{Aeq,\ 1\text{-}hour}$ 59dB. Short duration maximum levels were in the range L_{Amax} 80-82dB.

The assessment below is based on the higher manufacturing sound levels. On this basis, the break-out sound level just outside the building, from standard theory, would be approximately L_{Aeq} 45dB.

For positions at a significant distance from the proposed building, there will be additional distance attenuation and an accepted method of determining noise breakout is as follows:

$$spl_{ext} = spl_{int} - TL - 20\log r + 10\log s - 14dB$$ where r is the distance and s is wall area

The predicted break-out sound levels are as follows:

Parameter	Units 9 to 14
spl_{int}	76dB(A)
-TL	-25
-20logr	-45.1 (180m mid-point))
+10logs	28.9 (784m^2)
-14	-14
spl_{ext}	20.8 dB(A)

Assessment of the calculated immission levels in accordance with BS 4142 is shown below

Parameter	Units 9 to 14	
	Day	Night
spl_{ext}	21	21
Character correction (intermittent)	+3	+3
Rating level at nearest dwelling	24	24
Typical lowest night time background $L_{A90,\,T}$	52	41
Difference	-28	-17
BS4142 Assessment- impact	'low impact'	'low impact'

The assessment indicates a BS 4142 condition of 'low impact' during both the day and night at the nearest sensitive dwellings

It is noted that the assessment indicates that a significantly higher internal operational sound level would still achieve a condition of 'low impact' at all times at the nearest dwellings.

7.2 HGV Impact.

Based upon the current proposed site layout shown in Appendix 1, no section of the service yards across the development other than Unit 8 will be visible from the nearest dwellings on the far side of Eastern Avenue due to the screening effect of the intervening units 9 to 14 and the existing buildings to the north of Chancel Close. On this basis, the HGV impact will be limited to the movement of vehicles traversing the section of access road located closest to Eastern Avenue – it assumed that all HGVs will access the site via Chancel Close.

An assessment of the noise from HGV movements at the development on nearest sensitive dwellings has been based upon the following assumptions:

- 1 movement per loading bay per hour during the daytime (total 32 movements)
- 1 movement per unit in any 15 period during the night (32/4 = 8 movements per 15-minutes)
- The approximate maximum vehicle traverse distance is 70m which would take approximately 16 seconds at 10mph.
- HGV reversing time of 11 seconds based upon a reversing distance of 25m at a speed of 5mph
- Source noise data from HLA archived measurements
- Point source attenuation

7.2.1 HGV Movements

	Units 1 to 14	
Parameter	Day	Night
Archive HGV noise level ($L_{Aeq,T}$ at 2m)	75.1	75.1
On time correction *(16 seconds)*	-23.5	-17.5
Specific Noise Level – $L_{Aeq,T}$ dB	51.6	57.6
movements in assessment period (dB)	+15.1 (32)	+9.0 (8)
Distance Attenuation (mid-point)	-36.9 (140m)	-36.9 (140m)
Level at Dwelling - L_{Aeq}	29.8	29.7

7.2.2 HGV Reversing Alarms

Manufacturer's data indicates that, for tonal alarms, the most common rating level is SWL 96-98dB. For the purposes of the assessment, the common tonal noise alarm has been assumed with each alarm having a 1-second on/off cycle.

HGV Reversing Alarms	Unit 8	
Parameter	Day	Night
SWL	98dB	98dB
Alarm noise level (L_{Aeq} at 1m)	87	87
On time correction *(11 seconds)*	-25.1	-19.1
Specific Noise Level – $L_{Aeq,T}$ dB	61.9	67.9
movements per assessment period (dB)	+0 (1)	+0 (1)
Distance Attenuation	-44.6 (170m)	-44.6 (170m)
Level at Dwelling - L_{Aeq}	17.3	23.3

7.2.3 BS4142 Assessment.

From the above, the BS 4142 assessment for vehicle movements at the nearest dwellings to the north can be calculated as follows:

	Units 1 to 14			
	Day		Night	
	HGV	Alarm	HGV	Alarm
spl L_{Aeq}	30	17	30	23
correction (intermittent +3, tonal +2)	+3	+5	+3	+5
Rating Level at dwelling - L_{Aeq}	33	22	33	28
Total Rating level	33		34.2	
Typical lowest background	52		41	
Difference	-19		-6.8	
BS4142 Assessment	'low impact'		'low impact'	

7.3 Mechanical Services plant.

Mechanical services installations associated with the development are not yet known and, consequently, BS 4142 assessment cannot be carried out. However, noise limit criteria for the development can be determined from the measured background sound levels and the guidance in BS 4142.

The maximum allowable total cumulative plant noise level associated with the development can be determined in accordance with BS4142 and based upon a Rating Level no greater than the background sound level. This is equivalent to a BS 4142 assessment of 'low impact'.

The typical lowest L_{A90} values measured during the survey have been used as the basis of the assessment.

The total cumulative plant noise limits are derived as follows:

Parameter	Day	Night
Lowest typical L_{A90} level (1-hour day, 15-min night)	52	41
Noise character correction (BS4142 Annex 1))	-3	-3
Plant noise limit level at any dwelling - L_{Aeq}	49	38

The above limit criteria are the cumulative levels for all plant operating at rated output.

Noise control measures may be required to achieve these levels and it will be necessary to review plant selections and locations during the construction phase.

8. Discussion.

8.1 Existing Noise Climate.

The general ambient noise climate across the site is attributable to traffic flows on Eastern Avenue and other nearby roads. Additional intermittent noise is also generated by rail movements to the west of the site

The majority of noise from the roads is attributable to tyre 'roar' which has a characteristic mid-frequency tonal peak whilst noise from the railway during train pass-by has similar characteristics.

Traffic levels on the surrounding roads were moderate throughout the survey period and were mainly composed of car movements with but with intermittent HGV movements associated with other commercial and industrial units in the local vicinity.

8.2 BS8233 Assessment.

British Standard BS 8233:2014 provides guidance on acceptable sound levels in and around dwellings and it would be expected that the new development should not give rise to noise levels that exceed the design criteria in the standard.

BS 8233 advises internal noise level of L_{Aeq} 35dB daytime and L_{Aeq} 30dB night time. It must be assumed that windows may be open for ventilation and BS 8233 advises that an open window provides a sound reduction of 15dB. From this information, it may be extrapolated that external levels should not exceed L_{Aeq} 50dB daytime and L_{Aeq} 45dB night time.

The highest calculated immission level for break-out from the warehouse units is L_{Aeq} 25dB at the nearest dwellings to the east. The calculated levels would enable the BS 8233 internal criteria to be readily achieved with open windows.

The calculated levels for HGV activity within the service yard incident at dwellings to the south are below L_{Aeq} 30dB for both the daytime and night time. These levels would readily achieve the BS8233 internal criteria when windows are open.

In the case of gardens at the nearest dwellings, the calculated immission levels during daytime are significantly below the BS 8233 preferred limit level of L_{Aeq} 50dB.

8.3 BS4142 Assessment.

In the case of noise breakout from the warehouse buildings, the calculations indicate that immission levels would achieve a BS 4142 condition of 'low impact' at all times at the nearest dwellings.

It is noted that the assessment is based upon internal operational noise levels typical of engineering/manufacturing use and for warehouse type use, break-out sound levels will be significantly lower than indicated by the assessment. Noise break-out at the operational levels assumed is unlikely to be of significance due to the masking effect of general ambient noise.

The calculations shown in Section 7 indicate that all vehicle related activity on the service yards at the proposed new development would achieve a BS 4142 condition of 'low impact' at the nearest dwellings at all times of the day and night.

In the case of noise from vehicle movement, it is noted that vehicle movement is not a continuous operation and that there will be no noise from this source for the majority of the day.

For vehicle reversing alarms, the assessment indicates that night time use falls within the category of 'low impact' at all times. Given the infrequent and short duration of this noise, it is considered that impact upon the dwellings would be negligible.

Section 7 derives plant noise limit levels for the development which would enable a BS 4142 condition of 'low impact' to be achieved at all nearby dwellings at all times.

9. Recommendations.

It is recommended that all fixed mechanical services plant associated with the new development be selected and specified to achieve the noise limit criteria derived at Section 7.3 of this report. It will be necessary to review plant selections and locations during the construction phase to ensure compliance with the criteria.

The assessments provided in this report do not indicate any specific adverse impacts that require control measures. However, it will be beneficial to minimise unnecessary noise generation from day to day activities and this can be achieved with suitable good housekeeping measures. Such measures might include:

- instruction/induction procedures to all site personnel of the requirement, wherever practicable, to minimise noise emissions
- placement of prominent signs at key locations instructing visiting personnel of the need to minimise noise emissions
- instruction to all drivers to turn off the engines of stationary vehicles
- instruction to drivers to use vehicle horns only in cases of emergency
- instruction to drivers to switch off vehicle radios when on site
- minimise the number of external storage areas and waste skips and restrict the disposal times to daytime only

10. Conclusions.

Assessment carried out for this report indicates that the noise climate in the vicinity of the proposed development site is mostly attributable to road traffic noise. It is considered that this noise will determine background sound levels at existing dwellings nearest to the development site.

Assessment of activity noise levels for the proposed development indicates that the BS 8233 daytime and night time internal and external criteria for new dwellings would readily be achieved at the nearest residential properties. BS 8233 internal criteria would be achieved with open windows at the nearest dwellings.

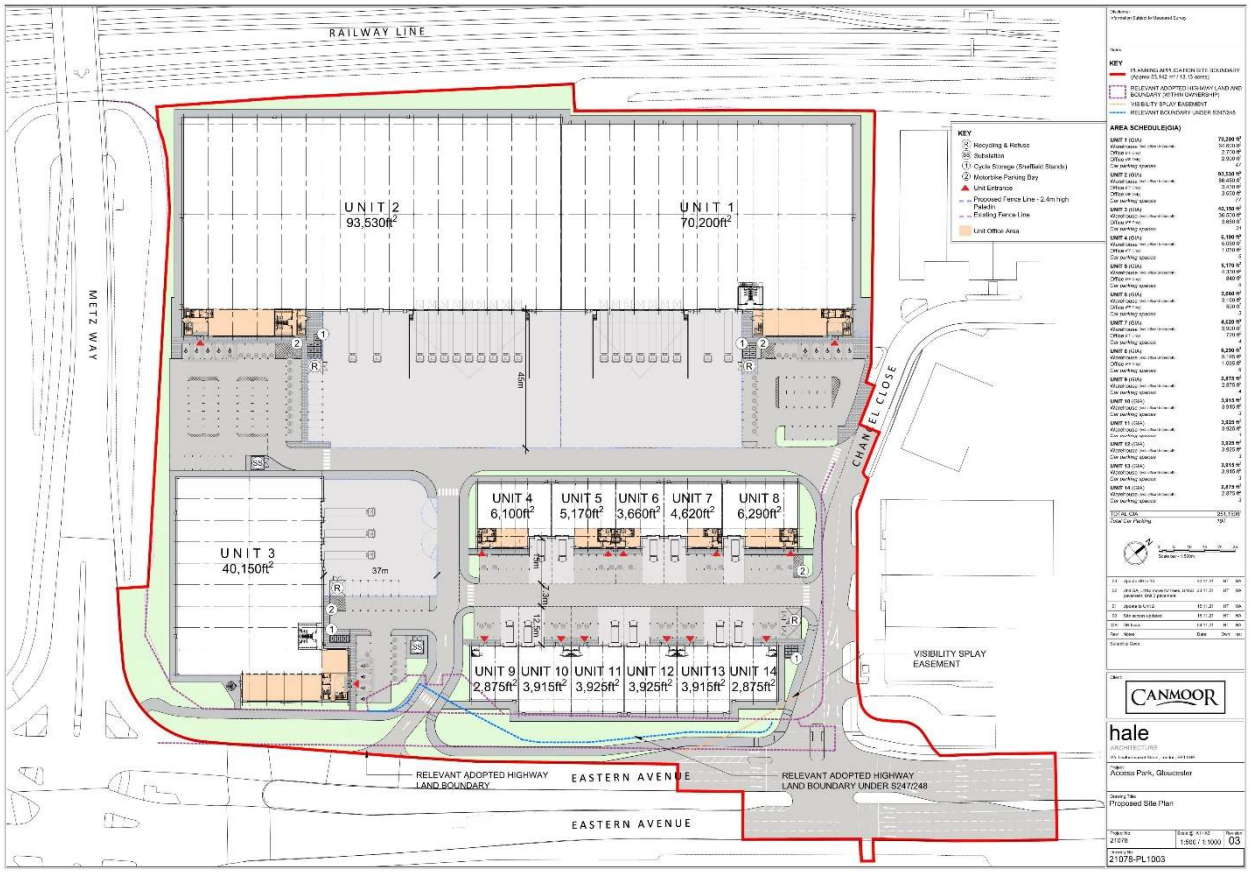
Assessment of activity noise levels in accordance with BS 4142 indicates that noise from the proposed development would achieve a condition of 'low impact' at the nearest existing residential properties at all times and would be unlikely to give rise to noise disturbance.

It is noted that the predicted noise levels at the dwellings from the proposed development are significantly below the existing ambient and background noise climate and, consequently, are unlikely to be noticeable.

It will be necessary to implement noise limit criteria for any plant installations associated with the proposed new development in order to prevent disturbance at the nearest residential properties. Limit criteria in this respect have been determined in accordance with BS 4142:2014.

It is noted that the proposed development does not represent the introduction of new noise sources to this site and noise from plant, HGV movements and loading and unloading activities will have occurred previously at the development site. Similar activities occur at existing commercial and industrial premises which are closer to the nearest dwellings than the proposed development.

Appendix 1 – Proposed Site Layout.



Appendix 2 – Measured Sound Pressure Levels.

Position L1 (East)

Date	Day	From:	To:	$L_{eq,1hr}$	$L_{max,1hr}$	$L_{10,1hr}$	$L_{90,1hr}$
11/11/2021	Thursday	11:00	11:59	63.7	89.8	66.2	56.5
		12:00	12:59	63.9	76.5	66.8	58.0
		13:00	13:59	63.6	75.7	66.6	57.8
		14:00	14:59	64.3	86.9	67.0	58.8
		15:00	15:59	64.4	85.5	67.0	58.6
		16:00	16:59	64.5	82.0	67.0	59.3
		17:00	17:59	64.5	85.8	66.7	59.3
		18:00	18:59	65.1	95.8	66.3	57.4
		19:00	19:59	62.1	84.0	64.8	56.3
		20:00	20:59	61.6	88.8	63.4	55.2
		21:00	21:59	61.4	87.3	63.1	54.1
		22:00	22:59	59.2	85.7	61.3	52.2
		23:00	23:59	57.1	80.3	60.0	49.2
12/11/2021	Friday	00:00	00:59	55.4	85.6	57.1	43.2
		01:00	01:59	52.2	76.4	55.5	42.5
		02:00	02:59	52.9	72.1	56.1	41.0
		03:00	03:59	53.7	71.8	57.1	42.7
		04:00	04:59	55.5	71.7	59.3	44.3
		05:00	05:59	60.8	72.9	64.6	52.0
		06:00	06:59	64.1	79.3	67.5	56.7
		07:00	07:59	66.6	81.2	69.5	60.6
		08:00	08:59	65.2	77.5	68.0	60.3
		09:00	09:59	65.3	88.7	67.9	59.9
		10:00	10:59	66.4	90.5	68.4	61.0
		11:00	11:59	65.6	82.6	67.9	60.3
		12:00	12:59	65.4	78.4	67.9	60.9
		13:00	13:59	65.4	89.8	67.6	60.6
		14:00	14:59	64.8	81.4	67.4	60.0

Date	Day	From:	To:	$L_{eq,1hr}$	$L_{max,1hr}$	$L_{10,1hr}$	$L_{90,1hr}$
		15:00	15:59	65.4	88.6	67.2	59.6
		16:00	16:59	64.4	85.1	66.8	59.4
		17:00	17:59	64.3	84.5	66.8	59.5
		18:00	18:59	64.9	88.5	66.4	58.3
		19:00	19:59	64.4	91.5	66.0	57.2
		20:00	20:59	61.9	83.7	64.9	56.3
		21:00	21:59	61.7	86.6	64.3	55.3
		22:00	22:59	60.1	74.6	63.4	53.6
		23:00	23:59	58.7	75.6	61.9	51.7
13/11/2021	Saturday	00:00	00:59	57.4	69.9	60.9	48.7
		01:00	01:59	57.6	84.4	60.4	45.6
		02:00	02:59	53.4	69.6	57.0	42.2
		03:00	03:59	53.1	77.0	56.5	40.7
		04:00	04:59	54.1	69.0	58.0	42.1
		05:00	05:59	56.5	70.5	60.5	45.2
		06:00	06:59	59.5	79.0	62.8	49.3
		07:00	07:59	62.4	89.4	65.2	53.9
		08:00	08:59	62.3	82.2	65.9	54.2
		09:00	09:59	63.5	81.8	66.6	56.2
		10:00	10:59	64.0	89.0	66.5	56.8
		11:00	11:59	62.8	80.5	65.8	56.5
		12:00	12:59	63.0	81.1	65.8	57.1
		13:00	13:59	62.8	78.9	65.6	56.2
		14:00	14:59	62.3	75.0	65.4	56.5
		15:00	15:59	62.7	83.0	65.8	55.9
		16:00	16:59	62.6	84.8	65.5	55.7
		17:00	17:59	62.9	87.1	65.5	54.8
		18:00	18:59	61.7	73.5	65.6	53.6
		19:00	19:59	61.7	84.2	65.0	52.6
		20:00	20:59	61.4	86.9	64.5	51.5

Date	Day	From:	To:	$L_{eq,1hr}$	$L_{max,1hr}$	$L_{10,1hr}$	$L_{90,1hr}$
		21:00	21:59	59.8	72.1	63.7	50.3
		22:00	22:59	59.4	76.0	62.9	50.3
		23:00	23:59	58.4	77.0	62.1	48.9
14/11/2021	Sunday	00:00	00:59	57.7	79.6	61.5	47.2
		01:00	01:59	55.1	70.8	59.3	42.2
		02:00	02:59	54.5	75.8	58.3	40.6
		03:00	03:59	53.2	72.9	57.2	40.2
		04:00	04:59	53.4	70.0	57.2	40.1
		05:00	05:59	54.7	71.5	59.0	40.8
		06:00	06:59	57.2	78.1	61.5	44.5
		07:00	07:59	59.0	74.8	63.0	49.2
		08:00	08:59	63.8	89.0	65.1	51.5
		09:00	09:59	63.0	87.6	66.1	53.0
		10:00	10:59	62.7	78.4	65.7	55.1
		11:00	11:59	62.8	78.2	66.0	55.9
		12:00	12:59	63.7	84.8	66.2	56.7
		13:00	13:59	65.1	92.8	66.1	56.6
		14:00	14:59	62.9	85.1	65.6	56.1
		15:00	15:59	62.7	83.3	65.8	54.6
		16:00	16:59	63.4	88.6	66.1	53.8
		17:00	17:59	62.4	86.5	65.3	53.2
		18:00	18:59	62.8	86.3	65.9	53.8
		19:00	19:59	61.7	84.4	64.8	54.0
		20:00	20:59	61.0	80.4	64.3	53.9
		21:00	21:59	59.8	80.2	63.2	53.2
		22:00	22:59	57.4	70.3	60.9	51.9
		23:00	23:59	56.1	74.6	59.1	51.3
15/11/2021	Monday	00:00	00:59	55.2	72.7	58.1	51.0
		01:00	01:59	53.5	73.2	55.3	50.6
		02:00	02:59	53.8	69.9	55.9	50.6

Date	Day	From:	To:	$L_{eq,1hr}$	$L_{max,1hr}$	$L_{10,1hr}$	$L_{90,1hr}$
		03:00	03:59	55.0	70.9	57.7	50.7
		04:00	04:59	56.9	73.3	60.3	51.5
		05:00	05:59	60.1	75.0	64.0	52.5
		06:00	06:59	62.4	78.6	65.8	54.2
		07:00	07:59	65.3	90.7	68.0	57.7
		08:00	08:59	65.8	87.5	67.4	57.4
		09:00	09:59	63.3	86.8	66.0	54.5
		10:00	10:59	63.2	80.3	66.3	55.4
		11:00	11:59	62.4	74.3	65.8	54.5

Position L2 (West)

Date	Day	From:	To:	$L_{eq,1hr}$	$L_{max,1hr}$	$L_{10,1hr}$	$L_{90,1hr}$
11/11/2021	Thursday	11:00	11:59	54.9	78.9	56.5	50.1
		12:00	12:59	54.8	71.5	56.7	50.3
		13:00	13:59	54.7	70.7	56.7	50.2
		14:00	14:59	55.8	79.1	57.0	50.5
		15:00	15:59	56.2	76.5	57.5	51.0
		16:00	16:59	55.8	84.2	56.4	51.3
		17:00	17:59	54.6	70.1	56.2	51.0
		18:00	18:59	54.8	73.9	56.3	50.2
		19:00	19:59	54.4	71.1	56.4	49.1
		20:00	20:59	53.3	70.8	55.6	47.5
		21:00	21:59	52.8	73.0	55.1	46.3
		22:00	22:59	52.1	75.0	54.0	44.1
		23:00	23:59	50.6	83.1	52.5	42.3
12/11/2021	Friday	00:00	00:59	45.7	72.9	48.9	37.4
		01:00	01:59	42.8	62.8	44.8	37.7
		02:00	02:59	43.4	63.0	46.0	37.2
		03:00	03:59	43.4	58.3	46.0	38.0
		04:00	04:59	45.2	60.9	48.8	37.1

Date	Day	From:	To:	$L_{eq,1hr}$	$L_{max,1hr}$	$L_{10,1hr}$	$L_{90,1hr}$
		05:00	05:59	51.9	73.8	53.5	43.6
		06:00	06:59	56.0	73.6	57.9	48.5
		07:00	07:59	56.7	69.9	58.6	53.0
		08:00	08:59	57.0	74.8	58.7	53.8
		09:00	09:59	57.4	79.5	58.8	53.8
		10:00	10:59	57.1	75.1	58.6	53.8
		11:00	11:59	57.2	79.1	58.2	52.7
		12:00	12:59	56.9	78.4	57.7	53.3
		13:00	13:59	56.6	77.6	58.0	53.3
		14:00	14:59	57.2	81.0	57.9	52.7
		15:00	15:59	56.6	74.8	57.8	52.4
		16:00	16:59	55.6	73.1	57.1	52.6
		17:00	17:59	55.6	72.0	56.8	52.2
		18:00	18:59	55.3	72.4	56.9	51.5
		19:00	19:59	55.3	72.3	57.2	50.9
		20:00	20:59	54.0	72.1	56.4	49.1
		21:00	21:59	54.1	71.3	56.2	49.6
		22:00	22:59	54.4	73.0	56.6	48.8
		23:00	23:59	52.4	70.2	54.9	45.5
13/11/2021	Saturday	00:00	00:59	50.1	66.2	53.4	41.5
		01:00	01:59	49.0	65.3	52.7	38.4
		02:00	02:59	48.1	62.2	51.9	36.6
		03:00	03:59	47.1	67.7	51.2	34.9
		04:00	04:59	46.3	61.7	50.4	35.4
		05:00	05:59	50.2	74.5	51.5	38.5
		06:00	06:59	51.1	82.8	53.0	42.5
		07:00	07:59	53.8	72.1	55.6	48.6
		08:00	08:59	55.7	79.1	57.1	51.1
		09:00	09:59	57.1	84.5	58.2	53.0
		10:00	10:59	57.5	77.5	58.5	53.3

Date	Day	From:	To:	$L_{eq,1hr}$	$L_{max,1hr}$	$L_{10,1hr}$	$L_{90,1hr}$
		11:00	11:59	56.1	71.1	57.6	53.0
		12:00	12:59	57.5	81.5	57.6	52.9
		13:00	13:59	55.8	73.4	57.1	52.3
		14:00	14:59	55.6	71.7	57.1	52.5
		15:00	15:59	55.4	73.7	56.9	52.0
		16:00	16:59	55.3	83.9	56.7	51.9
		17:00	17:59	56.2	80.3	57.1	50.9
		18:00	18:59	54.7	71.3	56.2	50.4
		19:00	19:59	54.7	81.3	56.2	49.3
		20:00	20:59	54.5	75.7	55.9	48.4
		21:00	21:59	53.3	77.5	55.0	46.9
		22:00	22:59	52.7	76.5	54.3	46.0
		23:00	23:59	50.0	60.3	53.2	45.0
14/11/2021	Sunday	00:00	00:59	49.6	70.4	52.4	41.6
		01:00	01:59	45.7	59.9	49.4	36.5
		02:00	02:59	45.9	60.2	49.8	38.1
		03:00	03:59	46.7	61.2	50.7	38.9
		04:00	04:59	46.2	63.1	49.8	38.5
		05:00	05:59	45.4	60.6	49.2	36.7
		06:00	06:59	47.3	65.1	50.9	40.2
		07:00	07:59	49.4	67.7	52.6	43.5
		08:00	08:59	59.7	85.0	54.6	46.3
		09:00	09:59	53.5	72.7	55.7	48.6
		10:00	10:59	54.7	71.1	56.6	50.8
		11:00	11:59	55.2	71.6	56.8	51.0
		12:00	12:59	56.4	78.7	57.0	51.5
		13:00	13:59	55.2	72.0	56.6	51.1
		14:00	14:59	55.4	75.7	56.4	50.9
		15:00	15:59	55.5	79.8	56.4	50.2
		16:00	16:59	54.6	75.1	56.1	49.5

Date	Day	From:	To:	$L_{eq,1hr}$	$L_{max,1hr}$	$L_{10,1hr}$	$L_{90,1hr}$
		17:00	17:59	53.7	73.7	55.4	47.6
		18:00	18:59	55.1	87.5	56.3	48.1
		19:00	19:59	53.4	77.4	55.2	47.0
		20:00	20:59	52.2	72.4	54.1	46.2
		21:00	21:59	51.8	72.9	53.8	45.2
		22:00	22:59	49.4	70.3	51.9	43.0
		23:00	23:59	46.4	69.2	49.5	39.8
15/11/2021	Monday	00:00	00:59	45.6	59.2	48.8	39.4
		01:00	01:59	40.6	56.9	42.2	36.3
		02:00	02:59	42.5	61.9	43.9	39.2
		03:00	03:59	46.9	70.3	46.8	40.5
		04:00	04:59	46.2	65.8	48.3	40.4
		05:00	05:59	48.8	67.7	52.2	41.5
		06:00	06:59	51.6	66.8	54.4	45.6
		07:00	07:59	54.8	74.7	56.6	49.3
		08:00	08:59	61.5	84.7	57.5	50.5
		09:00	09:59	54.8	69.1	57.0	49.0
		10:00	10:59	54.5	70.5	56.6	49.7
		11:00	11:59	54.6	79.0	56.0	49.0

Appendix 3 – Glossary of Terms.

Decibel (dB)

The decibel is the unit used to quantify sound pressure levels. The human ear has an approximately logarithmic response to acoustic pressure over a very large dynamic range (typically 20 micro-Pascals to 100 Pascals). Therefore, a logarithmic scale is used to describe sound pressure levels and also sound intensity and power levels. The logarithm's are taken to base 10. Hence an increase of 10 dB in sound pressure level is equivalent to an increase by a factor of 10 in the sound pressure level (measured in Pascals). Subjectively, this increase would correspond to a doubling of the perceived loudness of sound.

A-Weighting

The 'A' weighting is a correction term applied to the frequency range in order to mimic the sensitivity of the human ear to noise. It is generally used to obtain an overall noise level from octave or third octave band frequencies. An 'A' weighted value would be written as dB(A).

$L_{Aeq,T}$

The A-Weighted equivalent continuous sound level – the sound level of a notionally steady sound having the same energy as a fluctuating sound over a specified measurement period (T). $L_{Aeq,T}$ is used to describe many types of noise and can be measured directly with an integrating sound level meter.

$L_{A90,T}$

The A-Weighted noise level exceeded for 90% of the specified measurement period (T). This is generally taken to indicate the prevailing background noise level.

L_{Amax}

The highest A-Weighted noise level recorded during a noise event.

Appendix 4 – List of measurement equipment.

Measurements

Rion type NL-28 Sound Level Meter	S/N 01260202
Rion type NH-23 pre-amplifier	S/N 60105
Rion type UC-59 Microphone	S/N 282

Additional Equipment

Rion Type NC-74 Calibrator	S/N 34172706

The above equipment fulfils IEC 61672 Class 1 and is traceable to calibration under BS7580:Part 1:1997.

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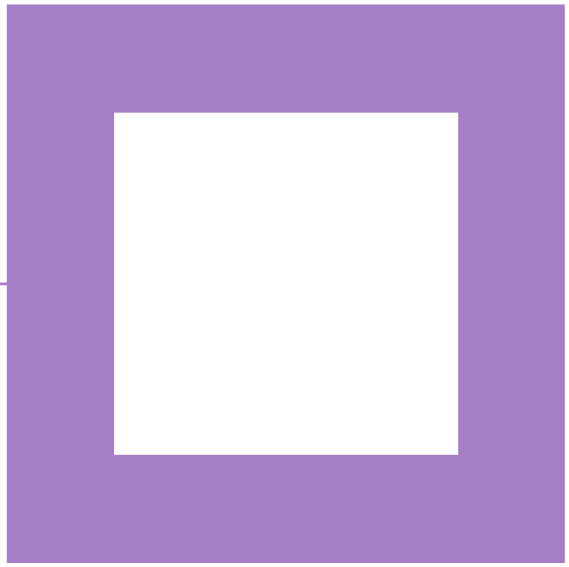
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Access Park, Gloucester

Flood Risk Assessment

21-038_Access Park, Gloucester

24th November 2021



Quality Control

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Revision History

Revision	Revision date	Details	Authorized	Name	Position
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Table of Contents

1. Introduction 4
2. Planning Policy and Evidence 6
3. Site Description 8
4. Existing Flood Risk 10
5. Flood Risk from the Proposed Development 13
6. Conclusion 20

Appendix A Environment Agency Product 4 Data 21
Appendix B Topographical Survey Plan 22
Appendix C Proposed Development Plan 24
Appendix D Public Sewer Map 25
Appendix E Proposed Drainage Strategy Layout 26
Appendix F Hydraulic Calculation 27

Figures

Figure 1: Site Location Plan 8
Figure 2: EA Flood Map for Planning (Source: https://flood-map-for-planning.service.gov.uk/) 10
Figure 3: Surface Water Flood Risk Map. (Source: https://flood-warning-information.service.gov.uk) 11

Tables

Table 1: Collected Data 5
Table 2: Peak rainfall intensity allowance in small and urban catchments (Ref: Flood risk assessments: climate change allowances Guidance by EA, February 2016) 7
Table 3: Summary of flood risk to the Site 12

1. Introduction

I&L Consulting Limited (I&L) was commissioned by the Applicant, Canmoor Developments Ltd, to undertake a Flood Risk Assessment (FRA) for a proposed industrial development located between Metz Way and Eastern Avenue (A38) in Gloucester. The site will be accessed off Eastern Avenue and Chancel Close and lies within the Lead Local Flood Authorities (LLFA) of Gloucestershire County Council (GCC).

The relevant national planning guidance is set out by the National Planning Policy Framework (NPPF, updated in 2021). A FRA is required because the proposed development is over 1 ha. The FRA must assess all aspects of flood risk both to the proposed development itself and also the potential impact on people and property elsewhere within the catchment.

1.1 Study Aims and Objectives

The overall objective of this study was to carry out a FRA that meets the requirements of the NPPF and GCC flood risk policies. These consider surface water runoff management and the specific needs of the Environment Agency (EA), GCC and Seven Trent Water. The study is required to assess all aspects of flood risk to the proposed development, the potential impacts of the development on people and property elsewhere within the catchment and identify possible mitigation measures to ensure that the development is safe in the event of a flood. To achieve this aim, the following key actions were undertaken:

- Obtain flood data from the EA;
- Review topographical and flood risk data to identify the existing flood risk posed to the site from all sources.
- Assess the residual flood risk post-development.
- Consider the vulnerability of the users and the development, taking account of the vulnerability classification.
- Assess the safety of the route of access/egress from the site in a flood event.
- Identify suitable mitigation measures to protect the development site against flooding; and
- The production of a conceptual surface water drainage strategy for the proposed development.

1.2 Scope of Works

In order to meet the above objectives, the following scope of work and tasks were undertaken:

- **Task 1: Data Collection.** I&L Consulting collected relevant available information on the nature of the flooding at the site. The Applicant and their consultant team have provided information about the site and proposed development layout and design.
- **Task 2: Identification of Current and Post-Development Flood Risk.** The existing and post-development flood risk posed to the site was assessed from the data that was collected in Task 1. The assessment identifies the flood risk from all potential sources of flooding and includes consideration of the impact of climate change on flood risk.
- **Task 3: Assessment of Site Safety**. I&L Consulting considered whether flood resilience measures needed to be undertaken and the safety of the route of access/egress from the site.

1.3 Data Collected

Table 1 lists the data that has been collected as part of this assessment. Comments on the source and the nature of the data are also provided.

Table 1: Collected Data

Purpose	Data and Source	Comments
Identification of site location	Ordnance Survey Map	Identifies the position of the site and local hydrological features
Identification of flood risk	Environment Agency Flood Map	Risk of flood from tidal and fluvial sources
	Topographical Survey	Existing site levels and topography
	Development details (drawings for existing site and proposed development)	Information on the layout of the proposed development
	Strategic Flood Risk Assessment (SFRA)	Reports that identify existing flood risk information within the area and considerations for development.
Identification of the existing drainage network	Sitewide Drainage Plan	Asset plans and drainage drawings identify public and private sewers nearest to the site.
Identification of ground conditions	British Geological Society (BGS) BH Logs and site investigation reports	Identifies the type of aquifer, groundwater level, permeability and geotechnical information

2. Planning Policy and Evidence

2.1 National Planning Policy Framework

The NPPF sets out what needs to be taken into account by developers to assess whether a proposed development is likely to be at risk of flooding or has the potential to increase flood risk elsewhere. Within the recently-published updated NPPF (July 2021), the principles relating to flood risk management remain mostly unchanged from the 2012 version.

The overall objective of the NPPF is to steer development towards areas of lowest flood risk. NPPF policy aims to ensure flood risks have been taken into account and appropriate measures put in place to ensure that:

- The development is safe;
- Where possible, the flood risk overall is reduced;
- Increased flood risk does not occur elsewhere; and
- Appropriate mitigation measures are employed to deal with these effects and risks.

Paragraph 167 and footnote 55 of the NPPF outlines that a site-specific flood risk assessment is required for proposals of 1 hectare or greater in Flood Zone 1; all proposals for new development (including minor development and change of use) in Flood Zones 2 and 3, or in an area within Flood Zone 1 which has critical drainage problems (as notified to the local planning authority by the Environment Agency); and where proposed development or a change of use to a more vulnerable class may be subject to other sources of flooding.

The EA Flood Map shows the site to be located within Flood Zone 1.

The NPPF considers the vulnerability of different forms of development to flooding; and classifies the proposed development as ‘Less Vulnerable’.

2.2 Local Planning Policy

The proposed development is located within the administrative area of Gloucester Council which is covered by the South Gloucester Core Strategy, adopted in December 2013. The Core Strategy contains the following in relation to flood risk.

South Gloucestershire Local Plan: Core Strategy adopted December 2013

New development has a significant role to play in managing flood risk by minimising its own surface water run-off through use of Sustainable Drainage Systems (SuDS) and positive land management. SuDS provide a method of discharging surface water in a sustainable way to reduce the risk of flooding and pollution. Some SuDS techniques offer opportunities for environmental and landscape enhancement as well as improving biodiversity and local amenity. Development is required to incorporate SuDS and, where this may not be practicable, an acceptable alternative means of surface water disposal should be used. In instances where SuDS alone cannot provide total surface water drainage solutions, they can be used beneficially in conjunction with conventional piped systems.

2.3 Climate Change

The Flood risk assessments: Climate Change Allowances Guidance published in February 2016 indicates that climate change is currently expected to result in increased rainfall and rising sea levels. Table 2 below shows anticipated changes in extreme rainfall intensity in small and urban catchments.

Table 2: Peak rainfall intensity allowance in small and urban catchments (Ref: Flood risk assessments: climate change allowances Guidance by EA, February 2016)

Applies across all of England	Total potential change anticipated for the '2020s' (2015 to 2039)	Total potential change anticipated for the '2050s' (2040 to 2069)	Total potential change anticipated for the '2080s' (2070 to 2115)
Upper End	10%	20%	40%
Central	5%	10%	20%

3. Site Description

The existing development site which is the subject of this Flood Risk Assessment (FRA) was the former kegged drinks distribution facility, currently consists of approximately 5.29 hectares of brownfield land incl uding a warehouse and associated concrete service yard.

The proposed development will consist of four terraces of industrial units with associated parking, soft landscaping and HGV turning areas. The total development site has a slight fall from the west to the east with a total site area of 5.29Ha.

The existing site is a Brownfield development. The proposal would be to drain the developed site by gravity and discharge to the Public Sewers located in Chancel Close, see **Appendix E**.

The site location plan is shown in Figure 1 below.



Figure 1: Site Location Plan

3.1 Topography and Hydrological Setting

Environment Agency (EA) river mapping shows that the nearest watercourses are the Wotton Brook is located approximately 260m to the north of the site, with a tributary brook approximately 1 60m to the east of the site. The River Twyver runs approximately 670m to the south of the site. is the Gretton Brook, which is located approximately 1.35km to the east of the site.

The topographic survey (**Appendix B**) indicates that the site levels fall from the west to the east across the site. Average spot levels are as follows:

Pre demolition:	**Demolished site:**
Western boundary - 24.50 m AOD.	Western boundary – 24.40 m AOD.
Eastern boundary (Chancel Close) – 22.00 m AOD.	Eastern boundary (Chancel Close) 21.10 to 22.00m AOD.

The site is a Brownfield site and as such the surface water will be restricted to the equivalent ICPSuDS (urban) rate, see **Appendix F**.

Please see **Appendix E** which shows the proposed drainage strategy for the site.

3.2 Ground and Groundwater Conditions

A summary of ground conditions encountered by WSP as part of their initial Geo-Environmental assessment, dated September 2016 and then in there Supplementary April 2018 on site:

Ground and Groundwater Conditions

Ground conditions encountered during the investigation comprised hardstanding (concrete and asphalt), overlying limestone gravel sub-base, and localised cohesive Made Ground. Underlying natural strata comprised the Blue Lias Formation and Charmouth Mudstone Formation (BLCMF), which was encountered as a stiff clay. Groundwater strikes were recorded in Made Ground at three locations, Alluvium at two locations and at three locations in the underlying BLCMF.

Group	Unit and description	Aquifer Status
Superficial Deposits	**Alluvium** *'Normally soft to firm consolidated, compressible silty clay, but can contain layers of silt, sand, peat and basal gravel. A stronger, desiccated surface zone may be present.'*	Secondary (A) Aquifer
Bedrock	**Blue Lias Formation and Charmouth Mudstone Formation (Undifferentiated)** *'Dark grey laminated shales, and dark, pale and bluish grey mudstones; locally concretionary and tabular limestone beds; abundant argillaceous limestone, phosphatic or ironstone (sideritic mudstone) nodules in some areas'*	Secondary (Undifferentiated) Aquifer

4. Existing Flood Risk

This section of the report identifies the existing risks from the different forms of flooding identified in NPPF.

4.1 Fluvial & Tidal Flooding

The EA has produced Flood Zone maps for much of England and Wales. The current displayed map is reproduced as Figure 2 below and shows the site to lie within Flood Zone 1 (low risk). Flood Zone 1 is defined as land assessed as having a less than 1 in 1,000 annual probability of river or sea flooding (<0.1%).

A small localised area in the eastern corner of the site is shown to be in Flood Zone 2 but this area is limited to Chancel Close and outside the redevelopment area.

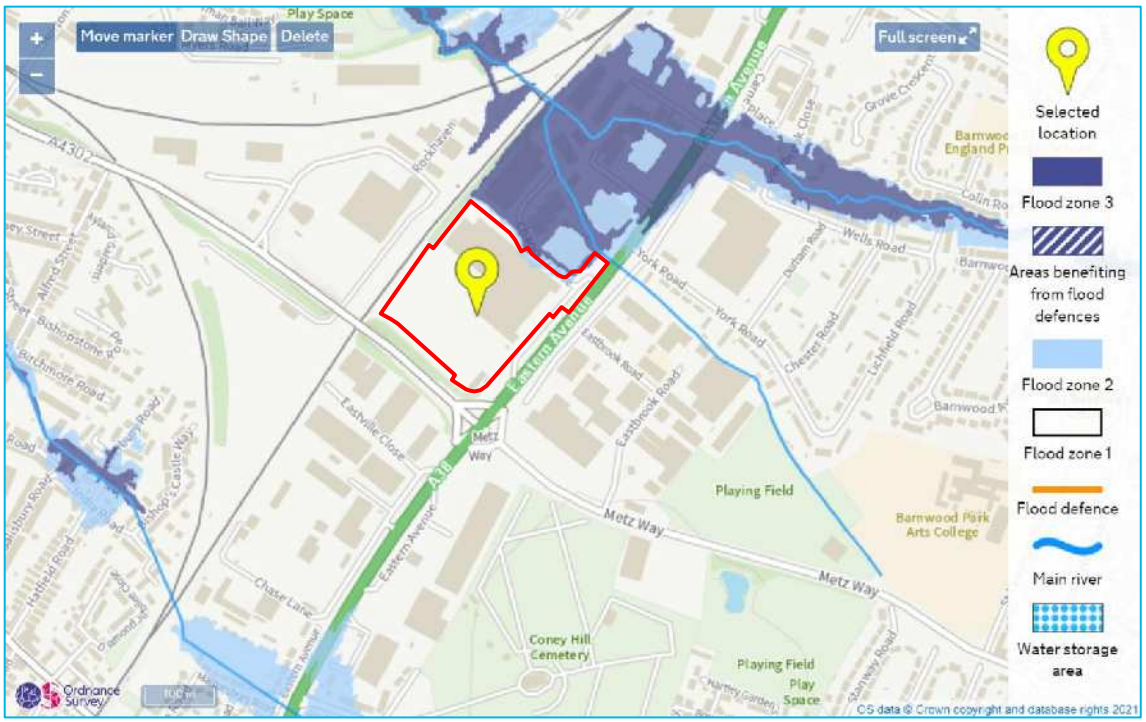


Figure 2: EA Flood Map for Planning (Source: https://flood-map-for-planning.service.gov.uk/)

On the coast storm surges and high tides can threaten low lying coastal areas and can be sometimes large and rapid enough to overtop defence works, causing significantly more damage than river flooding. Tidal flooding is not considered a risk to the site due to the inland location of the development.

Therefore, flood risk from fluvial and tidal sources to the site is considered to be low.

4.2 Surface Water Flooding

Surface water flooding occurs when rainfall is unable to infiltrate into the ground and/or engineered drainage networks and accumulates on the surface.

The risk of flooding from surface water is presented in the GOV.UK online map at a strategic scale. However, no historic flood events are recorded.

From inspection of the topographical survey, areas at risk appear to be a localised low area to the south west of the warehouse as indicated by the various gullies throughout this area.

The levels of the site will be raised in this lowlying area to match the surrounding levels. Sufficient surface water drainage, such as linear drainage and gullies will need to be constructed at low lying hardstanding areas of car parks, service yards and access roads to ensure water drains away from buildings.

Following development, the site will be at low level and unlikely to cause any risk to the site.

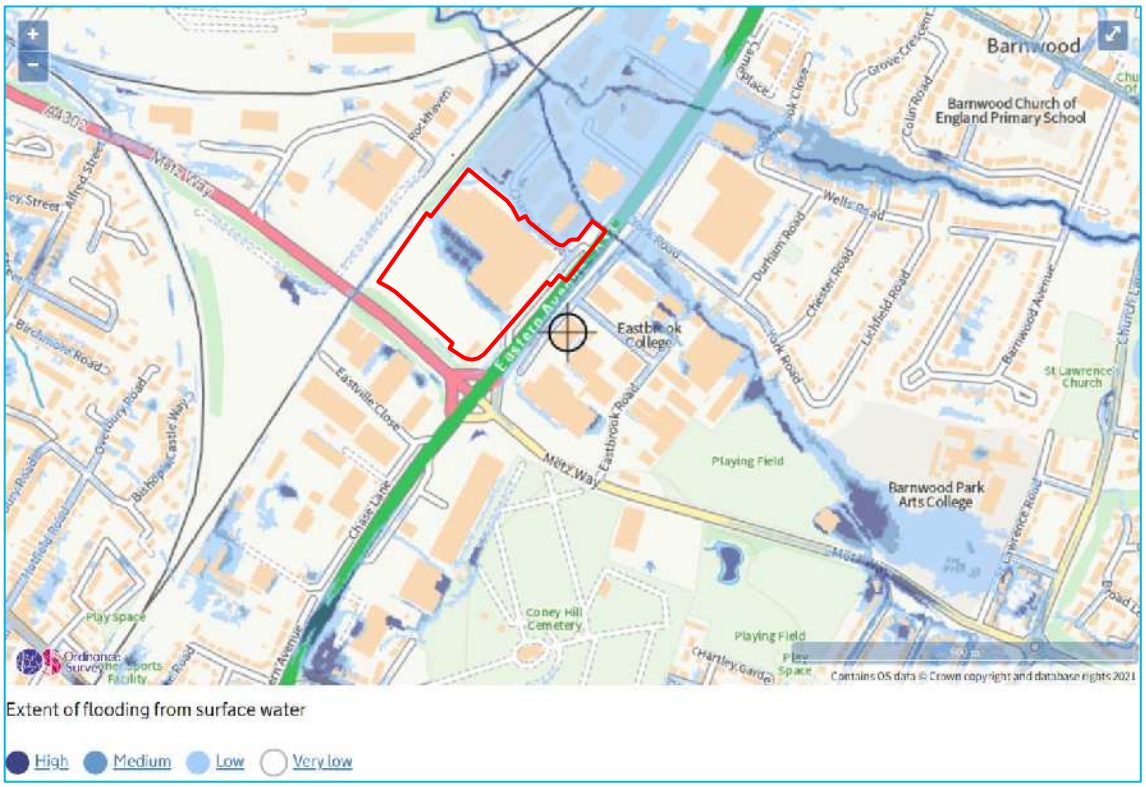


Figure 3: Surface Water Flood Risk Map. (Source: https://flood-warning-information.service.gov.uk)

Given the topography, existing drainage system and surface water flood map information, the site is understood to be at a low risk from surface water flooding.

4.3 Groundwater Flooding

The site geology is expected to consist of superficial deposits of Blue Lias and Charmouth Mudstone formation, which is a stiff clay. There was no recorded groundwater in monitoring points on site. The site is therefore not considered to be at a low risk from ground water flooding.

The existing flood risk from groundwater is therefore considered to be low.

4.4 Sewer Flooding

A sewer flood is often caused by surface water drains discharging into the combined sewer systems; sewer capacity is exceeded in large rainfall events causing the backing up of floodwaters within properties or discharging through manholes. Most adopted surface water drainage networks are designed to the criteria set out in Sewers for Adoption. One of the design parameters is that sewer systems be designed such that no flooding of any part of the site occurs in a 1 in 30-year rainfall event. By definition a 1 in 100-year event would exceed the capacity of the surrounding sewer network as well as any proposed drainage.

To ensure that sewer and surface water flooding is not exacerbated; surface water must be considered within the design of the site. This ensures that any additional surface water and overland flows are managed correctly, to minimise flood risk to the site and the surrounding area.

The site is will have new surface and foul water connection points. The connection and network downstream have been designed considering the future developments in these sites.

Therefore, the risk of sewer flooding to the site is considered low.

4.5 Artificial Sources of Flooding

The EA Flood Risk from Reservoirs mapping indicates that the site is located outside of an area of potential risk from flooding. There has been no loss of life in the UK from reservoir flooding since 1925.

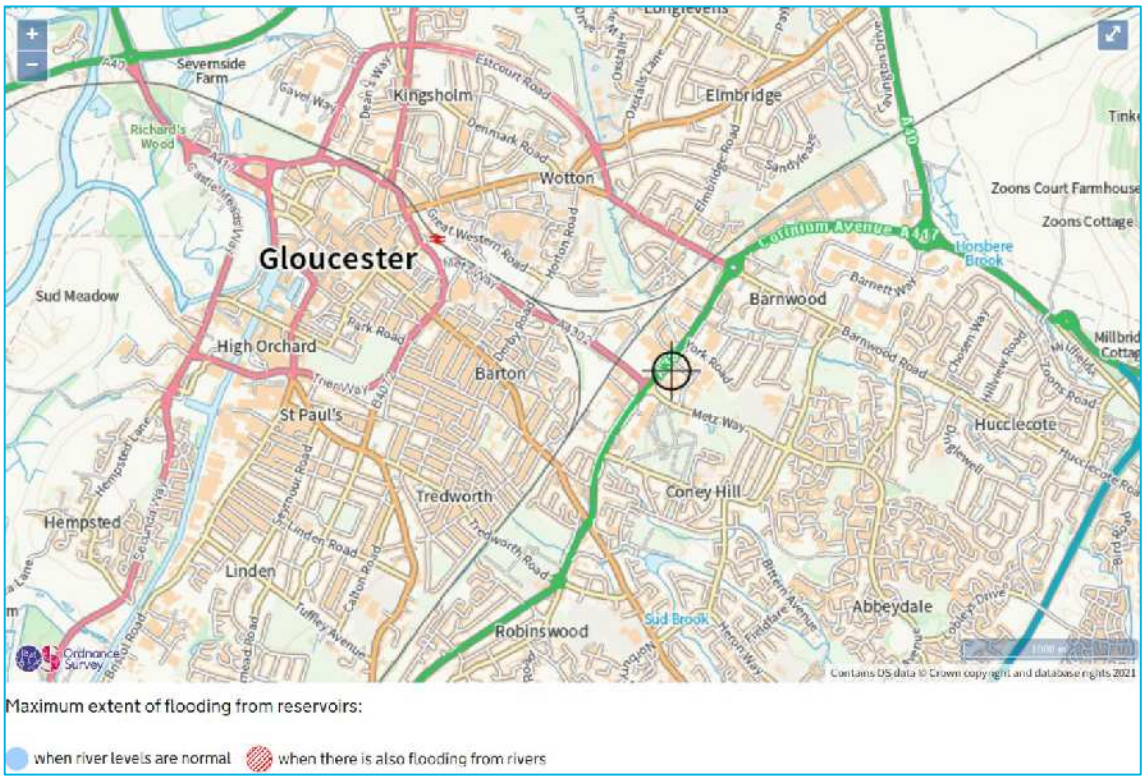


Figure 5: Reservoir Flood Risk Map. (Source: https://flood-warning-information.service.gov.uk)

Therefore, the risk from this type of flooding can be considered low.

4.6 Summary of Existing Flood Risk

The flood risk from fluvial & tidal flooding, surface water flooding, sewer flooding and groundwater is assessed to be low.

The flood risk to the site is summarised in Table 3.

Table 3: Summary of flood risk to the Site

Type of Flooding	Source of Flooding	Existing Flood Risk
Fluvial and Tidal	Wotton Brook	Low
Surface Water	Runoff from the site and surrounding land	Low
Sewers	Surrounding public drainage systems	Low
Ground Water	Underlying geology	Low
Artificial Sources	none	n/a

5. Flood Risk from the Proposed Development

The proposed development will consist of four terraces of industrial units with associated parking, soft landscaping and HGV turning areas. The total development site has a slight fall from the west to the east with a total site area of 5.29Ha.

The proposed development drawing is included in **Appendix C**.

5.1 Fluvial and Tidal Flooding

The site is located within Flood Zone 1 and at low risk of fluvial flooding.

The proposed development work would not have any impact on the fluvial or tidal flooding.

Therefore, the risk of flooding from fluvial and tidal sources has therefore been assessed as to remain low.

5.2 Surface Water Flooding and Proposed Drainage Strategy

Recommendation provided in the **South Gloucestershire Local Plan: Core Strategy**, is for sites to reduce surface water flows back to urban rate greenfield runoff and incorporate SUDS where applicable.

An ICPSUDS Greenfield (urban – previously developed Brownfield site) calculation has been undertaken for this site and included as **Appendix F**. The existing site is pre-demolition discharged into a public sewer via ø525mm pipe.

The new development will be restricted to the Qbar Greenfield (Urban) rate of **41.5L/s** for **1 year storm** and **74.9L/s** for storms up to and including **1 in 100year + 40%cc**.

As noted under 3.2 above, the investigations undertaken by WSP on site have identified underlying soils to consist of Blue Lias and Charmouth Mudstone formation, which is a stiff clay and not conducive to infiltration. The design has therefore not allowed for any infiltration at this stage.

The surface water drainage network for the proposed development is in line with the principles of integrated Construction Industry Research and Information Association (CIRIA) Sustainable Drainage System SuDS and source control methods to convey surface water runoff flows from the site as well as national and local standard.

- The site is a previously developed Industrial site. The in-situ ground is not expected to be conducive to infiltration drainage and therefore SuDS options at the proposed development are limited. The proposal therefore is to limit the discharge from the redeveloped site to the Greenfield (Urban) rate of **41.5L/s** for **1 year storm** and **74.9L/s** for storms up to and including **1 in 100year + 40%cc**
- Appropriate attenuation to be provided onsite;
- The onsite surface water drainage design will follow the principles listed in the Approved Document Part H of the Building Regulations and Sewers for Adoption 7th Edition. The Building Regulations established a hierarchy for surface water disposal which encourages a SuDS approach;
- No surcharge for the 1:1year rainfall event except for the outfall pipe which may surcharge due to restriction.
- Onsite surface water sewers shall be designed to a 1 in 30 year no flooding standard in accordance with BS EN 752: 2017. There will be no flooding of buildings or off-site areas during a 1 in 100-year return period storm event including climate change allowance.
- Any onsite flooding in the 1:100+40% event, will be directed into a safe place or mitigation measures to be provided on site for any flooding over $5m^3$.

The proposed drainage network and attenuation requirements are modelled using industry standard hydraulic modelling software and included in **Appendix F**. The controlled discharge will be made into the public sewer network located in Mammoth Drive.

The proposed drainage layout is included in **Appendix E**.

Therefore, the risk of surface water flooding from the proposed development will remain low.

Assessment of Surface Water Management Options

For sustainable management of surface water run-off from a new development, the use of SuDS is recommended. Table 6 provides a comparison of the different kinds of SuDS systems and their suitability for use at the development site.

5.3 Water Quality

Table 26.2 of the CIRIA C753 SuDS Manual identifies that the pollution hazard level associated with the land uses within the Proposed Development as being 'Medium'. On a scale from 0 – 1, 'Commercial Yard & delivery areas' are deemed to have the following pollution hazard indices:

- Total suspended solids = 0.7
- Metals = 0.6
- Hydrocarbons = 0.7

The SuDS Manual confirms that in England and Wales, where the destination of runoff is to a watercourse then surface water indices should be used for the surface water discharge (Table 26.3 of The SuDS Manual).

The proposed surface water drainage strategy discharges to an existing sewer out falling into a watercourse. Therefore, the use of the surface water indices approach is deemed to be appropriate.

In terms of pollution control the site it is proposed that the commercial yard and delivery areas are to be protected by Class 1 bypass petrol interceptor. The pollution mitigation assessment is summarised in Tables 5 below. The pollution removal characteristics of the pollution control features are based on data in CIRIA C753 and data provided by the product manufacturers.

Table 5: Pollution Mitigation Assessment for the site

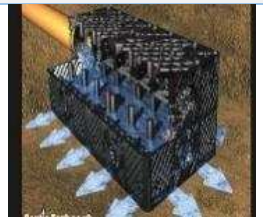
Type of SuDS component	Total suspended solids (TSS)	Metals	Hydrocarbons
Class 1 Bypass Petrol Interceptor (Kingspan or similar)	0.4*	0.6*	0.8*
Detention Basin	0.5	0.5	0.6
Total	**0.65**	**0.85**	**1.1**

*subject to manufactures details

The results in Table 5 shows that sufficient pollution mitigation is provided.

Pollution Mitigation Index data is not provided in CIRIA C753 for gullies/catch pit manholes, it is anticipated that sumps at the base of the gullies and catch pits will provide additional positive improvement that would further help with reduction in Total Suspended Solids.

Table 6: Assessment of Suitability of SuDS at the site as the drainage hierarchy

SUDS Group	Technique	Image	Description	Advantages	Disadvantages	Suitable for Use at Site
Retention	Balancing Pond		Provides both storm water attenuation and treatment. Run-off from each rain event is detained and treated in the pool. The retention time promotes pollutant removal through sedimentation.	Good removal of pollutants, can be used where groundwater is vulnerable, good community acceptability, high ecological, and amenity benefits.	No reduction in run-off volume, land take may limit use in high density sites.	× Not suitable for the type of development
	Sub-surface Storage		Oversized pipes, tank systems and modular geocellular systems that can be used to create a below ground storage structure.	Modular and flexible, dual usage (infiltration/storage, high void ratios), can be installed beneath trafficked and soft landscaped areas.	No water quality treatment.	✓ Sub-surface storage is recommended.
Wetland	Shallow wetland Extended detention wetland Pond wetland Pocket wetland Submerged gravel wetland Wetland channel		Wetlands provide storm water attenuation and treatment. They comprise shallow ponds and marshy areas, covered in aquatic vegetation. Wetlands detail flows for an extended period to allow sediments to settle and to remove contaminants. They can provide significant ecological benefits.	Good pollutant removal and if lined can be used where groundwater I vulnerable. Good community acceptability, ecological and amenity benefits.	Land take is high, requires base flow, little reduction in run-off volume, not suitable for steep sites.	× Wetlands are not possible due to the high land take required.
Infiltration	Infiltration trench Infiltration basin Soakaway		Surface water run-off can be discharged directly to ground for infiltration by soakaways, basins, or trenches. A prerequisite is that both groundwater and ground conditions are appropriate to receive the quality and quantity of water generated.	Reduces the volume of run-off, effective at pollutant removal, contributes to groundwater recharge, simple and cost-effective, easy performance observation.	Requires appropriate pre-treatment, basins require a large flat area, offset from foundations.	× Infiltration unlikely with Blue Lias and Charmouth Mudstone formation directly underlying the site.

SUDS Group	Technique	Image	Description	Advantages	Disadvantages	Suitable for Use at Site
	Porous paving Permeable paving		Block or porous paving allows run-off to infiltrate through to subbase layer. Water can then be infiltrated into ground or conveyed into storage or drainage systems.	Reduces the volume of run-off and if designed for infiltration contributes towards groundwater recharge. East to install and retrofit. Simple to manage. If lined can be used where groundwater is sensitive.	Not suitable for heavily trafficked areas or adoptable roads. Requires regular sweeping to prevent clogging with dirt.	✓ Porous paving to the car parking is possible but would have limited impact as it would treat the immediate surface only.
Filtration	Surface sand filter Sub-surface sand filter Perimeter sand filter		Structures designed to treat surface water run-off through filtration using a sand bed filter medium. The filters can be designed with or without infiltration. Temporary storage of run-off is achieved through ponding above the filter layer. They are used where particularly high pollutant removal is required.	Flexibility of design, efficient in removing pollutants, suitable for retrofits and in tightly constrained urban locations.	Not for high sediment content, detention times can support algae growth, minimum hydraulic head of 1.2m required, possible odour problems, high capital and maintenance cost.	× There is no requirement for high pollution reduction at this site
	Bioretention/filter swale		Vegetated strips of land designed to accept run-off as overland sheet flow between a hard-surfaced area and a receiving system.	Landscaping features, effective in removing pollutants, flexible layout to fit into landscape, suited for highly impervious areas, good retrofit, capability, effective pre-treatment option.	Requires landscaping and management, large land required, not suitable for steep sites; no significant attenuation or reduction of flows.	× No requirement for high pollution reduction; large land areas not available.
	Filter trench/drain		Shallow excavations filled with rubble or stone that create temporary subsurface storage for filtration of storm water run-off.	Hydraulic benefits achieved with filter trenches, trenches can be incorporated into site landscaping and fit	High clogging potential without effective pre-treatment, limited to small catchments,	× Not feasible for the proposed development

SUDS Group	Technique	Image	Description	Advantages	Disadvantages	Suitable for Use at Site
			Receive lateral inflow from an adjacent impermeable surface.	well beside roads and car parks.	high cost of replacing filter material.	
Detention	Detention basin		Surface storage basins that provide flow control through attenuation. Normally dry and in certain situations the land may also function as a recreational facility	Cater for a wide range of rainfall events, can be used where groundwater is vulnerable, potential for dual land use, easy to maintain.	Land take, little reduction in run-off volume, detention depths constrained by levels.	× Not possible due to the high land take required.
	Enhanced dry swale		Swales are linear vegetated drainage features in which surface water can be stored or conveyed. They can be designed to allow infiltration, where appropriate.	Incorporate into landscaping, good removal of pollutants, reduces run-off rates and volumes, low cost.	Not suitable for steep areas, significant land take, not suitable in areas with roadside parking.	× Not suitable and not required for this site
	Enhanced wet swale					
Conveyance	Conveyance swales		Formal linear drainage features in which surface water can be stored or conveyed. They can be incorporated with water features such as ponds or waterfalls where appropriate.	Negate the need for underground pipework. Can provide some attenuation. Possible reduction in run-off volume via plant uptake and infiltration.	Potential trip/wheel hazard, disable access issues.	× Not suitable and not required for this site
	Rills					
Source control	Green/brown roof		Multi-layered system that covers the roof of a building with vegetation cover/landscaping over a drainage layer. Designed to intercept and retain precipitation, reducing the volume of run-off and attenuating peak flows.	Mimics greenfield state of building footprint for high density developments, good removal of pollutants, ecological benefits, insulates buildings, sound absorption.	Additional weight, not appropriate for steep roofs, maintenance of roof vegetation.	× Not suitable for the proposed structure at this site

5.3.1 Maintenance of SuDS

The on-site drainage will be managed by the site management company who will be responsible to maintain any on-site services including drainage.

Table 7: Management and Maintenance Strategy

Drainage Feature	Regular Maintenance	Occasional/Remedial Maintenance	Monitoring
Drainage channels/Gullies	• Inspections will include gratings; covers including their locking bolts; sumps and sump buckets; exposed concrete surround and adjacent surfacing. • Check for accumulation of debris and silt and cleaned as necessary • Gratings, frames and all associated locking parts to be checked for damage. • Exposed concrete and adjacent surfacing to be checked for cracking and general damage. • Check condition of inlet and outlet pipes, flow controls, baffles and isolation structures	• Channel/Slot cleaning will be by flushing with water or high-pressure jetting (no boiling water or cleaning agent will be used). All silt buckets and sumps will be cleaned out replaced back into the units ensuring they are correctly fitted. • All channel surfaces and joints will be checked and repaired as necessary. • Repair/rehabilitation of inlets, outlet, as required.	• Inspect every 4 months or after large storm.
Manholes/Inspection Chambers	• Check for accumulation of debris and silt and clean as necessary. • Covers and frames to be checked for damage. • Exposed concrete and adjacent surfacing to be checked for cracking and general damage. • Check condition of inlet and outlet pipes, flap valves, baffles etc.	• Clean as necessary. • All manhole and inspection chamber covers and frames to be replaced as necessary. • Repair exposed concrete and surfacing as necessary • Repair/rehabilitation of inlets, outlet, overflows and vents, as required.	• Inspect every 6 months or after large storm.
Attenuation Tank	• Check for accumulation of debris and silt and clean as necessary. • Check condition of inlet and outlet pipes and ventilation structures	• Clean as necessary. • Repair/rehabilitation of inlets and outlet, as required.	• Inspect every 6 months or after large storm.

5.4 Sewer Flooding

The site will re-use existing outfall points from the site to the Severn Trent public sewer located in the adjoining roads to the site, see **Appendix B & D**. The peak discharge rate from the industrial development will be minimal and have limited impact on wider infrastructure.

Therefore, the risk of sewer flooding to the site post development work would remain unchanged.

5.5 Groundwater Flooding

The proposed development is unlikely to impact the groundwater due to geology of site.

Therefore, the risk from groundwater flooding will be remain as low.

5.6 Artificial Sources of Flooding

The proposed development work will not have an impact on artificial sources of flood risk.

5.7 Summary of Flood Risk from the Proposed Development

The flood risk to and from the proposed development has been assessed to remain low from all sources.

The flood risk to the development is summarised in Table 8.

Table 8: Summary of flood risk to the development

Type of Flooding	Source of Flooding	Flood Risk	Proposed Mitigation
Fluvial and Tidal	Wotton Brook	Low	Not required
Surface Water	Runoff from the site and surrounding land	Low	Discharge into the public sewer network a new connection at a controlled Greenfield (urban) discharge rate.
Sewers	Surrounding public drainage systems	Low	None
Ground Water	Underlying geology and groundwater levels	Low	Development levels raised.
Artificial Sources	none	Not applicable	

6. Conclusion

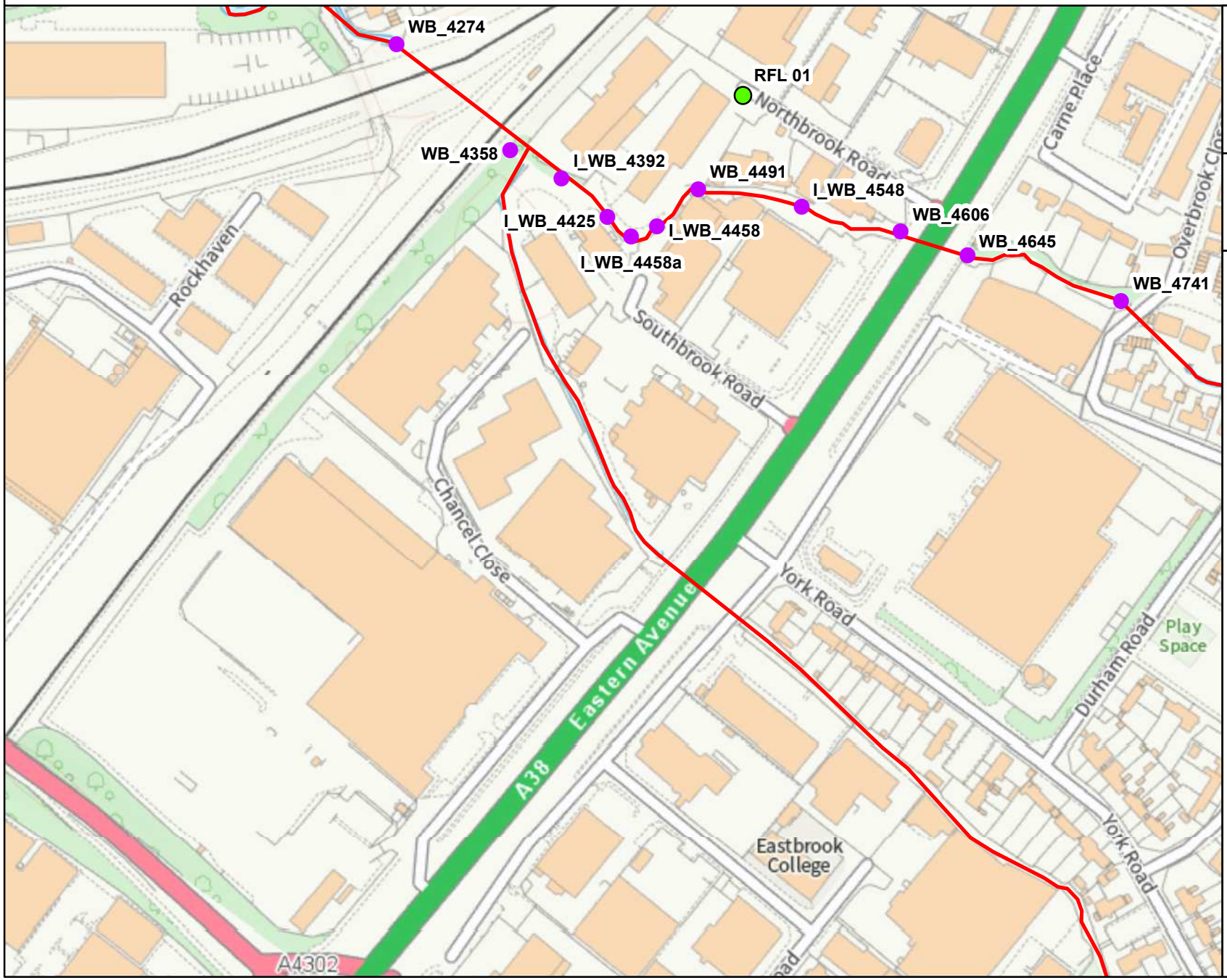
The existing flood risk to the development area from all sources has been assessed from a review of all available data. Future climate change has also been considered. Using the proposed development plan, the extent of the flood risk has been determined for the site as well as the effect that the development might have on flood risk elsewhere.

The assessment can be summarised as follows:

- The site is located in Flood Zone 1.
- The site is at low risk of flooding from all sources.
- The proposed development is classified as 'Less Vulnerable' and suitable for this location.
- The proposed development work would not increase the risk of flooding from any sources;
- A drainage strategy is proposed in consideration with the local and national standard and would not increase the flood risk.
- Recommendation provided in the South Gloucestershire Local Plan: Core Strategy, is for sites to reduce surface water flows back to greenfield (urban – Brownfield site) runoff and incorporate SUDS where applicable. The proposal therefore is to limit the discharge from the developed site to the Greenfield (Urban) rate of **41.5L/s** for **1 year storm** and **74.9L/s** for storms up to and including **1 in 100year + 40%cc**
- A geotechnical assessment by WSP has recorded superficial deposits below the site consisting of Blue Lias and Charmouth Mudstone, stiff clay. These soils have a very low to infiltration rate. The proposal includes SuDS measure in the form of attenuation tank and possibly porous paving for parking areas.
- In conclusion, the proposed development work will not increase the risk of flooding to the site or surrounding areas in accordance with the provisions of relevant national and local planning policies.

Appendix A Environment Agency Product 4 Data

Wotton Brook Model Node Location Map including GL4 3BS - created 20/08/2021 [229386]



Environment Agency

Scale 1: 3000

Legend

- Main River
- Recorded Flood Level
- Wotton Brook Model Node Point

West Midlands Area

Created by Partnerships and Strategic Overview Team, West Midlands

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Contact us: National Customer Contact Center, PO Box 544, Rotherham, S60 1BY. Tel: [redacted] (Mon - Fri 8-6). Email: [redacted]

Product 4 (Detailed Flood Risk Data) for Eastern Avenue, Gloucester, GL4 3BS

Reference number: 229386
Date of issue: 24 August 2021

Model Information

The following information and attached maps contain a summary of the modelled information relevant to the area of interest. The information provided is based on the best available data as of the date of issue.

Model Name	Release Date
Wotton Brook	2007
Caveat	
You may note there is a section of Wotton Brook to the south to which there are no detailed model levels attributed, this section may also pose a flood risk to the site. This is in addition to that already identified from the main channel of Wotton Brook.	

Flood Map for Planning (Rivers and Sea)

The Flood Map for Planning (Rivers and Sea) indicates the area at risk of flooding, **assuming no flood defences exist**, for a flood event with a 0.5% chance of occurring in any year for flooding from the sea, or a 1% chance of occurring in any year for fluvial (river) flooding (Flood Zone 3). It also shows the extent of the Extreme Flood Outlines (Flood Zone 2) which represents the extent of a flood event with a 0.1% chance of occurring in any year, or the highest recorded historic extent if greater. The Flood Zones refer to the land at risk of flooding and **do not** refer to individual properties. It is possible for properties to be built at a level above the floodplain but still fall within the risk area.

This Flood Map only indicates the extent and likelihood of flooding from rivers or the sea. It should also be remembered that flooding may occur from other sources such as surface water, sewers, road drainage, etc.

To find out which flood zone a location is in please use: https://flood-map-for-planning.service.gov.uk/

Definition of flood zones

- **Zone 1** - The area is within the lowest probability of flooding from rivers and the sea, where the chance of flooding in any one year is less than 0.1% (i.e. a 1000 to 1 chance).
- **Zone 2** - The area which falls between the extent of a flood with an annual probability of 0.1% (i.e. a 1000 to 1 chance) fluvial and tidal, or greatest recorded historic flood, whichever is greater, and the extent of a flood with an annual probability of 1% (i.e. a 100 to 1 chance) fluvial / 0.5% (i.e. a 200 to 1 chance) tidal. (Land shown in light blue on the Flood Map).
- **Zone 3** - The chance of flooding in any one year is greater than or equal to 1% (i.e. a 100 to 1 chance) for river flooding and greater than or equal to 0.5% (i.e. a 200 to 1 chance) for coastal and tidal flooding.

Note: The Flood Zones shown on the Environment Agency's Flood Map for Planning (Rivers and Sea) do not take account of the possible impacts of climate change and consequent changes in the future probability of flooding. Reference should therefore also be made to the Strategic Flood Risk Assessment when considering location and potential future flood risks to developments and land uses.

Areas Benefitting From Defences

Where possible we show the areas that benefit from the flood defences, in the event of flooding:

- from rivers with a 1% (1 in 100) chance in any given year, or;
- from the sea with a 0.5% (1 in 200) chance in any given year.

If the defences were not there, these areas would flood. Please note that we do not show all areas that benefit from flood defences.

The associated Dataset is available here: https://data.gov.uk/dataset/flood-map-for-planning-rivers-and-sea-areas-benefiting-from-defences

Node Data/ Modelled Levels

The attached map will show a selection of 1D model node points near to your site. The fluvial levels for these node points are shown below.

Fluvial Flood Levels (m AOD)

The modelled levels are given in m AOD (N), m AOD indicates metres Above Ordnance Datum (Newlyn).

The information is taken from the model referenced above and does not include the updated climate change figures.

			Annual Exceedance Probability - Maximum Water Levels (m AOD)									
Node Label	**Easting**	**Northing**	**50% (1 in 2)**	**20% (1 in 5)**	**10% (1 in 10)**	**4% (1 in 25)**	**2% (1 in 50)**	**1.33% (1 in 75)**	**1% (1 in 100)**	**1% (1 in 100) inc. 20% increase in inflows**	**0.5% (1 in 200)**	**0.1% (1 in 1000)**
WB_4741	385361	218107	20.58	21.01	21.63	21.68	21.76	21.78	21.79	21.89	21.85	22.01
WB_4645	385277	218133	20.52	20.98	21.55	21.67	21.75	21.75	21.80	21.90	21.86	22.01
WB_4606	385241	218145	20.23	20.54	20.97	21.40	21.62	21.74	21.70	21.94	21.72	21.88
I_WB_4548	385187	218159	20.20	20.50	20.97	21.40	21.62	21.77	21.81	22.02	21.70	21.84
WB_4491	385129	218169	20.13	20.52	21.09	21.98	22.39	22.54	22.48	22.79	22.51	22.65
I_WB_4458	385108	218148	20.09	20.57	21.19	22.32	22.55	23.02	22.96	23.01	22.80	22.94
I_WB_4458a	385094	218141	20.08	20.56	21.34	22.22	22.81	23.01	22.90	20.91	22.97	23.27
I_WB_4425	385080	218153	20.07	20.56	21.08	21.93	22.30	22.69	22.76	23.17	22.65	23.56
I_WB_4392	385056	218174	20.02	20.50	21.03	21.84	22.34	22.39	22.35	22.76	22.48	22.66
WB_4358	385027	218190	19.99	20.47	20.93	21.55	21.86	22.14	22.05	22.69	22.08	23.61
WB_4274	384965	218248	18.92	18.98	19.02	19.06	19.07	19.08	19.08	19.10	19.07	19.41

Email: [redacted]
Website: www.gov.uk/government/organisations/environment-agency

Modelled Flood Extents

Available modelled flood outlines produced as part of the detailed modelling have been provided to you in GIS format, these show modelled flood extents. Climate change will increase flood risk due to overtopping of defences.

https://ea.sharefile.com/d-sd2b41f46f20426eb

Climate Change

The 'Flood Risk Assessments: Climate Change Allowances' are published on gov.uk. This is in replacement of previous climate change allowances for planning applications. The data provided in this product does not include the new allowances. You will need to consider this data and factor in the new allowances to demonstrate the development will be safe from flooding. The climate change factors are now more complex and a single uplift percentage across England cannot be justified.

The Environment Agency will incorporate the new allowances into future modelling studies. For now it remains the applicant's responsibility to demonstrate through their proposal and flood risk assessments that new developments will be safe in flood risk terms for its lifetime.

Recorded Flood Outlines

Following an examination of our records of historical flooding we do hold records of flooding for this area, please find tabulated information below for these recorded flood events.

Flood Event Date	Recorded Level/s	Source of Flooding	Cause of Flooding
July 2007	**RFL 01:** 20.14m AOD(N)	Wotton Brook	Channel capacity exceeded (no raised defences)

The recorded flood level (RFL) detailed above was taken at National Grid Reference 385156, 218220 (RFL 01). It has also been included within the attached 'Node Point Map' for ease of reference.

The corresponding recorded flood outline/s can be accessed here:
https://data.gov.uk/dataset/recorded-flood-outlines1

Please note; the records of flooding from between October 2019 and March 2020 and beyond are still being reviewed, the outcomes of which have not yet been published or reflected within this request for information.

The Recorded Flood Outlines take into account the presence of defences, structures, and other infrastructure where they existed at the time of flooding. It includes flood extents that may have been affected by overtopping, breaches or blockages. Any flood extents shown do not

necessarily indicate that properties were flooded internally. It is also possible that the pattern of flooding in this area has changed and that this area would now flood or not flood under different circumstances.

Please note that our records are not comprehensive and that the map is an indicative outline of areas which have previously flooded, not all properties within this area will have flooded. It is possible that other flooding may have occurred that we do not have records for.

You may also wish to contact your Local Authority or Internal Drainage Board (where relevant), to see if they have other relevant local flood information.

Flood Defences

Flood defences do not completely remove the chance of flooding. They can be overtopped by water levels which exceed the capacity of the defences.

If flood defences are located in your area, you can access this data here:
https://data.gov.uk/dataset/spatial-flood-defences-including-standardised-attributes

Planning developments

If you have requested this information to help inform a development proposal, then you should note the information on GOV.UK on the use of Environment Agency Information for Flood Risk Assessments. You can also request pre application advice:

https://www.gov.uk/planning-applications-assessing-flood-risk
https://www.gov.uk/government/publications/pre-planning-application-enquiry-form-preliminary-opinion

Supporting Information

Surface Water

Managing the risk of flooding from surface water is the responsibility of Lead Local Flood Authorities. The 'risk of flooding from surface water' map has been produced by the Environment Agency on behalf of government, using information and input from Lead Local Flood Authorities.

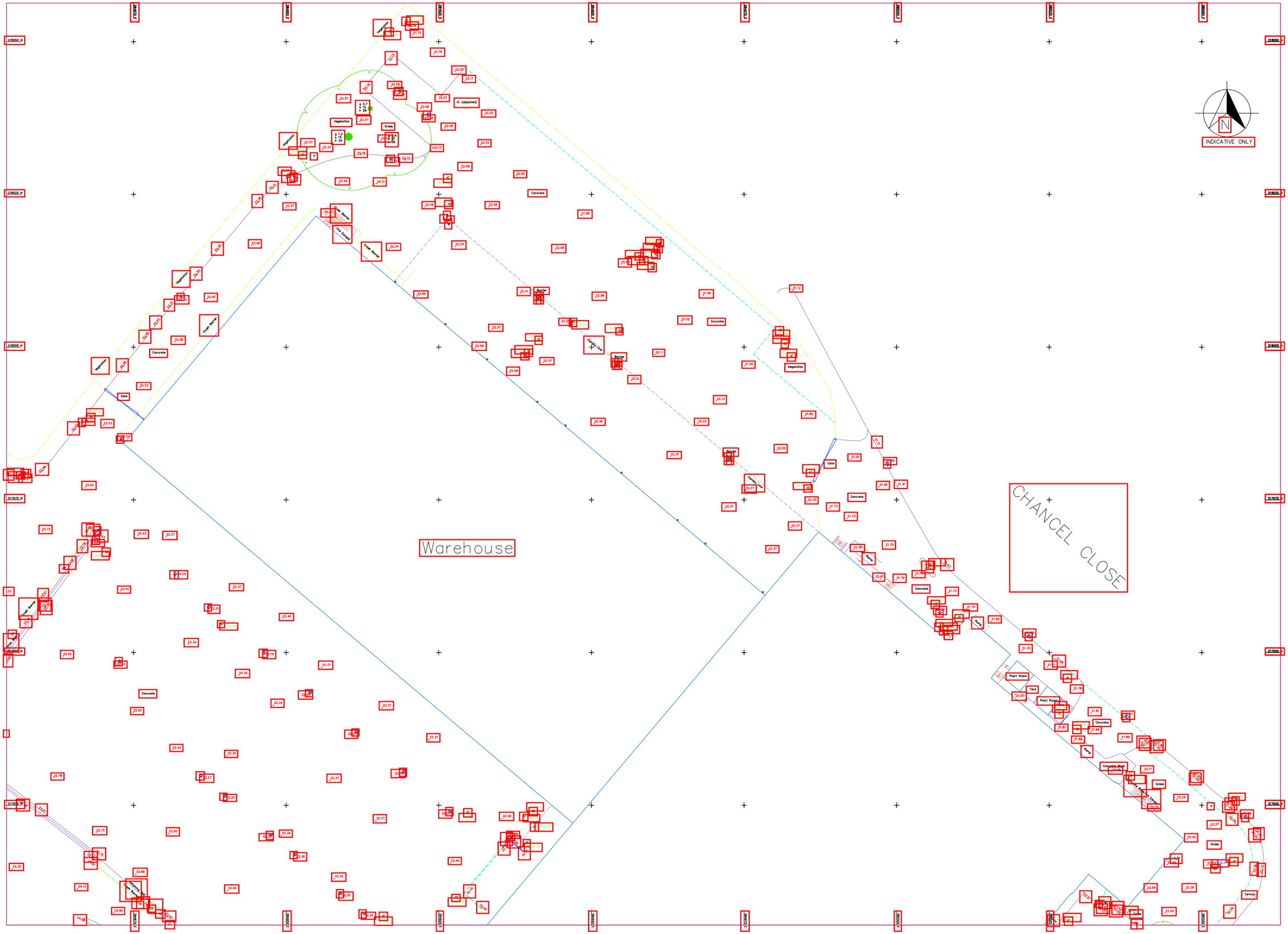
You may wish to contact your Local Authority who may be able to provide further detailed information on surface water.

It is not possible to say for certain what the flood risk is but we use the best information available to provide an indication so that people can make informed choices about living with or managing the risks. The information we supply does not provide an indicator of flood risk at an individual site level. Further information can be found on the Agency's website:

https://flood-warning-information.service.gov.uk/long-term-flood-risk

Appendix B Topographical Survey Plan

Pre-Demolition



NOTES

1) ALL DIMENSIONS TO BE CHECKED ON SITE AND ANY DISCREPANCIES REPORTED.
2) UNDERGROUND SERVICES NOT SHOWN.
3) ALL DIMENSIONS ARE IN METRES ONLY.
4) THE ORIGIN AND ORIENTATION OF THE SURVEY GRID RELATE TO A OPS TIE TO ORDNANCE SURVEY GRID.
5) ALL LEVELS ARE BASED ON A OPS TIE TO OS LEVEL DATUM.

KEY

25.50 Spot Level

Stair Arrow (points up)

SURVEY CONTROL	Station	Easting	Northing	Level
	S68	384846.396	217934.865	24.501

REVISIONS

No.	Date	Amendments	Initial

THIS DRAWING IS FOR THE FOLLOWING PURPOSE ONLY!

MEASURED SURVEY

TITLE

Former Interbrew Site
Eastern Avenue

Topographical Survey

CLIENT

Paloma Capital
2 Bridge House Street
London
W1W 7FA

PROJECT NAME

Former Interbrew Site
Eastern Avenue
Gloucester
GL5, GL4 6SW

malcolm hollis
80–82 Silverthorne Road
London
SW8 8BB
[redacted]

DRAWN BY	DATE
KD	08.06.2016
SCALE	DRG.SIZE
1:200 @A0	DTI
DRAWING NO.	REV. NO.
51552-T-02	

Warehouse

METZ WAY

INDICATIVE ONLY

NOTES

1) ALL DIMENSIONS TO BE CHECKED ON SITE AND NOT SCALED FROM THIS DRAWING.
2) ANY DISCREPANCIES TO BE CONFIRMED IN WRITING PRIOR TO WORKS.
3) ALL DIMENSIONS ARE IN METRES ONLY.
4) THE ORIGIN AND ORIENTATION OF THE SURVEY GRID RELATE TO A GPS TIE TO ORDNANCE SURVEY GRID.
5) ALL LEVELS ARE BASED ON A GPS TIE TO OS LEVEL DATUM.

KEY

Boundary
Manhole
Fence
Survey Bench Mark
Ground Water
Monitoring Point
Kerbs
Drainage Channel
Gully
Inspection Chamber
Rodding Eye
Soil Vent Pipe
Vent Pipe
Gas Valve
Water Valve
Stop Valve
Hydrant
Electric Box
Telecom Box
Traffic Light
Lamp Post
Bollard
Sign
Tree
Hedge
Shrub
Grass
Concrete
Tarmac
Paving
Steps
Ramp
Kerb
Edge of Road
Road Marking
Building
Canopy
Window
Door
Roof Light
Roof Access
Roof Level
Spot Level
Stair Arrow (points up)

SURVEY CONTROL

Station	Easting	Northing	Level
Mat8	386846.396	217934.815	24.501

REVISIONS

No.	Date	Amendments	Initial

THIS DRAWING IS FOR THE FOLLOWING PURPOSE ONLY!

MEASURED SURVEY

TITLE

Former Interbrew Site
Eastern Avenue

Topographical Survey

CLIENT

Paloma Capital
2 Riding House Street
London
W1W 7FA

PROJECT NAME

Former Interbrew Site
Eastern Avenue
Gloucester
Glos, GL4 6SW

malcolm hollis
80-82 Silverthorne Road
London
SW8 5BP
[redacted]

DRAWN BY	DATE
KD	08.06.2016
SCALE	CHECKED
1:200 @A0	DTT
DRAWING NO.	REV. NO.
51552-T-03	

Warehouse

Offices

EASTERN AVENUE

INDICATIVE ONLY

NOTES

1) ALL DIMENSIONS TO BE CHECKED ON SITE AND ANY DISCREPANCIES REPORTED IN WRITING PRIOR TO COMMENCEMENT OF WORKS.
2) ALL DIMENSIONS ARE IN METRES ONLY.
3) THE ORIGIN AND ORIENTATION OF THE SURVEY GRID RELATE TO A OPS TIE TO ORDNANCE SURVEY GRID.
4) ALL LEVELS ARE BASED ON A OPS TIE TO OS LEVEL DATUM.

KEY

25.50 Spot Level

Stair Arrow (points up)

SURVEY CONTROL	Station	Easting	Northing	Level
	TBM	384846.396	217934.865	24.501

REVISIONS

No.	Date	Amendments	Initial

THIS DRAWING IS FOR THE FOLLOWING PURPOSE ONLY:

MEASURED SURVEY

TITLE

Former Interbrew Site
Eastern Avenue

Topographical Survey

CLIENT

Paloma Capital
2 Bridge House Street
London
W1W 7FA

PROJECT NAME

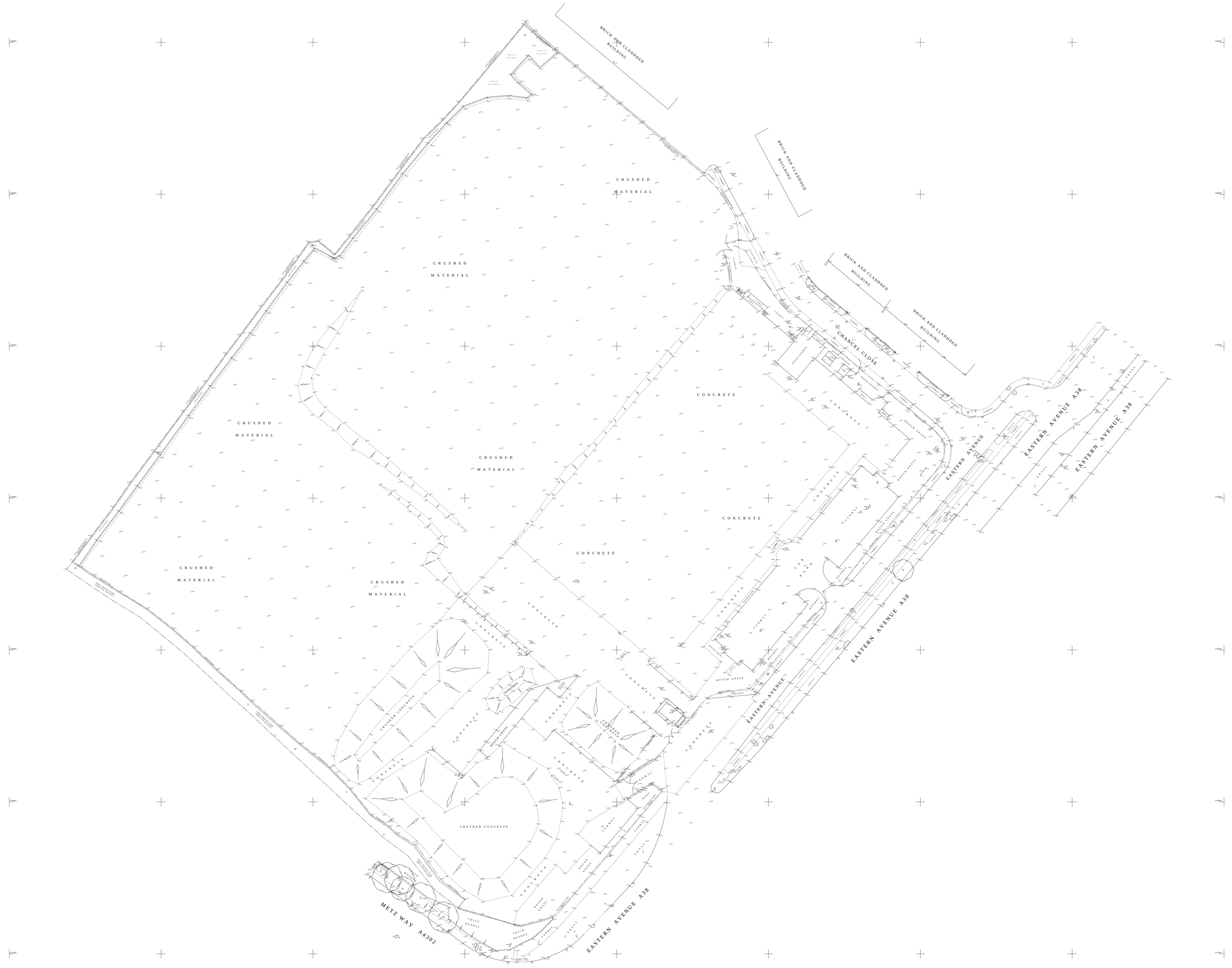
Former Interbrew Site
Eastern Avenue
Gloucester
Glos, GL4 6SW

malcolm hollis
80–82 Silverthorne Road
London
[redacted]

DRAWN BY	DATE
KD	08.06.2016
SCALE	CHECKED
1:200 @A0	DTT
DRAWING NO.	REV. NO.
51552–T–04	

Post Demolition

Station	Easting	Northing	Level
5701	364955.447	217778.727	21.488
5702	364923.445	217778.727	21.488
6704	364987.473	217801.253	21.742
6705	364987.473	217801.253	21.742
6706	365004.000	217822.750	21.727
6707	365004.000	217822.750	21.727
6708	364982.494	218008.452	21.122
6709	364982.494	218008.452	21.122
6710	364955.874	217973.018	21.765


BRICK AND CLADDED BUILDING
BRICK AND CLADDED BUILDING
BRICK AND CLADDED BUILDING
BRICK AND CLADDED BUILDING
CRUSHED MATERIAL
CRUSHED MATERIAL
CRUSHED MATERIAL
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CRUSHED MATERIAL
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CONCRETE
CONCRETE

Appendix C Proposed Development Plan

RAILWAY LINE

METZ WAY

UNIT 2
93,530ft²

UNIT 1
70,200ft²

45m

UNIT 3
40,150ft²

37m

UNIT 4
6,100ft²

UNIT 5
5,170ft²

UNIT 6
3,660ft²

UNIT 7
4,620ft²

UNIT 8
6,290ft²

15m

7.3m

12.5m

UNIT 9
2,875ft²

UNIT 10
3,915ft²

UNIT 11
3,925ft²

UNIT 12
3,925ft²

UNIT13
3,915ft²

UNIT 14
2,875ft²

CHANNEL CLOSE

VISIBILITY SPLAY EASEMENT

RELEVANT ADOPTED HIGHWAY LAND BOUNDARY

EASTERN AVENUE

RELEVANT ADOPTED HIGHWAY LAND BOUNDARY UNDER S247/248

EASTERN AVENUE

KEY

- (R) Recycling & Refuse
- (SS) Substation
- (1) Cycle Storage (Sheffield Stands)
- (2) Motorbike Parking Bay
- Unit Entrance
- Proposed Fence Line - 2.4m high Paladin
- Existing Fence Line
- Unit Office Area

Disclaimer:
Information Subject to Measured Survey

Notes:

KEY

- PLANNING APPLICATION SITE BOUNDARY (Approx 53,142 m² / 13.13 acres)
- RELEVANT ADOPTED HIGHWAY LAND AND BOUNDARY (WITHIN OWNERSHIP)
- VISIBILITY SPLAY EASEMENT
- RELEVANT BOUNDARY UNDER S247/248

AREA SCHEDULE(GIA)

UNIT 1 (GIA)	**70,200 ft²**
Warehouse (Incl. office Undercroft)	64,600 ft²
Office (FF Only)	2,700 ft²
Office (SF Only)	2,900 ft²
Car parking spaces	*47*
UNIT 2 (GIA)	**93,530 ft²**
Warehouse (Incl. office Undercroft)	86,450 ft²
Office (FF Only)	3,430 ft²
Office (SF Only)	3,650 ft²
Car parking spaces	*77*
UNIT 3 (GIA)	**40,150 ft²**
Warehouse (Incl. office Undercroft)	36,500 ft²
Office (FF Only)	3,650 ft²
Car parking spaces	*31*
UNIT 4 (GIA)	**6,100 ft²**
Warehouse (Incl. office Undercroft)	5,050 ft²
Office (FF Only)	1,050 ft²
Car parking spaces	*6*
UNIT 5 (GIA)	**5,170 ft²**
Warehouse (Incl. office Undercroft)	4,330 ft²
Office (FF Only)	840 ft²
Car parking spaces	*5*
UNIT 6 (GIA)	**3,660 ft²**
Warehouse (Incl. office Undercroft)	3,160 ft²
Office (FF Only)	500 ft²
Car parking spaces	*3*
UNIT 7 (GIA)	**4,620 ft²**
Warehouse (Incl. office Undercroft)	3,900 ft²
Office (FF Only)	720 ft²
Car parking spaces	*4*
UNIT 8 (GIA)	**6,290 ft²**
Warehouse (Incl. office Undercroft)	5,195 ft²
Office (FF Only)	1,095 ft²
Car parking spaces	*6*
UNIT 9 (GIA)	**2,875 ft²**
Warehouse (Incl. office Undercroft)	2,875 ft²
Car parking spaces	*4*
UNIT 10 (GIA)	**3,915 ft²**
Warehouse (Incl. office Undercroft)	3,915 ft²
Car parking spaces	*3*
UNIT 11 (GIA)	**3,925 ft²**
Warehouse (Incl. office Undercroft)	3,925 ft²
Car parking spaces	*3*
UNIT 12 (GIA)	**3,925 ft²**
Warehouse (Incl. office Undercroft)	3,925 ft²
Car parking spaces	*3*
UNIT 13 (GIA)	**3,915 ft²**
Warehouse (Incl. office Undercroft)	3,915 ft²
Car parking spaces	*3*
UNIT 14 (GIA)	**2,875 ft²**
Warehouse (Incl. office Undercroft)	2,875 ft²
Car parking spaces	*3*
TOTAL GIA	251,150ft²
Total Car Parking	*197*

N

0 5 10 15 20 25
Scale bar - 1:500m

Rev:	Notes:	Date:	Dwn:	Iss:
03	Update U9 to 14	30.11.21	HT	HA
02	Unit GA, U1&2 move for trees, U4to8 pavement, Unit 3 pavement	23.11.21	HT	HA
01	Update to Unit 2	15.11.21	HT	HA
00	Site access updated	15.11.21	HT	HA
DR	DR Issue	04.11.21	HT	HA

Suitability Code:

Client:
CANMOOR

hale
ARCHITECTURE
22c Leathermarket Street, London, SE1 3HP

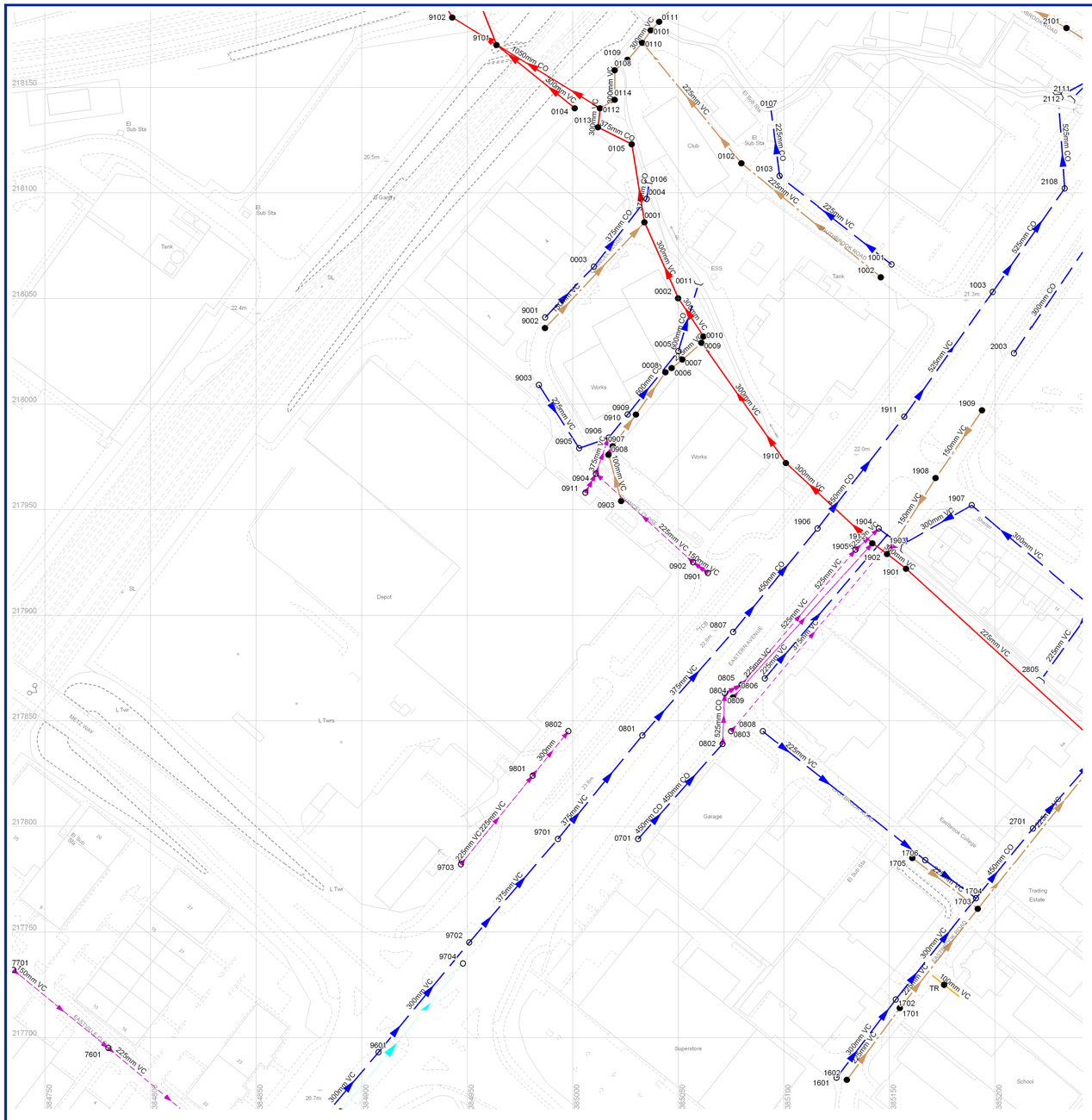
Project:
Access Park, Gloucester

Drawing Title:
Proposed Site Plan

Project No: 21078
Scale @ A1 / A3: 1:500 / 1:1000
Revision: 03

Drawing No:
21078-PL1003

Appendix D Public Sewer Map



Sewer Node / Sewer Pipe Data

REFERENCE	COVER LEVEL	INV LEVEL UPSTR	INV LEVEL DOWNSTR	PURP	MATL	SHAPE	MAX SIZE	MIN SIZE	GRADIENT	YEAR LAID
SO84177601	27.41	25.48	25.12	S	VC	C	225	nil	207.00	nill
SO84177601	27.41	25.48	25.12	S	VC	C	225	nil	207.00	nill
SO84177701	27.22	26.10	25.50	S	VC	C	150	nil	97.10	nill
SO84177701	27.22	26.10	25.50	S	VC	C	150	nil	97.10	nill
SO84179601	26.32	23.62	22.61	S	VC	C	300	nil	66.81	nill
SO84179701	24.10	22.03	21.16	S	VC	C	375	nil	72.70	2003
SO84179702	25.14	22.59	22.03	S	VC	C	375	nil	115.25	nill
SO84179703	24.21	21.79	21.15	S	VC	C	225	nil	84.44	nill
SO84179703	24.21	21.79	21.15	S	VC	C	225	nil	84.44	2003
SO84179801	23.06	21.15	21.05	S	nil	C	300	nil	270.20	nill
SO84179801	23.06	21.15	21.05	S	VC	C	300	nil	270.20	2003
SO84189001	20.68	19.41	19.25	S	VC	C	300	nil	207.75	2003
SO84189002	20.67	19.07	18.47	F	VC	C	150	nil	114.37	nill
SO84189003	21.08	19.94	19.88	S	VC	C	225	nil	591.83	nill
SO84189101	19.60	18.00	17.38	C	VC	C	nil	nil	194.21	nill
SO84189102	19.54	14.44	13.70	C	CO	C	1050	nil	149.26	nill
SO85170701	24.08	22.59	21.80	S	CO	C	450	nil	76.22	2003
SO85170701	24.08	22.59	21.80	S	CO	C	450	nil	76.22	nill
SO85170801	23.21	21.15	20.43	S	VC	C	375	nil	90.54	2003
SO85170802	23.28	21.48	20.98	S	CO	C	525	nil	48.04	nill
SO85170802	23.28	21.48	20.98	S	CO	C	525	nil	48.04	2003
SO85170803	23.17	21.56	19.43	S	VC	C	375	nil	56.38	2003
SO85170804	22.95	20.64	19.23	F	VC	C	225	nil	69.79	nill
SO85170804	22.95	20.64	19.23	F	VC	C	225	nil	69.79	2003
SO85170805	22.85	20.83	20.14	S	VC	C	525	nil	121.36	nill
SO85170805	22.85	20.83	20.14	S	VC	C	525	nil	121.36	2003
SO85170806	22.59	20.94	nil	S	VC	C	225	nil	0.00	2003
SO85170807	22.69	20.42	19.93	S	CO	C	450	nil	129.08	nill
SO85170808	22.98	21.98	21.40	S	VC	C	225	nil	169.36	2003
SO85170809	22.97	20.96	20.85	S	VC	C	525	nil	81.27	2003
SO85170809	22.97	20.96	20.85	S	VC	C	525	nil	81.27	nill
SO85170901	22.02	20.85	20.78	S	VC	C	150	nil	122.86	nill
SO85170901	22.02	20.85	20.78	S	VC	C	150	nil	122.86	nill
SO85170902	21.93	20.68	20.20	S	VC	C	225	nil	129.77	nill
SO85170902	21.93	20.68	20.20	S	VC	C	225	nil	129.77	nill
SO85170903	21.71	19.90	19.81	F	VC	C	100	nil	253.33	nill
SO85170903	21.71	19.90	19.81	F	VC	C	100	nil	253.33	nill
SO85170904	21.59	20.05	19.89	S	VC	C	375	nil	112.69	2003
SO85170904	21.59	20.05	19.89	S	VC	C	375	nil	112.69	nill
SO85170905	21.43	19.47	19.44	S	CO	C	600	nil	371.75	nill
SO85170906	21.07	19.43	19.23	S	CO	C	600	nil	71.05	2003
SO85170907	21.14	19.53	19.30	F	VC	C	225	nil	80.87	2003
SO85170908	21.28	19.72	19.55	F	VC	C	100	nil	26.29	nill
SO85170908	21.28	19.72	19.55	F	VC	C	100	nil	26.29	nill
SO85170909	20.59	19.29	19.17	F	VC	C	225	nil	203.42	2003
SO85170910	20.50	19.22	19.15	S	CO	C	600	nil	548.86	nill
SO85170911	21.79	20.08	20.06	S	VC	C	375	nil	1030.00	nill
SO85170911	21.79	20.08	20.06	S	VC	C	375	nil	1030.00	2003
SO85171601	27.40	25.55	23.31	S	VC	C	300	nil	20.62	2003
SO85171602	27.35	25.02	23.05	F	VC	C	225	nil	21.42	2003
SO85171701	25.35	23.02	20.98	F	VC	C	225	nil	29.18	2003
SO85171702	25.21	23.30	21.29	S	VC	C	300	nil	30.61	2003
SO85171703	23.61	20.97	20.38	F	VC	C	225	nil	165.60	2003
SO85171704	23.58	21.27	21.04	S	CO	C	450	nil	177.67	2003
SO85171705	23.41	21.93	21.00	F	VC	C	225	nil	41.70	2003
SO85171706	23.43	21.39	21.35	S	VC	C	225	nil	750.00	2003
SO85171901	21.88	19.28	19.28	C	VC	C	300	nil	1140.00	2003
SO85171902	21.70	19.27	19.24	C	VC	C	300	nil	286.67	nill
SO85171905	22.09	20.13	20.02	S	VC	C	525	nil	135.18	2003
SO85171905	22.09	20.13	20.02	S	VC	C	525	nil	135.18	nill
SO85171906	22.40	19.92	19.57	S	CO	C	450	nil	191.46	nill
SO85171907	22.11	19.76	nil	S	VC	C	300	nil	0.00	2003
SO85171908	22.01	19.64	19.40	F	VC	C	nil	nil	178.00	nill
SO85171909	22.04	19.88	19.65	F	VC	C	150	nil	161.79	nill
SO85171910	20.57	19.00	18.67	C	VC	C	300	nil	204.79	2003
SO85171911	22.03	19.56	19.25	S	VC	C	525	nil	233.61	nill
SO85171912	21.84	19.21	19.01	C	VC	C	300	nil	279.50	nill
SO85172701	22.83	21.03	nil	S	CO	C	450	nil	0.00	nill
SO85180001	19.92	18.33	17.97	C	CO	C	375	nil	104.11	2003
SO85180002	19.86	18.52	18.36	C	VC	C	300	nil	262.67	2003
SO85180003	20.27	19.18	18.87	S	CO	C	375	nil	131.00	2003
SO85180004	19.90	18.81	18.53	S	CO	C	375	nil	21.71	nill
SO85180005	20.15	19.13	18.88	S	CO	C	600	nil	125.28	nill
SO85180006	20.30	19.15	19.05	F	VC	C	225	nil	64.00	2003
SO85180007	20.23	19.03	18.73	F	VC	C	225	nil	38.84	nill
SO85180008	20.31	19.16	19.16	F	VC	C	225	nil	0.00	2003
SO85180009	19.88	18.67	18.66	C	VC	C	300	nil	316.00	nill
SO85180010	19.89	18.65	18.54	C	VC	C	300	nil	196.64	2003
SO85180101	19.12	18.07	18.03	F	VC	C	300	nil	180.25	nill
SO85180102	20.12	18.48	18.03	F	VC	C	225	nil	164.18	2003
SO85180103	20.53	18.83	17.86	S	CO	C	225	nil	32.23	2003
SO85180104	19.35	17.96	17.94	C	VC	C	nil	nil	2381.50	nill
SO85180105	19.79	17.97	17.99	C	CO	C	375	nil	0.00	nill
SO85180108	19.04	18.06	18.08	F	VC	C	300	nil	0.00	nill
SO85180109	19.06	18.11	18.07	F	VC	C	300	nil	156.20	nill
SO85180110	19.08	18.03	18.12	F	VC	C	300	nil	0.00	nill
SO85180111	19.18	18.11	18.07	F	CI	C	300	nil	141.50	nill
SO85180112	19.43	14.88	14.51	C	CO	C	1050	nil	222.03	nill
SO85180113	19.61	18.00	17.84	C	VC	C	300	nil	56.63	nill
SO85180114	19.34	18.03	17.97	F	VC	C	300	nil	134.33	nill
SO85181001	21.58	20.04	18.84	S	VC	C	225	nil	56.35	2003
SO85181002	21.57	18.83	18.49	F	VC	C	225	nil	250.82	2003
SO85181003	21.51	19.24	18.91	S	CO	C	525	nil	180.73	nill
SO85182003	21.95	20.24	19.46	S	CO	C	300	nil	107.04	2003
SO85182101	20.62	19.00	18.81	F	VC	C	225	nil	244.89	2003

Sewer Node / Sewer Pipe Data

REFERENCE	COVER LEVEL	INV LEVEL UPSTR	INV LEVEL DOWNSTR	PURP	MATL	SHAPE	MAX SIZE	MIN SIZE	GRADIENT	YEAR LAID
SO85182106	21.17	18.90	18.49	S	CO	C	525	nil	105.12	nill
nil	nil	nil	nil	C	VC	nil	nil	nil	0.00	nill

- Abandoned Sewer
- Private Combined Gravity Sewer
- Private Foul Gravity Sewer
- Private Surface Water Gravity Sewer
- Public Combined Gravity Sewer
- Public Foul Gravity Sewer
- Public Surface Water Gravity Sewer
- Trunk Combined Gravity Sewer
- Trunk Foul Use Gravity Sewer
- Trunk Surface Water Gravity Sewer
- Combined Use Pressurised Sewer
- Foul Use Pressurised Sewer
- Surface Water Pressurised Sewer
- Highway Drain
- Combined Lateral Drain (SS)
- Foul Lateral Drain (SS)
- Surface Water Lateral Drain (SS)

- Cable, Earthing
- Cable Junction
- Cable, Optical Fibre/Instrumentation
- Cable, Low Voltage
- Cable, High Voltage
- Cable, Other
- Housing, Building
- Housing, Kiosk
- Disposal Site
- Sewage Treatment Works
- Housing, Other
- Pipe Support Structure
- Sewage Pumping Facility
- Sewer Facility Connection Inlet / Outlet

- Blind Shaft
- Combined Use Manhole
- Flushing Chamber
- Foul Use Manhole
- Grease Trap
- Head Node
- Hydrobrake
- Lamphole
- Outfall
- Overflow
- Penstock
- Petrol Interceptor

- Sewer Chemical Injection Point
- Sewer Junction
- Sewerage Air Valve
- Sewerage Hatch Box Point
- Sewerage Isolation Valve
- Soakaway
- Surface Water Manhole
- Vent Column
- Waste Water Storage
- Culverted Watercourse
- Pre-1937 Properties

MATERIALS

AC	- ASBESTOS CEMENT
BR	- BRICK
CC	- CONCRETE BOX CULVERT
CI	- CAST IRON
CO	- CONCRETE
CSB	- CONCRETE SEGMENTS (BOLTED)
CSU	- CONCRETE SEGMENTS (UNBOLTED)
DI	- DUCTILE IRON
GRC	- GLASS REINFORCED CONCRETE
MAC	- MASONRY IN REGULAR COURSES
MAR	- MASONRY RANDOMLY COURSED
PE	- POLYETHLENE
PF	- PITCH
PP	- POLYPROPYLENE
PSC	- PLASTIC STEEL COMPOSITE
PVC	- POLYVINYL CHLORIDE
RPM	- REINFORCED PLASTIC MATRIX
SI	- SPUN (GREY) IRON
XXX	- OTHER

CATEGORIES

W	- WEIR
C	- CASCADE
DB	- DAMBOARD
SE	- SIDE ENTRY
FV	- FLAP VALVE
BD	- BACK DROP
S	- SIPHON
HD	- HIGHWAY DRAIN
S104	- SECTION 104

SHAPE

C	- CIRCULAR
E	- EGG SHAPED
O	- OTHER
R	- RECTANGLE
S	- SQUARE
T	- TRAPEZOIDAL
U	- UNKNOWN

TABULAR KEY

A. Sewer pipe data refers to downstream sewer pipe.

B. Where the node bifurcates (splits) X and Y indicates downstream sewer pipe.

C. Gradient is stated a 1 in...

PURPOSE

C	- COMBINED
E	- FINAL EFFLUENT
F	- FOUL
L	- SLUDGE
S	- SURFACE WATER

All Private Sewers are shown in magenta
All section 104 sewers are shown in green
All Sewers that have been transferred to Severn Trent Water after the 1st October 2011, but have not been surveyed and confirmed by Severn Trent Water are shown in orange

N W E S

SEVERN TRENT WATER

Severn Trent Water Limited
Asset Data Management
PO Box 5344
Coventry
CV3 9FT
Telephone: [redacted]

SEWER RECORD (TABULAR)

O/S Map scale: 1:1250
Date of issue: 03.11.17
Sheet No. 1 of 1

This map is centred upon:
O / S Grid reference:
x : 384988
y : 217925

Disclaimer Statement:
1. Do not scale off this Map.
2. This map and any information supplied with it is furnished as a general guide, is only valid at the date of issue and no warranty as to its correctness is given or implied. In particular this Map and any information shown on it must not be relied upon in the event of any development or works (including but not limited to excavations) in the vicinity of Severn Trent Water's assets or for the purposes of determining the suitability of a point of connection to the sewerage or distribution systems.
3. On **1 October 2011** most private sewers and private lateral drains in Severn Trent Water's sewerage area, which were connected to a public sewer as at 1 July 2011, transferred to the ownership of Severn Trent Water and became public sewers and public lateral drains. A further transfer takes place on 1 October 2012 (date to be confirmed).
Private pumping stations, which form part of these sewers or lateral drains, will transfer to the ownership of Severn Trent Water on or before 1 October 2016.
Severn Trent Water does not possess complete records of these assets.
These assets may not be displayed on this Map.
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Appendix E Proposed Drainage Strategy Layout

RAILWAY LINE

METZ WAY

EASTERN AVENUE

CHANCEL CLOSE

UNIT 1-2 FFL= 23.50
+/- 300
UNIT 2

UNIT 1-2 FFL= 22.60
+/- 300
UNIT 1

SURFACE WATER TANK-3 (DESIGNED FOR 100 YEAR + 40%CC)
690m² X 1.20m DEEP TANK = 828m³
WATER VOLUME (95% POROSITY) = 786m³
DRAINED AREA = 14,404m²

SURFACE WATER TANK-4 (DESIGNED FOR 100 YEAR + 40%CC)
540m² X 1.20m DEEP TANK = 648m³
WATER VOLUME (95% POROSITY) = 615m³
DRAINED AREA = 11,286m²

SIPHONIC ROOF WATER CONNECTIONS SUBJECT TO SPECIALIST DESIGN.

SIPHONIC ROOF WATER CONNECTIONS SUBJECT TO SPECIALIST DESIGN.

FLOW CONTROL RESTRICTED TO 14.80 L/S

FLOW CONTROL RESTRICTED TO 11.60 L/S

Ex SMH
CL 21.76
IL 19.66

Ex FMH
CL 22.04
IL 19.81

Ex STW 0905
CL 21.45
IL 19.47
IL 19.44

STORM WATER TO DRAIN TO THE EXISTING PRIVATE NETWORK VIA EXISTING Ø525 PIPE.

FOUL WATER TO DRAIN TO THE EXISTING PRIVATE NETWORK

FLOW CONTROL RESTRICTED TO 6.90 L/S

SIPHONIC ROOF WATER CONNECTIONS SUBJECT TO SPECIALIST DESIGN.

SURFACE WATER TANK-2 (DESIGNED FOR 100 YEAR + 40%CC)
320m² X 1.20m DEEP TANK = 384m³
WATER VOLUME (95% POROSITY) = 365m³
DRAINED AREA = 6,697m²

UNIT 3
UNIT 6-7 FFL= 23.00
+/- 300

UNIT 4 | UNIT 5 | UNIT 6 | UNIT 7 | UNIT 8

SIPHONIC ROOF WATER CONNECTIONS SUBJECT TO SPECIALIST DESIGN.

UNIT 4-8 FFL= 22.30
+/- 300

SURFACE WATER TANK-1 (DESIGNED FOR 100 YEAR + 40%CC)
580m² X 0.80m DEEP TANK = 464m³
WATER VOLUME (95% POROSITY) = 440m³
DRAINED AREA = 7,958m²

FLOW CONTROL RESTRICTED TO 8.20 L/S

SIPHONIC ROOF WATER CONNECTIONS SUBJECT TO SPECIALIST DESIGN.

UNIT 9 | UNIT 10 | UNIT 11 | UNIT 12 | UNIT 13 | UNIT 14

UNIT 9-14 FFL= 22.30
+/- 300

STRATEGY

1. THIS DRAWING SHOULD ONLY USED TO SUPPORT A PLANNING APPLICATION AND MAY FORM PART OF A FLOOD RISK ASSESSMENT. IT FORMS AN INTENDED STRATEGY THAT WILL BE DEVELOPED IN MORE DETAIL.

2. DO NOT USE THIS DRAWING FOR DETAILED COST ESTIMATES OR TENDER PURPOSES.

PRE-DEVELOPMENT:

3. THE EXISTING SITE IS PRE-DEVELOPED AND DISCHARGES INTO A PUBLIC SEWER VIA Ø525mm PIPE.

PROPOSAL:

4. THE NEW DEVELOPMENT TO BE RESTRICTED TO 41.5l/s FOR 1 YEAR STORM AND 74.9l/s FOR STORMS UP TO AND INCLUDING 1 IN 100YEAR + 40%CC. THIS IS BASED ON QBAR URBAN RATE AND Q100 URBAN RATE CALCULATED USING ICP SUDS.
TOTAL ATTENUATION FOR 100Yr+40% CLIMATE CHANGE BELOW GROUND CRATES = 2324m³

HYDRAULIC DESIGN:

5. THE SURFACE WATER NETWORK, FLOW CONTROL AND ATTENUATION HAS BEEN DESIGNED USING MICRODRAINAGE SOFTWARE WITH FSR RAINFALL DATA.

FINAL DRAINAGE CONNECTIONS:

6. DISCHARGE POINTS SHOWN MAY NEED TO BE FURTHER INVESTIGATED IN TERMS OF LOCATING AND INVERT LEVELS.

7. APPROVAL SHALL BE OBTAINED FOR INTENDED DISCHARGE INTO THE PUBLIC SEWER/MAJOR WATER COURSE/ORDINARY WATERCOURSE.

MAINTENANCE:

8. THE NETWORK AND ALL ANCILLARY COMPONENTS SHALL RECEIVE REGULAR MAINTENANCE AS OUTLINED IN SEPARATE SCHEDULE.

LEGEND

- SITE BOUNDARY (4.55ha)
- EXISTING FW PUBLIC SEWER
- EXISTING PRIVATE FW
- EXISTING SW PUBLIC SEWER
- EXISTING PRIVATE SW
- NEW STORM WATER RUN
- NEW FOUL WATER RUN
- PI — PETROL INTERCEPTOR
  SERVICE YARD AND OTHER VEHICULAR ACCESSED AREAS TO PASS THROUGH PETROL INTERCEPTOR BEFORE DRAINING TO TANK.
- UNIT 1 CATCHMENT AREA (1.13ha)
- UNIT 2 CATCHMENT AREA (1.44ha)
- UNIT 3 CATCHMENT AREA (0.67ha)
- UNIT 4-14 CATCHMENT AREA (0.79ha)

Rev.	Date	Description	Technician	Reviewer
P1	24.11.21	PRELIMINARY ISSUE	NM	IL

I&L CONSULTING ltd.

Drawing: **PROPOSED DRAINAGE PLANNING STRATEGY**

Project	Scale	Project Number	Drawing Number	Revision
ACCESS PARK, GLOUCESTER	1:500 @ A1 1:250 @ A3	20-038-CAN	D00	P1

Appendix F Hydraulic Calculation

ICP SUDS Mean Annual Flood

Input

Return Period (years) 2 SAAR (mm) 700 Urban 0.700
Area (ha) 4.550 Soil 0.400 Region Number Region 4

Results l/s

QBAR Rural 15.5
QBAR Urban 41.5

Q2 years 41.5

Q1 year 34.4
Q30 years 66.3
Q100 years 74.9

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Summary of Results for 30 year Return Period

Half Drain Time : 215 minutes.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Control (l/s)	Max Σ Outflow (l/s)	Max Volume (m³)	Status
15 min Summer	20.669	0.169	0.0	8.0	8.0	93.2	O K
30 min Summer	20.720	0.220	0.0	8.1	8.1	121.2	O K
60 min Summer	20.769	0.269	0.0	8.2	8.2	148.2	O K
120 min Summer	20.808	0.308	0.0	8.2	8.2	169.9	O K
180 min Summer	20.821	0.321	0.0	8.2	8.2	177.1	O K
240 min Summer	20.827	0.327	0.0	8.2	8.2	180.2	O K
360 min Summer	20.829	0.329	0.0	8.2	8.2	181.2	O K
480 min Summer	20.825	0.325	0.0	8.2	8.2	179.1	O K
600 min Summer	20.818	0.318	0.0	8.2	8.2	175.1	O K
720 min Summer	20.809	0.309	0.0	8.2	8.2	170.2	O K
960 min Summer	20.788	0.288	0.0	8.2	8.2	158.8	O K
1440 min Summer	20.746	0.246	0.0	8.2	8.2	135.7	O K
2160 min Summer	20.695	0.195	0.0	8.1	8.1	107.6	O K
2880 min Summer	20.661	0.161	0.0	7.9	7.9	88.4	O K
4320 min Summer	20.628	0.128	0.0	6.7	6.7	70.7	O K
5760 min Summer	20.611	0.111	0.0	5.7	5.7	61.2	O K
7200 min Summer	20.600	0.100	0.0	4.9	4.9	55.3	O K
8640 min Summer	20.593	0.093	0.0	4.4	4.4	51.0	O K
10080 min Summer	20.586	0.086	0.0	3.9	3.9	47.7	O K
15 min Winter	20.690	0.190	0.0	8.1	8.1	104.7	O K
30 min Winter	20.748	0.248	0.0	8.2	8.2	136.5	O K
60 min Winter	20.804	0.304	0.0	8.2	8.2	167.5	O K
120 min Winter	20.852	0.352	0.0	8.2	8.2	193.7	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
15 min Summer	65.385	0.0	92.2	18
30 min Summer	43.546	0.0	124.3	33
60 min Summer	27.812	0.0	163.2	62
120 min Summer	17.267	0.0	203.3	120
180 min Summer	12.927	0.0	228.5	162
240 min Summer	10.480	0.0	247.2	192
360 min Summer	7.754	0.0	274.5	258
480 min Summer	6.261	0.0	295.7	326
600 min Summer	5.301	0.0	313.1	394
720 min Summer	4.625	0.0	327.8	462
960 min Summer	3.727	0.0	352.2	596
1440 min Summer	2.746	0.0	388.8	852
2160 min Summer	2.020	0.0	432.2	1212
2880 min Summer	1.623	0.0	462.9	1556
4320 min Summer	1.192	0.0	508.1	2248
5760 min Summer	0.956	0.0	546.7	2952
7200 min Summer	0.805	0.0	575.5	3680
8640 min Summer	0.700	0.0	599.6	4408
10080 min Summer	0.622	0.0	620.2	5144
15 min Winter	65.385	0.0	103.8	18
30 min Winter	43.546	0.0	139.8	32
60 min Winter	27.812	0.0	183.1	60
120 min Winter	17.267	0.0	227.9	118

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Summary of Results for 30 year Return Period

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Control (l/s)	Max Σ Outflow (l/s)	Max Volume (m³)	Status
180 min Winter	20.869	0.369	0.0	8.2	8.2	203.1	O K
240 min Winter	20.873	0.373	0.0	8.2	8.2	205.3	O K
360 min Winter	20.870	0.370	0.0	8.2	8.2	204.0	O K
480 min Winter	20.862	0.362	0.0	8.2	8.2	199.2	O K
600 min Winter	20.848	0.348	0.0	8.2	8.2	191.9	O K
720 min Winter	20.833	0.333	0.0	8.2	8.2	183.3	O K
960 min Winter	20.798	0.298	0.0	8.2	8.2	164.4	O K
1440 min Winter	20.733	0.233	0.0	8.2	8.2	128.5	O K
2160 min Winter	20.664	0.164	0.0	7.9	7.9	90.3	O K
2880 min Winter	20.634	0.134	0.0	7.1	7.1	74.0	O K
4320 min Winter	20.607	0.107	0.0	5.4	5.4	59.0	O K
5760 min Winter	20.593	0.093	0.0	4.4	4.4	51.3	O K
7200 min Winter	20.584	0.084	0.0	3.8	3.8	46.3	O K
8640 min Winter	20.577	0.077	0.0	3.3	3.3	42.6	O K
10080 min Winter	20.572	0.072	0.0	2.9	2.9	39.8	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
180 min Winter	12.927	0.0	256.3	174
240 min Winter	10.480	0.0	277.1	224
360 min Winter	7.754	0.0	307.8	278
480 min Winter	6.261	0.0	331.5	356
600 min Winter	5.301	0.0	351.0	430
720 min Winter	4.625	0.0	367.5	504
960 min Winter	3.727	0.0	394.9	644
1440 min Winter	2.746	0.0	436.0	896
2160 min Winter	2.020	0.0	484.3	1232
2880 min Winter	1.623	0.0	518.7	1560
4320 min Winter	1.192	0.0	569.6	2252
5760 min Winter	0.956	0.0	612.4	2992
7200 min Winter	0.805	0.0	644.7	3736
8640 min Winter	0.700	0.0	671.9	4416
10080 min Winter	0.622	0.0	695.3	5144

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Rainfall Details

Rainfall Model	FSR	Winter Storms	Yes
Return Period (years)	30	Cv (Summer)	0.750
Region	England and Wales	Cv (Winter)	0.840
M5-60 (mm)	18.100	Shortest Storm (mins)	15
Ratio R	0.350	Longest Storm (mins)	10080
Summer Storms	Yes	Climate Change %	+0

Time Area Diagram

Total Area (ha) 0.796

Time (mins) From:	To:	Area (ha)
0	4	0.796

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Model Details

Storage is Online Cover Level (m) 22.150

Cellular Storage Structure

Invert Level (m) 20.500 Safety Factor 2.0
Infiltration Coefficient Base (m/hr) 0.00000 Porosity 0.95
Infiltration Coefficient Side (m/hr) 0.00000

Depth (m)	Area (m²)	Inf. Area (m²)	Depth (m)	Area (m²)	Inf. Area (m²)	Depth (m)	Area (m²)	Inf. Area (m²)
0.000	580.0	0.0	0.800	580.0	0.0	0.801	0.0	0.0

Hydro-Brake® Optimum Outflow Control

Unit Reference	MD-SHE-0136-8200-0800-8200
Design Head (m)	0.800
Design Flow (l/s)	8.2
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	136
Invert Level (m)	20.500
Minimum Outlet Pipe Diameter (mm)	150
Suggested Manhole Diameter (mm)	1200

Control Points	Head (m)	Flow (l/s)	Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	0.800	8.2	Kick-Flo®	0.559	6.9
Flush-Flo™	0.253	8.2	Mean Flow over Head Range	-	7.0

The hydrological calculations have been based on the Head/Discharge relationship for the Hydro-Brake® Optimum as specified. Should another type of control device other than a Hydro-Brake Optimum® be utilised then these storage routing calculations will be invalidated

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	4.9	0.800	8.2	2.000	12.6	4.000	17.6	7.000	23.0
0.200	8.1	1.000	9.1	2.200	13.2	4.500	18.6	7.500	23.8
0.300	8.1	1.200	9.9	2.400	13.8	5.000	19.5	8.000	24.5
0.400	7.9	1.400	10.7	2.600	14.3	5.500	20.5	8.500	25.2
0.500	7.5	1.600	11.4	3.000	15.3	6.000	21.3	9.000	25.9
0.600	7.2	1.800	12.0	3.500	16.5	6.500	22.2	9.500	26.6

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Summary of Results for 100 year Return Period (+40%)

Half Drain Time : 459 minutes.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Control (l/s)	Max Σ Outflow (l/s)	Max Volume (m³)	Status
15 min Summer	20.810	0.310	0.0	8.2	8.2	170.8	O K
30 min Summer	20.912	0.412	0.0	8.2	8.2	227.1	O K
60 min Summer	21.017	0.517	0.0	8.2	8.2	285.1	O K
120 min Summer	21.118	0.618	0.0	8.2	8.2	340.4	O K
180 min Summer	21.163	0.663	0.0	8.2	8.2	365.4	O K
240 min Summer	21.184	0.684	0.0	8.2	8.2	377.0	O K
360 min Summer	21.192	0.692	0.0	8.2	8.2	381.5	O K
480 min Summer	21.189	0.689	0.0	8.2	8.2	379.6	O K
600 min Summer	21.182	0.682	0.0	8.2	8.2	375.9	O K
720 min Summer	21.173	0.673	0.0	8.2	8.2	370.8	O K
960 min Summer	21.150	0.650	0.0	8.2	8.2	358.4	O K
1440 min Summer	21.097	0.597	0.0	8.2	8.2	329.1	O K
2160 min Summer	21.004	0.504	0.0	8.2	8.2	277.7	O K
2880 min Summer	20.920	0.420	0.0	8.2	8.2	231.4	O K
4320 min Summer	20.789	0.289	0.0	8.2	8.2	159.1	O K
5760 min Summer	20.705	0.205	0.0	8.1	8.1	113.0	O K
7200 min Summer	20.659	0.159	0.0	7.9	7.9	87.3	O K
8640 min Summer	20.638	0.138	0.0	7.3	7.3	76.0	O K
10080 min Summer	20.625	0.125	0.0	6.6	6.6	69.1	O K
15 min Winter	20.848	0.348	0.0	8.2	8.2	191.9	O K
30 min Winter	20.963	0.463	0.0	8.2	8.2	255.3	O K
60 min Winter	21.084	0.584	0.0	8.2	8.2	321.8	O K
120 min Winter	21.197	0.697	0.0	8.2	8.2	384.3	O K
180 min Winter	21.251	0.751	0.0	8.2	8.2	413.7	O K
240 min Winter	21.278	0.778	0.0	8.2	8.2	428.4	O K
360 min Winter	21.293	0.793	0.0	8.2	8.2	437.2	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
15 min Summer	118.165	0.0	170.3	19
30 min Summer	79.488	0.0	230.5	33
60 min Summer	51.110	0.0	302.0	62
120 min Summer	31.795	0.0	376.2	122
180 min Summer	23.759	0.0	421.9	182
240 min Summer	19.197	0.0	454.7	242
360 min Summer	14.105	0.0	501.2	358
480 min Summer	11.340	0.0	537.3	410
600 min Summer	9.566	0.0	566.6	474
720 min Summer	8.321	0.0	591.4	536
960 min Summer	6.671	0.0	631.9	672
1440 min Summer	4.876	0.0	692.1	952
2160 min Summer	3.557	0.0	762.4	1344
2880 min Summer	2.840	0.0	811.4	1728
4320 min Summer	2.064	0.0	882.8	2420
5760 min Summer	1.644	0.0	940.8	3104
7200 min Summer	1.377	0.0	984.7	3744
8640 min Summer	1.190	0.0	1021.1	4416
10080 min Summer	1.054	0.0	1052.7	5144
15 min Winter	118.165	0.0	191.3	18
30 min Winter	79.488	0.0	258.6	33
60 min Winter	51.110	0.0	338.5	62
120 min Winter	31.795	0.0	421.6	120
180 min Winter	23.759	0.0	472.8	178
240 min Winter	19.197	0.0	509.5	236
360 min Winter	14.105	0.0	561.6	346

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Summary of Results for 100 year Return Period (+40%)

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Control (l/s)	Max Σ Outflow (l/s)	Max Volume (m³)	Status
480 min Winter	21.290	0.790	0.0	8.2	8.2	435.4	O K
600 min Winter	21.278	0.778	0.0	8.2	8.2	428.4	O K
720 min Winter	21.266	0.766	0.0	8.2	8.2	422.0	O K
960 min Winter	21.235	0.735	0.0	8.2	8.2	404.9	O K
1440 min Winter	21.158	0.658	0.0	8.2	8.2	362.4	O K
2160 min Winter	21.018	0.518	0.0	8.2	8.2	285.4	O K
2880 min Winter	20.887	0.387	0.0	8.2	8.2	213.1	O K
4320 min Winter	20.710	0.210	0.0	8.1	8.1	115.6	O K
5760 min Winter	20.642	0.142	0.0	7.5	7.5	78.3	O K
7200 min Winter	20.622	0.122	0.0	6.4	6.4	67.1	O K
8640 min Winter	20.609	0.109	0.0	5.5	5.5	60.0	O K
10080 min Winter	20.600	0.100	0.0	4.9	4.9	55.2	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
480 min Winter	11.340	0.0	602.0	452
600 min Winter	9.566	0.0	634.8	494
720 min Winter	8.321	0.0	662.5	564
960 min Winter	6.671	0.0	707.9	722
1440 min Winter	4.876	0.0	775.2	1026
2160 min Winter	3.557	0.0	854.1	1452
2880 min Winter	2.840	0.0	909.0	1820
4320 min Winter	2.064	0.0	989.4	2464
5760 min Winter	1.644	0.0	1053.9	3008
7200 min Winter	1.377	0.0	1103.0	3744
8640 min Winter	1.190	0.0	1144.0	4416
10080 min Winter	1.054	0.0	1179.8	5144

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Rainfall Details

Rainfall Model	FSR	Winter Storms	Yes
Return Period (years)	100	Cv (Summer)	0.750
Region	England and Wales	Cv (Winter)	0.840
M5-60 (mm)	18.100	Shortest Storm (mins)	15
Ratio R	0.350	Longest Storm (mins)	10080
Summer Storms	Yes	Climate Change %	+40

Time Area Diagram

Total Area (ha) 0.796

Time (mins) From:	To:	Area (ha)
0	4	0.796

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Model Details

Storage is Online Cover Level (m) 22.150

Cellular Storage Structure

Invert Level (m) 20.500 Safety Factor 2.0
Infiltration Coefficient Base (m/hr) 0.00000 Porosity 0.95
Infiltration Coefficient Side (m/hr) 0.00000

Depth (m)	Area (m²)	Inf. Area (m²)	Depth (m)	Area (m²)	Inf. Area (m²)	Depth (m)	Area (m²)	Inf. Area (m²)
0.000	580.0	0.0	0.800	580.0	0.0	0.801	0.0	0.0

Hydro-Brake® Optimum Outflow Control

Unit Reference	MD-SHE-0136-8200-0800-8200
Design Head (m)	0.800
Design Flow (l/s)	8.2
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	136
Invert Level (m)	20.500
Minimum Outlet Pipe Diameter (mm)	150
Suggested Manhole Diameter (mm)	1200

Control Points	Head (m)	Flow (l/s)	Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	0.800	8.2	Kick-Flo®	0.559	6.9
Flush-Flo™	0.253	8.2	Mean Flow over Head Range	-	7.0

The hydrological calculations have been based on the Head/Discharge relationship for the Hydro-Brake® Optimum as specified. Should another type of control device other than a Hydro-Brake Optimum® be utilised then these storage routing calculations will be invalidated

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	4.9	0.800	8.2	2.000	12.6	4.000	17.6	7.000	23.0
0.200	8.1	1.000	9.1	2.200	13.2	4.500	18.6	7.500	23.8
0.300	8.1	1.200	9.9	2.400	13.8	5.000	19.5	8.000	24.5
0.400	7.9	1.400	10.7	2.600	14.3	5.500	20.5	8.500	25.2
0.500	7.5	1.600	11.4	3.000	15.3	6.000	21.3	9.000	25.9
0.600	7.2	1.800	12.0	3.500	16.5	6.500	22.2	9.500	26.6

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Summary of Results for 30 year Return Period

Half Drain Time : 205 minutes.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Control (l/s)	Max Σ Outflow (l/s)	Max Volume (m³)	Status
15 min Summer	20.706	0.256	0.0	6.8	6.8	77.9	O K
30 min Summer	20.783	0.333	0.0	6.9	6.9	101.2	O K
60 min Summer	20.856	0.406	0.0	6.9	6.9	123.3	O K
120 min Summer	20.911	0.461	0.0	6.9	6.9	140.0	O K
180 min Summer	20.926	0.476	0.0	6.9	6.9	144.7	O K
240 min Summer	20.931	0.481	0.0	6.9	6.9	146.2	O K
360 min Summer	20.926	0.476	0.0	6.9	6.9	144.8	O K
480 min Summer	20.915	0.465	0.0	6.9	6.9	141.3	O K
600 min Summer	20.899	0.449	0.0	6.9	6.9	136.6	O K
720 min Summer	20.882	0.432	0.0	6.9	6.9	131.4	O K
960 min Summer	20.846	0.396	0.0	6.9	6.9	120.4	O K
1440 min Summer	20.778	0.328	0.0	6.9	6.9	99.7	O K
2160 min Summer	20.698	0.248	0.0	6.7	6.7	75.4	O K
2880 min Summer	20.643	0.193	0.0	6.5	6.5	58.7	O K
4320 min Summer	20.586	0.136	0.0	5.9	5.9	41.3	O K
5760 min Summer	20.564	0.114	0.0	4.9	4.9	34.6	O K
7200 min Summer	20.550	0.100	0.0	4.3	4.3	30.5	O K
8640 min Summer	20.541	0.091	0.0	3.8	3.8	27.8	O K
10080 min Summer	20.535	0.085	0.0	3.4	3.4	25.8	O K
15 min Winter	20.738	0.288	0.0	6.8	6.8	87.6	O K
30 min Winter	20.825	0.375	0.0	6.9	6.9	114.1	O K
60 min Winter	20.909	0.459	0.0	6.9	6.9	139.5	O K
120 min Winter	20.977	0.527	0.0	6.9	6.9	160.3	O K
180 min Winter	20.999	0.549	0.0	6.9	6.9	167.0	O K
240 min Winter	21.002	0.552	0.0	6.9	6.9	167.8	O K
360 min Winter	20.991	0.541	0.0	6.9	6.9	164.5	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
15 min Summer	65.385	0.0	80.3	18
30 min Summer	43.546	0.0	107.5	33
60 min Summer	27.812	0.0	138.8	62
120 min Summer	17.267	0.0	172.6	120
180 min Summer	12.927	0.0	193.9	162
240 min Summer	10.480	0.0	209.6	192
360 min Summer	7.754	0.0	232.7	258
480 min Summer	6.261	0.0	250.6	326
600 min Summer	5.301	0.0	265.3	394
720 min Summer	4.625	0.0	277.7	462
960 min Summer	3.727	0.0	298.4	596
1440 min Summer	2.746	0.0	329.6	852
2160 min Summer	2.020	0.0	364.8	1212
2880 min Summer	1.623	0.0	390.8	1556
4320 min Summer	1.192	0.0	429.6	2244
5760 min Summer	0.956	0.0	460.8	2944
7200 min Summer	0.805	0.0	485.2	3672
8640 min Summer	0.700	0.0	505.8	4408
10080 min Summer	0.622	0.0	523.8	5136
15 min Winter	65.385	0.0	90.1	18
30 min Winter	43.546	0.0	120.5	32
60 min Winter	27.812	0.0	155.6	60
120 min Winter	17.267	0.0	193.4	118
180 min Winter	12.927	0.0	217.3	174
240 min Winter	10.480	0.0	234.9	224
360 min Winter	7.754	0.0	260.7	280

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Summary of Results for 30 year Return Period

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Control (l/s)	Max Σ Outflow (l/s)	Max Volume (m³)	Status
480 min Winter	20.972	0.522	0.0	6.9	6.9	158.7	O K
600 min Winter	20.947	0.497	0.0	6.9	6.9	151.0	O K
720 min Winter	20.919	0.469	0.0	6.9	6.9	142.5	O K
960 min Winter	20.861	0.411	0.0	6.9	6.9	125.0	O K
1440 min Winter	20.757	0.307	0.0	6.9	6.9	93.3	O K
2160 min Winter	20.649	0.199	0.0	6.5	6.5	60.5	O K
2880 min Winter	20.592	0.142	0.0	6.0	6.0	43.0	O K
4320 min Winter	20.557	0.107	0.0	4.6	4.6	32.6	O K
5760 min Winter	20.541	0.091	0.0	3.8	3.8	27.7	O K
7200 min Winter	20.532	0.082	0.0	3.2	3.2	24.8	O K
8640 min Winter	20.525	0.075	0.0	2.8	2.8	22.7	O K
10080 min Winter	20.520	0.070	0.0	2.5	2.5	21.1	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
480 min Winter	6.261	0.0	280.8	356
600 min Winter	5.301	0.0	297.2	430
720 min Winter	4.625	0.0	311.2	504
960 min Winter	3.727	0.0	334.4	644
1440 min Winter	2.746	0.0	369.4	896
2160 min Winter	2.020	0.0	408.7	1252
2880 min Winter	1.623	0.0	437.8	1556
4320 min Winter	1.192	0.0	481.4	2248
5760 min Winter	0.956	0.0	516.1	2944
7200 min Winter	0.805	0.0	543.5	3672
8640 min Winter	0.700	0.0	566.6	4408
10080 min Winter	0.622	0.0	586.9	5104

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Rainfall Details

Rainfall Model	FSR	Winter Storms	Yes
Return Period (years)	30	Cv (Summer)	0.750
Region	England and Wales	Cv (Winter)	0.840
M5-60 (mm)	18.100	Shortest Storm (mins)	15
Ratio R	0.350	Longest Storm (mins)	10080
Summer Storms	Yes	Climate Change %	+0

Time Area Diagram

Total Area (ha) 0.670

Time (mins) From:	To:	Area (ha)
0	4	0.670

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Model Details

Storage is Online Cover Level (m) 22.828

Cellular Storage Structure

Invert Level (m) 20.450 Safety Factor 2.0
Infiltration Coefficient Base (m/hr) 0.00000 Porosity 0.95
Infiltration Coefficient Side (m/hr) 0.00000

Depth (m)	Area (m²)	Inf. Area (m²)	Depth (m)	Area (m²)	Inf. Area (m²)	Depth (m)	Area (m²)	Inf. Area (m²)
0.000	320.0	0.0	1.200	320.0	0.0	1.201	0.0	0.0

Hydro-Brake® Optimum Outflow Control

Unit Reference	MD-SHE-0120-6900-1200-6900
Design Head (m)	1.200
Design Flow (l/s)	6.9
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	120
Invert Level (m)	20.450
Minimum Outlet Pipe Diameter (mm)	150
Suggested Manhole Diameter (mm)	1200

Control Points	Head (m)	Flow (l/s)	Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	1.200	6.9	Kick-Flo®	0.760	5.6
Flush-Flo™	0.356	6.9	Mean Flow over Head Range	-	6.0

The hydrological calculations have been based on the Head/Discharge relationship for the Hydro-Brake® Optimum as specified. Should another type of control device other than a Hydro-Brake Optimum® be utilised then these storage routing calculations will be invalidated

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	4.2	0.800	5.7	2.000	8.8	4.000	12.2	7.000	15.9
0.200	6.5	1.000	6.3	2.200	9.2	4.500	12.9	7.500	16.4
0.300	6.9	1.200	6.9	2.400	9.5	5.000	13.5	8.000	16.9
0.400	6.9	1.400	7.4	2.600	9.9	5.500	14.2	8.500	17.4
0.500	6.8	1.600	7.9	3.000	10.6	6.000	14.8	9.000	17.9
0.600	6.5	1.800	8.3	3.500	11.4	6.500	15.3	9.500	18.4

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Summary of Results for 100 year Return Period (+40%)

Half Drain Time : 450 minutes.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Control (l/s)	Max Σ Outflow (l/s)	Max Volume (m³)	Status
15 min Summer	20.922	0.472	0.0	6.9	6.9	143.4	O K
30 min Summer	21.076	0.626	0.0	6.9	6.9	190.4	O K
60 min Summer	21.237	0.787	0.0	6.9	6.9	239.2	O K
120 min Summer	21.384	0.934	0.0	6.9	6.9	283.8	O K
180 min Summer	21.448	0.998	0.0	6.9	6.9	303.4	O K
240 min Summer	21.476	1.026	0.0	6.9	6.9	311.9	O K
360 min Summer	21.482	1.032	0.0	6.9	6.9	313.7	O K
480 min Summer	21.471	1.021	0.0	6.9	6.9	310.4	O K
600 min Summer	21.456	1.006	0.0	6.9	6.9	305.9	O K
720 min Summer	21.439	0.989	0.0	6.9	6.9	300.5	O K
960 min Summer	21.400	0.950	0.0	6.9	6.9	288.8	O K
1440 min Summer	21.317	0.867	0.0	6.9	6.9	263.7	O K
2160 min Summer	21.177	0.727	0.0	6.9	6.9	220.9	O K
2880 min Summer	21.039	0.589	0.0	6.9	6.9	178.9	O K
4320 min Summer	20.836	0.386	0.0	6.9	6.9	117.4	O K
5760 min Summer	20.710	0.260	0.0	6.8	6.8	79.2	O K
7200 min Summer	20.638	0.188	0.0	6.4	6.4	57.2	O K
8640 min Summer	20.597	0.147	0.0	6.1	6.1	44.8	O K
10080 min Summer	20.580	0.130	0.0	5.6	5.6	39.4	O K
15 min Winter	20.980	0.530	0.0	6.9	6.9	161.2	O K
30 min Winter	21.155	0.705	0.0	6.9	6.9	214.4	O K
60 min Winter	21.337	0.887	0.0	6.9	6.9	269.8	O K
120 min Winter	21.506	1.056	0.0	6.9	6.9	321.0	O K
180 min Winter	21.584	1.134	0.0	6.9	6.9	344.6	O K
240 min Winter	21.621	1.171	0.0	6.9	6.9	356.0	O K
360 min Winter	21.640	1.190	0.0	6.9	6.9	361.6	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
15 min Summer	118.165	0.0	146.4	19
30 min Summer	79.488	0.0	197.4	33
60 min Summer	51.110	0.0	255.8	64
120 min Summer	31.795	0.0	318.4	122
180 min Summer	23.759	0.0	357.0	182
240 min Summer	19.197	0.0	384.6	242
360 min Summer	14.105	0.0	423.9	358
480 min Summer	11.340	0.0	454.4	410
600 min Summer	9.566	0.0	479.2	474
720 min Summer	8.321	0.0	500.1	536
960 min Summer	6.671	0.0	534.6	674
1440 min Summer	4.876	0.0	585.8	952
2160 min Summer	3.557	0.0	642.8	1360
2880 min Summer	2.840	0.0	684.2	1728
4320 min Summer	2.064	0.0	745.3	2420
5760 min Summer	1.644	0.0	792.6	3112
7200 min Summer	1.377	0.0	829.6	3752
8640 min Summer	1.190	0.0	860.6	4416
10080 min Summer	1.054	0.0	888.1	5144
15 min Winter	118.165	0.0	164.1	18
30 min Winter	79.488	0.0	221.2	33
60 min Winter	51.110	0.0	286.6	62
120 min Winter	31.795	0.0	356.7	120
180 min Winter	23.759	0.0	399.9	178
240 min Winter	19.197	0.0	430.8	236
360 min Winter	14.105	0.0	474.8	346

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Summary of Results for 100 year Return Period (+40%)

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Control (l/s)	Max Σ Outflow (l/s)	Max Volume (m³)	Status
480 min Winter	21.630	1.180	0.0	6.9	6.9	358.6	O K
600 min Winter	21.606	1.156	0.0	6.9	6.9	351.4	O K
720 min Winter	21.585	1.135	0.0	6.9	6.9	344.9	O K
960 min Winter	21.533	1.083	0.0	6.9	6.9	329.1	O K
1440 min Winter	21.412	0.962	0.0	6.9	6.9	292.3	O K
2160 min Winter	21.206	0.756	0.0	6.9	6.9	229.8	O K
2880 min Winter	20.986	0.536	0.0	6.9	6.9	163.0	O K
4320 min Winter	20.721	0.271	0.0	6.8	6.8	82.3	O K
5760 min Winter	20.606	0.156	0.0	6.2	6.2	47.5	O K
7200 min Winter	20.574	0.124	0.0	5.4	5.4	37.6	O K
8640 min Winter	20.558	0.108	0.0	4.7	4.7	33.0	O K
10080 min Winter	20.548	0.098	0.0	4.2	4.2	29.8	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
480 min Winter	11.340	0.0	509.0	452
600 min Winter	9.566	0.0	536.8	496
720 min Winter	8.321	0.0	560.2	564
960 min Winter	6.671	0.0	598.7	722
1440 min Winter	4.876	0.0	656.1	1028
2160 min Winter	3.557	0.0	720.0	1492
2880 min Winter	2.840	0.0	766.4	1820
4320 min Winter	2.064	0.0	834.9	2464
5760 min Winter	1.644	0.0	887.7	3056
7200 min Winter	1.377	0.0	929.2	3680
8640 min Winter	1.190	0.0	964.0	4408
10080 min Winter	1.054	0.0	994.9	5144

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Rainfall Details

Rainfall Model	FSR	Winter Storms	Yes
Return Period (years)	100	Cv (Summer)	0.750
Region	England and Wales	Cv (Winter)	0.840
M5-60 (mm)	18.100	Shortest Storm (mins)	15
Ratio R	0.350	Longest Storm (mins)	10080
Summer Storms	Yes	Climate Change %	+40

Time Area Diagram

Total Area (ha) 0.670

Time (mins) From:	To:	Area (ha)
0	4	0.670

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Model Details

Storage is Online Cover Level (m) 22.828

Cellular Storage Structure

Invert Level (m) 20.450 Safety Factor 2.0
Infiltration Coefficient Base (m/hr) 0.00000 Porosity 0.95
Infiltration Coefficient Side (m/hr) 0.00000

Depth (m)	Area (m²)	Inf. Area (m²)	Depth (m)	Area (m²)	Inf. Area (m²)	Depth (m)	Area (m²)	Inf. Area (m²)
0.000	320.0	0.0	1.200	320.0	0.0	1.201	0.0	0.0

Hydro-Brake® Optimum Outflow Control

Unit Reference	MD-SHE-0120-6900-1200-6900
Design Head (m)	1.200
Design Flow (l/s)	6.9
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	120
Invert Level (m)	20.450
Minimum Outlet Pipe Diameter (mm)	150
Suggested Manhole Diameter (mm)	1200

Control Points	Head (m)	Flow (l/s)	Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	1.200	6.9	Kick-Flo®	0.760	5.6
Flush-Flo™	0.356	6.9	Mean Flow over Head Range	-	6.0

The hydrological calculations have been based on the Head/Discharge relationship for the Hydro-Brake® Optimum as specified. Should another type of control device other than a Hydro-Brake Optimum® be utilised then these storage routing calculations will be invalidated

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	4.2	0.800	5.7	2.000	8.8	4.000	12.2	7.000	15.9
0.200	6.5	1.000	6.3	2.200	9.2	4.500	12.9	7.500	16.4
0.300	6.9	1.200	6.9	2.400	9.5	5.000	13.5	8.000	16.9
0.400	6.9	1.400	7.4	2.600	9.9	5.500	14.2	8.500	17.4
0.500	6.8	1.600	7.9	3.000	10.6	6.000	14.8	9.000	17.9
0.600	6.5	1.800	8.3	3.500	11.4	6.500	15.3	9.500	18.4

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Summary of Results for 30 year Return Period

Half Drain Time : 216 minutes.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Control (l/s)	Max Σ Outflow (l/s)	Max Volume (m³)	Status
15 min Summer	20.756	0.256	0.0	14.5	14.5	168.1	O K
30 min Summer	20.833	0.333	0.0	14.8	14.8	218.5	O K
60 min Summer	20.907	0.407	0.0	14.8	14.8	266.9	O K
120 min Summer	20.965	0.465	0.0	14.8	14.8	304.9	O K
180 min Summer	20.983	0.483	0.0	14.8	14.8	316.7	O K
240 min Summer	20.990	0.490	0.0	14.8	14.8	321.3	O K
360 min Summer	20.990	0.490	0.0	14.8	14.8	321.0	O K
480 min Summer	20.981	0.481	0.0	14.8	14.8	315.6	O K
600 min Summer	20.968	0.468	0.0	14.8	14.8	307.0	O K
720 min Summer	20.953	0.453	0.0	14.8	14.8	296.8	O K
960 min Summer	20.919	0.419	0.0	14.8	14.8	274.5	O K
1440 min Summer	20.852	0.352	0.0	14.8	14.8	231.1	O K
2160 min Summer	20.773	0.273	0.0	14.6	14.6	178.9	O K
2880 min Summer	20.719	0.219	0.0	14.1	14.1	143.4	O K
4320 min Summer	20.667	0.167	0.0	12.5	12.5	109.6	O K
5760 min Summer	20.644	0.144	0.0	10.5	10.5	94.1	O K
7200 min Summer	20.629	0.129	0.0	9.1	9.1	84.6	O K
8640 min Summer	20.619	0.119	0.0	8.0	8.0	77.7	O K
10080 min Summer	20.611	0.111	0.0	7.2	7.2	72.5	O K
15 min Winter	20.788	0.288	0.0	14.6	14.6	189.0	O K
30 min Winter	20.876	0.376	0.0	14.8	14.8	246.2	O K
60 min Winter	20.960	0.460	0.0	14.8	14.8	301.8	O K
120 min Winter	21.031	0.531	0.0	14.8	14.8	348.0	O K
180 min Winter	21.055	0.555	0.0	14.8	14.8	364.0	O K
240 min Winter	21.060	0.560	0.0	14.8	14.8	367.0	O K
360 min Winter	21.053	0.553	0.0	14.8	14.8	362.5	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
15 min Summer	65.385	0.0	169.7	18
30 min Summer	43.546	0.0	227.9	33
60 min Summer	27.812	0.0	296.8	62
120 min Summer	17.267	0.0	369.3	120
180 min Summer	12.927	0.0	415.1	162
240 min Summer	10.480	0.0	448.8	192
360 min Summer	7.754	0.0	498.4	258
480 min Summer	6.261	0.0	536.8	326
600 min Summer	5.301	0.0	568.2	394
720 min Summer	4.625	0.0	595.0	462
960 min Summer	3.727	0.0	639.3	596
1440 min Summer	2.746	0.0	705.9	852
2160 min Summer	2.020	0.0	783.0	1212
2880 min Summer	1.623	0.0	838.6	1556
4320 min Summer	1.192	0.0	921.2	2248
5760 min Summer	0.956	0.0	989.6	2944
7200 min Summer	0.805	0.0	1041.9	3672
8640 min Summer	0.700	0.0	1085.9	4408
10080 min Summer	0.622	0.0	1123.8	5144
15 min Winter	65.385	0.0	190.7	18
30 min Winter	43.546	0.0	255.9	32
60 min Winter	27.812	0.0	332.8	60
120 min Winter	17.267	0.0	414.0	118
180 min Winter	12.927	0.0	465.2	174
240 min Winter	10.480	0.0	503.1	224
360 min Winter	7.754	0.0	558.6	280

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Summary of Results for 30 year Return Period

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Control (l/s)	Max Σ Outflow (l/s)	Max Volume (m³)	Status
480 min Winter	21.037	0.537	0.0	14.8	14.8	352.2	O K
600 min Winter	21.015	0.515	0.0	14.8	14.8	337.5	O K
720 min Winter	20.989	0.489	0.0	14.8	14.8	320.5	O K
960 min Winter	20.934	0.434	0.0	14.8	14.8	284.5	O K
1440 min Winter	20.831	0.331	0.0	14.8	14.8	217.2	O K
2160 min Winter	20.723	0.223	0.0	14.2	14.2	146.4	O K
2880 min Winter	20.674	0.174	0.0	13.0	13.0	113.9	O K
4320 min Winter	20.637	0.137	0.0	9.9	9.9	89.8	O K
5760 min Winter	20.619	0.119	0.0	8.0	8.0	77.8	O K
7200 min Winter	20.607	0.107	0.0	6.8	6.8	70.1	O K
8640 min Winter	20.598	0.098	0.0	5.9	5.9	64.5	O K
10080 min Winter	20.592	0.092	0.0	5.3	5.3	60.2	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
480 min Winter	6.261	0.0	601.6	356
600 min Winter	5.301	0.0	636.8	430
720 min Winter	4.625	0.0	666.8	504
960 min Winter	3.727	0.0	716.5	644
1440 min Winter	2.746	0.0	791.3	896
2160 min Winter	2.020	0.0	877.3	1236
2880 min Winter	1.623	0.0	939.6	1556
4320 min Winter	1.192	0.0	1032.5	2248
5760 min Winter	0.956	0.0	1108.6	2992
7200 min Winter	0.805	0.0	1167.2	3680
8640 min Winter	0.700	0.0	1216.6	4408
10080 min Winter	0.622	0.0	1259.6	5144

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Rainfall Details

Rainfall Model	FSR	Winter Storms	Yes
Return Period (years)	30	Cv (Summer)	0.750
Region	England and Wales	Cv (Winter)	0.840
M5-60 (mm)	18.100	Shortest Storm (mins)	15
Ratio R	0.350	Longest Storm (mins)	10080
Summer Storms	Yes	Climate Change %	+0

Time Area Diagram

Total Area (ha) 1.440

Time (mins) From:	To:	Area (ha)
0	4	1.440

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Model Details

Storage is Online Cover Level (m) 22.900

Cellular Storage Structure

Invert Level (m) 20.500 Safety Factor 2.0
Infiltration Coefficient Base (m/hr) 0.00000 Porosity 0.95
Infiltration Coefficient Side (m/hr) 0.00000

Depth (m)	Area (m²)	Inf. Area (m²)	Depth (m)	Area (m²)	Inf. Area (m²)	Depth (m)	Area (m²)	Inf. Area (m²)
0.000	690.0	0.0	1.200	690.0	0.0	1.201	0.0	0.0

Hydro-Brake® Optimum Outflow Control

Unit Reference	MD-SHE-0171-1480-1200-1480
Design Head (m)	1.200
Design Flow (l/s)	14.8
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	171
Invert Level (m)	20.500
Minimum Outlet Pipe Diameter (mm)	225
Suggested Manhole Diameter (mm)	1500

Control Points	Head (m)	Flow (l/s)	Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	1.200	14.8	Kick-Flo®	0.805	12.3
Flush-Flo™	0.366	14.8	Mean Flow over Head Range	-	12.7

The hydrological calculations have been based on the Head/Discharge relationship for the Hydro-Brake® Optimum as specified. Should another type of control device other than a Hydro-Brake Optimum® be utilised then these storage routing calculations will be invalidated

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	6.1	0.800	12.4	2.000	18.9	4.000	26.3	7.000	34.4
0.200	13.9	1.000	13.6	2.200	19.7	4.500	27.8	7.500	35.6
0.300	14.7	1.200	14.8	2.400	20.6	5.000	29.3	8.000	36.7
0.400	14.8	1.400	15.9	2.600	21.4	5.500	30.6	8.500	37.8
0.500	14.6	1.600	17.0	3.000	22.9	6.000	32.0	9.000	38.9
0.600	14.2	1.800	17.9	3.500	24.7	6.500	33.2	9.500	39.9

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Summary of Results for 100 year Return Period (+40%)

Half Drain Time : 462 minutes.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Control (l/s)	Max Σ Outflow (l/s)	Max Volume (m³)	Status
15 min Summer	20.971	0.471	0.0	14.8	14.8	308.7	O K
30 min Summer	21.126	0.626	0.0	14.8	14.8	410.2	O K
60 min Summer	21.286	0.786	0.0	14.8	14.8	515.0	O K
120 min Summer	21.436	0.936	0.0	14.8	14.8	613.6	O K
180 min Summer	21.503	1.003	0.0	14.8	14.8	657.3	O K
240 min Summer	21.533	1.033	0.0	14.8	14.8	677.1	O K
360 min Summer	21.542	1.042	0.0	14.8	14.8	683.3	O K
480 min Summer	21.535	1.035	0.0	14.8	14.8	678.2	O K
600 min Summer	21.522	1.022	0.0	14.8	14.8	670.1	O K
720 min Summer	21.507	1.007	0.0	14.8	14.8	659.8	O K
960 min Summer	21.470	0.970	0.0	14.8	14.8	636.1	O K
1440 min Summer	21.389	0.889	0.0	14.8	14.8	582.4	O K
2160 min Summer	21.246	0.746	0.0	14.8	14.8	489.1	O K
2880 min Summer	21.114	0.614	0.0	14.8	14.8	402.7	O K
4320 min Summer	20.913	0.413	0.0	14.8	14.8	270.4	O K
5760 min Summer	20.785	0.285	0.0	14.6	14.6	186.9	O K
7200 min Summer	20.713	0.213	0.0	14.1	14.1	139.8	O K
8640 min Summer	20.679	0.179	0.0	13.3	13.3	117.2	O K
10080 min Summer	20.661	0.161	0.0	12.0	12.0	105.8	O K
15 min Winter	21.029	0.529	0.0	14.8	14.8	346.8	O K
30 min Winter	21.204	0.704	0.0	14.8	14.8	461.5	O K
60 min Winter	21.387	0.887	0.0	14.8	14.8	581.3	O K
120 min Winter	21.557	1.057	0.0	14.8	14.8	693.0	O K
180 min Winter	21.637	1.137	0.0	14.8	14.8	745.2	O K
240 min Winter	21.676	1.176	0.0	14.8	14.8	770.8	O K
360 min Winter	21.698	1.198	0.0	14.8	14.8	785.0	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
15 min Summer	118.165	0.0	311.3	19
30 min Summer	79.488	0.0	420.5	33
60 min Summer	51.110	0.0	548.0	62
120 min Summer	31.795	0.0	682.4	122
180 min Summer	23.759	0.0	765.2	182
240 min Summer	19.197	0.0	824.5	242
360 min Summer	14.105	0.0	908.9	358
480 min Summer	11.340	0.0	974.4	410
600 min Summer	9.566	0.0	1027.4	474
720 min Summer	8.321	0.0	1072.3	536
960 min Summer	6.671	0.0	1146.0	674
1440 min Summer	4.876	0.0	1255.5	952
2160 min Summer	3.557	0.0	1380.3	1344
2880 min Summer	2.840	0.0	1469.1	1728
4320 min Summer	2.064	0.0	1599.4	2420
5760 min Summer	1.644	0.0	1702.7	3112
7200 min Summer	1.377	0.0	1782.2	3752
8640 min Summer	1.190	0.0	1848.5	4408
10080 min Summer	1.054	0.0	1906.5	5144
15 min Winter	118.165	0.0	349.3	18
30 min Winter	79.488	0.0	471.5	33
60 min Winter	51.110	0.0	614.1	62
120 min Winter	31.795	0.0	764.6	120
180 min Winter	23.759	0.0	857.3	178
240 min Winter	19.197	0.0	923.8	236
360 min Winter	14.105	0.0	1018.2	346

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Summary of Results for 100 year Return Period (+40%)

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Control (l/s)	Max Σ Outflow (l/s)	Max Volume (m³)	Status
480 min Winter	21.690	1.190	0.0	14.8	14.8	780.2	O K
600 min Winter	21.669	1.169	0.0	14.8	14.8	766.4	O K
720 min Winter	21.650	1.150	0.0	14.8	14.8	753.7	O K
960 min Winter	21.600	1.100	0.0	14.8	14.8	721.3	O K
1440 min Winter	21.481	0.981	0.0	14.8	14.8	643.3	O K
2160 min Winter	21.271	0.771	0.0	14.8	14.8	505.1	O K
2880 min Winter	21.063	0.563	0.0	14.8	14.8	368.8	O K
4320 min Winter	20.793	0.293	0.0	14.7	14.7	192.2	O K
5760 min Winter	20.683	0.183	0.0	13.7	13.7	119.8	O K
7200 min Winter	20.656	0.156	0.0	11.5	11.5	102.0	O K
8640 min Winter	20.639	0.139	0.0	10.0	10.0	91.0	O K
10080 min Winter	20.628	0.128	0.0	8.9	8.9	83.6	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
480 min Winter	11.340	0.0	1091.5	452
600 min Winter	9.566	0.0	1151.0	494
720 min Winter	8.321	0.0	1201.3	564
960 min Winter	6.671	0.0	1283.7	722
1440 min Winter	4.876	0.0	1406.1	1026
2160 min Winter	3.557	0.0	1546.2	1472
2880 min Winter	2.840	0.0	1645.8	1820
4320 min Winter	2.064	0.0	1792.1	2464
5760 min Winter	1.644	0.0	1907.2	3000
7200 min Winter	1.377	0.0	1996.3	3680
8640 min Winter	1.190	0.0	2070.8	4408
10080 min Winter	1.054	0.0	2136.3	5144

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Rainfall Details

Rainfall Model	FSR	Winter Storms	Yes
Return Period (years)	100	Cv (Summer)	0.750
Region	England and Wales	Cv (Winter)	0.840
M5-60 (mm)	18.100	Shortest Storm (mins)	15
Ratio R	0.350	Longest Storm (mins)	10080
Summer Storms	Yes	Climate Change %	+40

Time Area Diagram

Total Area (ha) 1.440

Time (mins) From:	To:	Area (ha)
0	4	1.440

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Model Details

Storage is Online Cover Level (m) 22.900

Cellular Storage Structure

Invert Level (m) 20.500 Safety Factor 2.0
Infiltration Coefficient Base (m/hr) 0.00000 Porosity 0.95
Infiltration Coefficient Side (m/hr) 0.00000

Depth (m)	Area (m²)	Inf. Area (m²)	Depth (m)	Area (m²)	Inf. Area (m²)	Depth (m)	Area (m²)	Inf. Area (m²)
0.000	690.0	0.0	1.200	690.0	0.0	1.201	0.0	0.0

Hydro-Brake® Optimum Outflow Control

Unit Reference	MD-SHE-0171-1480-1200-1480
Design Head (m)	1.200
Design Flow (l/s)	14.8
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	171
Invert Level (m)	20.500
Minimum Outlet Pipe Diameter (mm)	225
Suggested Manhole Diameter (mm)	1500

Control Points	Head (m)	Flow (l/s)	Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	1.200	14.8	Kick-Flo®	0.805	12.3
Flush-Flo™	0.366	14.8	Mean Flow over Head Range	-	12.7

The hydrological calculations have been based on the Head/Discharge relationship for the Hydro-Brake® Optimum as specified. Should another type of control device other than a Hydro-Brake Optimum® be utilised then these storage routing calculations will be invalidated

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	6.1	0.800	12.4	2.000	18.9	4.000	26.3	7.000	34.4
0.200	13.9	1.000	13.6	2.200	19.7	4.500	27.8	7.500	35.6
0.300	14.7	1.200	14.8	2.400	20.6	5.000	29.3	8.000	36.7
0.400	14.8	1.400	15.9	2.600	21.4	5.500	30.6	8.500	37.8
0.500	14.6	1.600	17.0	3.000	22.9	6.000	32.0	9.000	38.9
0.600	14.2	1.800	17.9	3.500	24.7	6.500	33.2	9.500	39.9

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Summary of Results for 30 year Return Period

Half Drain Time : 216 minutes.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Control (l/s)	Max Σ Outflow (l/s)	Max Volume (m³)	Status
15 min Summer	19.857	0.257	0.0	11.4	11.4	131.6	O K
30 min Summer	19.933	0.333	0.0	11.6	11.6	171.1	O K
60 min Summer	20.007	0.407	0.0	11.6	11.6	208.8	O K
120 min Summer	20.064	0.464	0.0	11.6	11.6	238.1	O K
180 min Summer	20.081	0.481	0.0	11.6	11.6	246.9	O K
240 min Summer	20.088	0.488	0.0	11.6	11.6	250.2	O K
360 min Summer	20.086	0.486	0.0	11.6	11.6	249.2	O K
480 min Summer	20.076	0.476	0.0	11.6	11.6	244.4	O K
600 min Summer	20.062	0.462	0.0	11.6	11.6	237.2	O K
720 min Summer	20.046	0.446	0.0	11.6	11.6	228.9	O K
960 min Summer	20.011	0.411	0.0	11.6	11.6	211.0	O K
1440 min Summer	19.944	0.344	0.0	11.6	11.6	176.5	O K
2160 min Summer	19.864	0.264	0.0	11.4	11.4	135.4	O K
2880 min Summer	19.809	0.209	0.0	11.0	11.0	107.5	O K
4320 min Summer	19.756	0.156	0.0	9.8	9.8	80.0	O K
5760 min Summer	19.733	0.133	0.0	8.2	8.2	68.2	O K
7200 min Summer	19.719	0.119	0.0	7.1	7.1	61.0	O K
8640 min Summer	19.709	0.109	0.0	6.3	6.3	56.0	O K
10080 min Summer	19.702	0.102	0.0	5.7	5.7	52.1	O K
15 min Winter	19.888	0.288	0.0	11.5	11.5	148.0	O K
30 min Winter	19.976	0.376	0.0	11.6	11.6	192.8	O K
60 min Winter	20.060	0.460	0.0	11.6	11.6	236.1	O K
120 min Winter	20.130	0.530	0.0	11.6	11.6	272.0	O K
180 min Winter	20.154	0.554	0.0	11.6	11.6	284.2	O K
240 min Winter	20.158	0.558	0.0	11.6	11.6	286.2	O K
360 min Winter	20.150	0.550	0.0	11.6	11.6	282.0	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
15 min Summer	65.385	0.0	133.9	18
30 min Summer	43.546	0.0	179.6	33
60 min Summer	27.812	0.0	233.2	62
120 min Summer	17.267	0.0	290.0	120
180 min Summer	12.927	0.0	325.9	162
240 min Summer	10.480	0.0	352.4	192
360 min Summer	7.754	0.0	391.3	258
480 min Summer	6.261	0.0	421.4	326
600 min Summer	5.301	0.0	446.1	394
720 min Summer	4.625	0.0	467.1	462
960 min Summer	3.727	0.0	501.9	596
1440 min Summer	2.746	0.0	554.2	852
2160 min Summer	2.020	0.0	614.2	1212
2880 min Summer	1.623	0.0	657.9	1556
4320 min Summer	1.192	0.0	722.9	2248
5760 min Summer	0.956	0.0	776.1	2944
7200 min Summer	0.805	0.0	817.1	3672
8640 min Summer	0.700	0.0	851.7	4408
10080 min Summer	0.622	0.0	881.7	5144
15 min Winter	65.385	0.0	150.4	18
30 min Winter	43.546	0.0	201.6	32
60 min Winter	27.812	0.0	261.4	60
120 min Winter	17.267	0.0	325.0	118
180 min Winter	12.927	0.0	365.3	174
240 min Winter	10.480	0.0	394.9	224
360 min Winter	7.754	0.0	438.5	280

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Summary of Results for 30 year Return Period

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Control (l/s)	Max Σ Outflow (l/s)	Max Volume (m³)	Status
480 min Winter	20.133	0.533	0.0	11.6	11.6	273.3	O K
600 min Winter	20.109	0.509	0.0	11.6	11.6	261.3	O K
720 min Winter	20.083	0.483	0.0	11.6	11.6	247.6	O K
960 min Winter	20.027	0.427	0.0	11.6	11.6	218.8	O K
1440 min Winter	19.923	0.323	0.0	11.6	11.6	165.7	O K
2160 min Winter	19.814	0.214	0.0	11.1	11.1	110.0	O K
2880 min Winter	19.762	0.162	0.0	10.2	10.2	83.1	O K
4320 min Winter	19.726	0.126	0.0	7.7	7.7	64.8	O K
5760 min Winter	19.709	0.109	0.0	6.3	6.3	55.9	O K
7200 min Winter	19.698	0.098	0.0	5.3	5.3	50.3	O K
8640 min Winter	19.690	0.090	0.0	4.7	4.7	46.2	O K
10080 min Winter	19.684	0.084	0.0	4.1	4.1	43.1	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
480 min Winter	6.261	0.0	472.2	356
600 min Winter	5.301	0.0	499.9	432
720 min Winter	4.625	0.0	523.4	504
960 min Winter	3.727	0.0	562.4	644
1440 min Winter	2.746	0.0	621.2	896
2160 min Winter	2.020	0.0	688.1	1236
2880 min Winter	1.623	0.0	737.1	1552
4320 min Winter	1.192	0.0	810.2	2248
5760 min Winter	0.956	0.0	869.4	2952
7200 min Winter	0.805	0.0	915.4	3680
8640 min Winter	0.700	0.0	954.2	4400
10080 min Winter	0.622	0.0	988.1	5128

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Rainfall Details

Rainfall Model	FSR	Winter Storms	Yes
Return Period (years)	30	Cv (Summer)	0.750
Region	England and Wales	Cv (Winter)	0.840
M5-60 (mm)	18.100	Shortest Storm (mins)	15
Ratio R	0.350	Longest Storm (mins)	10080
Summer Storms	Yes	Climate Change %	+0

Time Area Diagram

Total Area (ha) 1.129

Time (mins) From:	To:	Area (ha)
0	4	1.129

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Model Details

Storage is Online Cover Level (m) 21.900

Cellular Storage Structure

Invert Level (m) 19.600 Safety Factor 2.0
Infiltration Coefficient Base (m/hr) 0.00000 Porosity 0.95
Infiltration Coefficient Side (m/hr) 0.00000

Depth (m)	Area (m²)	Inf. Area (m²)	Depth (m)	Area (m²)	Inf. Area (m²)	Depth (m)	Area (m²)	Inf. Area (m²)
0.000	540.0	0.0	1.200	540.0	0.0	1.201	0.0	0.0

Hydro-Brake® Optimum Outflow Control

Unit Reference	MD-SHE-0153-1160-1200-1160
Design Head (m)	1.200
Design Flow (l/s)	11.6
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	153
Invert Level (m)	19.600
Minimum Outlet Pipe Diameter (mm)	225
Suggested Manhole Diameter (mm)	1200

Control Points	Head (m)	Flow (l/s)	Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	1.200	11.6	Kick-Flo®	0.787	9.5
Flush-Flo™	0.359	11.6	Mean Flow over Head Range	-	10.0

The hydrological calculations have been based on the Head/Discharge relationship for the Hydro-Brake® Optimum as specified. Should another type of control device other than a Hydro-Brake Optimum® be utilised then these storage routing calculations will be invalidated

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	5.5	0.800	9.6	2.000	14.8	4.000	20.6	7.000	26.9
0.200	10.9	1.000	10.6	2.200	15.5	4.500	21.8	7.500	27.8
0.300	11.5	1.200	11.6	2.400	16.1	5.000	22.9	8.000	28.7
0.400	11.6	1.400	12.5	2.600	16.7	5.500	24.0	8.500	29.5
0.500	11.4	1.600	13.3	3.000	17.9	6.000	25.0	9.000	30.4
0.600	11.1	1.800	14.1	3.500	19.3	6.500	26.0	9.500	31.2

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Summary of Results for 100 year Return Period (+40%)

Half Drain Time : 463 minutes.

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Control (l/s)	Max Σ Outflow (l/s)	Max Volume (m³)	Status
15 min Summer	20.072	0.472	0.0	11.6	11.6	241.9	O K
30 min Summer	20.227	0.627	0.0	11.6	11.6	321.4	O K
60 min Summer	20.387	0.787	0.0	11.6	11.6	403.7	O K
120 min Summer	20.536	0.936	0.0	11.6	11.6	480.2	O K
180 min Summer	20.602	1.002	0.0	11.6	11.6	514.0	O K
240 min Summer	20.631	1.031	0.0	11.6	11.6	529.1	O K
360 min Summer	20.640	1.040	0.0	11.6	11.6	533.4	O K
480 min Summer	20.631	1.031	0.0	11.6	11.6	528.9	O K
600 min Summer	20.618	1.018	0.0	11.6	11.6	522.0	O K
720 min Summer	20.601	1.001	0.0	11.6	11.6	513.6	O K
960 min Summer	20.564	0.964	0.0	11.6	11.6	494.7	O K
1440 min Summer	20.482	0.882	0.0	11.6	11.6	452.5	O K
2160 min Summer	20.341	0.741	0.0	11.6	11.6	380.0	O K
2880 min Summer	20.206	0.606	0.0	11.6	11.6	311.1	O K
4320 min Summer	20.004	0.404	0.0	11.6	11.6	207.1	O K
5760 min Summer	19.876	0.276	0.0	11.4	11.4	141.7	O K
7200 min Summer	19.804	0.204	0.0	11.0	11.0	104.6	O K
8640 min Summer	19.767	0.167	0.0	10.5	10.5	85.6	O K
10080 min Summer	19.750	0.150	0.0	9.4	9.4	76.9	O K
15 min Winter	20.130	0.530	0.0	11.6	11.6	271.8	O K
30 min Winter	20.305	0.705	0.0	11.6	11.6	361.6	O K
60 min Winter	20.488	0.888	0.0	11.6	11.6	455.4	O K
120 min Winter	20.658	1.058	0.0	11.6	11.6	542.5	O K
180 min Winter	20.737	1.137	0.0	11.6	11.6	583.1	O K
240 min Winter	20.775	1.175	0.0	11.6	11.6	602.9	O K
360 min Winter	20.796	1.196	0.0	11.6	11.6	613.5	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
15 min Summer	118.165	0.0	245.0	19
30 min Summer	79.488	0.0	330.8	33
60 min Summer	51.110	0.0	430.2	64
120 min Summer	31.795	0.0	535.6	122
180 min Summer	23.759	0.0	600.5	182
240 min Summer	19.197	0.0	647.1	242
360 min Summer	14.105	0.0	713.3	358
480 min Summer	11.340	0.0	764.6	410
600 min Summer	9.566	0.0	806.3	474
720 min Summer	8.321	0.0	841.5	536
960 min Summer	6.671	0.0	899.4	674
1440 min Summer	4.876	0.0	985.4	952
2160 min Summer	3.557	0.0	1082.6	1360
2880 min Summer	2.840	0.0	1152.2	1728
4320 min Summer	2.064	0.0	1254.7	2420
5760 min Summer	1.644	0.0	1335.2	3112
7200 min Summer	1.377	0.0	1397.5	3752
8640 min Summer	1.190	0.0	1449.6	4408
10080 min Summer	1.054	0.0	1495.4	5144
15 min Winter	118.165	0.0	274.8	18
30 min Winter	79.488	0.0	370.8	33
60 min Winter	51.110	0.0	482.0	62
120 min Winter	31.795	0.0	600.1	120
180 min Winter	23.759	0.0	672.8	178
240 min Winter	19.197	0.0	724.9	236
360 min Winter	14.105	0.0	799.0	346

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Summary of Results for 100 year Return Period (+40%)

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Control (l/s)	Max Σ Outflow (l/s)	Max Volume (m³)	Status
480 min Winter	20.788	1.188	0.0	11.6	11.6	609.3	O K
600 min Winter	20.766	1.166	0.0	11.6	11.6	598.0	O K
720 min Winter	20.746	1.146	0.0	11.6	11.6	587.8	O K
960 min Winter	20.695	1.095	0.0	11.6	11.6	562.0	O K
1440 min Winter	20.576	0.976	0.0	11.6	11.6	500.6	O K
2160 min Winter	20.367	0.767	0.0	11.6	11.6	393.7	O K
2880 min Winter	20.155	0.555	0.0	11.6	11.6	284.5	O K
4320 min Winter	19.885	0.285	0.0	11.5	11.5	146.3	O K
5760 min Winter	19.771	0.171	0.0	10.6	10.6	87.9	O K
7200 min Winter	19.744	0.144	0.0	9.1	9.1	74.0	O K
8640 min Winter	19.728	0.128	0.0	7.9	7.9	65.6	O K
10080 min Winter	19.717	0.117	0.0	7.0	7.0	60.1	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
480 min Winter	11.340	0.0	856.6	452
600 min Winter	9.566	0.0	903.2	494
720 min Winter	8.321	0.0	942.7	564
960 min Winter	6.671	0.0	1007.4	722
1440 min Winter	4.876	0.0	1103.6	1026
2160 min Winter	3.557	0.0	1212.6	1472
2880 min Winter	2.840	0.0	1290.8	1820
4320 min Winter	2.064	0.0	1405.8	2464
5760 min Winter	1.644	0.0	1495.5	3048
7200 min Winter	1.377	0.0	1565.4	3680
8640 min Winter	1.190	0.0	1623.9	4416
10080 min Winter	1.054	0.0	1675.5	5136

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Rainfall Details

Rainfall Model	FSR	Winter Storms	Yes
Return Period (years)	100	Cv (Summer)	0.750
Region	England and Wales	Cv (Winter)	0.840
M5-60 (mm)	18.100	Shortest Storm (mins)	15
Ratio R	0.350	Longest Storm (mins)	10080
Summer Storms	Yes	Climate Change %	+40

Time Area Diagram

Total Area (ha) 1.129

Time (mins) From:	To:	Area (ha)
0	4	1.129

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Model Details

Storage is Online Cover Level (m) 21.900

Cellular Storage Structure

Invert Level (m) 19.600 Safety Factor 2.0
Infiltration Coefficient Base (m/hr) 0.00000 Porosity 0.95
Infiltration Coefficient Side (m/hr) 0.00000

Depth (m)	Area (m²)	Inf. Area (m²)	Depth (m)	Area (m²)	Inf. Area (m²)	Depth (m)	Area (m²)	Inf. Area (m²)
0.000	540.0	0.0	1.200	540.0	0.0	1.201	0.0	0.0

Hydro-Brake® Optimum Outflow Control

Unit Reference	MD-SHE-0153-1160-1200-1160
Design Head (m)	1.200
Design Flow (l/s)	11.6
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	153
Invert Level (m)	19.600
Minimum Outlet Pipe Diameter (mm)	225
Suggested Manhole Diameter (mm)	1200

Control Points	Head (m)	Flow (l/s)	Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	1.200	11.6	Kick-Flo®	0.787	9.5
Flush-Flo™	0.359	11.6	Mean Flow over Head Range	-	10.0

The hydrological calculations have been based on the Head/Discharge relationship for the Hydro-Brake® Optimum as specified. Should another type of control device other than a Hydro-Brake Optimum® be utilised then these storage routing calculations will be invalidated

Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)	Depth (m)	Flow (l/s)
0.100	5.5	0.800	9.6	2.000	14.8	4.000	20.6	7.000	26.9
0.200	10.9	1.000	10.6	2.200	15.5	4.500	21.8	7.500	27.8
0.300	11.5	1.200	11.6	2.400	16.1	5.000	22.9	8.000	28.7
0.400	11.6	1.400	12.5	2.600	16.7	5.500	24.0	8.500	29.5
0.500	11.4	1.600	13.3	3.000	17.9	6.000	25.0	9.000	30.4
0.600	11.1	1.800	14.1	3.500	19.3	6.500	26.0	9.500	31.2

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Access Park, Gloucester

Framework Travel Plan

DTA

Transport Planning Consultants

Access Park, Gloucester

Framework Travel Plan

8th December 2021
SJT/TM/23390-02_Framework Travel Plan

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Table of Contents

		Page
1.0	**INTRODUCTION**	**1**
2.0	**POLICY CONTEXT**	**3**
2.1	National Policy and Guidance	3
2.2	Local Policy and Guidance	5
3.0	**EXISTING CONDITIONS**	**8**
3.1	Site Location	8
3.2	Pedestrian and Cyclist Network	8
3.3	Public Transport Network	8
3.4	Local Facilities	9
3.5	Local Road Network	10
4.0	**TRAVEL PLAN TARGETS AND OBJECTIVES**	**13**
4.1	Introduction	13
4.2	Outcomes	13
4.3	Base Mode Share	14
4.4	Targets	14
4.5	Indicators	15
4.6	Objectives	16
5.0	**TRAVEL PLAN IMPLEMENTATION AND MANAGEMENT**	**19**
5.1	Introduction	19
5.2	Travel Plan Coordinator	19
5.3	General Promotion	20
6.0	**TRAVEL PLAN MONITORING AND AUDIT**	**22**
6.1	Target Monitoring	22
6.2	Remedial Measures	23
7.0	**ACTION PLAN**	**24**

Figures

Figure 1 Site Location Plan

Appendices

Appendix A Proposed Site Layout
Appendix B Example Travel Survey

1.0 INTRODUCTION

1.1 This Framework Travel Plan (FTP) has been prepared by DTA Transportation Limited on behalf of Canmor to support a full planning application for the redevelopment of Access Park (the former Interbrew site) off Eastern Avenue in Gloucester to provide 251,150sqm (23,333sqm) of flexible Class E(g)(ii) light industrial/ B2 general industrial/ B8 storage & distribution use. The location of the site is shown on **Figure 1** and the proposed site layout is attached as **Appendix A**.

1.2 The application site is located some 2.5km east of the City Centre and extends to circa 13 acres. It is currently significantly underutilised, comprising vacant land that previously accommodated warehouse buildings and associated office space, alongside what was once open storage and lorry parking. The total floor area for previous buildings amounted to some 13,748sqm (148,000sqft).

1.3 The site has been fully vacant since September 2017, although occupation and activity steadily decreased for the nine months prior to this. The open storage element is currently secured via perimeter fencing. A planning application for the mixed-use redevelopment of the site to provide employment use, along with a retail store, hotel/ pub/restaurant and drive-thru was granted planning permission in December 2018 (ref: 18/01444/FUL). The impact of the current development proposals has been reviewed within the context of this existing planning consent.

1.4 The DfT's 'Good Practice Guidelines: Delivering Travel Plans through the Planning Process' (April 2009 – the Good Practice Guidelines), defines a Travel Plan (TP) as *"...a long-term management strategy for an occupier or site that seeks to deliver sustainable transport objectives through positive action and is articulated in a document that is regularly reviewed. It involves the development of agreed explicit outcomes linked to an appropriate package of measures aimed at encouraging more sustainable travel, with an emphasis on reducing single occupancy car use"*.

1.5 Additionally, the Good Practice Guidelines state that *"...in the case of large mixed-use developments with multiple occupants, it will be appropriate to prepare a framework travel plan".* Once complete, the proposed development will comprise a combination of employers and hence an FTP has prepared in accordance with the following definition, provided in the Good Practice Guidelines (Glossary of Terms):

"Framework (umbrella) travel plan: An overarching travel plan that embraces a large development which may have mixed uses and multiple occupiers/ phases. Specific travel plans, i.e. subsidiary travel plans, would be created for developments within the site which would need to be consistent with the wider targets and requirements of the overall framework travel plan."

1.6 This FTP will therefore act as a guide for the occupiers where appropriate to produce more detailed TPs tailored to their organisations, which will outline specific measures and timescales for their implementation. Subsequent implementation of the detailed TPs will commence on or prior to first occupation and shall be monitored and reviewed annually for a period of up to five years.

2.0 POLICY CONTEXT

2.1 National Policy and Guidance

Revised National Planning Policy Framework

2.1.1 In July 2021, the Government published a revised National Planning Policy Framework (NPPF).

2.1.2 Within this context, the NPPF identifies in Paragraph 112 that applications for development should:

"a) give priority first to pedestrian and cycle movements, both within the scheme and with neighbouring areas; and second – so far as possible – to facilitating access to high quality public transport, with layouts that maximise the catchment area for bus or other public transport services, and appropriate facilities that encourage public transport use;

b) address the needs of people with disabilities and reduced mobility in relation to all modes of transport;

c) create places that are safe, secure and attractive – which minimise the scope for conflicts between pedestrians, cyclists and vehicles, avoid unnecessary street clutter, and respond to local character and design standards;

d) allow for the efficient delivery of goods, and access by service and emergency vehicles;

e) be designed to enable charging of plug-in and other ultra-low emission vehicles in safe, accessible and convenient locations."

2.1.3 Paragraph 113 of the NPPF goes on to state that: *"All developments that will generate significant amounts of movement should be required to provide a travel plan, and the application should be supported by a transport statement or transport assessment so that the likely impacts of the proposal can be assessed".*

2.1.4 In reinforcing the principle of supporting sustainable development, paragraph 10 stipulates that at the heart of the Framework is "...a presumption in favour of sustainable development".

Planning Practice Guidance (March 2014)

2.1.5 The Department for Communities and Local Government (CLG) first published the Planning Practice Guidance (PPG) in 2014, which reinforces the guidance contained in the NPPF. It is now an online resource which is regularly updated.

2.1.6 The PPG in Paragraph: 002 Reference ID: 42-002-20140306 states that Travel Plans and Transport Assessments are ways of assessing and mitigating the negative transport impacts of development in order to promote sustainable development. They are required for all developments which generate significant amounts of movements.

2.1.7 The Guidance goes on to explain what these documents are, why they are important, what information they should contain and how they should relate to one another.

2.1.8 The Guidance focuses on an 'outcomes' approach to TPs, requiring that specific outcomes or targets be established by agreement on what should be achieved through the TP over time.

Good Practice Guidelines – Delivering Travel Plans through the Planning Process (April 2009)

2.1.9 In April 2009, the DfT published 'Good Practice Guidelines: Delivering Travel Plans through the Planning Process'. The Guidelines aim to bring together some of the best practice from around the country, together the key principles and mechanisms that have been found to help secure effective TPs in England.

2.1.10 The Good Practice Guidelines defines a TP as:

"...a long-term management strategy for an occupier or site that seeks to deliver sustainable transport objectives through positive action and is articulated in a document that is regularly reviewed. It involves the development of agreed explicit outcomes linked to an appropriate package of measures aimed at encouraging more sustainable travel, with an emphasis on reducing single occupancy car use".

2.1.11 In terms of workplace TPs, the guidelines recognise that a destination based approach to travel planning focussed primarily on commuter travel is required. Where appropriate, measures "...can and should also include strategies to make visitor and freight travel more sustainable".

2.2 Local Policy and Guidance

City of Gloucester Local Plan (1983)

2.2.1 The adopted Local Plan is the Gloucester Local Plan from 1983 from which a number of policies were saved in 2007. Two further Local Plan documents were produced in 1996 but these were not formally adopted. In 2000, the Council began consulting on a new Local Plan for Gloucester and this reached the Second Stage Deposit Draft in 2002.

2.2.2 Following this, the document was adopted by the Council for development control purposes. However, since adoption of the NPPF and 2017 Joint Core Strategy (see below) a number of these policies have been replaced.

Gloucester, Cheltenham and Tewkesbury Joint Core Strategy (2017)

2.2.3 The Joint Core Strategy (JCS) incorporates the administrative areas of Gloucester City, Cheltenham Borough and Tewkesbury Councils. The purpose of the document is to set out the *"identified need and location for housing and employment, supporting infrastructure"* in these areas. The Local Transport Plan (LTP) is prepared by Gloucester CC and sits alongside the JCS.

2.2.4 The principal transport related policies are outlined below and include INF1 and INF2:

Policy INF1: Access to the Transport Network

Developers should aim to provide safe and accessible connections to the transport network to enable travel choice for residents and commuters. All proposals should ensure that:

- *The development provides safe vehicular access to the highway network;*
- *Any increased level of car use derived from the development does not result in severe impact. Severe impact will be determined on a case by case basis;*

- *Any severe impacts that can be attributable to the development must be mitigated; and*

- *Connections should be provided where appropriate to existing walking, cycling and passenger transport networks and should be designed to enable and encourage maximum potential use.*

Where a significant amount of new trips is anticipated from a proposed development, the local planning authority may require applications to be accompanied by a Travel Plan that has full regard to the criteria set out in the NPPF.

Policy INF2: Safety and Efficiency of the Transport Network

Developers will be required to assess the impact of proposals on the transport network to ensure that they will not detrimentally affect its safety or efficiency. All proposals will demonstrate the impact of prospective development on:

- *Congestion at network pinch-points;*

- *Travel safety within the vicinity of the development; and*

- *Noise and/or atmospheric pollution within the vicinity of the development.*

Planning permission will be granted only where the impact of development is not considered to be severe or, where severe impact is considered likely, can be mitigated to the satisfaction of the local planning authority in consultation with the Local Highway Authority.

Gloucestershire's Local Transport Plan (2015-2031)

2.2.5 The Local Transport Plan (LTP) sets out the transport strategy for the County up to 2031, with a focus placed on having a *"…resilient transport network that enables sustainable economic growth by providing door to door travel choices"*. The overarching objectives of the LTP are to:

- Support sustainable economic growth;

- Enable community connectivity;

- Conserve the environment; and

- Improve community health and wellbeing.

Manual for Gloucestershire Streets (July 2020)

2.2.6 The Manual for Gloucestershire Streets (MfGS) *"…provides guidance to developers, their consultants and design engineers, Local Planning Authorities, Parish and Town Councils and the public on how new development within Gloucestershire can contribute towards the provision of a safe and sustainable transport network within the County".* It sets out thresholds for when Transport Assessments, Transport Statements and Travel Plans are required.

2.2.7 An addendum to the MfGS was published in October 2021 seeking to provide clarity on changes to national guidance and policy which supersedes elements of the 2020 MfGS.

3.0 EXISTING CONDITIONS

3.1 Site Location

3.1.1 The site is located 2.5km to the southeast of Gloucester City Centre and is bound by the A38 Eastern Avenue to the south-east, the A4302 Metz Way to the south-west, the Great Western Railway Line to the north-west and Chancel Close to the north-east. The location of the proposed development is shown on **Figure 1**.

3.2 Pedestrian and Cyclist Network

3.2.1 The site benefits from good connectivity with an established network of cyclist and pedestrian links routeing through the local area. Further details are provided within the Non-Motorised User audit/ Pedestrian Environment Review within the Transport Assessment, which includes measures to improve accessibility.

3.3 Public Transport Network

Bus

3.3.1 As shown on **Figure 1**, the closest bus stops to the site are located on Metz Way to the south-east – approximately 400m from the centre of the site via the most direct route. These are served by the no.8 bus operated by Stagecoach which routes between Gloucester and Brockworth, and include a flagpole & timetable information. A summary of this service is provided in **Table 1**.

Table 1 – Bus Services and Frequencies

Service	Route	Journey Time	Freq. M-F	Freq. Sat	Freq. Sun
8	Gloucester - Brockworth	15 mins	20mins	20mins	30mins

3.3.2 As part of this development scheme it is proposed that the existing bus stops located on Metz Way to the east of Eastern Avenue would be upgraded to provide bus shelters and real-time information. The funding for this would be secured through a Section 106 Agreement.

Rail

3.3.3 Gloucester Railway Station is located approximately 2km or 8 minutes cycle time from the site. The station is served by several rail operators, offering rail users a wide range of destinations around the country. **Table 2** below summarises the rail services operating through Gloucester Railway Station.

Table 2 – Rail Services and Frequencies

Destination	Journey Time	Frequency
Cheltenham Spa	10m	15-30 mins
Cardiff Central	1 hour 8 mins	30 mins
Weymouth	3 hours 22 mins	1-5 hours (5 services)
Nottingham	2 hours 19 mins	1 hour
London Paddington	1 hour 49 mins	1-2 hours
Maesteg	2 hours 10 mins	1-3 hours
Swindon (Wilts)	46 mins	1 hour
Great Malvern	52 mins	2-4 hours
Brighton	4 hours 32 mins	Single Service
Birmingham New Street	58 mins	1 hour
Bristol	52 mins	1 hour

3.3.4 Gloucester Railway Station has a good range of facilities with parking provided for 32 bicycles and up to 200 cars. It can be accessed using the frequent no.8 bus service which stops within 400m of the proposed development.

Public Transport Accessibility Index

3.3.5 The Accessibility Index (AI) for the site is 4.23. The calculations for this is attached as **Appendix C**.

3.4 Local Facilities

3.4.1 Local facilities within 500m of the site are set out in **Table 3**.

Table 3 – Local Facilities within 500m

Amenities	Location
Appropriate food outlet	There is a Starbucks, KFC and Tim Hortons within 500m of the site.
Access to cash	There are no ATM's within 500m of the site.
Access to an outdoor open space (public or private, suitably sized and accessible to building users)	There are no outdoor open spaces within 500m of the site.
Access to a recreation or leisure facility for fitness or sports	There are no recreation or leisure facilities within 500m of the site.
Publicly available postal facility	There is a postbox approximately 300m south of the site.
Community facility	There are no community facilities within 500m of the site.
Over the counter services associated with a pharmacy	There are no over the counter services within 500m of the site.
Public sector GP surgery or general medical centre	There are no public sector GP surgeries or general medical centres within 500m of the site.
Childcare facility or school	There are no childcare facilities or schools within 500m of the site.

3.5 Local Road Network

3.5.1 The site is currently served by a one-way service road, which runs adjacent to Eastern Avenue, via a left-in/ left-out arrangement. This road is separated from Eastern Avenue by a grass verge with raised kerbs and a shared foot/ cycleway. The site access forms the minor arm of a priority controlled T-junction with the service road, which is shown below in **Photo 1**.

Photo 1 – Existing Primary Site Access (looking west)



3.5.2 The existing service road measures approximately 6.5m in width and is lit.

3.5.3 The service road and site can be accessed from the northbound carriageway of Eastern Avenue. There is a break in the central reservation around 20m to the south of the access allowing southbound vehicles travelling along Eastern Avenue to make a U-turn and continue north along Eastern Avenue or access the site/ adjacent premises. Vehicles turning right into the site from the A38 can therefore currently do so using this facility, with gaps in traffic created by the adjacent traffic signals at the Eastern Avenue/Metz Way signalised crossroads.

3.5.4 A secondary access to the site is located off Chancel Close, which is a single carriageway cul-de-sac serving a small business park with around 13 units. This access is currently gated and is shown in **Photo 2**.

Photo 2 – Existing Secondary Site Access (looking north-west)



3.5.5 Chancel Close meets the service road at a simple priority junction. Vehicles exiting from Chancel Close then have to turn left along the service road before re-joining the northeast-bound carriageway of Eastern Avenue at a simple priority junction. There is no existing right-turn facility at the junction.

3.5.6 Eastern Avenue itself is a three lane dual carriageway within the vicinity of the site and is subject to a 40mph speed limit. It operates as an eastern distributor road around Gloucester and provides connection with Junction 11A of the M5 motorway to the north. The northbound and southbound carriageways are separated by a 5m wide central reservation.

3.5.7 The Eastern Avenue/Metz Way signalised crossroads are located around 110m to the south of the existing site access. Each arm of the junction has a segregated left-turn lane which are priority controlled – with the exception of Metz Way (East) where this is signalised. Metz Way west of the junction has a 7.5T weight restriction (except for access).

3.5.8 There is a signalised junction encompassing Eastern Avenue and York Road approximately 220m to the north of the site access. North of this junction, Eastern Avenue connects with Barnwood Road and Corinium Avenue via a 4-arm at-grade part-signalised roundabout.

4.0 TRAVEL PLAN TARGETS AND OBJECTIVES

4.1 Introduction

4.1.1 The overall TP objective for the development is to reduce the percentage of occupants travelling by car and this chapter provides an indication as to the impact travel planning could have at reducing car use.

4.2 Outcomes

4.2.1 The Good Practice Guidelines identifies that good practice has evolved from previous guidance into a single main approach to TPs. It states that:

"The 'outcomes' approach, specifies outcomes linked to specific targets that can also be strengthened with sanctions if these are not met. This approach is distinct from that which focuses wholly on the establishment of a list of measures, e.g. the provision of a shuttle bus or cycle shelter. Many, if not the majority of, travel plans combine the two approaches, depending upon the type of travel plan and what it is designed to achieve. However, the establishment of outcomes is important."

4.2.2 With the outcomes approach, the focus is placed on ensuring the performance of the TP – for example, meeting modal shift targets. The applicant/ developer is then required to commit to meeting these targets, and agrees to a monitoring and review process. Should the targets not be met within the timescales stated, then it may be appropriate to implement remedial measures (see **Section 6.2**).

4.2.3 It is identified in the Good Practice Guidelines that, for new developments in particular, outcome targets should be expressed in terms of a maximum end levels of car use. This relates to the maximum allowable modal share of car use for when the development is complete. This figure should be lower than what would be expected should the development not have a TP.

4.3 Base Mode Share

4.3.1 This FTP provides a framework for the occupiers to produce their own TPs that complement the measures implemented by the developer. As this is a new development and no current travel patterns exist, specific targets for modal shift cannot be set at this stage.

4.3.2 Nevertheless, in order to derive a preliminary baseline mode share for the overall site, reference has been made to the existing journey to work mode share for the middle super output area (MSOA) of Gloucester 007 within which the site is located, derived from 2011 'Method of Travel to Work' Census data. The resulting mode share data is summarised in **Table 4**.

Table 4 – Preliminary Mode Share Baseline

Mode of travel	Modal Split (%)
Bus	4.3%
Train	0.6%
Car	74.0%
Car - passenger	4.8%
Motorcycle	1.2%
On-foot	7.7%

4.3.3 It can be seen from **Table 4** that approximately 74% of journeys to work are made by car, with around 15% made by active modes (foot and cycle), 5% as car sharers, 5% by public transport, and 1% by motorcycle.

4.4 Targets

4.4.1 At this stage, an initial 10% proportional mode shift reduction target in car use for employees has been set for the development site against the baseline mode share of 74%. This is to be achieved over a five-year implementation period, as summarised in **Table 5**.

Table 5 – Car Driver Mode Share Target

Car Driver Modal Share*					
Baseline	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 5**
74.0%	*72.5%*	*71.0%*	*69.6%*	*68.1%*	*66.6%*

**to be reviewed following initial staff survey*

4.4.2 The base mode share for the site and associated car driver target will be reviewed within three months of the opening of the first unit. This will then set the timing for the annual monitoring of the Full TPs, with each subsequent unit completing initial monitoring surveys in line with this date for a period of five years.

4.4.3 The information obtained from the surveys will be used to set occupant specific targets as part of subsidiary TPs, which would be agreed with GCC. These targets would be continually reviewed and monitored to determine whether the overall objectives of the TP are being achieved.

4.5 Indicators

4.5.1 The Good Practice Guidelines highlights the importance of distinguishing between outcome targets and indicators. Whereas the target for the proposed development is focussed on reducing the number of car trips, the indicators are used to monitor how the site is being accessed and how effectively different modes are meeting travel needs. This information can subsequently be used to identify where the greatest potential for mode shift may lie and to inform the implementation strategy for the TP over the coming year.

4.5.2 A number of indicators will be measured at the proposed development. The responsibility for measuring these indicators lies with the Travel Plan Coordinator (see **Section 5.2**), and will include the following:

- % of employees walking;
- % of employees cycling;
- % of employees using public transport;

- % of employees' car sharing; and

- Use of cycle parking and electric vehicle charging spaces.

4.6 Objectives

4.6.1 The following section sets out the developer and occupier objectives and targets. In summary, the key role of the developer is to ensure that the key sustainable transport infrastructure is implemented prior to occupation and provide this FTP to guide occupiers in producing their own subsidiary TPs that are consistent with the vision for the proposed development. The occupiers will be responsible for encouraging, monitoring and reviewing sustainable travel initiatives as defined through their subsidiary TPs.

Developer Objectives

4.6.2 To ensure the potential for access by sustainable travel modes, the developer, through liaison with the local authority, will ensure that the appropriate infrastructure is implemented prior to first occupation.

4.6.3 Key developer objectives are defined as follows:

- To provide the necessary transport and building infrastructure;

- To enable access to the development by a number of alternative modes of transport; and

- To provide an attractive, secure environment for non-motorised modes.

4.6.4 **Table 6** summarises the preliminary design features aimed to give priority to those arriving by sustainable modes to the proposed development. Further consideration will be given to the requirements of those arriving by sustainable means at the more detailed design stage.

Table 6 – Design Features

Preliminary Design Feature	Description
Pedestrian and Cycle Access	Pedestrian/ cycle links will be provided within the site and staff entrances will be conveniently reached from the footways. Improvements to existing foot/ cycle provision will be provided along the site frontage connecting to the north and south of the site. This will include the creation of an improved 3m wide shared foot/cycleway and crossing facilities. Lighting, landscaping and shelter will create a pleasant environment for pedestrians and cyclists.
Cycle Parking	Cycle parking will be provided for each unit in accordance with local standards and BREEAM requirements. These will be located next to the main entrance points, and will be covered and secure.
Public Transport	Direct and attractive pedestrian links to public transport connections will be provided. Improvements to bus stop facilities on Metz Way would be provided as part of the development proposals.
Disabled Access	The development include adequate provision for disabled access, which accounts for varying levels of disability and visual impairment.
Detailed Design Feature	
Car Share Spaces	It is proposed that 5% of car parking spaces will be designated for car sharers and will be located at preferential locations.
Showering/changing Facilities	Shower and changing facilities will be provided where appropriate.
Electric Charging Points	28% of car parking spaces will have electric vehicle charging facilities.

Occupier Objectives

4.6.5 The future occupiers of units 1-3 on the site will be expected to prepare their own subsidiary TPs in accordance with this framework document. In the case of units 4-14 it is proposed that a Travel Plan Statement will be prepared given their size. These documents will commit the occupiers to encouraging and facilitating employees and, where feasible, visitors to travel by sustainable modes of transport.

5.0 TRAVEL PLAN IMPLEMENTATION AND MANAGEMENT

5.1 Introduction

5.1.1 This section of the FTP reviews implementation and management, and provides a selection of sustainable travel measures that could be implemented by the occupiers. The list of measures provided is not exhaustive and is only intended to act as a guide to occupiers, who may find that through operating their subsidiary TP they find their own unique ways of minimising the impact of transport by their organisation.

5.2 Travel Plan Coordinator

5.2.1 In order to implement the FTP, a Framework Travel Plan Co-ordinator (FTPC) will be appointed by the developer prior to occupation of the development and will be funded for a minimum period of five years.

5.2.2 With regard to the subsidiary TPs, the FTPC will be responsible for liaising and co-ordinating with staff who, where appropriate, have been appointed by their respective employers as subsidiary Travel Plan Co-ordinators. This will include providing guidance where requested on the content of the subsidiary TPs being prepared by the future occupiers, the parameters for which are set out within this document.

5.2.3 The subsidiary Travel Plan Co-ordinators will be responsible for the following:

- Explaining and marketing the TPs;
- Seeking commitment from senior management, staff and other relevant parties;
- Arranging promotional events;
- Ensuring the health, wealth and environmental benefits of sustainable travel are publicised;
- Producing questionnaires, promotional and informative material;

- Liaising with the local authority and external stakeholders as appropriate;
- Setting up a Staff Travel Database if appropriate; and
- Organising annual surveys, analysing these and providing the results to the FTPC.

5.3 General Promotion

5.3.1 **Table 7** provides a toolkit of measures which could be adopted by the future occupiers of the proposed development.

Table 7 – Travel Plan Tool Kit

Potential Travel Plan Initiatives	**Responsibility**
Walking (best suited to journeys under 2km)	
Provide cloakroom facilities within the building with drying and storage locker facilities.	Under agreement between developer and occupier, such facilities should be included within building design. For speculative builds developer to provide.
Produce a map illustrating local walking routes.	Occupiers through TPCs
Keep a store of pool umbrellas on-site for use by staff.	
Raise awareness of health benefits of walking through posters, leaflets and/or events.	
Offer a guaranteed ride home to alleviate staff concerns of being stranded at work in the event of unforeseen circumstances.	
Arrange events to promote walking, such as a walk to work day with incentives, prizes, give-aways etc.	
Cycling (best suited to journeys under 5km)	
Provide safe, secure and fully weatherproof cycle storage near to main entrances of building.	Under agreement between developer and occupier, such facilities should be included within building design. For speculative builds developer to provide.
Provide shower facilities and changing rooms/areas within the buildings.	
Provide lockers for cyclist safety gear.	Occupiers through TPCs
Raise awareness of health benefits of cycling through continual publicity.	
Provide cycle route maps.	
Offer financial incentives such as interest free loans or seek discounted purchase prices for bicycles & equipment from local retailers.	
Keep a supply of basic cycle maintenance equipment on-site e.g. pump, puncture repair kit, tools etc.	

Offer a guaranteed ride home to alleviate staff concerns of being stranded at work in the event of unforeseen circumstances.	
Establish a bicycle user group (BUG) & bike buddy scheme.	
Arrange events to promote cycling to work such as free breakfast days for cyclists.	
Public Transport (provides a sustainable alternative for many commuter & business trips)	
Disseminate up-to-date public transport information on-site. Including routes, timetables and fares for local services.	Occupiers through TPCs
Promote benefits of public transport. Savings etc	
Establish an interest free loan system for staff to purchase yearly or quarterly season tickets with payments taken directly from salary.	
Liaise with local operators for improved services.	
Fund a works bus/minibus if appropriate.	
Car Sharing (provides a sustainable alternative when the car is the only option)	
Consider setting up an in-house car sharing database for staff or encourage staff to sign up to CarshareGloucestershire.com	Occupiers through TPCs
Consider providing preferential parking spaces for car sharers close to main entrances.	
Provide a guaranteed ride home scheme for car sharers in the event of unforeseen circumstances.	
Devise a protocol/ guidelines for car sharers to follow.	
Arrange coffee mornings or other events to allow potential car sharers to meet before committing to sharing with someone they previously did not know.	
Run prize draws open to those registered on the car share scheme.	

6.0 TRAVEL PLAN MONITORING AND AUDIT

6.1 Target Monitoring

6.1.1 As stated within the DfT's Good Practice Guidelines, TPs are living documents that need to be updated regularly and implementing a TP involves "*a continuous process for improving, monitoring, reviewing and adjusting the measures in the plan to reflect changing circumstances".*

6.1.2 The FTPC for the site as a whole would be responsible for liaising with the subsidiary Travel Plan Coordinators and providing support during the monitoring process. This would include collating the monitoring data from the subsidiary Travel Plan Coordinators for analysis and summarising this information for submission to the local authority in the form of an Annual Performance Report for the site as a whole.

6.1.3 The appointed subsidiary Travel Plan Coordinators would be responsible for monitoring employee travel patterns. This would include:

- Distributing annual travel questionnaires to staff. An example questionnaire is attached as **Appendix B**;
- Monitoring the use of car and cycle parking;
- Recording the uptake of car sharing and membership; and
- Recording the update of any sustainable transport initiatives.

6.1.4 Initial surveys would be undertaken by the occupants in line with the annual monitoring programme, with the first unit to be occupied completing an initial travel survey within 3 months of occupations. This in turn will set the annual monitoring programme for the rest of the site. A response rate to the travel surveys of 40% is targeted with incentives offered to respondents if necessary.

6.1.5 The TPCs will feedback the results of the travel surveys and other monitoring exercises to the FTPC, who will compile the results into an annual report for distribution to GCC. The FTPC will also provide support to the TPCs during the monitoring process.

6.1.6 The FTPC will agree a date for the delivery of the monitoring report with GCC, and to agree with the TPCs when surveys should be completed. This will help to ensure that there is a consistent approach to the scope of the surveys across all occupied sites, including the date which should include all occupied sites regardless of the time occupied.

6.1.7 The TPCs and FTPC will review progress towards targets annually in consultation with GCC. Where appropriate, discussions will be held as to how TP targets might be better achieved. Through consultation with the local authority, the TP targets will be reviewed annually.

6.2 Remedial Measures

6.2.1 Should targets not be met then consideration will be given to implementing remedial measures. These measures are not precluded from implementation within the Full TPs if required and could include:

- Increased travel behaviour change initiatives such as travel awareness campaigns;
- Offering one to one travel planning sessions to identify how individuals could travel to the site more sustainably; and
- Providing financial incentives for staff, for example prize draws for car share users.

6.2.2 GCC will be consulted regarding the activation of any remedial measures at the site.

7.0 ACTION PLAN

7.1.1 The proposed action plan in terms of Travel Plan implementation is set out in **Table 8**.

Table 8 – Action Plan

Action	Timeframe	Responsibility
Initial Actions:		
Appointment of Framework Travel Plan Coordinator (FTPC)	Prior to occupation	Site Management
Identification of the annual travel plan budget	Prior to occupation/annually	Site Management
Appointment of subsidiary Travel plan Co-ordinator (TPC)	Prior to occupation	Occupier
Prepare Full Travel Plans or Travel Plan Statements for agreement with GCC	Prior to occupation	TPCs with assistance from FTPC
Undertake initial Travel Survey to review baseline and targets	Within 3 months of opening of first unit	TPCs with assistance from FTPC
Monitoring and Reporting:		
Staff Travel Survey	Annually after first travel survey	TPCs with assistance from FTPC
Monitoring use of cycle and car parking	Ongoing	TPCs
Recording uptake of car sharing and membership	Ongoing	TPCs
Recording uptake of sustainable travel initiatives	Ongoing	TPCs
Preparation of annual report	Within 2 months of the surveys being completed	FTPC
Issue annual report to GCC	Within 2 months of the surveys being completed	FTPC
Review and update Travel Plan Strategy in respect of monitoring results	Following feedback from GCC	FTPC/ TPCs/ GCC
Implement remedial measures	Following feedback from GCC	FTPC/ TPCs/ GCC
Measures:		
Identify measures to facilitate and encourage travel by foot (see Table 7)	Ongoing	TPCs with assistance from FTPC
Identify measures to facilitate and encourage travel by bicycle (see Table 7)	Ongoing	TPCs with assistance from FTPC
Identify measures to facilitate and encourage travel by public transport (see Table 7)	Ongoing	TPCs with assistance from FTPC
Identify measures to facilitate and encourage car sharing (see Table 7)	Ongoing	TPCs with assistance from FTPC

Figures


Site Location Plan
Legend
Indicative Site Location
Blinkhorns Bridge Ln
Channel Close
Southbrook Rd
A38
A4302
Metz Way
York Rd
Eastbrook Rd
Eastern Ave
Eastville Close
Google Earth
© 2018 Google
N
100 m

Appendix A
Propose Site Layout

RAILWAY LINE

METZ WAY

UNIT 2
93,530ft²

UNIT 1
70,200ft²

45m

UNIT 3
40,150ft²

37m

UNIT 4
6,100ft²

UNIT 5
5,170ft²

UNIT 6
3,660ft²

UNIT 7
4,620ft²

UNIT 8
6,290ft²

15m

7.3m

12.5m

UNIT 9
2,875ft²

UNIT 10
3,915ft²

UNIT 11
3,925ft²

UNIT 12
3,925ft²

UNIT13
3,915ft²

UNIT 14
2,875ft²

CHANNEL CLOSE

VISIBILITY SPLAY EASEMENT

RELEVANT ADOPTED HIGHWAY LAND BOUNDARY

EASTERN AVENUE

RELEVANT ADOPTED HIGHWAY LAND BOUNDARY UNDER S247/248

EASTERN AVENUE

KEY

- (R) Recycling & Refuse
- (SS) Substation
- (1) Cycle Storage (Sheffield Stands)
- (2) Motorbike Parking Bay
- Unit Entrance
- Proposed Fence Line - 2.4m high Paladin
- Existing Fence Line
- Unit Office Area

Disclaimer:
Information Subject to Measured Survey

Notes:

KEY

- PLANNING APPLICATION SITE BOUNDARY (Approx 53,142 m² / 13.13 acres)
- RELEVANT ADOPTED HIGHWAY LAND AND BOUNDARY (WITHIN OWNERSHIP)
- VISIBILITY SPLAY EASEMENT
- RELEVANT BOUNDARY UNDER S247/248

AREA SCHEDULE(GIA)

UNIT 1 (GIA)	**70,200 ft²**
Warehouse (Incl. office Undercroft)	64,600 ft²
Office (FF Only)	2,700 ft²
Office (SF Only)	2,900 ft²
Car parking spaces	*44*
UNIT 2 (GIA)	**93,530 ft²**
Warehouse (Incl. office Undercroft)	86,450 ft²
Office (FF Only)	3,430 ft²
Office (SF Only)	3,650 ft²
Car parking spaces	*79*
UNIT 3 (GIA)	**40,150 ft²**
Warehouse (Incl. office Undercroft)	36,375 ft²
Office (FF Only)	3,775 ft²
Car parking spaces	*31*
UNIT 4 (GIA)	**6,100 ft²**
Warehouse (Incl. office Undercroft)	5,050 ft²
Office (FF Only)	1,050 ft²
Car parking spaces	*6*
UNIT 5 (GIA)	**5,170 ft²**
Warehouse (Incl. office Undercroft)	4,330 ft²
Office (FF Only)	840 ft²
Car parking spaces	*5*
UNIT 6 (GIA)	**3,660 ft²**
Warehouse (Incl. office Undercroft)	3,160 ft²
Office (FF Only)	500 ft²
Car parking spaces	*3*
UNIT 7 (GIA)	**4,620 ft²**
Warehouse (Incl. office Undercroft)	3,900 ft²
Office (FF Only)	720 ft²
Car parking spaces	*4*
UNIT 8 (GIA)	**6,290 ft²**
Warehouse (Incl. office Undercroft)	5,195 ft²
Office (FF Only)	1,095 ft²
Car parking spaces	*6*
UNIT 9 (GIA)	**2,875 ft²**
Warehouse (Incl. office Undercroft)	2,875 ft²
Car parking spaces	*3*
UNIT 10 (GIA)	**3,915 ft²**
Warehouse (Incl. office Undercroft)	3,915 ft²
Car parking spaces	*3*
UNIT 11 (GIA)	**3,925 ft²**
Warehouse (Incl. office Undercroft)	3,925 ft²
Car parking spaces	*3*
UNIT 12 (GIA)	**3,925 ft²**
Warehouse (Incl. office Undercroft)	3,925 ft²
Car parking spaces	*3*
UNIT 13 (GIA)	**3,915 ft²**
Warehouse (Incl. office Undercroft)	3,915 ft²
Car parking spaces	*3*
UNIT 14 (GIA)	**2,875 ft²**
Warehouse (Incl. office Undercroft)	2,875 ft²
Car parking spaces	*3*
TOTAL GIA	251,150ft²
Total Car Parking	*196*

N

0 5 10 15 20 25
Scale bar - 1:500m

Rev:	Notes:	Date:	Dwn:	Iss:
04	Amendments to unit cores	12.12.21	HT	HA
03	Update U9 to 14	30.11.21	HT	HA
02	Unit GA, U1&2 move for trees, U4to8 pavement, Unit 3 pavement	23.11.21	HT	HA
01	Update to Unit 2	15.11.21	HT	HA
00	Site access updated	15.11.21	HT	HA
DR	DR Issue	04.11.21	HT	HA

Suitability Code:

Client:
CANMOOR

hale
ARCHITECTURE
22c Leathermarket Street, London, SE1 3HP

Project:
Access Park, Gloucester

Drawing Title:
Proposed Site Plan

Project No: 21078
Scale @ A1 / A3: 1:500 / 1:1000
Revision: 04

Drawing No: 21078-PL1003

Appendix B
Example Staff Travel Questionnaire

Example Staff Travel Questionnaire

General information

1. Home postcode.....

2. Do you have a disability which affects your travel arrangements?
   - ❑ Yes
   - ❑ No

3. What time do you usually arrive at work?
   - ❑ 7.00 – 7.30 am
   - ❑ 7.30 – 8.00 am
   - ❑ 8.00 – 8.30 am
   - ❑ 8.30 – 9.00 am
   - ❑ 9.00 – 9.30 am
   - ❑ 10.00 – 10.30am
   - ❑ Other (please specify).....
   .....

4. What time do you usually leave for home?
   - ❑ 3.00 – 3.30 pm
   - ❑ 3.30 – 4.00 pm
   - ❑ 4.00 – 4.30 pm
   - ❑ 4.30 – 5.00 pm
   - ❑ 5.00 - 5.30 pm
   - ❑ 5.30 – 6.00 pm
   - ❑ 6.00 – 6.30 pm
   - ❑ 6.30 – 7.00 pm
   - ❑ 7.00 – 7.30 pm

   Other (please specify)
   .....

5. Do you work:
   - ❑ Part time
   - ❑ Full time

   Other (please specify)

8. How would you *prefer* to travel to work? (please tick only one)
   - ❑ Car (on your own)
   - ❑ Car (with others)
   - ❑ Bus
   - ❑ Train
   - ❑ Motorbike
   - ❑ Walk
   - ❑ Cycle

General travel information

6a How do you usually travel to work?
   - ❑ Car (on your own)
   - ❑ Car (with others)
   - ❑ Bus
   - ❑ Train
   - ❑ Motorbike
   - ❑ Walk
   - ❑ Cycle
   - ❑ Taxi

6b Why do you choose to travel in this way? (tick all that apply)
   - ❑ Convenience
   - ❑ Cost
   - ❑ Health reasons
   - ❑ Alternative not available
   - ❑ Need to for work purposes
   - ❑ Other (please specify) .....
   .....

7. Do you ever use a different mode of transport?
   - ❑ Yes
   - ❑ No

   If yes, how
   - ❑ Car (on your own)
   - ❑ Car (with others)
   - ❑ Bus
   - ❑ Train
   - ❑ Motorbike
   - ❑ Walk
   - ❑ Cycle
   - ❑ Taxi

   .....

Questions for Car Drivers

9. Do you ever work from home?

- ❑ Yes
- ❑ No

10. If so, how often?

- ❑ more than once a week
- ❑ Once a week
- ❑ Once a fortnight
- ❑ Once a month
- ❑ Occasionally

11. How far do you travel to work?

- ❑ Less than one mile
- ❑ 1 – 2 miles
- ❑ 2 – 5 miles
- ❑ 6 – 10 miles
- ❑ 11 – 25 miles
- ❑ 26 miles or more

Please specify……..
…….

12. How would you get to work if your car broke down or it was being serviced?

- ❑ Car (with others)
- ❑ Bus
- ❑ Train
- ❑ Motorbike
- ❑ Walk
- ❑ Cycle
- ❑

13. What are your main reasons for driving to work (tick no more than 3)?

- ❑ Drop/collect a child off at school on the way
- ❑ Need car for other activities after work e.g. shopping, gym
- ❑ Distance from home too great to walk or cycle
- ❑ Need the car for work during the day
- ❑ No one to car share with
- ❑ No public transport or it would take too long
- ❑ Personal safety
- ❑ Car needed because of health (e.g. physical disability
- ❑ Cheaper than public transport
- ❑ More reliable than public transport
- ❑ Other (please specify):

14. Would you be prepared to car share?

- ❑ Yes
- ❑ No
- ❑ Already do

15. How long does your journey generally take you?

- ❑ Less than 15 minutes
- ❑ 16 – 30 minutes
- ❑ 30 – 45 minutes
- ❑ 45 – 60 minutes
- ❑ Over an hour

16. Are you aware that this Organisation has a Travel Plan?

- ❑ Yes
- ❑ No

17. On average how often do you use your car alone for work purposes?

- ❑ Less than once a month
- ❑ One day per week or less
- ❑ At least 2 days per week
- ❑ At least 4 days per week

18. How many miles for work purposes do you travel on average per month? ……miles

Forester House
Doctor's Lane
Henley-in-Arden
Warwickshire
B95 5AW

[redacted]

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hale
architecture : design management

Access Park, Gloucester 21078/3.1/02

22c Leathermarket Street
London SE1 3HP

15 December 2021

Access Park (Former Interbrew Site), Eastern Avenue, Gloucester GL4 6SW - planning application for fourteen speculative industrial units with E(g) (iii), B2 & B8 uses plus alternative trade counter uses for Units 9 to 14, ref PP-10440761

Planning Statement

Introduction

The proposed development is geared towards improving economic growth in-line with the Local Plan, with the continued regeneration of the area to encourage further growth.

The application will encompass and seeks to attract the following uses:

- E(g)(iii) - Light Industry (previously B1c use)
- B2 - General Industry (Other than within Class B1)
- B8 - Wholesale warehouse, distribution centres & depositories

Site Location

The site is situated at the junction of Eastern Avenue (A38) and Metz Way (A4302) within the established commercial area of Gloucester.

The site is approx. 5.2 Hectares (12.9 Acres) in size, with the south-east and south-west boundary adjacent to Eastern Avenue and Metz Way junction, the north-west boundary parallel to the main railway line (Gloucester - Cheltenham - Bristol) and the north-east boundary adjacent to Chancel Close with Eastern Avenue providing direct dual carriageway access to Junctions 11, 11A and 12 of the M5 motorway (all within approximately 5 miles radius).

Current Use

The site was previously occupied by Whitbread drinks company and its successors as a goods distribution centre (from approx. 1994, last use up to September 2017) and since then the site has been cleared and is currently vacant.

Planning History

A full planning application was submitted in 2018 by the previous site owner with a proposal for units falling within industrial (B1, B2 and B8), retail (A1), hotel (C1) and restaurant (A3/A4 and A3/A4) use classes with permission granted in September 2020 (planning consent reference number 18/01444/FUL).
As part of the planning consent Conditions 6 is for the implementation of new signal controlled junction on Eastern Avenue (signal controlled T junction with Eastern Avenue and Chancel Close to provide ingress and egress to the site from north and south including cycleway, carriageway, footways and street lighting) and Condition 7 notes the implementation of bus stop on Metz Way with real time information, bus shelter and connecting footways into the site.

Flood Zone / Drainage

The proposed site is located in Flood Zone 1 which is classed as low risk of flooding. Although there will be no issues from a flooding point of view, due to the size of the site a Flood Risk Assessment has been completed and is submitted with the planning application.

Planning and Planning Policy

The planning determination process is guided by the following statutory development plan documents:

- Gloucester, Cheltenham and Tewkesbury Joint Core Strategy (JCS)
- City of Gloucester Local Plan and Emerging Local Plan - Gloucester City Plan (GPC)

The site does not have any specific site planning use class designation however it is a historic and established employment use site.

We have spoken to the Gloucester City Council Planning Policy (Officer Adam Gooch) who confirmed this was the case. He also noted that the proposal for an employment only development with E(g)(iii), B2 & B8 uses was much preferred to the previous approved mixed use scheme (ref 18/01444/FUL).

Therefore Use Classes E(g)(iii), B2 and B8 are supported by the local planning authority for the re-development of the site. This is also in line with Gloucester, Cheltenham and Tewkesbury Joint Core Strategy (JCS) Policy SD1. This specifically supports the re-development of existing employment sites for further employment uses.

The Gloucester City Council Emerging Local Plan (not yet adopted) also has Policy B3 which encourages the intensification of existing employment land along with Policy B2 which safe guards existing employment sites.

In summary the redevelopment of the whole site for employment uses is fully supported.

Community Infrastructure Levy and Section 106

Gloucester City Council have confirmed that there are no Community Infrastructure Levy (CIL) charges for employment use developments.

As with any planning application Section 106 contributions are dealt with on an application by application basis taking a view on any impact any development would have on the surrounding area.

A Section 106 was in place for the current planning approval ref 18/01444/FUL, for £10,000 to cover the monitoring of a Travel Plan.

BREEAM Policy

The Council has the view that a development of this size and type will require a BREEAM rating of 'Very Good'. This planning application proposes a development with an "excellent" rating.

Submission of a new Planning Application

This full planning application requires the following supporting reports which include the following:

- Design and Access Statement
- Geotechnical investigation / Environmental Investigation
- Transport Assessment (including Travel Plan)
- Flood Risk Assessment and Drainage Strategy
- Noise Assessment
- Landscape Proposal, tree survey & constraints plan and tree protection plan
- Ecology Report / Appraisal incl Bio Diversity Net Gain Assessment
- Energy and Sustainability Strategy
- Air Quality Assessment
- Archaeological Assessment

Planning Summary

The site has an established historic employment use.

We have spoken to Gloucester City Council Planning Policy (Officer Adam Gooch) who confirmed that E(g)(iii), B2 and B8 uses would be supported and encouraged on the site. He also noted that the proposal of an employment only development was much preferred to the previous approved mixed use scheme.

In Policy terms the Gloucester, Cheltenham and Tewkesbury Joint Core Strategy (JCS) Policy SD1, specifically supports re-development of existing employment sites for further employment uses.

The Gloucester City Council Emerging Local Plan (not yet adopted) also has Policy B3 which encourages the intensification of existing employment land and Policy B2 which safe guards existing employment sites.

It is noted that any new development will have to include the new road access works as shown as part of planning approval 18/01444/FUL.

Access Park, Gloucester

Transport Assessment

DTA

Transport Planning Consultants

Access Park, Gloucester

Transport Assessment

8th December 2021
SJT/TM 23390-01_Transport Assessment

Prepared by:

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Prepared For:

Canmoor

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Table of Contents

1.0 INTRODUCTION 1

2.0 POLICY CONTEXT 2

2.1 National Policy and Guidance 2

2.2 Local Policy and Guidance 3

3.0 EXISTING CONDITIONS 7

3.1 Site Location 7

3.2 Local Road Network 7

3.3 Personal Injury Collisions 9

3.4 Pedestrian and Cyclist Network 10

3.5 Public Transport Network 10

4.0 NON-MOTORISED USER / PEDESTRIAN ENVIRONMENT REVIEW 12

4.1 Introduction 12

4.2 Access by Public Transport 19

4.3 Site Layout 21

4.4 Conclusions 21

5.0 DEVELOPMENT PROPOSALS 22

5.1 Site History 22

5.2 Development Proposals 22

5.3 Site Layout 22

5.5 Vehicle Access 23

5.6 Parking 23

6.0 TRAFFIC GENERATION AND IMPACT 26

6.1 Introduction 26

6.2 Previous Traffic Generation 26

6.3 Proposed Traffic Generation 26

6.4 Traffic Impact 27

7.0 CONCLUSIONS 28

Figures

Figure 1 Site Location Plan
Figure 2 NMU Assessment Area (in text)

Drawings

23390-01A Visibility Splays
23390-02A Swept-path Analysis 1
23390-03A Swept-path Analysis 1

Appendices

Appendix A Proposed Site Layout
Appendix B Personal Injury Collision Data
Appendix C Public Transport Accessibility Index
Appendix D TRICS Data

1.0 INTRODUCTION

1.1 DTA Transportation Limited have been commissioned by Canmoor to provide highways and transport advice to support a full planning application for the redevelopment of Access Park (the former Interbrew site) off Eastern Avenue in Gloucester to provide 251,150sqm (23,333sqm) of flexible Class E(g)(ii) light industrial/ B2 general industrial/ B8 storage & distribution use. The proposed site layout plan is attached as **Appendix A** and the location of the site is shown on **Figure 1**.

1.2 The application site is located some 2.5km east of the City Centre and extends to circa 13 acres. It is currently significantly underutilised, comprising vacant land that previously accommodated warehouse buildings and associated office space, alongside what was once open storage and lorry parking. The total floor area for previous buildings amounted to some 13,748sqm (148,000sqft).

1.3 The site has been fully vacant since September 2017, although occupation and activity steadily decreased for the nine months prior to this. The open storage element is currently secured via perimeter fencing. A planning application for the mixed-use redevelopment of the site to provide employment use, along with a retail store, hotel/ pub/restaurant and drive-thru was granted planning permission in December 2018 (ref: 18/01444/FUL). The impact of the current development proposals has been reviewed within the context of this existing planning consent.

1.4 A Transport Assessment (TA) has been prepared in accordance with the National Planning Policy Framework (NPPF) and national Planning Practice Guidance (PPG). It is supported by a Framework Travel Plan. It is concluded from this analysis that the proposed redevelopment would have no material residual adverse impact on the safe operation of the local highway network.

2.0 POLICY CONTEXT

2.1 National Policy and Guidance

Revised National Planning Policy Framework

2.1.1 In July 2021, the Government published a revised National Planning Policy Framework (NPPF).

2.1.2 Paragraph 111 of the NPPF is clear that: *"Development should only be prevented or refused on highways grounds if there would be an unacceptable impact on highway safety, or the residual cumulative impacts on the road network would be severe"*.

2.1.3 Within this context, the NPPF identifies in Paragraph 112 that applications for development should:

"a) give priority first to pedestrian and cycle movements, both within the scheme and with neighbouring areas; and second – so far as possible – to facilitating access to high quality public transport, with layouts that maximise the catchment area for bus or other public transport services, and appropriate facilities that encourage public transport use;

b) address the needs of people with disabilities and reduced mobility in relation to all modes of transport;

c) create places that are safe, secure and attractive – which minimise the scope for conflicts between pedestrians, cyclists and vehicles, avoid unnecessary street clutter, and respond to local character and design standards;

d) allow for the efficient delivery of goods, and access by service and emergency vehicles;

e) be designed to enable charging of plug-in and other ultra-low emission vehicles in safe, accessible and convenient locations."

2.1.4 Paragraph 113 of the NPPF goes on to state that: *"All developments that will generate significant amounts of movement should be required to provide a travel plan, and the application should be supported by a transport statement or transport assessment so that the likely impacts of the proposal can be assessed".*

2.1.5 In reinforcing the principle of supporting sustainable development, paragraph 10 stipulates that at the heart of the Framework is "...a presumption in favour of sustainable development".

Planning Practice Guidance (March 2014)

2.1.6 The Department for Communities and Local Government (CLG) first published the Planning Practice Guidance (PPG) in 2014, which reinforces the guidance contained in the NPPF. It is now an online resource which is regularly updated.

2.1.7 The PPG in Paragraph: 002 Reference ID: 42-002-20140306 states that Travel Plans and Transport Assessments are ways of assessing and mitigating the negative transport impacts of development in order to promote sustainable development. They are required for all developments which generate significant amounts of movements.

2.1.8 The Guidance goes on to explain what these documents are, why they are important, what information they should contain and how they should relate to one another.

2.1.9 The Guidance focuses on an 'outcomes' approach to TPs, requiring that specific outcomes or targets be established by agreement on what should be achieved through the TP over time.

2.2 Local Policy and Guidance

City of Gloucester Local Plan (1983)

2.2.1 The adopted Local Plan is the Gloucester Local Plan from 1983 from which a number of policies were saved in 2007. Two further Local Plan documents were produced in 1996 but these were not formally adopted. In 2000, the Council began consulting on a new Local Plan for Gloucester and this reached the Second Stage Deposit Draft in 2002.

2.2.2 Following this, the document was adopted by the Council for development control purposes. However, since adoption of the NPPF and 2017 Joint Core Strategy (see below) a number of these policies have been replaced.

Gloucester, Cheltenham and Tewkesbury Joint Core Strategy (2017)

2.2.3 The Joint Core Strategy (JCS) incorporates the administrative areas of Gloucester City, Cheltenham Borough and Tewkesbury Councils. The purpose of the document is to set out the *"identified need and location for housing and employment, supporting infrastructure"* in these areas. The Local Transport Plan (LTP) is prepared by Gloucester CC and sits alongside the JCS.

2.2.4 The principal transport related policies are outlined below and include INF1 and INF2:

Policy INF1: Access to the Transport Network

Developers should aim to provide safe and accessible connections to the transport network to enable travel choice for residents and commuters. All proposals should ensure that:

- *The development provides safe vehicular access to the highway network;*
- *Any increased level of car use derived from the development does not result in severe impact. Severe impact will be determined on a case by case basis;*
- *Any severe impacts that can be attributable to the development must be mitigated; and*
- *Connections should be provided where appropriate to existing walking, cycling and passenger transport networks and should be designed to enable and encourage maximum potential use.*

Where a significant amount of new trips is anticipated from a proposed development, the local planning authority may require applications to be accompanied by a Travel Plan that has full regard to the criteria set out in the NPPF.

Policy INF2: Safety and Efficiency of the Transport Network

Developers will be required to assess the impact of proposals on the transport network to ensure that they will not detrimentally affect its safety or efficiency. All proposals will demonstrate the impact of prospective development on:

- *Congestion at network pinch-points;*
- *Travel safety within the vicinity of the development; and*
- *Noise and/or atmospheric pollution within the vicinity of the development.*

Planning permission will be granted only where the impact of development is not considered to be severe or, where severe impact is considered likely, can be mitigated to the satisfaction of the local planning authority in consultation with the Local Highway Authority.

Gloucestershire's Local Transport Plan (2015-2031)

2.2.5 The Local Transport Plan (LTP) sets out the transport strategy for the County up to 2031, with a focus placed on having a *"…resilient transport network that enables sustainable economic growth by providing door to door travel choices"*. The overarching objectives of the LTP are to:

- Support sustainable economic growth;
- Enable community connectivity;
- Conserve the environment; and
- Improve community health and wellbeing.

Manual for Gloucestershire Streets (July 2020)

2.2.6 The Manual for Gloucestershire Streets (MfGS) *"…provides guidance to developers, their consultants and design engineers, Local Planning Authorities, Parish and Town Councils and the public on how new development within Gloucestershire can contribute towards the provision of a safe and sustainable transport network within the County".* It sets out thresholds for when Transport Assessments, Transport Statements and Travel Plans are required.

2.2.7 An addendum to the MfGS was published in October 2021 seeking to provide clarity on changes to national guidance and policy which supersedes elements of the 2020 MfGS.

3.0 EXISTING CONDITIONS

3.1 Site Location

3.1.1 The site is located 2.5km to the southeast of Gloucester City Centre and is bound by the A38 Eastern Avenue to the south-east, the A4302 Metz Way to the south-west, the Great Western Railway Line to the north-west and Chancel Close to the north-east. The location of the proposed development is shown on **Figure 1**.

3.2 Local Road Network

3.2.1 The site is currently served by a one-way service road, which runs adjacent to Eastern Avenue, via a left-in/ left-out arrangement. This road is separated from Eastern Avenue by a grass verge with raised kerbs and a shared foot/ cycleway. The site access forms the minor arm of a priority controlled T-junction with the service road, which is shown below in **Photo 1**.

Photo 1 – Existing Primary Site Access (looking west)



3.2.2 The existing service road measures approximately 6.5m in width and is lit.

3.2.3 The service road and site can be accessed from the northbound carriageway of Eastern Avenue. There is a break in the central reservation around 20m to the south of the access allowing southbound vehicles travelling along Eastern Avenue to make a u-turn and continue north along Eastern Avenue or access the site/ adjacent premises. Vehicles turning right into the site from the A38 can therefore currently do so using this facility, with gaps in traffic created by the adjacent traffic signals at the Eastern Avenue/Metz Way signalised crossroads.

3.2.4 A secondary access to the site is located off Chancel Close, which is a single carriageway cul-de-sac serving a small business park with around 13 units. This access is currently gated and is shown in **Photo 2**.

Photo 2 – Existing Secondary Site Access (looking north-west)



3.2.5 Chancel Close meets the service road at a simple priority junction. Vehicles exiting from Chancel Close then have to turn left along the service road before rejoining the northeast-bound carriageway of Eastern Avenue at a simple priority junction. There is no existing right-turn facility at the junction.

3.2.6 Eastern Avenue itself is a three lane dual carriageway within the vicinity of the site and is subject to a 40mph speed limit. It operates as an eastern distributor road around Gloucester and provides connection with Junction 11A of the M5 motorway to the north. The northbound and southbound carriageways are separated by a 5m wide central reservation.

3.2.7 The Eastern Avenue/Metz Way signalised crossroads are located around 110m to the south of the existing site access. Each arm of the junction has a segregated left-turn lane which are priority controlled – with the exception of Metz Way (East) where this is signalised. Metz Way west of the junction has a 7.5T weight restriction (except for access).

3.2.8 There is a signalised junction encompassing Eastern Avenue and York Road approximately 220m to the north of the site access. North of this junction, Eastern Avenue connects with Barnwood Road and Corinium Avenue via a 4-arm at-grade part-signalised roundabout.

3.3 Personal Injury Collisions

3.3.1 In order to review road safety in the area of the site, Personal Injury Collision (PIC) data was obtained from Gloucestershire County Council (GCC), for the latest five-year period. The data is summarised in **Table 1** and is attached as **Appendix B**.

Table 1 – Summary of PICs by Severity

PIC Severity	Slight	Serious	Fatal	Total
Number of PICs	15	2	0	17
% of Total	88%	12%	0%	100%

3.3.2 As shown above, a total of 17 PICs have been recorded over the most recent year period, of which 15 were recorded as being ‘slight’ and two were ‘serious’. No fatalities have been recorded in the study area.

3.3.3 No PICs have been recorded at the existing site access nor at the Eastern Avenue/ Chancel Close junction, with the majority (15) having taken place at the Eastern Avenue/ Metz Way signalised crossroads to the south. In the TA for the previous planning application a total of 21 PICs were recorded at the junction including four 'serious' incidents. Consequently, it appears that there has been a reduction in the number of PICs since the previous work was undertaken.

3.3.4 In terms of the two 'serious' PICs that were recorded, these involved the following:

- PIC (Reference 211191) – This occurred in December 2016 and involved a 'distracted' pedestrian stepping into the road into the path of a car; and

- PIC (Reference 212433) – This incident occurred in July 2018 and took place when a car travelling towards the City Centre along Metz Way drove in front of another car travelling along Eastern Avenue.

3.3.5 Overall, it is concluded from this review that the number and nature of the incidents recorded within the vicinity of the site does not indicate any existing highway safety issues that would warrant mitigation as part of the development proposals.

3.4 Pedestrian and Cyclist Network

3.4.1 The site benefits from good connectivity with an established network of cyclist and pedestrian links routeing through the local area. Further details are provided within the Non-Motorised User audit/ Pedestrian Environment Review in **Chapter 4**.

3.5 Public Transport Network

Bus

3.5.1 As shown on **Figure 1**, the closest bus stops to the site are located on Metz Way to the south-east – approximately 400m from the centre of the site via the most direct route. These are served by the no.8 bus operated by Stagecoach which routes between Gloucester and Brockworth, and include a flagpole & timetable information. A summary of this service is provided in **Table 2**.

Table 2 – Bus Services and Frequencies

Service	Route	Journey Time	Freq. M-F	Freq. Sat	Freq. Sun
8	Gloucester - Brockworth	15 mins	20mins	20mins	30mins

Rail

3.5.2 Gloucester Railway Station is located approximately 2km or 8 minutes cycle time from the site. The station is served by several rail operators, offering rail users a wide range of destinations around the country. **Table 3** below summarises the rail services operating through Gloucester Railway Station.

Table 3 – Rail Services and Frequencies

Destination	Journey Time	Frequency
Cheltenham Spa	10m	15-30 mins
Cardiff Central	1 hour 8 mins	30 mins
Weymouth	3 hours 22 mins	1-5 hours (5 services)
Nottingham	2 hours 19 mins	1 hour
London Paddington	1 hour 49 mins	1-2 hours
Maesteg	2 hours 10 mins	1-3 hours
Swindon (Wilts)	46 mins	1 hour
Great Malvern	52 mins	2-4 hours
Brighton	4 hours 32 mins	Single Service
Birmingham New Street	58 mins	1 hour
Bristol	52 mins	1 hour

3.5.3 Gloucester Railway Station has a good range of facilities with parking provided for 32 bicycles and up to 200 cars. It can be accessed using the frequent no.8 bus service which stops within 400m of the proposed development.

Public Transport Accessibility Index

3.5.4 The Accessibility Index (AI) for the site is 4.23. The calculations for this is attached as **Appendix C**.

4.0 NON-MOTORISED USER/ PEDESTRIAN ENVIRONMENT REVIEW

4.1 Introduction

4.1.1 This non-motorised user (NMU)/ Pedestrian Environment Review considers the existing pedestrian and cycle provision within the vicinity of the application site. It focuses on connectivity between the site and the mix of commercial and residential areas around it, which represents the main attraction for future NMU movements generated by the proposals.

4.1.2 The focus of this review is on the likely desire line for future employees and customers of the proposed development.

Scope of Analysis

4.1.3 This review focusses on the pedestrian and cycle network within the vicinity of the site between the Eastern Avenue/ Metz Way and Eastern Avenue/ York Road junctions, as well as connections to the closest bus stops which are located on Metz Way to the east of Eastern Avenue. The area of assessment is shown on **Figure 2**.

Figure 2 – Assessment Area



Site Frontage

4.1.4 The site is currently served off a one-way service road, which runs adjacent to A38 Eastern Avenue, and is accessed via a left-in/ left-out arrangement. The service road is separated from Eastern Avenue by a grass verge and a 2m wide shared foot/ cycleway (see **Photo 3**).

4.1.5 The access onto the service road from Eastern Avenue (**Photo 4**) is approximately 40m wide and the width of the access combined with the angle of entry results in relatively high vehicle speeds onto the service road. This in turn creates an unattractive and potentially intimidating environment for pedestrians and cyclists travelling along the shared foot/cycleway to the west of Eastern Avenue.

Photo 3 – Eastern Avenue (looking north on-site frontage)



Photo 4 – Eastern Avenue (looking north across service road and existing site access)



4.1.6 In line with the previous planning application, the proposals have been designed to improve the pedestrian and cycle environment along the site frontage by:

- Closing the existing service road;
- Providing an improved 3m wide shared foot/cycleway along site frontage;
- Reducing the crossing width across the site access and providing an improved alignment; and
- Reducing the speed of vehicles exiting Eastern Avenue by rationalising the existing access and providing a smaller radius for vehicles exiting off Eastern Avenue.

4.1.7 These improvements are shown on the proposed site layout plan attached as **Appendix A**.

4.1.8 To the south of the current site access, the existing shared foot/ cycleway provides connection to/ from the Eastern Avenue/ Metz Way signalised crossroads. The link to those crossroads is currently overgrown, as shown in **Photo 5**. Going forward, it is proposed that the vegetation causing the partial obstruction will be removed and the frontage actively maintained, to ensure that pedestrian/ cycle movements are unimpeded. This will be addressed in the landscaping scheme, and associated Maintenance & Management Plan.

Photo 5 – Eastern Avenue (looking south from existing site access)



Between the Site and Local Bus Stops on Metz Way

4.1.9 As shown on **Figure 1**, the closest bus stops to the site are located on Metz Way to the south-east – approximately 400m from the centre of the site via the most direct route. The desire line for bus users would take them across the Eastern Avenue/ Metz Way junction before accessing the site off Eastern Avenue. It should be noted that the bus stops shown on York Road are not in use.

4.1.10 The Eastern Avenue/ Metz Way junction was recently upgraded by GCC to provide toucan crossing facilities across all arms (see **Photo 6**). This has resulted in improved connectivity between the site and the closest bus stop facilities on Metz Way and a journey time of around 4-5 minutes by foot (see **Section 4.2**).

Photo 6 – Eastern Avenue/ Metz Way Junction (looking west across Eastern Avenue)



4.1.11 Recently improved shared foot/ cycleways are also located on both sides of Metz Way to the east of Eastern Avenue providing connections to the bus stops and beyond.

Between the Site and Eastern Avenue/ York Road Junction

4.1.12 To the north of the existing site access, the service road connects to Chancel Close via a priority T-junction. Chancel Close is a cul-de-sac, providing access to existing employment units and an access point into the site. The service road then connects with Eastern Avenue via a left-out T-junction. Uncontrolled crossings are provided at this location (see **Photo 7**).

Photo 7 – Eastern Avenue (looking north along Eastern Avenue from Chancel Close)



4.1.13 In line with the access strategy agreed with GCC for the previously approved planning application, it is proposed that the service road/ Chancel Close access will be replaced by an all-movement signalised junction which will serve the development and adjacent industrial uses. This is shown on the proposed site layout plan attached as **Appendix A**.

4.1.14 Eastern Avenue currently acts as a significant barrier to pedestrians and cyclists travelling east to west and vice versa. The closest existing formal crossing points are located on the northern arm of the Eastern Avenue/ York Road junction to the north of the site (puffin crossing only) and at the Eastern Avenue/ Metz Way junction to the south (toucan crossing). There is a gap of approximately 350m between crossing points. The provision of a new toucan crossing facility over Eastern Avenue as part of the development proposals will therefore result in improved connectivity for current and future pedestrians and cyclists.

4.1.15 Where the proposed toucan crossing connects to the southern side of Eastern Avenue opposite Chancel Close, there is currently a circa 100m tarmacked footpath within the verge. However, this is in a poor condition/ unmaintained as shown on **Photo 8**.

Photo 8 – Existing Footpath to East of Eastern Avenue (looking south from York Road)



4.1.16 The demand for the link by pedestrians and cyclists is limited due to the adjacent service road being relatively lightly trafficked and the presence of a footway along the eastern side of the carriageway. However, an improved section of foot/cycleway was previously identified as part of the access strategy to link the toucan crossing over Eastern Avenue with existing facilities. This will connect to the existing network via a similar arrangement to that to the north of York Road (see **Photo 9**).

Photo 9 – GCC Foot/ Cycle Improvements to North of York Road



Conclusions

4.1.17 Overall, it is clear from this review that site is well located with regard to access by foot and cycle, although there are some existing barriers to movement that the proposals seek to address. Recent works to the Eastern Avenue/ Metz Way junction and nearby facilities implemented by GCC have improved the local pedestrian/ cycle environment, and the proposals identified as part of the development scheme will build upon these to further improve, encourage and facilitate travel by non-car modes.

4.2 Access by Public Transport

4.2.1 As discussed above, the closest bus stops to the site are located on Metz Way to the south-east of the site – approximately 400m from the centre of the site using the most direct route via the Eastern Avenue/ Metz Way junction.

4.2.2 The Metz Way bus stops are served by the no.8 bus service which operates with a 20-minute frequency between Monday and Saturday, reducing to 30 minutes on Sunday. This service can in turn can be used to travel to/ from Gloucester Railway Station which is located approximately 1.7km from the site.

4.2.3 The route taken from the bus stops on Metz Way to the site via the Eastern Avenue/ Metz Way junction is direct, and wide foot/ cycleways combined with improved/ modern crossing facilities create a pleasant environment for bus users accessing the site.

4.2.4 As part of the work undertaken with the previous application, a survey of journey times between the existing bus stops on Metz Way and the site access was undertaken on Tuesday 1st October 2019. The results of this survey are provided in **Table 4** and show an average journey time of between 4-5 minutes which is not significant and is unlikely to be a significant deterrent to future staff and visitors wishing to access the site by bus.

Table 4 – Bus Stop Journey Times

Route	Journey Time
EB Bus Stop to Site Access	3.56
	3.52
	4.11
Site Access to EB Bus Stop	4.15
	3.54
	4.21
WB Bus Stop to Site Access	4.22
	4.15
	3.58
Site Access to WB Bus Stop	4.02
	4.34
	4.03

4.2.5 As part of this development scheme it is proposed that the existing bus stops located on Metz Way to the east of Eastern Avenue would be upgraded to provide bus shelters and real-time information. The funding for this would be secured through a Section 106 Agreement.

4.2.6 With regard to rail services, Gloucester Railway Station is located approximately 1.7km to the north-west of the site and can be accessed from the site access using a designated shared foot/cycleway along Eastern Avenue, Metz Way and Bruton Way. This translates into a cycle time of approximately 7 minutes and a walk time of around 20 minutes. Cycle parking facilities are provided at the station.

4.3 Site Layout

4.3.1 The layout of the site has also been designed to facilitate and encourage travel by non-car modes. The measures provided within the site to encourage sustainable travel include:

- A 3m wide shared foot/cycleway running along both access points into the site;
- Continuous and legible pedestrian corridors within individual plots that connect with the estate road and main building entrances, as well as clear demarcation for wayfinding;
- Crossing points at various locations around the site to align with likely desire lines;
- Cycle parking across the site to meet forecast demand including a combination of short and long stay spaces; and
- A commitment to providing 28% Electric Vehicle Charging spaces.

4.4 Conclusions

4.4.1 Overall, it is concluded that the site is well located in terms of accessibility to foot, cycle and public transport. Opportunities for enhancing and maximising the use of these facilities have been identified, and sustainable travel practices will be promoted through the Travel Plan, which was also submitted as part of the application.

5.0 DEVELOPMENT PROPOSALS

5.1 Site History

5.1.1 The site is located in central Gloucester and was until recently a distribution centre for DHL. The site has been fully vacant since September 2017. The previous buildings associated with the site's use as a distribution centre have since been demolished.

5.1.2 A planning application for the mixed-use redevelopment of the site to provide employment use, along with a retail store, hotel/ pub/restaurant and drive-thru was granted planning permission in December 2018 (ref: 18/01444/FUL). The impact of the current development proposals has been reviewed within the context of this existing planning consent.

5.2 Development Proposals

5.2.1 The development proposals are for the redevelopment of the existing site to provide 251,150sqm (23,333sqm) of flexible Class E(g)(ii) light industrial/ B2 general industrial/ B8 storage & distribution use. The proposals comprise 14 employment units which are shown on the proposed site layout plan is attached as **Appendix A**.

5.2.2 The development include adequate provision for disabled access, which accounts for varying levels of disability and visual impairment.

5.3 Site Layout

5.3.1 The visibility splays at the internal junctions and access points has been reviewed and is shown on **Drawing 23390-01A**.

5.4 Swept-path analysis of the site accesses and layout has been undertaken and is shown on **Drawings 23390-2A and 23390-3A**. The site has been designed to allow vehicles to enter the site, turn around and egress the site in forward gear.

5.5 Vehicle Access

5.5.1 The proposed vehicle access strategy is consistent with that agreed with GCC for the previously consented mixed-use scheme on the site, which had been subject to a Stage F/1 Road Safety Audit.

5.5.2 As such, the development will have two points of access off Eastern Avenue. To the north-east, the previously agreed all-movement signalised T-junction will be formed with Eastern Avenue via Chancel Close. To the south-west, the current main access to the site will be retained and formalised to provide an in-only access served off Eastern Avenue (which was also agreed with GCC through the previous application). This arrangement is shown on proposed layout plan attached as **Appendix A**.

5.5.3 Consequently, the existing service road running parallel to Eastern Avenue would be removed as part of the access proposals and an improved 3m wide shared foot/ cycleway would be provided along the site frontage as shown on the site layout plan attached as **Appendix A**.

5.6 Parking

5.6.1 The approach to parking in relation to new development is set out within the MfGS. For commercial/ industrial uses, it is identified that *"…the applicant should provide a minimum parking provision… along with an evidence base to demonstrate the appropriate level of provision"*. Consequently, an analysis of likely operational need has been undertaken to ensure that adequate levels of parking are provided on-site. This exercise has been completed using TRICS data to derive the accumulated parking demand and the TRICS outputs are attached as **Appendix D**.

5.6.2 The assessment demonstrates that the level of parking proposed across the site, as set out in **Table 5** below, is sufficient to accommodate the anticipated levels of demand.

Table 5 – Car Parking Review

Unit	Proposed	TRICS Demand
1	44	41
2	79	55
3	31	23
4	6	4
5	5	3
6	3	2
7	4	3
8	6	4
9	3	2
10	3	2
11	3	2
12	3	2
13	3	2
14	3	2

5.6.3 With regard to disabled parking, this accords with the standards set out within the MfGS and equates to approximately 8% of overall car parking provision across the site.

5.6.4 It is proposed that around 28% of spaces would be equipped with electric vehicle charging (EVC), which is well in excess of the levels set out in MfGS.

5.6.5 A total of 20 motorcycle spaces are proposed, which accords with the levels set out in MfGS at 1 space per 10 car spaces.

5.6.6 In terms of bicycle parking, MfGS identifies that: *"The number of stands should reflect the governments aspiration to double cycling by 2025, therefore no fewer than the level of cycling in the area per person as should in the latest census and then doubling it should be provided"*.

5.6.7 According to the latest modal share data from the 2011 Census, 7.4% of journeys to work within the area are undertaken by bicycle. On this basis, parking on the site should relate to double this figure i.e. 14.8%.

5.6.8 As future staffing levels across the site are unknown at this stage, reference has been made to the Employment Density Guide (3rd Edition) published by the Homes & Community Agency. For light industrial use, an average employment density of 1 staff per 47sqm is identified, which if applied to the total development quantum equates to around 496 employees. At 14.8% cycle mode share, there would therefore be a requirement for around 73 bicycle spaces. A total of 74 bicycle spaces are proposed, which therefore accords with the local guidance.

5.6.9 It should be noted that average employment levels for B8 use are significantly lower than this (between 70-95sqm), and therefore the application of the above rates is robust.

6.0 TRAFFIC GENERATION AND IMPACT

6.1 Introduction

6.1.1 This Chapter of the TA reviews the traffic generation resulting from the development proposals and how this compares with the level of traffic assessed as part of the previously consented planning application for the mixed-use redevelopment of the site.

6.2 Previous Traffic Generation

6.2.1 The traffic generation assessed in the previous TA for the mixed-use redevelopment of the site is summarised in **Table 6** for the weekday peaks.

Table 6 – Previously Assessed Traffic Generation (Vehicles)

	Arrivals	Departures	Total
AM Peak	87	52	139
PM Peak	94	116	210

6.3 Proposed Traffic Generation

6.3.1 TRICS data has been used to forecast the peak hour traffic generation resulting from the development proposals. For this, Land-use 02 – Employment, Category D – Industrial Estate was selected and the full TRICS outputs are attached as **Appendix D**. The resulting trip generation is shown in in **Table 7**.

Table 7 – Proposed Development Traffic Generation (Vehicles)

	Arrivals	Departures	Total
Vehicle Trip Rates			
AM Peak	0.355	0.146	0.501
PM Peak	0.150	0.365	0.515
Vehicle Trip Generation			
AM Peak	83	34	117
PM Peak	35	85	120

6.4 Traffic Impact

6.4.1 The forecast net change in traffic generation when compared with the previously consented planning application is shown in **Table 8**. This demonstrates that there would be a net reduction in peak traffic movements from that previously assessed and deemed to be acceptable. The number of weekend movements has also significantly reduced from that associated with retail use. Consequently, it is concluded that the highways impact of the development proposals would not be 'severe'.

Table 8 – Net Change in Traffic Generation (Vehicles)

	Arrivals	Departures	Total
AM Peak	-4	-18	-22
PM Peak	-59	-31	-90

7.0 CONCLUSIONS

7.1 DTA Transportation Limited have been commissioned by Canmoor to provide highways and transport advice to support a full planning application for the redevelopment of Access Park (the former Interbrew site) off Eastern Avenue in Gloucester to provide 251,150sqm (23,333sqm) of flexible Class E(g)(ii) light industrial/ B2 general industrial/ B8 storage & distribution use.

7.2 The application site is located some 2.5km east of the City Centre and extends to circa 13 acres. It is currently significantly underutilised, comprising vacant land that previously accommodated warehouse buildings and associated office space, alongside what was once open storage and lorry parking. The total floor area for previous buildings amounted to some 13,748sqm (148,000sqft).

7.3 The site has been fully vacant since September 2017, although occupation and activity steadily decreased for the 9 months prior to this. The open storage element is currently secured via perimeter fencing. A planning application for the mixed-use redevelopment of the site to provide employment use, along with a retail store, hotel/ pub/restaurant and drive-thru was granted planning permission in December 2018 (ref: 18/01444/FUL). The impact of the current development proposals has been reviewed within the context of this existing planning consent.

7.4 This report has reviewed the accessibility of the site in line with local and national policy, and demonstrates that the site is well located in terms of sustainable accessibility. Opportunities for enhancing connectivity by sustainable modes between the site and local area have also been identified. These measures are supported by a Framework Travel Plan which sets out a strategy for encouraging and facilitating travel by sustainable modes.

7.5 A review of the most recent five year personal injury collision data for the local highway network has been undertaken and does not highlight any existing safety issues that would need to be mitigated as part of the development proposals.

7.6 The proposed vehicle access strategy is consistent with that agreed with Gloucestershire County Council for the previously consented mixed-use scheme on the site, which was subject to a Stage F/1 Road Safety Audit.

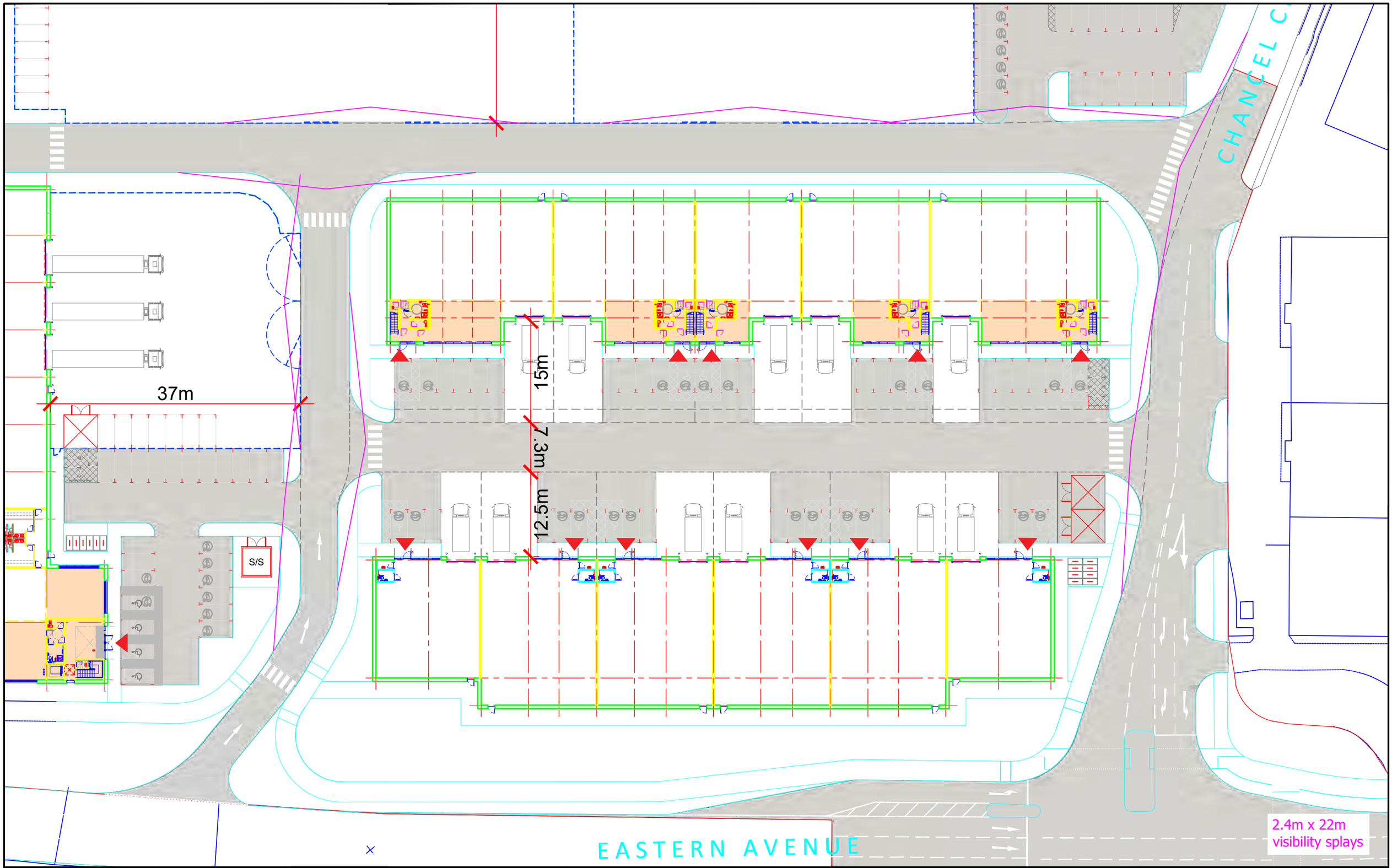
7.7 In considering the potential impact of the proposed development on the local highway network, an assessment of the change in vehicle traffic generation resulting from the development proposals has been undertaken. This demonstrates that the level of peak hour traffic generated by the proposals is less than that assessed as part of the 2018 planning consent. Consequently, it is concluded that the impact of the development proposals on the operation of the local highway network would not be 'severe'.

7.8 Overall, it is concluded that the proposed development is in full accordance with the transport policy tests for new developments as set out in the National Planning Policy Framework.

Figures


Site Location Plan
Legend
Indicative Site Location
Blinkhorns Bridge Ln
Channel Close
Southbrook Rd
A38
A4302
Metz Way
York Rd
Eastbrook Rd
Eastern Ave
Eastville Close
Google Earth
© 2018 Google
N
100 m

Drawings



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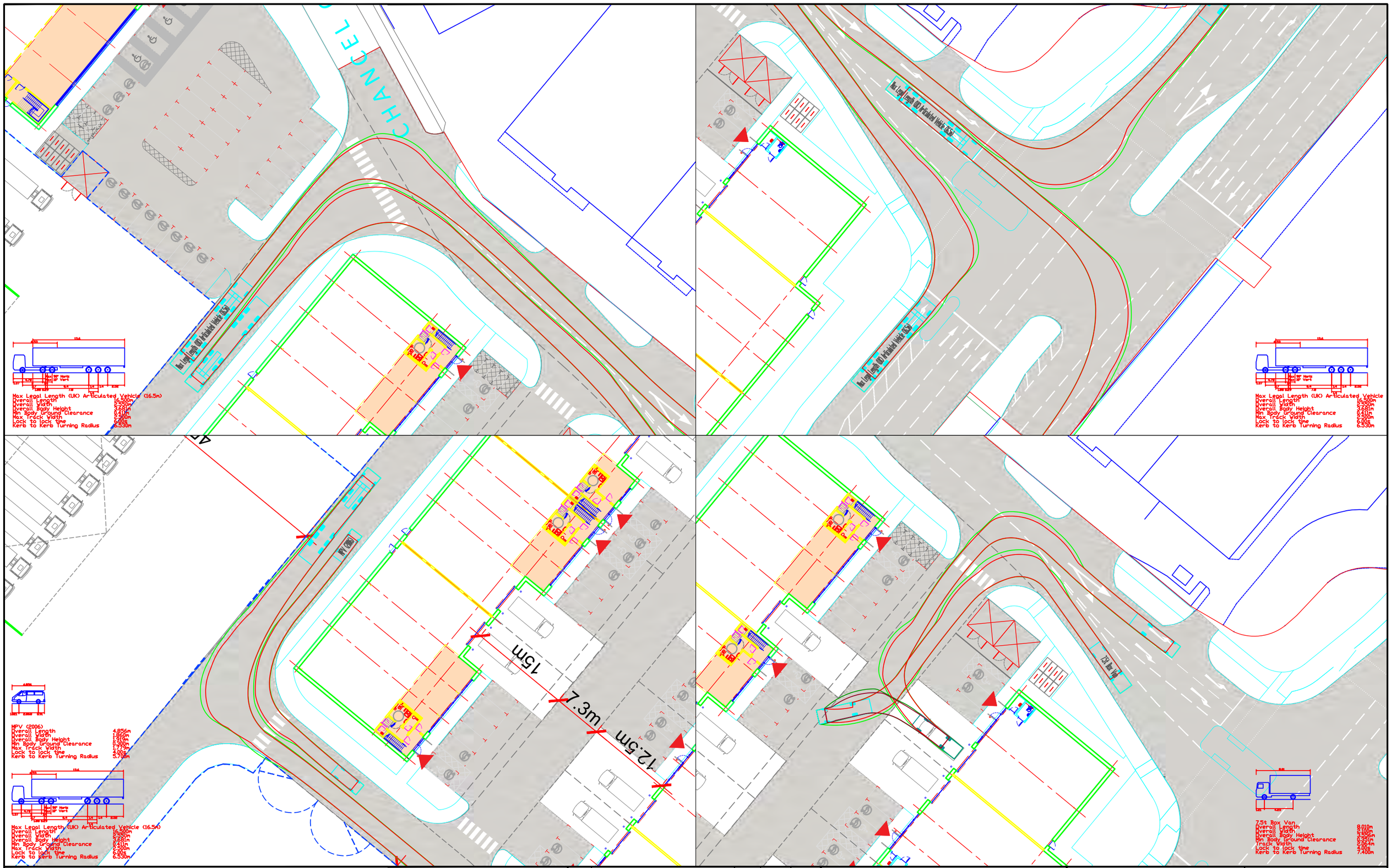
REV	DESCRIPTION	DRAWN	INITIALS	DATE

DTA
Transport Planning Consultants

Forester House, Doctors Lane,
Henley in Arden,
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[redacted]
www.dtatransportation.co.uk

JOB TITLE: Access Park, Gloucester		CLIENT: Canmoor	
DRAWING TITLE: Visibility Splays			
SCALE: 1:500@A3	DRAWN BY: TM	DATE: 08.12.21	DRAWING No: 23390–01

REVISION: A



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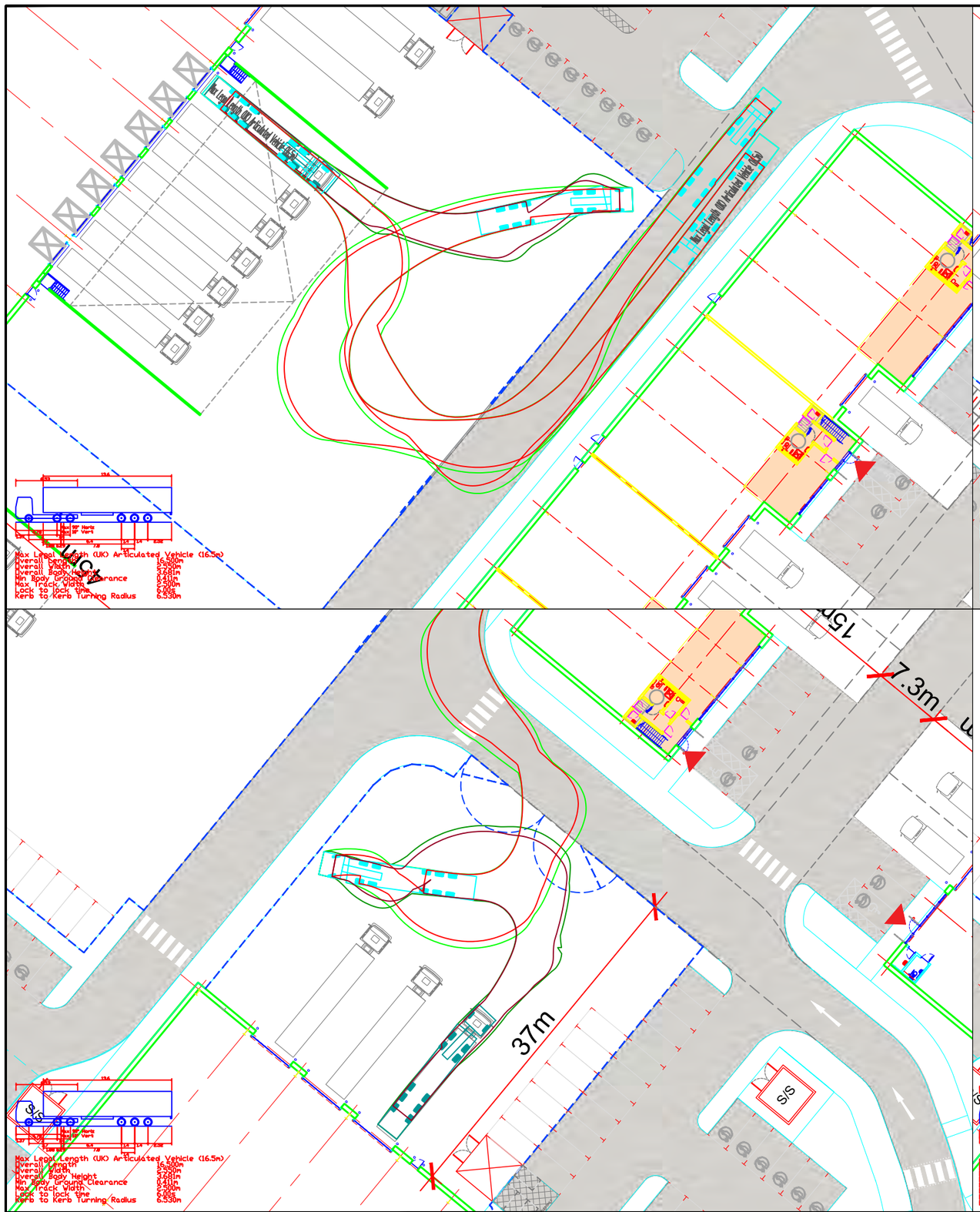
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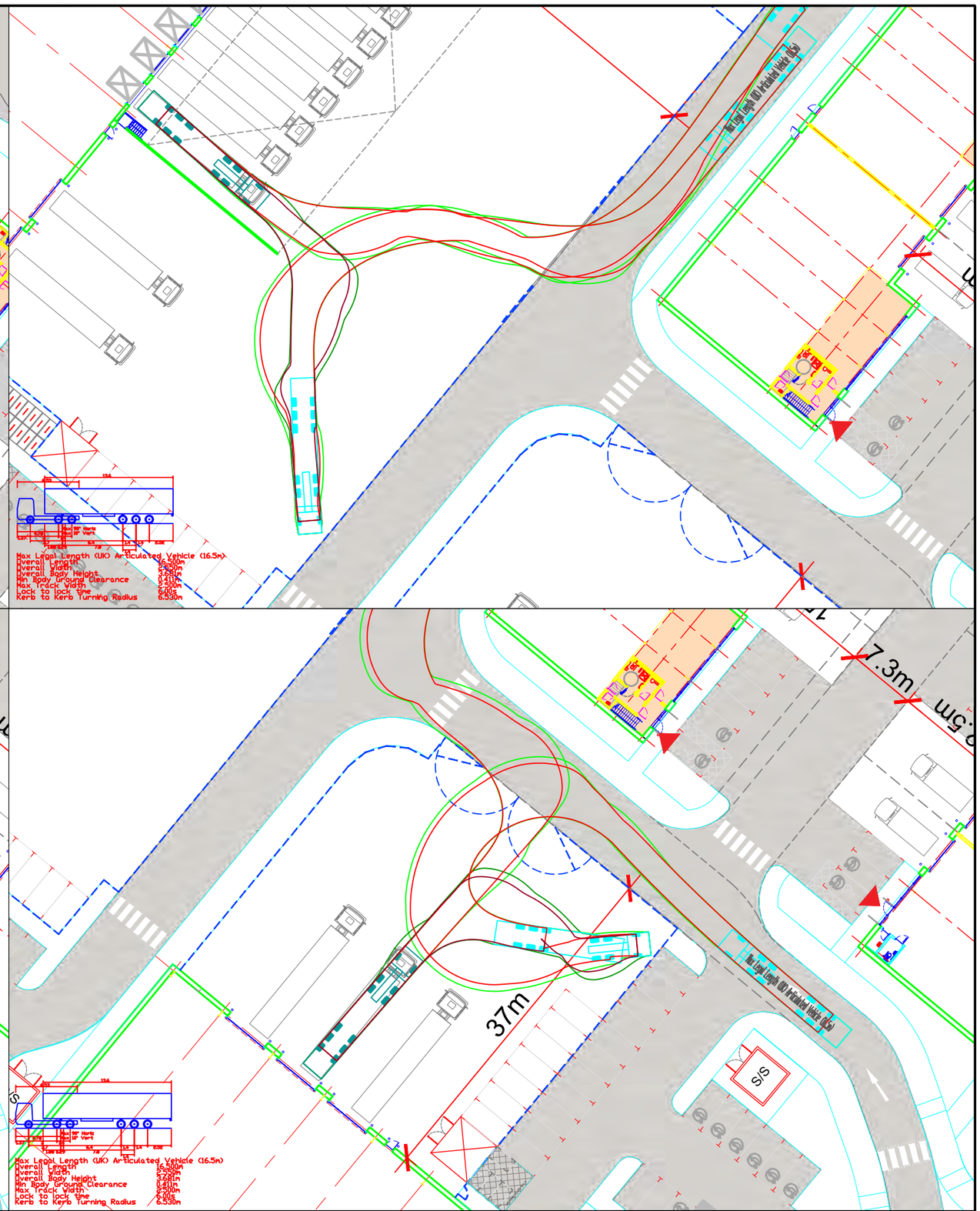
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JOB TITLE	Access Park, Gloucester
CLIENT	Canmoor
DRAWING TITLE	Swept-path Analysis 1
SCALE	1:500@A3
DRAWN BY	TM
DATE	08.12.21
DRAWING No	23390-02
REVISION	A





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JOB TITLE	CLIENT
Access Park, Gloucester	Canmoor

DRAWING TITLE

Swept-path Analysis 2

SCALE	DRAWN BY	DATE	DRAWING No	REVISION
1:500@A3	TM	08.12.21	23390-03	A

Appendix A
Proposed Site Layout



Disclaimer:
Information Subject to Measured Survey

Notes:

KEY

- PLANNING APPLICATION SITE BOUNDARY (Approx 53,142 m² / 13.13 acres)
- RELEVANT ADOPTED HIGHWAY LAND AND BOUNDARY (WITHIN OWNERSHIP)
- VISIBILITY SPLAY EASEMENT
- RELEVANT BOUNDARY UNDER S247/248

AREA SCHEDULE(GIA)

UNIT 1 (GIA)	**70,200 ft²**
Warehouse (Incl. office Undercroft)	64,600 ft²
Office (FF Only)	2,700 ft²
Office (SF Only)	2,900 ft²
Car parking spaces	*44*
UNIT 2 (GIA)	**93,530 ft²**
Warehouse (Incl. office Undercroft)	86,450 ft²
Office (FF Only)	3,430 ft²
Office (SF Only)	3,650 ft²
Car parking spaces	*79*
UNIT 3 (GIA)	**40,150 ft²**
Warehouse (Incl. office Undercroft)	36,375 ft²
Office (FF Only)	3,775 ft²
Car parking spaces	*31*
UNIT 4 (GIA)	**6,100 ft²**
Warehouse (Incl. office Undercroft)	5,050 ft²
Office (FF Only)	1,050 ft²
Car parking spaces	*6*
UNIT 5 (GIA)	**5,170 ft²**
Warehouse (Incl. office Undercroft)	4,330 ft²
Office (FF Only)	840 ft²
Car parking spaces	*5*
UNIT 6 (GIA)	**3,660 ft²**
Warehouse (Incl. office Undercroft)	3,160 ft²
Office (FF Only)	500 ft²
Car parking spaces	*3*
UNIT 7 (GIA)	**4,620 ft²**
Warehouse (Incl. office Undercroft)	3,900 ft²
Office (FF Only)	720 ft²
Car parking spaces	*4*
UNIT 8 (GIA)	**6,290 ft²**
Warehouse (Incl. office Undercroft)	5,195 ft²
Office (FF Only)	1,095 ft²
Car parking spaces	*6*
UNIT 9 (GIA)	**2,875 ft²**
Warehouse (Incl. office Undercroft)	2,875 ft²
Car parking spaces	*3*
UNIT 10 (GIA)	**3,915 ft²**
Warehouse (Incl. office Undercroft)	3,915 ft²
Car parking spaces	*3*
UNIT 11 (GIA)	**3,925 ft²**
Warehouse (Incl. office Undercroft)	3,925 ft²
Car parking spaces	*3*
UNIT 12 (GIA)	**3,925 ft²**
Warehouse (Incl. office Undercroft)	3,925 ft²
Car parking spaces	*3*
UNIT 13 (GIA)	**3,915 ft²**
Warehouse (Incl. office Undercroft)	3,915 ft²
Car parking spaces	*3*
UNIT 14 (GIA)	**2,875 ft²**
Warehouse (Incl. office Undercroft)	2,875 ft²
Car parking spaces	*3*
TOTAL GIA	251,150ft²
Total Car Parking	*196*

N

0 5 10 15 20 25
Scale bar - 1:500m

Rev:	Notes:	Date:	Dwn:	Iss:
04	Amendments to unit cores	12.12.21	HT	HA
03	Update U9 to 14	30.11.21	HT	HA
02	Unit GA, U1&2 move for trees, U4to8 pavement, Unit 3 pavement	23.11.21	HT	HA
01	Update to Unit 2	15.11.21	HT	HA
00	Site access updated	15.11.21	HT	HA
DR	DR Issue	04.11.21	HT	HA

Suitability Code:

Client:
CANMOOR

hale
ARCHITECTURE
22c Leathermarket Street, London, SE1 3HP

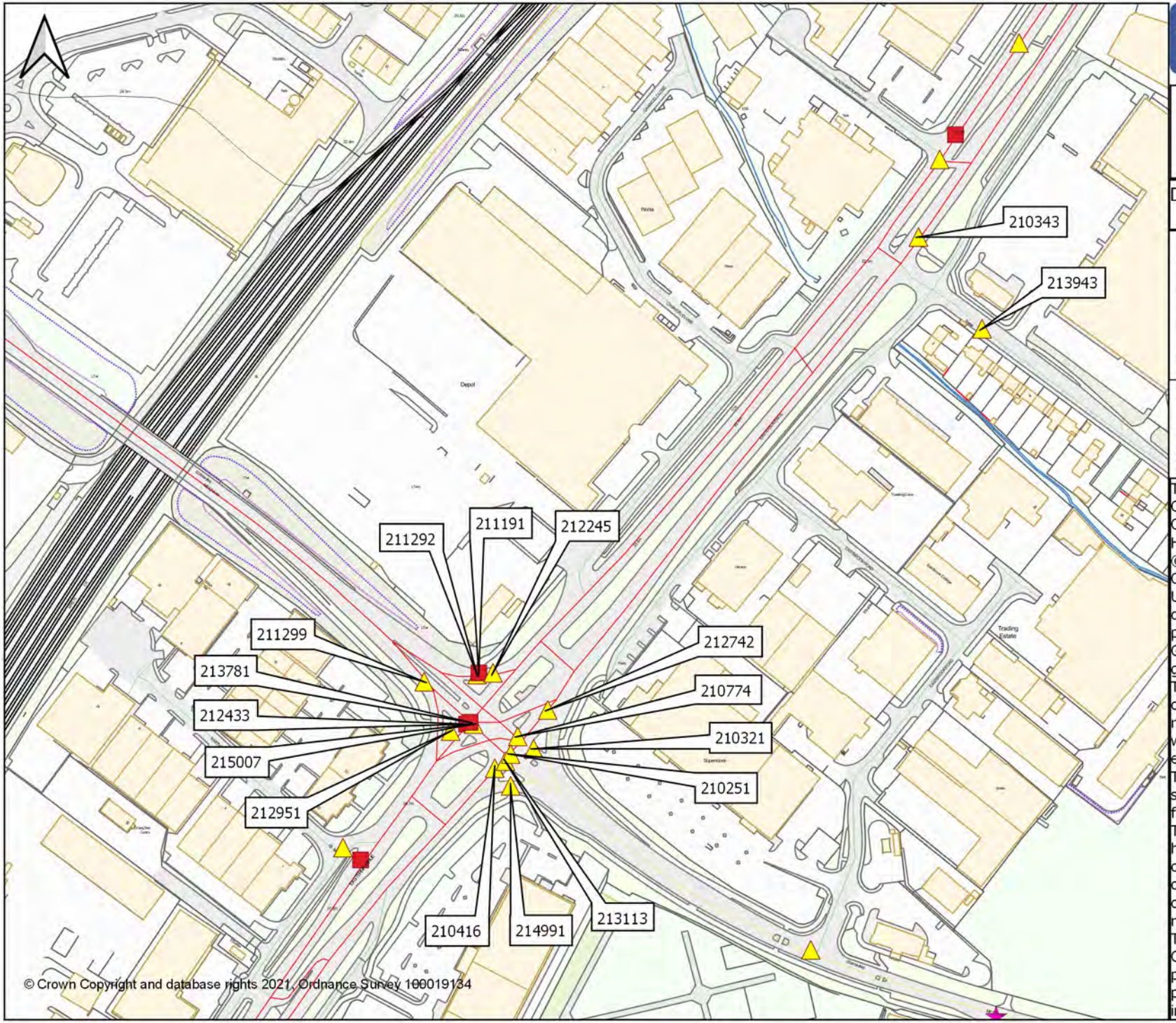
Project:
Access Park, Gloucester

Drawing Title:
Proposed Site Plan

Project No:	Scale @ A1 / A3	Revision:
21078	1:500 / 1:1000	04

Drawing No:
21078-PL1003

Appendix B
Personal Injury Collision Data



Gloucestershire COUNTY COUNCIL

A38 Eastern Avenue Gloucester

Date Range
2016 to 2021 (to date)

Accidents

Fatal

Serious

Slight

DATE: 15/10/2021
SCALE: 1:3000

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RTA2480 Detailed Collision Report

Compiled from an original report by Gloucestershire County Council

Accident Investigation and Prevention Section

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Database as at 15-OCT-21

Collisions within GLOUCESTERSHIRE

For period 01-JAN-2016 TO 30-SEP-2021

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A38 Eastern Avenue Gloucester

DETAILED COLLISION REPORT

Ref	210251	Severity	SLIGHT		
Day	TUESDAY	Date	26 JAN 2016	Time	2305
Light	DARKNESS	Weather	RAIN	Surface	WET
Grid ref	384935 217699	Major rd	A 38	Minor rd	3 8008
Control	AUTO SIGNALS	Junction	CROSS ROAD	Speed lim	40
Lighting	LIGHTS LIT	Condition	NONE	C'way	DUAL CWAY
UNIFI Ref	46538	Type	GB	Hazard	NONE

LOCATION

METZ WAY JUNCTION WITH EASTERN AVENUE A38, GLOUCESTER

DESCRIPTION

V1, BLUE LIGHTS, EASTERN AVE N BOUND. V2 WRONG LANE TO CONTINUE METZ WAY, INDICATED TO FRIEND IN ADJACENT LANE TO LET V2 IN. ON GREEN LIGHT V2 STARTED, HESITATED THEN CONTINUED. V1 THOUGHT V2 STOPPING TO ALLOW IT TO PASS & THEY COLL

VEHICLE DETAILS

No	Type	Manoeuvre	From-to	Driver Age
1	Other Vehicle Type	GO AHEAD OTHER	NE SW	37
2	Car	GO AHEAD OTHER	SE NW	30

CASUALTY DETAILS

No	Severity	Casualty Age	Veh	Further Details
1	SLIGHT	37	1	DRIVER

DETAILED COLLISION REPORT

Ref	210321	Severity	SLIGHT		
Day	SUNDAY	Date	21 FEB 2016	Time	1354
Light	DAYLIGHT	Weather	FINE/WIND	Surface	DRY
Grid ref	384948 217702	Major rd	3 8008	Minor rd	A 38
Control	AUTO SIGNALS	Junction	CROSS ROAD	Speed lim	40
Lighting	LIGHTS	Condition	NONE	C'way	DUAL CWAY
UNIFI Ref	51106	Type	P	Hazard	NONE

LOCATION

METZ WAY JUNCTION WITH EASTERN AVENUE, GLOUCESTER

DESCRIPTION

V1 TRAVELLING FROM EASTERN AVENUE ONTO METZ WAY. DURING THIS TIME A PEDESTRIAN RUNNING BETWEEN MOVING VEHICLES HAS RUN INTO V1 COLLIDING WITH THE REAR NEARSIDE QUARTER PANEL.

VEHICLE DETAILS

No	Type	Manoeuvre	From-to	Driver Age
1	Car	TURNING RIGHT	SW SE	36

CASUALTY DETAILS

No	Severity	Casualty Age	Veh	Further Details
1	SLIGHT	15	1	PEDESTRIAN

DETAILED COLLISION REPORT

Ref	210343	Severity	SLIGHT		
Day	WEDNESDAY	Date	23 MAR 2016	Time	1420
Light	DAYLIGHT	Weather	FINE	Surface	DRY
Grid ref	385166 217992	Major rd	A 38	Minor rd	4 84524
Control	AUTO SIGNALS	Junction	T/STAG/Y JUNC	Speed lim	40
Lighting	LIGHTS	Condition	NONE	C'way	DUAL CWAY
UNIFI Ref	54612	Type	Q	Hazard	NONE

LOCATION

EASTERN AVENUE A38 JUNCTION WITH YORK ROAD, GLOUCESTER

DESCRIPTION

2 VEHICLE RTC AT TRAFFIC LIGHT JUNCTION, V2 STATIONARY AT TRAFFIC LIGHTS DISPLAYING RED. WHILST WAITING FOR LIGHTS TO CHANGE V1 HAS COLLIDED WITH THE REAR OF V2 AND THEN LEFT THE SCENE WITHOUT EXCHANGING DETAILS.

VEHICLE DETAILS

No	Type	Manoeuvre	From-to	Driver Age
1	Car	GO AHEAD OTHER	NE SW	
2	Car	WAIT GO AHEAD	NE SW	67

CASUALTY DETAILS

No	Severity	Casualty Age	Veh	Further Details
1	SLIGHT	67	2	DRIVER

DETAILED COLLISION REPORT

Ref	210416	Severity	SLIGHT		
Day	THURSDAY	Date	14 APR 2016	Time	1540
Light	DAYLIGHT	Weather	RAIN	Surface	WET
Grid ref	384926 217691	Major rd	A 38	Minor rd	3 8008
Control	AUTO SIGNALS	Junction	CROSS ROAD	Speed lim	40
Lighting	LIGHTS	Condition	NONE	C'way	DUAL CWAY
UNIFI Ref	62554	Type	CX	Hazard	NONE

LOCATION

A38 JUNCTION WITH METZ WAY, GLOUCESTER

DESCRIPTION

GIRL ON A PEDAL CYCLE HAS CYCLED ONTO MAIN ROAD WITHOUT LOOKING AND HAS BEEN HIT BY A CAR

VEHICLE DETAILS

No	Type	Manoeuvre	From-to	Driver Age
1	Car	GO AHEAD OTHER	S N	80
2	Pedal Cycle	GO AHEAD OTHER	E W	11

CASUALTY DETAILS

No	Severity	Casualty Age	Veh	Further Details
1	SLIGHT	11	2	DRIVER

DETAILED COLLISION REPORT

Ref	210774	Severity	SLIGHT		
Day	FRIDAY	Date	23 SEP 2016	Time	1419
Light	DAYLIGHT	Weather	FINE	Surface	DRY
Grid ref	384939 217709	Major rd	A 38	Minor rd	3 8008
Control	AUTO SIGNALS	Junction	CROSS ROAD	Speed lim	40
Lighting	LIGHTS	Condition	NONE	C'way	DUAL CWAY
UNIFI Ref	109883	Type	G	Hazard	NONE

LOCATION

METZ WAY AT EASTERN AVENUE JUNCTION, GLOUCESTER

DESCRIPTION

V1 APPEARS TO HAVE OVERSHOT RED TRAFFIC LIGHTS AND DRIVEN INTO THE PATH OF V2 AND V1 HAS LOST CONTROL AND COLLIDED INTO A STATIONARY V3

VEHICLE DETAILS

No	Type	Manoeuvre	From-to	Driver Age
1	Car	GO AHEAD OTHER	NW SE	72
2	Car	GO AHEAD OTHER	NE SW	47
3	Car	GO AHEAD OTHER	SE NW	48

CASUALTY DETAILS

No	Severity	Casualty Age	Veh	Further Details
1	SLIGHT	47	2	DRIVER

DETAILED COLLISION REPORT

Ref	211191	Severity	SERIOUS		
Day	THURSDAY	Date	01 DEC 2016	Time	1445
Light	DAYLIGHT	Weather	FINE	Surface	DRY
Grid ref	384917 217745	Major rd	A 4302	Minor rd	A 38
Control	AUTO SIGNALS	Junction	CROSS ROAD	Speed lim	40
Lighting	LIGHTS	Condition	NONE	C'way	SINGLE CWAY
UNIFI Ref	159085	Type	P	Hazard	NONE

LOCATION

METZ WAY JUNCTION WITH EASTERN AVENUE, GLOUCESTER

DESCRIPTION

C1 was distracted and stepped into the road into the path of V1.

VEHICLE DETAILS

No	Type	Manoeuvre	From-to	Driver Age
1	Car	TURNING LEFT	S W	79

CASUALTY DETAILS

No	Severity	Casualty Age	Veh	Further Details
1	SERIOUS	32	1	PEDESTRIAN

DETAILED COLLISION REPORT

Ref	211292	Severity	SLIGHT		
Day	TUESDAY	Date	10 JAN 2017	Time	0700
Light	DARKNESS	Weather	UNKNOWN	Surface	WET
Grid ref	384916 217744	Major rd	A 4302	Minor rd	A 38
Control	G WAY/UNCONTROLLED	Junction	SLIP ROAD	Speed lim	40
Lighting	LIGHTS LIT	Condition	NONE	C'way	SLIP ROAD
UNIFI Ref	173264	Type	Q	Hazard	NONE

LOCATION

METZ WAY A4302 JUNCTION WITH EASTERN AVENUE A38

DESCRIPTION

FIRST DRIVER STOPPED AT EXIT OF SLIP ROAD. SECOND CAR DROVE INTO REAR OF THE FIRST BELEIVING THE FIRST HAD PULLED OFF, THE THIRD CAR DROVE INTO BACK OF THE SECOND CAR NOT REALSING WHAT HAD HAPPENED IN FRONT OF HIM.

VEHICLE DETAILS

No	Type	Manoeuvre	From-to	Driver Age
1	Car	WAIT TURN LEFT	NE SE	27
2	Car	GO AHEAD OTHER	NE SW	70
3	Car	GO AHEAD OTHER	NE SW	39

CASUALTY DETAILS

No	Severity	Casualty Age	Veh	Further Details
1	SLIGHT	27	1	DRIVER

DETAILED COLLISION REPORT

Ref	211299	Severity	SLIGHT		
Day	THURSDAY	Date	09 MAR 2017	Time	1740
Light	DAYLIGHT	Weather	UNKNOWN	Surface	DRY
Grid ref	384886 217740	Major rd	A 4302	Minor rd	A 38
Control	G WAY/UNCONTROLLED	Junction	SLIP ROAD	Speed lim	40
Lighting	LIGHTS	Condition	NONE	C'way	SINGLE CWAY
UNIFI Ref	174100	Type	L	Hazard	NONE

LOCATION

METZ WAY JUNCTION WITH EASTERN AVENUE, GLOUCESTER

DESCRIPTION

V2 IN THE RIGHT HAND LANE WHEN V1 PULLED IN FRONT OF V2 AND COLLIDED WITH SIDE OF V2. V1 HAS IMPACTED INTO FRONT PASSENGER SIDE OF V2 CAUSING DAMAGE AND INJURY TO THE FRONT SEAT PASSENGER. CAS AGE GUESSED.

VEHICLE DETAILS

No	Type	Manoeuvre	From-to		Driver Age
1	Car	CHG LANE TO RIGH	SE	NW	23
2	Car	O TAKE MOV VH O/S	SE	NW	51

CASUALTY DETAILS

No	Severity	Casualty Age	Veh	Further Details
1	SLIGHT	48	2	PASSENGER

DETAILED COLLISION REPORT

Ref	212245	Severity	SLIGHT		
Day	SATURDAY	Date	24 FEB 2018	Time	1115
Light	DAYLIGHT	Weather	FINE	Surface	DRY
Grid ref	384925 217745	Major rd	A 4302	Minor rd	A 38
Control	G WAY/UNCONTROLLED	Junction	T/STAG/Y JUNC	Speed lim	40
Lighting	LIGHTS	Condition	NONE	C'way	DUAL CWAY
UNIFI Ref	292386	Type	Q	Hazard	NONE

LOCATION

METZ WAY JUNCTION A4302 AT JUNCTION WITH EASTERN AVENUE A38, GLOUCESTER

DESCRIPTION

V1 PULLED UP AT THE JUNCTION, STATIONARY WAITING TO TURN LEFT, LANE 1 WAS CLEAR. V1 STARTED TO MOVE FORWARD, V2 MOVED FROM LANE 2 INTO LANE 1, V1 STOPPED. V2 HAS GONE INTO THE BACK OF V1.

VEHICLE DETAILS

No	Type	Manoeuvre	From-to	Driver Age
1	Car	STOPPING	SW N	17
2	Car	STARTING	SW N	

CASUALTY DETAILS

No	Severity	Casualty Age	Veh	Further Details
1	SLIGHT	17	1	DRIVER
2	SLIGHT	61	1	PASSENGER

DETAILED COLLISION REPORT

Ref	212433	Severity	SERIOUS		
Day	THURSDAY	Date	05 JUL 2018	Time	0001
Light	DARKNESS	Weather	FINE	Surface	DRY
Grid ref	384910 217716	Major rd	A 38	Minor rd	A 4302
Control	AUTO SIGNALS	Junction	CROSS ROAD	Speed lim	40
Lighting	LIGHTS LIT	Condition	NONE	C'way	DUAL CWAY
UNIFI Ref	312293	Type	H	Hazard	NONE

LOCATION

METZ WAY A4302 AT JUNCTION WITH EASTERN AVENUE A38, GLOUCESTER

DESCRIPTION

V1 TRAVMETZ WAY TOWARDS THE CITY FROM CONEY HILL ENTERED THE JUNCTION AND DROVE INFRONT OF V2 TRAVELLING ALONG EASTERN AVE TOWARDS WALLS ROUNDABOUT AND VEHICLES COLLIDED. V1 THEN HIT TRAFFIC LIGHTS.

VEHICLE DETAILS

No	Type	Manoeuvre	From	To	Driver Age
1	Car	GO AHEAD OTHER	E	W	27
2	Car	GO AHEAD OTHER	S	N	21

CASUALTY DETAILS

No	Severity	Casualty Age	Veh	Further Details
1	SERIOUS	27	1	DRIVER
2	SERIOUS	21	2	DRIVER

DETAILED COLLISION REPORT

Ref	212742	Severity	SLIGHT		
Day	SUNDAY	Date	11 NOV 2018	Time	1400
Light	DAYLIGHT	Weather	FINE	Surface	DRY
Grid ref	384956 217724	Major rd	A 38	Minor rd	3 8008
Control	AUTO SIGNALS	Junction	CROSS ROAD	Speed lim	40
Lighting	LIGHTS	Condition	NONE	C'way	DUAL CWAY
UNIFI Ref	802232	Type	Q	Hazard	NONE

LOCATION

EASTERN AVENUE (A38) NEAR JUNCTION WITH EASTERN AVENUE (A4302), GLOUCESTER

DESCRIPTION

V2 WAS STATIONARY AT TRAFFIC LIGHTS WHEN V1 RAN INTO THE BACK OF IT. BOTH DRIVERS STOPPED BUT FULL DETAILS WERE NOT EXCHANGED.

VEHICLE DETAILS

No	Type	Manoeuvre	From-to	Driver Age
1	Car	GO AHEAD OTHER	NE SW	
2	Car	WAIT GO AHEAD	NE SW	34

CASUALTY DETAILS

No	Severity	Casualty Age	Veh	Further Details
1	SLIGHT	34	2	DRIVER

DETAILED COLLISION REPORT

Ref	212951	Severity	SLIGHT		
Day	SATURDAY	Date	02 FEB 2019	Time	1145
Light	DAYLIGHT	Weather	FINE	Surface	WET
Grid ref	384901 217712	Major rd	A 38	Minor rd	A 4302
Control	AUTO SIGNALS	Junction	CROSS ROAD	Speed lim	40
Lighting	LIGHTS	Condition	NONE	C'way	DUAL CWAY
UNIFI Ref	813486	Type	ZQ	Hazard	NONE

LOCATION

EASTERN AVENUE (A38) NEAR JUNCTION WITH METZ WAY (A4302). GLOUCESTER

DESCRIPTION

V2 STATIONARY AT TRAFFIC SIGNALS ON EASTERN AVE WHEN SILVER CAR V1, RAN INTO BACK OF V2, KNOCKING RIDER OFF BIKE. V1 DRIVER STOPPED & SIMPLY SAID THAT CAR WAS DAMAGED MORE THAN THE BIKE, GAVE RIDER £20 BEFORE DRIVING OFF.

VEHICLE DETAILS

No	Type	Manoeuvre	From-to		Driver Age
1	Car	GO AHEAD OTHER	SW	NE	
2	M'cycle up to 50cc	WAIT GO AHEAD	SW	NE	16

CASUALTY DETAILS

No	Severity	Casualty Age	Veh	Further Details
1	SLIGHT	16	2	DRIVER

DETAILED COLLISION REPORT

Ref	213113	Severity	SLIGHT		
Day	SUNDAY	Date	07 APR 2019	Time	1450
Light	DAYLIGHT	Weather	FINE	Surface	DRY
Grid ref	384932 217695	Major rd	A 38	Minor rd	3 8008
Control	AUTO SIGNALS	Junction	CROSS ROAD	Speed lim	40
Lighting	LIGHTS	Condition	NONE	C'way	DUAL CWAY
UNIFI Ref	829727	Type	BH	Hazard	NONE

LOCATION

EASTERN AVENUE (A38) NEAR JUNCTION WITH METZ WAY

DESCRIPTION

V1 ON A GRADE 1 RESPONSE TRAV EASTERN AVE SOUTH, AT METZ WAY LIGHTS WERE RED. V1 SLOWED AND WENT THROUGH RED LIGHT. V2 TRAV FROM ABBEYMEAD, LANE 1 ON GREEN COLLIDED WITH V1 CAUSING V1 TO SPIN AND V2 TO GO INTO CENRAL ISLAND.

VEHICLE DETAILS

No	Type	Manoeuvre	From-to	Driver Age
1	Car	GO AHEAD OTHER	NE SW	40
2	Car	GO AHEAD OTHER	SE NW	22

CASUALTY DETAILS

No	Severity	Casualty Age	Veh	Further Details
1	SLIGHT	22	2	DRIVER

DETAILED COLLISION REPORT

Ref	213943	Severity	SLIGHT		
Day	FRIDAY	Date	18 OCT 2019	Time	1345
Light	DAYLIGHT	Weather	UNKNOWN	Surface	DRY
Grid ref	385202 217940	Major rd	4 84524	Minor rd	
Control		Junction	NOT WITHIN 20M	Speed lim	30
Lighting	LIGHTS	Condition	NONE	C'way	SINGLE CWAY
UNIFI Ref	939123	Type	Q	Hazard	NONE

LOCATION

YORK ROAD - 39 METRES FROM JUNCTION WITH UNCLASSIFIED ROAD, GLOUCESTER

DESCRIPTION

V2 DRIVING ON YORK RD & UNKNOWN CAR IN FRONT HAS BRAKED HARD/SUDDENLY IN AN ATTEMPT TO CUT ACROSS TRAFFIC TO MAKE A LEFT TURN INTO A JUNC. V2 DRIVER NEEDED TO BRAKE PROMPTLY. V1 BEHIND DRIVEN INTO THE BACK OF V2.

VEHICLE DETAILS

No	Type	Manoeuvre	From-to	Driver Age
1	Car	GO AHEAD OTHER	NW SE	22
2	Car	STOPPING	NW SE	54

CASUALTY DETAILS

No	Severity	Casualty Age	Veh	Further Details
1	SLIGHT	54	2	DRIVER

DETAILED COLLISION REPORT

Ref	213781	Severity	SERIOUS		
Day	SUNDAY	Date	05 JAN 2020	Time	1634
Light	DAYLIGHT	Weather	FINE	Surface	DRY
Grid ref	384912 217717	Major rd	A 38	Minor rd	A 4302
Control	AUTO SIGNALS	Junction	CROSS ROAD	Speed lim	40
Lighting	LIGHTS	Condition	NONE	C'way	SINGLE CWAY
UNIFI Ref	917107	Type	G	Hazard	NONE

LOCATION

METZ WAY (A4302) AT JUNCTION WITH EASTERN AVENUE (A38), GLOUCESTER

DESCRIPTION

Both vehicles have thought they were on green lights and have collided mid junction.

VEHICLE DETAILS

No	Type	Manoeuvre	From-to	Driver Age
1	Car	GO AHEAD OTHER	E W	42
2	Car	TURNING RIGHT	W S	19

CASUALTY DETAILS

No	Severity	Casualty Age	Veh	Further Details
1	SLIGHT	42	1	DRIVER
2	SLIGHT	42	1	PASSENGER
3	SERIOUS	71	1	PASSENGER
4	SLIGHT	9	1	PASSENGER
5	SERIOUS	64	2	PASSENGER

DETAILED COLLISION REPORT

Ref	214991	Severity	SLIGHT		
Day	WEDNESDAY	Date	08 SEP 2021	Time	1524
Light	DAYLIGHT	Weather	FINE	Surface	DRY
Grid ref	384935 217681	Major rd	3 8008	Minor rd	A 38
Control	AUTO SIGNALS	Junction	CROSS ROAD	Speed lim	40
Lighting	LIGHTS	Condition	NONE	C'way	SLIP ROAD
UNIFI Ref	1086630	Type	CX	Hazard	NONE

LOCATION

METZ WAY AT JUNCTION WITH EASTERN AVENUE (A38), GLOUCESTER

DESCRIPTION

V1 APPROACHING JUNC ON METZ WAY FROM KFC SIDE TO TURN LEFT ONTO EASTERN AVE, V2 CYCLIST WAS CROSSING TOWARDS THE RANGE DIR ON TOUCAN. V1 RUN RED LIGHT & CYCLIST FAILED TO LOOK AS THEY CROSSED. V1 STOPPED & THEN DROVE OFF.

VEHICLE DETAILS

No	Type	Manoeuvre	From-to		Driver Age
1	Car	TURNING LEFT	SE	SW	35
2	Pedal Cycle	GO AHEAD OTHER	SW	NE	48

CASUALTY DETAILS

No	Severity	Casualty Age	Veh	Further Details
1	SLIGHT	48	2	DRIVER

DETAILED COLLISION REPORT

Ref	215007	Severity	SLIGHT		
Day	THURSDAY	Date	16 SEP 2021	Time	0749
Light	DAYLIGHT	Weather	FINE	Surface	DRY
Grid ref	384914 217716	Major rd	A 38	Minor rd	A 4302
Control	AUTO SIGNALS	Junction	CROSS ROAD	Speed lim	40
Lighting	LIGHTS	Condition	NONE	C'way	DUAL CWAY
UNIFI Ref	1088245	Type	DH	Hazard	NONE

LOCATION

METZ WAY (A4302) AT JUNCTION WITH EASTERN AVENUE (A38), GLOUCESTER

DESCRIPTION

V1 TRAV SB ON EASTERN AVE DRIVER INTENDS TO TURN RIGHT TO METZ WAY, HOWEVER DOESN'T REALISE THERE IS A RIGHT HAND FILTER LANE & TURNS FROM AHEAD ONLY LANE. V2 SETS OFF N/B & IMPACTS N/S OF V1 AS IT TURNS. V1 PUSHED INTO A ROADSIGN.

VEHICLE DETAILS

No	Type	Manoeuvre	From-to		Driver Age
1	Car	TURNING RIGHT	NE	NW	49
2	Goods veh - unknown weight	GO AHEAD OTHER	SW	NE	44

CASUALTY DETAILS

No	Severity	Casualty Age	Veh	Further Details
1	SLIGHT	49	1	DRIVER
2	SLIGHT	44	2	DRIVER

Appendix C
Public Transport Accessibility Index

BREEAM 2018 Tra01/02 Accessibility Index calculator

BREEAM® UK delivered by bre

Using the drop down boxes make the relevant selections and press the 'Select' button

Building type: Offices/Industrial

No. nodes required: 2

Select

NODE 1

Public transport type	Bus
Distance to node (m)	650

	Service 1	Service 2	Service 3	Service 4	Service 5	Service 6	Service 7	Service 8	Service 9	Service 10
Average frequency per hour	1									

NODE 2

Public transport type	Bus
Distance to node (m)	400

	Service 1	Service 2	Service 3	Service 4	Service 5	Service 6	Service 7	Service 8	Service 9	Service 10
Average frequency per hour	4									

NODE 3

Public transport type	Rail
Distance to node (m)	2000

	Service 1	Service 2	Service 3	Service 4	Service 5	Service 6	Service 7	Service 8	Service 9	Service 10
Average frequency per hour	1	1	1	1	1	0.5				

Accessibility Index	4.23

Appendix D
TRICS Data

Calculation Reference: AUDIT-623801-211116-1112

TRIP RATE CALCULATION SELECTION PARAMETERS:

Land Use : 02 - EMPLOYMENT
Category : D - INDUSTRIAL ESTATE
TOTAL VEHICLES

Selected regions and areas:

03	SOUTH WEST		
	BR	BRISTOL CITY	2 days
05	EAST MIDLANDS		
	LN	LINCOLNSHIRE	1 days
	NR	NORTHAMPTONSHIRE	1 days
06	WEST MIDLANDS		
	WK	WARWICKSHIRE	1 days
07	YORKSHIRE & NORTH LINCOLNSHIRE		
	WY	WEST YORKSHIRE	2 days
10	WALES		
	VG	VALE OF GLAMORGAN	1 days

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

Primary Filtering selection:

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

Parameter: Gross floor area
Actual Range: 11265 to 24980 (units: sqm)
Range Selected by User: 10000 to 30000 (units: sqm)

Parking Spaces Range: All Surveys Included

Public Transport Provision:
Selection by: Include all surveys

Date Range: 01/01/13 to 21/10/20

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

Selected survey days:

Monday	1 days
Wednesday	2 days
Friday	5 days

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

Selected survey types:

Manual count	8 days
Directional ATC Count	0 days

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

Selected Locations:

Suburban Area (PPS6 Out of Centre)	3
Edge of Town	5

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

Selected Location Sub Categories:

Industrial Zone	5
No Sub Category	3

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

Secondary Filtering selection:

Use Class:

Not Known	8 days

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

Filter by Site Operations Breakdown:
All Surveys Included

Population within 500m Range:
All Surveys Included

Population within 1 mile:

10,001 to 15,000	2 days
20,001 to 25,000	2 days
25,001 to 50,000	4 days

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

Population within 5 miles:

50,001 to 75,000	1 days
100,001 to 125,000	1 days
125,001 to 250,000	3 days
250,001 to 500,000	1 days
500,001 or More	2 days

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

Car ownership within 5 miles:

0.6 to 1.0	5 days
1.1 to 1.5	3 days

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

Travel Plan:

No	8 days

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

PTAL Rating:

No PTAL Present	8 days

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

Covid-19 Restrictions	Yes	At least one survey within the selected data set was undertaken at a time of Covid-19 restrictions

LIST OF SITES relevant to selection parameters

1 BR-02-D-04 INDUSTRIAL ESTATE BRISTOL CITY
CROFTS END ROAD
BRISTOL
SPEEDWELL
Suburban Area (PPS6 Out of Centre)
Industrial Zone
Total Gross floor area: 18018 sqm
Survey date: FRIDAY *29/11/13* *Survey Type: MANUAL*

2 BR-02-D-05 INDUSTRIAL ESTATE BRISTOL CITY
NOVERS HILL
BRISTOL
BEDMINSTER
Suburban Area (PPS6 Out of Centre)
Industrial Zone
Total Gross floor area: 18128 sqm
Survey date: FRIDAY *29/11/13* *Survey Type: MANUAL*

3 LN-02-D-03 INDUSTRIAL ESTATE LINCOLNSHIRE
DEACON ROAD
LINCOLN

Edge of Town
Industrial Zone
Total Gross floor area: 11265 sqm
Survey date: FRIDAY *28/06/19* *Survey Type: MANUAL*

4 NR-02-D-02 INDUSTRIAL ESTATE NORTHAMPTONSHIRE
CORNHILL CLOSE
NORTHAMPTON
LODGE FARM IND. ESTATE
Edge of Town
Industrial Zone
Total Gross floor area: 12670 sqm
Survey date: WEDNESDAY *21/10/20* *Survey Type: MANUAL*

5 VG-02-D-01 INDUSTRIAL ESTATE VALE OF GLAMORGAN
ARTHUR STREET
BARRY

Edge of Town
No Sub Category
Total Gross floor area: 13091 sqm
Survey date: MONDAY *08/05/17* *Survey Type: MANUAL*

6 WK-02-D-04 INDUSTRIAL ESTATE WARWICKSHIRE
ABELES WAY
ATHERSTONE

Edge of Town
No Sub Category
Total Gross floor area: 17500 sqm
Survey date: FRIDAY *27/09/19* *Survey Type: MANUAL*

7 WY-02-D-03 INDUSTRIAL ESTATE WEST YORKSHIRE
ARMLEY ROAD
LEEDS

Suburban Area (PPS6 Out of Centre)
Industrial Zone
Total Gross floor area: 24980 sqm
Survey date: FRIDAY *20/09/13* *Survey Type: MANUAL*

8 WY-02-D-08 INDUSTRIAL ESTATE WEST YORKSHIRE
MILL LANE
HALIFAX

Edge of Town
No Sub Category
Total Gross floor area: 11305 sqm
Survey date: WEDNESDAY *17/10/18* *Survey Type: MANUAL*

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

MANUALLY DESELECTED SITES

Site Ref	Reason for Deselection
NR-02-D-01	25% Office
WK-02-D-03	30% Office
WL-02-D-02	25% Office
WY-02-D-04	50% Office

TRIP RATE for Land Use 02 - EMPLOYMENT/D - INDUSTRIAL ESTATE
TOTAL VEHICLES
Calculation factor: 100 sqm
BOLD print indicates peak (busiest) period

	ARRIVALS			DEPARTURES			TOTALS		
Time Range	No. Days	Ave. GFA	Trip Rate	No. Days	Ave. GFA	Trip Rate	No. Days	Ave. GFA	Trip Rate
00:00 - 01:00									
01:00 - 02:00									
02:00 - 03:00									
03:00 - 04:00									
04:00 - 05:00									
05:00 - 06:00	2	15085	0.046	2	15085	0.007	2	15085	0.053
06:00 - 07:00	3	13812	0.101	3	13812	0.034	3	13812	0.135
07:00 - 08:00	8	15870	0.253	8	15870	0.072	8	15870	0.325
08:00 - 09:00	8	15870	0.355	8	15870	0.146	8	15870	0.501
09:00 - 10:00	8	15870	0.264	8	15870	0.165	8	15870	0.429
10:00 - 11:00	8	15870	0.198	8	15870	0.202	8	15870	0.400
11:00 - 12:00	8	15870	0.217	8	15870	0.180	8	15870	0.397
12:00 - 13:00	8	15870	0.211	8	15870	0.226	8	15870	0.437
13:00 - 14:00	8	15870	0.233	8	15870	0.222	8	15870	0.455
14:00 - 15:00	8	15870	0.190	8	15870	0.237	8	15870	0.427
15:00 - 16:00	8	15870	0.169	8	15870	0.250	8	15870	0.419
16:00 - 17:00	8	15870	0.221	8	15870	0.300	8	15870	0.521
17:00 - 18:00	8	15870	0.150	8	15870	0.365	8	15870	0.515
18:00 - 19:00	8	15870	0.063	8	15870	0.135	8	15870	0.198
19:00 - 20:00	3	13812	0.014	3	13812	0.019	3	13812	0.033
20:00 - 21:00	3	13812	0.012	3	13812	0.010	3	13812	0.022
21:00 - 22:00									
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			2.697			2.570			5.267

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

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

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Parameter summary

Trip rate parameter range selected:	11265 - 24980 (units: sqm)
Survey date date range:	01/01/13 - 21/10/20
Number of weekdays (Monday-Friday):	8
Number of Saturdays:	0
Number of Sundays:	0
Surveys automatically removed from selection:	0
Surveys manually removed from selection:	4

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

TRIP RATE for Land Use 02 - EMPLOYMENT/D - INDUSTRIAL ESTATE
OGVS
Calculation factor: 100 sqm
BOLD print indicates peak (busiest) period

	ARRIVALS			DEPARTURES			TOTALS		
Time Range	No. Days	Ave. GFA	Trip Rate	No. Days	Ave. GFA	Trip Rate	No. Days	Ave. GFA	Trip Rate
00:00 - 01:00									
01:00 - 02:00									
02:00 - 03:00									
03:00 - 04:00									
04:00 - 05:00									
05:00 - 06:00	2	15085	0.000	2	15085	0.000	2	15085	0.000
06:00 - 07:00	3	13812	0.002	3	13812	0.002	3	13812	0.004
07:00 - 08:00	8	15870	0.021	8	15870	0.013	8	15870	0.034
08:00 - 09:00	8	15870	0.031	8	15870	0.030	8	15870	0.061
09:00 - 10:00	8	15870	0.031	8	15870	0.023	8	15870	0.054
10:00 - 11:00	8	15870	0.028	8	15870	0.025	8	15870	0.053
11:00 - 12:00	8	15870	0.023	8	15870	0.025	8	15870	0.048
12:00 - 13:00	8	15870	0.028	8	15870	0.022	8	15870	0.050
13:00 - 14:00	8	15870	0.022	8	15870	0.024	8	15870	0.046
14:00 - 15:00	8	15870	0.017	8	15870	0.020	8	15870	0.037
15:00 - 16:00	8	15870	0.024	8	15870	0.023	8	15870	0.047
16:00 - 17:00	8	15870	0.012	8	15870	0.021	8	15870	0.033
17:00 - 18:00	8	15870	0.008	8	15870	0.015	8	15870	0.023
18:00 - 19:00	8	15870	0.004	8	15870	0.005	8	15870	0.009
19:00 - 20:00	3	13812	0.000	3	13812	0.000	3	13812	0.000
20:00 - 21:00	3	13812	0.005	3	13812	0.000	3	13812	0.005
21:00 - 22:00									
22:00 - 23:00									
23:00 - 24:00									
Total Rates:			0.256			0.248			0.504

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

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

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CANMOOR

ACCESS PARK, GLOUCESTER

TREE SURVEY TO BS 5837:2012



our ref:	21135 / EH / TR001
date:	19th November 2021
prepared by:	E.C.H
checked by:	T.G-W

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consultants: Dr N E Haycock Bsc, D.Phil (Oxon) Hydrology. Registered in England as Bea Landscape Design Ltd, number 04707914.

Rev:	Date:	Description:	By:

ACCESS PARK, GLOUCESTER

1.0 Introduction:

1.1 The tree survey for the site at Access Park, Gloucester was carried out by Bea Landscape Design on behalf of Canmoor on the 16th November 2021 for submission to the local planning authority Gloucester City Council.

1.2 The tree survey inspection was carried out from ground level only and no invasive diagnostic tools were used. This is a pre-development site inspection prepared in accordance with BS5837: 2012 'Trees in relation to design, demolition and construction – Recommendations' and the report is valid and relevant only as part of the planning process.

1.3 It should be noted that tree surveys carried out at specific times of year are subject to seasonal limitations. For example; in spring leaves are not present or are just emerging and fungi are generally not visible (depending on species) which limits the assessment of a trees physiological condition, in summer trees are in leaf which reduces the visibility of the crown and can limit the ability to assess the structural condition with fungi not generally visible (depending on species), in autumn there is a decline in leaf quality / cover affording an improved view of the crown and fungal fruiting bodies can be present, in winter the structure of the crown can be easily assessed however assessment of physiological condition is limited and fungi are generally not visible.

1.4 Trees are dynamic natural structures and require frequent monitoring if predictable failures are to be identified. As such the trees should be re-inspected within at least a two year period from the date of this report or when changes occur to the trees (such as appearance of fungal growths, splits in branches etc.) or changes in their immediate environment occur. Any recommendations for action should also be carried out within this period unless identified in the report as requiring immediate action.

1.5 Some tree failures are not predictable such as those occurring during 'freak weather' conditions and those without external symptoms, these types of failure are not covered by this report.

1.6 The tree survey schedules document 21135/EH/TS001 and survey drawing 21-135-P-01 are included within this report. The tree survey is based on the topographical survey carried out by ELLAM Land Surveys in November 2021. It should be noted that the majority of trees surveyed T01, T02, G03, W4, G05, G06, T12, T13, T14, T15 are on or just outside of the site boundary and as such were not identified on the original topographical survey. The location of these trees has been estimated using triangulation or based on aerial photography and their location should not be relied on for the construction purposes.

1.7 In accordance with British Standard 5837: 2012 the survey records the tree common names (refer to Appendix A for a key to scientific names), height, stem diameter and branch spread and existing height above ground level of the canopy or first significant branch including life stage, general observations (such as structural, physiological condition and/or preliminary management recommendations) and the estimated remaining contribution in years.

1.8 Each tree is also awarded a category grading based on Table 1 'Cascade Chart for Tree Quality Assessment' of the British Standard as included within Appendix C.

The following are an explanation of the terms used to describe the life stage, physiological condition and sizes referred to within the tree survey schedule.

Life Stage

Young	A tree in the first third of its expected life span.
Semi-mature	A tree within the second third of its expected life span.
Mature	A tree within the final third of its expected life span.
Over mature	A tree in natural decline.
Notable	A mature tree that stands out in the local environment because it is large in comparison with other trees around it. The tree doesn't have any obvious veteran characteristics, but may be taller than ancients and fatter than some veterans. Notable trees are usually worthy of recognition and can be potential, next generation veteran trees.
Transition veteran	A mature tree that shows three veteran features i,e rot sites, holes & water pockets, deadwood, hollowing and fungal fruiting bodies. Transition veterans have some habitat characteristics and may become potentially important veteran trees for biodiversity in time.
Veteran	Non ancient trees of any diameter that show four or more veteran features i.e rot sites, holes & water pockets, deadwood, hollowing and fungal fruiting bodies. These trees show the habitat characteristics of veteran trees that are thought to be important in terms of biodiversity. A veteran tree is a survivor that has developed some of the features found on an ancient tree but not necessarily as a consequence of time, but of its life or environment.
Ancient	An over mature tree identified primarily by the girth. Likely to have abundant veteran tree features. An ancient tree has great aesthetic appeal and is defined by the following characteristics; a small canopy exhibiting stag headedness following crown retrenchment; with a very wide hollowing trunk relative to other trees of the same species and one or more openings to the outside exhibiting the fruiting bodies of heart rot fungi

Physiological condition

Good	The tree appears to have no obvious defects.
Fair	The trees condition is slightly compromised and considered to be remediable.
Poor	The trees condition is significantly compromised and considered non-remediable. Significant defects.

Sizes:

Minor	A diameter of less than 25 millimetres.
Moderate	A diameter of between 25 to 50 millimetres.
Major	A diameter of greater than 50 millimetres.

1.9 This report does not consider any potential influence that trees may have upon load bearing soils beneath existing or proposed structures through abstraction of water by their roots (i.e. soil shrinkage and expansion and subsequent building subsidence and heave). The advice of a structural engineer should be sought with regard to appropriate foundation depths for new buildings with reference to NHBC standards Chapter 4.2 (NHBC, 2011).

2.0 Context:

2.1 The site is located off Eastern Avenue, Access Park in the Barnwood area of the Gloucester district as identified in Figure 01. Location Plan.

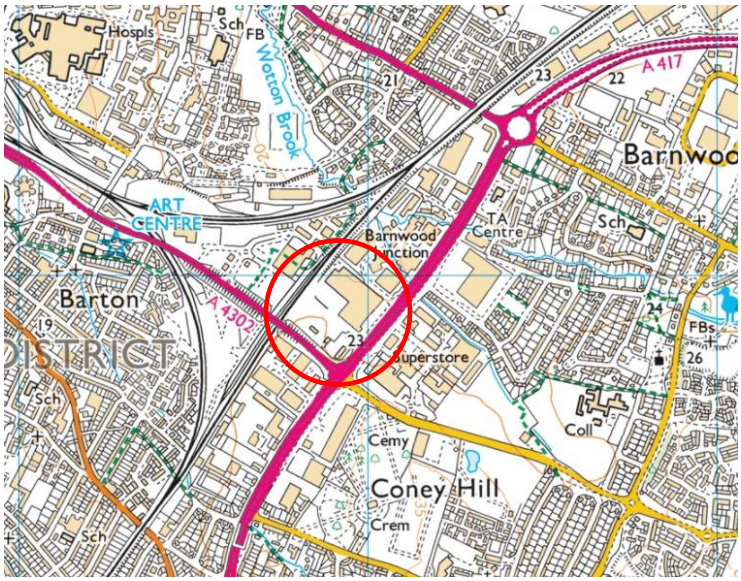


Figure 01. Location Plan

2.2 The area surveyed is the site of a demolished factory / warehouse (refer to Figure 02. Aerial Photograph below) and the embankment to Metz Way the A4302 that runs to the Southwest of the site.

2.3 The topography of the site is generally level with a localised slope or embankment to the Southwestern boundary.

2.4 In order to inform the design of any future development taking account retained, removed and proposed trees; it is recommended that a soil assessment or geotechnical survey is undertaken to determine the soils shrinkability. This can affect the extent of the root protection area, tree protection and ultimately foundation design.



Figure 02. Aerial Photograph

3.0 Tree Survey Summary:

3.1 The majority of trees surveyed are located to the Southwestern boundary of the site and form part of the landscaping associated with the construction of Metz Way and the associated road infrastructure.

3.2 G03 is a small group of self set Aspen poplar of moderate quality and value located outside of the site on the edge of the railway land.

3.3 W04 is a young woodland of Cherry, Alder, Scots pine and Goat willow growing on the road embankment to the Southwest of the site of moderate quality and value with an overgrown drawn up Hawthorn and Field maple hedgerow to the bottom of the slope. Between the woodland and the site boundary are a row of mature Hornbeam and London plane again of moderate quality and value.

3.4 Trees T07 to T15 are a number of mature London plane, Silver birch, Cherry and Scots pine trees to the corner of the road junction between Eastern Avenue and Metz Way of low to moderate quality and value.

4.0 Tree Preservation Orders & Conservation Areas

4.1 It is our understanding that trees there are currently no Tree Preservation Orders designated within the survey area, the site is not within a Conservation Area and no surveyed trees are considered to be Veteran or Ancient or listed on the Woodland Trust Ancient Tree Inventory. For the avoidance of doubt we would recommend that the local authority tree officer is contacted and confirmation obtained.



Figure 3. Looking Northeast towards G03



Figure 4. Looking Northwest towards W4 & T7 to T11



Figure 5 Looking Southeast towards W4, G05, G06

5.0 Protected Species

5.1 The Wildlife & Countryside Act 1981 forms the legislative basis for protecting Britain's flora and fauna, together with its 1985 and 1991 amendments, the subsequent variations to the schedule of orders, and strengthening amendments made within the Countryside & Rights of Way Act 2000.

5.2 Nesting birds are afforded statutory protection by the Wildlife & countryside Act 1981. The bird nesting season is officially from February until August with the busiest time for nesting birds from the 1st March until the 31st July according to species.

5.3 As such, consideration should be given to the presence of nesting birds when clipping hedges, pruning or removing trees or removing ivy or other climbing plants during the bird nesting season. Trees, hedges and ivy should be inspected for nests prior to pruning or removal and any work likely to destroy or disturb active nests should be avoided until the young have fledged. Hedges provide valuable nesting sites for a wide range of birds and clipping should therefore be avoided during the months of March to July.

5.4 In Britain all bats are protected under Schedule 5 of the Wildlife & Countryside Act 1981 (as amended) and under Schedule 2 of the Conservation (Natural Habitats) Regulations 1994 (as amended). In England, under current legislation, it is an offence to:

- Deliberately capture, injure or kill a bat;
- Deliberately disturb in a way that would significantly affect their local distribution or abundance, or affect their ability to survive, breed or rear young;
- Damage or destroy a bat roost (note – this is an 'absolute' offence whereby intent or recklessness does not have to be proved).
- Possess, control, transport, sell, exchange or offer for sale/exchange any live or dead bat or any part of a bat;
- Intentionally or recklessly disturb at bat roost; and
- Intentionally or recklessly obstruct access to a roost.

5.5 In this respect it should be noted that bats utilise tree cavities, cracks and dense ivy as roosts. It is also possible that unidentified bat habitat features may be located high up in the tree crowns and all personnel subsequently carrying out tree works at the site should therefore be vigilant and mindful of the possibility that roosting bats may be present. If any bats roosts are identified during tree works then it is essential that the works are halted immediately and an ecologist investigate them prior to works continuing.

6.0 Felling Licences

6.1 The Forestry Act (1967), as amended, requires that a 'Felling Licence' is obtained for the felling of growing trees subject to certain exemptions. Felling licences are administered by the Forestry Commission and the contravention of the associated controls can incur substantial penalties. Conditions, such as replanting requirements, may be attached to a licence. When processing a licence application the Forestry Commission generally consult the local planning authority and other statutory authorities and can take up to / over 15 weeks to determine.

6.2 Under these controls a Felling Licence is not required to fell up to five cubic meters of timber in any calendar quarter, providing that no more than two cubic meters of said timber are sold.

6.3 It should, however, be noted that a Felling Licence is not needed for the felling of trees where their removal is immediately required for the purpose of carrying out a development authorised by detailed planning permission granted under the Act (1990), or for felling trees within a garden, an orchard, churchyard or a designated open space.

7.0 Tree Surgery & Removal:

7.1 The following trees are scheduled to be felled, or removed due to their poor condition, being dead or structurally dangerous and unsuitable for retention; T01 & T02.

7.2 The preliminary tree management works and tree removal are to be carried out by an Arboricultural Association accredited tree surgeon in accordance with BS 3998: 2010 'Tree Work - Recommendations' with particular care to be taken where trees are in confined spaces or adjacent to highways.

7.3 The stumps of tree species that sucker from roots or stumps such as Alder, Ash, Beech, Birch, Cherry, Elm, Lime, Maple, Oak, Poplar, Rowan, Sycamore, Tree of heaven and Willow are to be treated on removal with glyphosate plugs i.e 'Ecoplug Max Tree Stump Killer' in accordance with the manufacturer's instructions and specifications.

8.0 Root Protection Area

8.1 In order to inform the future retention of existing trees the root protection area has been calculated for each tree in accordance with BS 5837:2012 Annex D, Table D.1 – Root Protection Area and using the two calculation methods as detailed within clause 4.6.1. The root protection areas are illustrated on the Tree Constraints Plan 21-135-P-02.

8.2 Where Veteran & Ancient trees have been identified within the tree survey the root protection area has been based on a minimum of 15 times the diameter of the trunk in accordance with the standing advice from Natural England and the Forestry Commission.

8.3 Where pre-existing site conditions (i.e the presence of retaining walls) or other factors indicate that rooting has occurred asymmetrically, a polygon of equivalent area had been illustrated

8.4 All trees that are being retained on site should be protected by barriers and/or ground protection before any materials or machinery are brought onto the site, and before any demolition, development or stripping of soil commences. These 'Construction Exclusion Zones' are to be protected by barriers and ground protection in accordance with section 6.2 of BS 5837:2012 and as specified and indicated on an approved Tree Protection Plan to be prepared by the project arboriculturalist.

8.5 Of particular importance on sites where there are significant level changes it should be noted that existing ground levels are to be retained within the RPA. Intrusion into soil (other than for piling) within the RPA is generally not acceptable, and topsoil within it should be retained in situ and any re-grading works or the location of retaining features should take this into account. The advice of an arborist should be sought where underground structures are present within the RPA are, or will become, redundant. In general it is preferable to leave such structures in situ, as their removal could damage adjacent tree roots.

8.6 Where construction operations are proposed and permitted within the Root Protection Area precautions should be taken and specified within an Arboricultural Method Statement prepared by the project arboriculturalist to maintain the condition and health of the root system in accordance with Section 7 'Demolition and construction in proximity to existing trees' of BS 5837:2012.

8.7 Where permanent hard surfacing within the RPA is considered unavoidable, site-specific and specialist arboricultural and construction design advice should be sought to determine whether it is achievable without significant adverse impact on trees to be retained. As a general guide new permanent hard surfacing should not exceed 20% of any existing unsurfaced ground within the RPA.

9.0 Above Ground Constraints

9.1 In addition to the condition of the tree the probable impact on proposed buildings or development of trees considered for retention should be assessed to take into account the root protection areas, shadow patterns, species characteristics, maintenance requirements and allowances for space and future tree growth.

Shading:

9.2 In order to assess any unreasonable obstruction of sunlight or daylight to any proposed development tree shadow patterns are also illustrated on the Tree Constraints Plan 21-135-P-02.

9.3 The orientation of the site means that shadows from the more significant and larger trees along the Southwestern site boundary shade areas of the site.

Species Characteristics:

9.4 Trees are living organisms and exhibit structural and seasonal characteristics that may give rise to conflicts in proximity to buildings, footpaths and hard standing areas.

9.5 Hornbeam are a native medium sized tree for large gardens or as individual specimens that can withstand being heavily shaped and pruned growing up to 25 metres in height and 20 metres in width with a lifespan of between 150-200 years.

9.6 London Plane are a large long lived tree (200 years plus) introduced from Spain in 1663. Broadly columnar they can attain a mature height of 30 metres with a 20 metre spread and are often planted as a free standing specimen tree or in groups and avenues. Tolerant of pruning and resistant to pollution, drought and soil compaction London plane thrive in urban conditions. They are a large leaved deciduous species that drop their leaves in the autumn. This can result in increased maintenance requirements to structures or surfaces located in the vicinity.

9.7 Silver birch are native short lived trees with a lifespan of between 75 and 150 years. Intolerant of hard pruning they dislike waterlogged soils and are vulnerable to drought. They are prone to branch failures on dense branch ends and stem and branch failures due to wood decay and weak wood. Sensitive to fungal pathogens including Honey fungus they are also vulnerable to storm damage from snow, ice and wind.

9.8 The following trees species are identified within the NHBC Standards Chapter 4.2 as of high water demand and therefore impacting significantly on foundation design on high shrinkability soils; Cypress, Elm, Eucalyptus Hawthorn, Oak, Poplar and Willow.

Ultimate Height and Spread:

9.9 Where surveyed trees are classified as young to semi mature their future growth in terms of predicted height and canopy spread at maturity (refer to Appendix B) should be considered to prevent direct potential damage to structures or buildings, minimise future pressure for removal and increase the effect of shading as described above.

Appendix A: Scientific Names

Common names:	*Scientific Name*
Common alder	*Alnus glutinosa*
Crab apple	*Malus sylvestris*
Common ash	*Fraxinus excelsior*
False acacia	*Robinia pseudacacia*
Silver birch	*Betula pendula*
Downy birch	*Betula pubescens*
Common beech	*Fagus sylvatica*
Wild cherry	*Prunus avium*
Bird cherry	*Prunus padus*
Cherry plum	*Prunus cerasifera*
Horse chestnut	*Aesculus hippocastanum*
Sweet chestnut	*Castanea sativa*
Cypress	*Chamaecyparis cultivar*
Leyland cypress	*Cupressus x leylandii*
Lawson cypress	*Chamaecyparis lawsoniana*
Douglas fir	*Pseudotsuga menziesii*
Common hawthorn	*Crataegus monogyna*
Common hornbeam	*Carpinus betulus*
Holly	*Ilex aquifolium*
Laburnum	*Laburnum anagryoides*
Small leaved lime	*Tilia cordata*
Common lime	*Tilia x europaea*
Large leaved lime	*Tilia platyphyllos*
European larch	*Larix decidua*
Field maple	*Acer campestre*
Norway maple	*Acer platanoides*
Sycamore	*Acer pseudoplatanus*
Common oak	*Quercus robur*
Sessile oak	*Quercus petraea*
Holm oak	*Quercus ilex*
Pear	*Pyrus communis*
Scots pine	*Pinus sylvestris*
Aspen poplar	*Populus tremula*
Lombardy poplar	*Populus italica*
Hybrid black poplar	*Populus x canadensis*
London plane	*Platanus x hispanica*
Norway spruce	*Picea abies*
Rowan	*Sorbus aucuparia*
Whitebeam	*Sorbus aria*
Wild service tree	*Sorbus torminalis*)
Crack willow	*Salix fragilis*
Goat willow	*Salix caprea*
White willow	*Salix alba*
Weeping willow	*Salix babylonica*
Yew	*Taxus baccata*

Appendix B: Predicted Tree Height & Canopy Spread

Common name	*Height (m)*	*Canopy Spread (m)*
Common alder	25	10
Crab apple	9	7
Common ash	30	20
False acacia	25	15
Silver birch	25	10
Downy birch	20	10
Common beech	25	15
Wild cherry	20	10
Bird cherry	15	10
Cherry plum	10	10
Horse chestnut	25	20
Sweet chestnut	30	15
Cypress	15-40	2-5
Leyland cypress	35	5
Lawson cypress	15-40	2-5
Douglas fir	25-50	6-10
Common hawthorn	10	8
Common hornbeam	25	20
Holly	25	8
Laburnum	8	8
Small leaved lime	25	15
Common lime	35	15
Large leaved lime	30	20
European larch	30	4-6
Field maple	10	8
Norway maple	25	15
Sycamore	30	25
Common oak	35	25
Sessile oak	30	25
Holm oak	25	20
Pear	15	10
Scots pine	15-30	6-9
Aspen poplar	20	10
Lombardy poplar	30	5
Hybrid black poplar	35	20
London plane	30	20
Norway spruce	20-40	6
Rowan	15	7
Whitebeam	10-25	10
Wild service tree	20	12
Crack willow	15	15
Goat willow	10	8
White willow	25	10
Weeping willow	12	12
Yew	10-20	8-10

Category and definition	Criteria (including subcategories where appropriate)			Identification on plan
TREES UNSUITABLE FOR RETENTION				
Category U Those in such a condition that they cannot realistically be retained as living trees in the context of the current land use for longer than 10 years.	• Trees that have a serious, irremediable, structural defect, such that their early loss is expected due to collapse, including those that will become unviable after removal of other U category trees (i.e. where, for whatever reason, the loss of companion shelter cannot be mitigated by pruning) • Trees that are dead or are showing signs of significant, immediate, and irreversible overall decline. • Trees infected with pathogens of significance to the health and/or safety of other trees nearby, or very low quality trees suppressing adjacent trees of better quality. *NOTE Category U trees can have existing or potential conservation value which it might be desirable to preserve.*			DARK RED
TREES TO BE CONSIDERED FOR RETENTION				
	1 Mainly arboricultural values	**2 Mainly landscape values**	**3 Mainly cultural values, including conservation**	
Category A Trees of high quality with an estimated remaining life expectancy of at least 40 years.	Trees that are particularly good examples of their species, especially if rare or unusual; or those that are essential components of groups or formal or semi-formal arboricultural features (e.g. the dominant and/or principal trees within an avenue)	Trees, groups or woodlands of particular visual importance as arboricultural and/or landscape features	Trees, groups or woodlands of significant conservation, historical, commemorative or other value (e.g. veteran trees or wood-pasture)	LIGHT GREEN
Category B Trees of moderate quality with an estimated remaining life expectancy of at least 20 years.	Trees that might be included in category A, but are downgraded because of impaired condition (e.g. presence of significant though remediable defects, including unsympathetic past management and storm damage), such that they are unlikely to be suitable for retention for beyond 40 years; or trees lacking the special quality necessary to merit the category A designation	Trees present in numbers, usually growing as groups or woodlands, such that they attract a higher collective rating than they might as individuals; or trees occurring as collectives but situated so as to make little visual contribution to the wider locality	Trees with material conservation or other cultural value	MID BLUE
Category C Trees of low quality with an estimated remaining life expectancy of at least 10 years, or young trees with a stem diameter below 150 mm.	Trees of low quality with an estimated remaining life expectancy of at least 10 years, or young trees with a stem diameter below 150 mm	Trees present in groups or woodlands, but without this conferring on them significantly greater collective landscape value, and/or trees offering low or only temporary / transient landscape benefits.	Trees with no material conservation or other cultural value	GREY

Appendix D: Root Protection Area

Single stem diameter *mm*	**Radius of nominal circle** *m*	**Root Protection Area (RPA)** *m²*
75	0.90	3
100	1.20	5
125	1.50	7
150	1.80	10
175	2.10	14
200	2.40	18
225	2.70	23
250	3.00	28
275	3.30	34
300	3.60	41
325	3.90	48
350	4.20	55
375	4.50	64
400	4.80	72
425	5.10	81
450	5.40	92
475	5.70	102
500	6.00	113
525	6.30	124
550	6.60	137
575	6.90	150
600	7.20	163
625	7.50	177
650	7.80	191
675	8.10	206
700	8.40	222
725	8.70	238
750	9.00	255
775	9.30	272
800	9.60	290
825	9.90	308
850	10.20	327
875	10.50	346
900	10.80	366
925	11.10	387
950	11.40	408
975	11.70	430
1000	12.00	452
1025	12.30	475
1050	12.60	499
1075	12.90	519
1100	13.20	547
1125	13.50	573
1150	13.80	598
1175	14.10	625
1200	14.40	652
1225	14.70	679
1250	15.00	707

Appendix E: Technical Definitions

Access Facilitation Pruning:	One off tree pruning operation, the nature and effects of which are without significant adverse impact on tree physiology or amenity value, which is directly necessary to provide access for operations on site.
Arboricultural Impact Assessment	An evaluation of the direct and indirect effects of the proposed design on the trees identified within the Tree Survey, where necessary recommending mitigation or amendments to the design.
Arboricultural Method Statement	Methodology for the implementation of any aspect of development that is within the root protection area, or has the potential to result in loss of or damage to a tree to be retained.
Construction Exclusion Zone	An area based on the root protection area from which access is prohibited for the duration of a project
Root Protection Area (RPA)	The minimum area around a tree deemed to contain sufficient roots and rooting volume to maintain the tree's viability, and where the protection of the roots and soil structure is considered a priority
Tree Protection Plan	A scale drawing informed by descriptive text where necessary, based upon finalised proposals, showing trees for retention and illustrating the tree and landscape protection measures.

Disclaimer:

This report is issued to the client for their sole use and for the intended purpose as stated in the agreement between the client and Bea Landscape Design Limited under which this work was completed, or else as set out within this report. This report may not be relied upon by any other party without the express written agreement of Bea Landscape Design Limited. The use of this report by unauthorised third parties is at their own risk and Bea Landscape Design accepts no duty of care to any such third party.

Bea Landscape Design has exercised due care in preparing this report. It has not, unless specifically stated, independently verified information provided by others. No other warranty, express or implied, is made in relation to the content of this report and Bea Landscape Design assumes no liability for any loss resulting from errors, omissions or misrepresentation made by others.

Any recommendation, opinion or finding stated in this report is based on circumstances and facts as they existed at the time that Bea Landscape Design performed the work. The content of this report has been provided in accordance with the provisions of the BS 5837:2012 'Trees in relation to design, demolition and construction – Recommendations'.

Nothing in this report constitutes legal opinion. If legal opinion is required the advice of a qualified legal professional should be secured. Observations relating to ecology and the condition of built structures have been made from an arboricultural point of view and, unless stated otherwise, do not constitute structural or ecological advice.

Tree Survey in accordance with BS5837:2012

 # Estimated dimensions (for offsite or othewise inaccessible trees where accurate data cannot be recovered).

Tree / Group Number	Common Name	Height (m)	Stem(s) Diameter (mm)	Branch Spread (m) N	E	S	W	Canopy Height (m) / First Significant Branch	Life Stage	Physiological Condition	Structural Condition	Preliminary Management Recommendations	Remaining Contribution (years)	Category Grading	Root Protection Area (m2)
T01	Sycamore	8	90, 90, 90, 100, 100	3.5	3.5	3.5	3.5	/	Young	Poor	Restricted root environment with tarmac to East and hardcore to West. Multi stem. Self set tree on fenceline growing through and around palisade fence.	Remove to ground level.	<10	U	20
T02	Hawthorn	7	200	2.5	2.5	2.5	2.5	2	Young	Poor	Restricted root environment with tarmac cycle path to Southwest. Growing through fence. Self set tree. Random past pruning / surgery. Topped at 3m.	Remove to ground level.	10+	U	18
G03	Aspen poplar	15-20	<300					2	Young	Good	Offsite self set trees at bottom of railway embankment.	Remove ivy clad leaning / windthrow tree on fenceline.	20+	B2	41
W04	Cherry, Alder, Field maple, Scots Pine, Dogwood, Hawthorn, Goat willow	12-15	<300					/	Young / Semi mature	Good	Offsite trees and hedge growing on roadside embankment.	No action required.	40+	B2	41
G05	London plane (x7)	18	300-500	9#	9#	9#	9#	2	Semi mature	Fair	Offsite line of trees growing at base motorway embankment.	Remove stakes and support ties. Remove dead limbs and raise low hanging bracnhes from fenceline.	40+	B2	113
G06	Hornbeam (x4)	15	<350	6	6	0	6	2	Young	Fair	Offsite line of trees growing at base motorway embankment.	Remove stakes and support ties. Raise low hanging branches from fenceline.	40+	B2	55

Tree Survey in accordance with BS5837:2012

 # Estimated dimensions (for offsite or othewise inaccessible trees where accurate data cannot be recovered).

Tree / Group Number	Common Name	Height (m)	Stem(s) Diameter (mm)	Branch Spread (m) N	E	S	W	Canopy Height (m) / First Significant Branch	Life Stage	Physiological Condition	Structural Condition	Preliminary Management Recommendations	Remaining Contribution (years)	Category Grading	Root Protection Area (m2)
T07	Cherry	11	200, 160, 100, 100	4	4	4	4	/	Semi mature	Fair	Restricted root environment road to Southwest. Multi stem. Major pruning wounds. Moderate deadwood snags. Random past pruning / surgery. Offsite tree growing on road embankment.	No action required.	20+	B2	39
T08	London plane	12	280	4	6	4	4	2	Young	Good	Restricted root environment with road to Southwest / light pad Northwest.	No action required.	40+	B2	35
T09	Scots pine	10	260	3	3.5	3.5	3.5	2.5	Young	Fair	Restricted root environment road to Southwest and services in verge within RPA. Corrected trunk lean / basal sweep.	No action required.	10+	C2	31
T10	London plane	13	390	7.5	5	4	5	2	Semi mature	Good	Restricted root environment road to Southwest.	No action required.	40+	B2	69
T11	London plane	18	440	8	8	8	6.5	3	Semi mature	Good	Restricted root environment road to South; services in verge.	No action required.	40+	B2	88
T12	Silver birch	16	350	5	5	5	5	2	Semi mature	Good	Restricted root environment road to South, services in verge.	No action required.	20+	B2	55
T13	Silver birch	12	300	2.5	2.5	2.5	2.5	2	Semi mature	Fair	Offsite tree, swamped by overgrown Eleagnus.	Remove / cut back Eleagnus.	20+	C2	41
T14	Crab apple	8	200, 160	6	6	2	2	1.5	Young	Fair	Twin stemmed. Unbalanced / supressed Crown.	Raise low canopy from fenceline.	20+	C2	29
T15	Silver birch	10	240	2.5	2.5	2.5	2.5	2	Young	Fair	Unbalanced / supressed crown. Offsite tree swamped by Eleangus.	Remove suspended or broken limbs. Remove / cut back Eleagnus.	20+	C2	26

Tree Survey in accordance with BS5837:2012

 # Estimated dimensions (for offsite or othewise inaccessible trees where accurate data cannot be recovered).

Tree / Group Number	Common Name	Height (m)	Stem(s) Diameter (mm)	Branch Spread (m)				Canopy Height (m) / First Significant Branch	Life Stage	Physiological Condition	Structural Condition	Preliminary Management Recommendations	Remaining Contribution (years)	Category Grading	Root Protection Area (m2)
				N	E	S	W								
T16	Sycamore	8	300#	2	2	2	2	2	Semi mature	Fair	Restricted root environment with road to North & South. Random past pruning. Crown reduction. Bark wounds.	No action required.	10+	C1	55

LEGEND: TREE SURVEY TO BS 5837:2012

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- T4 — Category U: Trees unsuitable for retention.



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project: ACCESS PARK, GLOUCESTER

title: TREE SURVEY PLAN

status: PLANNING

date:	drawn:	number:
NOV'21	E.C.H	21-135-P-01
scale@A0:	**checked:**	**revision:**
1:500	T.G-W	(-)

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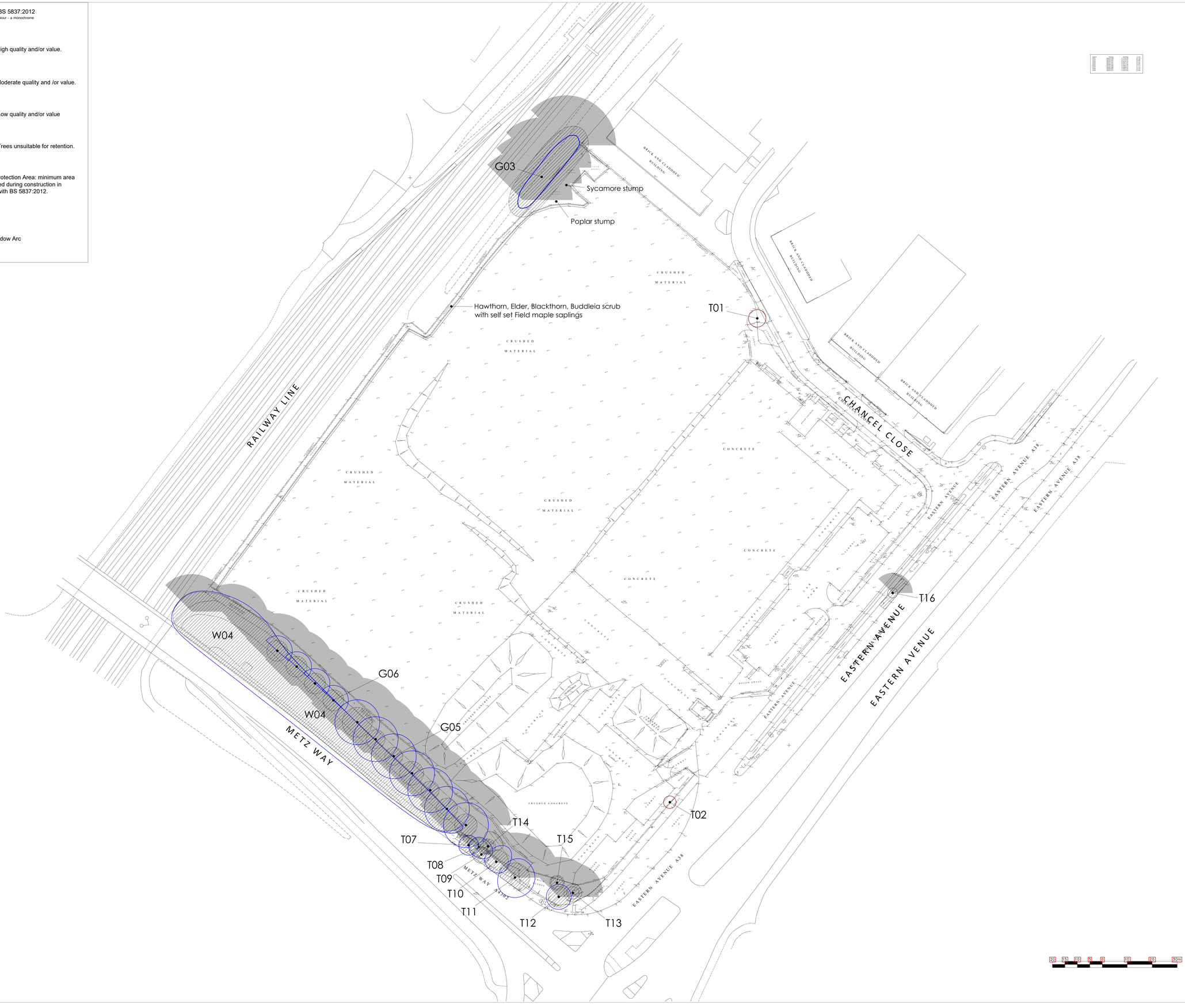
T2 — Category B: Moderate quality and /or value.

T3 — Category C: Low quality and/or value

T4 — Category U: Trees unsuitable for retention.

RPA: Root Protection Area: minimum area to be protected during construction in accordance with BS 5837:2012.

Shadow Arc



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title: TREE CONSTRAINTS PLAN

status: PLANNING

date:	drawn:	number:
NOV'21	E.C.H	21-135-P-02
scale@A0:	checked:	revision:
1:500	T.G-W	(-)

20 15 10 5 0 10 20 30m

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landscape architects - arboricultural consultants
urban designers - environmental assessors



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WV3 9QB

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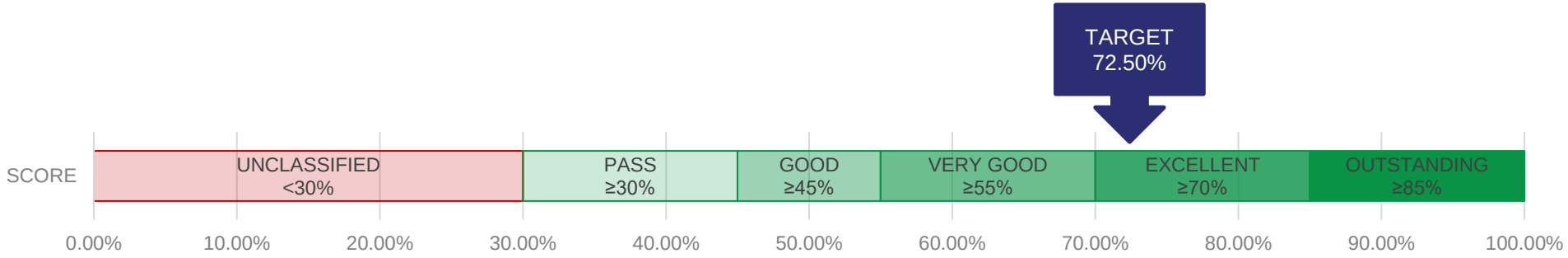
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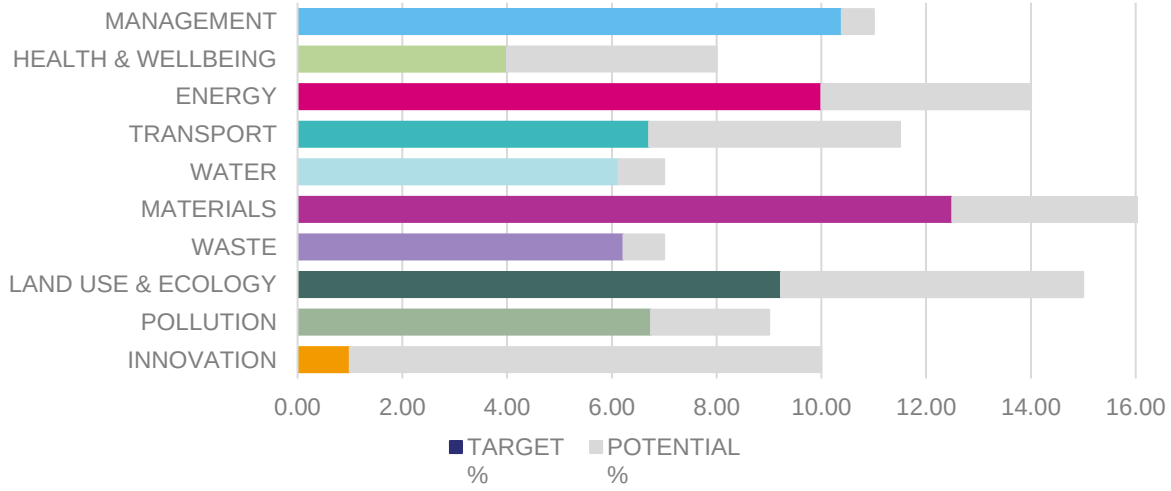
BREEAM NC 2018 PRE-ASSESSMENT

ACCESS PARK, GLOUCESTER

OCTOBER 2021

The pre-assessment estimator outlines an indicative strategy to achieve a BREEAM NC 2018 rating of Excellent. This requires an overall score of 70%.
Mandatory credits required are written in red. **P** indicates criteria that is a pre-requisite for other credits.





MANAGEMENT				AVAILABLE	TARGET
Man 01	Project Brief & Design	Project Delivery Planning	Concept Design	1	1
		Stakeholder Consultation (Interested Parties)	Concept Design	1	0
		Formally Agree Strategic Performance Targets	Concept Design	P	P
		BREEAM AP (Concept Design)	Concept Design	1	1
		BREEAM AP (Developed Design)	Developed Design	1	1
Man 02	Life Cycle Cost & Service Life Planning	Elemental LCC	Concept Design	2	2
		Component Level LCC Options Appraisal	Technical Design	1	1
		Capital Cost Reporting	Technical Design	1	1
Man 03	Responsible Construction Practices	Legally Harvested & Traded Timber	Construction	P	P
		Environmental Management	Construction	1	1
		Formally Agree Strategic Performance Targets	Construction	P	P
		BREEAM AP (Site)	Construction	1	1
		Responsible Construction Management	Construction	2	2
		Utility Consumption	Construction	1	1
		Transportation of Construction Materials & Waste	Construction	1	1
Man 04	Commissioning & Handover	Commissioning - Testing Schedule & Responsibilities	Developed Design	1	1
		Commissioning - Design & Preparation	Design Stage	1	1
		Testing & Inspection Building Fabric	Post-Construction	1	1
		Handover	Handover	1	1
			Section Total	18	17
			Section Score %	11.00	10.39
			Single Credit Value %	0.61	

HEALTH AND WELLBEING				AVAILABLE	TARGET
Hea 01	Visual Comfort	Daylighting	Developed Design	1	0
		View Out	Developed Design	1	1
		Internal & External Lighting Levels, Zoning & Controls	Technical Design	1	1
Hea 02	Indoor Air Quality	Indoor Air Quality Plan	Concept Design	**P**	**0**
		Ventilation	Technical Design	1	0
Hea 04	Thermal Comfort	Thermal Modelling	Developed Design	1	1
		Design for Future Thermal Comfort	Developed Design	1	1
Hea 05	Acoustic Performance	Indoor Ambient Noise Level	Developed Design	1	1
Hea 06	Security	Security of Site & Building	Concept Design	1	0
Hea 07	Safe & Healthy Surroundings	Safe Access	Developed Design	1	0
		Outdoor Space	Developed Design	1	0
			Section Total	10	5
			Section Score %	8.00	4.00
			Single Credit Value %	0.80	

ENERGY				AVAILABLE	TARGET
Ene 01	Reduction of Energy Use & Carbon Emissions	Energy Performance	Developed Design	9	4
		Energy Modelling & Reporting	Developed Design	4	4
Ene 02	Energy Monitoring	Sub-Metering of End-Use Categories	Technical Design	1	1
		Sub-Metering of High Energy Load & Tenancy Areas	Technical Design	1	1
Ene 03	External Lighting	External Lighting	Developed Design	1	1
Ene 04	Low Carbon Design	Passive Design Analysis	Concept Design	1	1
		Free Cooling	Concept Design	1	0
		Low & Zero Carbon Technologies	Concept Design	1	1
Ene 06	Energy Efficient Transportation Systems	Energy Consumption	Developed Design	1	1
		Energy Efficient Features - Lifts	Technical Design	1	1
			Section Total	21	15
			Section Score %	14.00	10.00
			Single Credit Value %	0.67	

TRANSPORT				AVAILABLE	TARGET
Tra 01	Transport Assessment & Travel Plan	Travel Plan	Feasibility	2	2
Tra 02	Sustainable Transport Measures	Transport Options Implementation	Feasibility	10	5
			Section Total	12	7
			Section Score %	11.50	6.71
			Single Credit Value %	0.96	

WATER				AVAILABLE	TARGET
Wat 01	Water Consumption	Reduction in Potable Water Use	Technical Design	5	4
Wat 02	Water Monitoring	Water Monitoring	Technical Design	1	1
Wat 03	Water Leak Detection & Prevention	Leak Detection System	Technical Design	1	1
		Flow Control Devices	Technical Design	1	1
Wat 04	Water Efficient Equipment	Unregulated Water Reduction	Technical Design	0	0
			Section Total	8	7
			Section Score %	7.00	6.13
			Single Credit Value %	0.88	

MATERIALS				AVAILABLE	TARGET
Mat 01	Building Life Cycle Assessment	Superstructure	Concept Design	6	4
		Substructure & Hard Landscaping Options Appraisal	Concept Design	1	1
Mat 02	Environmental Product Declarations	Specification of Products with a Recognised EPD	Technical Design	1	0
Mat 03	Responsible Sourcing of Construction Products	Legally Harvested & Traded Timber	Construction	**P**	**P**
		Enabling Sustainable Procurement	Concept Design	1	1
		Measuring Responsible Sourcing	Construction	3	2
Mat 05	Designing for Durability & Resilience	Protect Vulnerable & Exposed Elements from Damage & Degradation	Technical Design	1	1
Mat 06	Material Efficiency	Minimise Environmental Impact of Materials	Preparation & Brief	1	1
			Section Total	14	10
			Section Score %	17.50	12.50
			Single Credit Value %	1.25	

WASTE				AVAILABLE	TARGET
Wst 01	Construction Waste Management	Pre-demolition Audit	Concept Design	1	1
		Construction Resource Efficiency	Construction	3	3
		Diversion of Resources from Landfill	Construction	1	1
Wst 02	Use of Recycled & Sustainably Sourced Aggregates	Project Sustainable Aggregate Points	Construction	1	0
Wst 03	Operational Waste	Operational Waste	Technical Design	1	1
Wst 05	Adaptation to Climate Change	Resilience of Structure, Fabric, Building Services & Renewables Installation	Concept Design	1	1
Wst 06	Functional Adaptability	Design for Disassembly & Functional Adaptability - Recommendations	Concept Design	1	1
		Design for Disassembly & Functional Adaptability - Implementation	Concept Design	1	1
			Section Total	9	8
			Section Score %	7.00	6.22
			Single Credit Value %	0.78	

LAND USE AND ECOLOGY				AVAILABLE	TARGET
Le 01	Site Selection	Previously Occupied Land	Developed Design	1	1
		Contaminated Land	Developed Design	1	0
Le 02	Identifying & Understanding the Risks & Opportunities for the Project	Assessment Route Selection	Preparation & Brief	**P**	**P**
		Survey & Evaluation	Preparation & Brief	1	1
		Determining the Ecological Outcomes for the Site	Concept Design	1	1
Le 03	Managing Negative Impacts on Ecology	Identification & Understanding the Risks & Opportunities of the Site	Concept Design	**P**	**P**
		Planning, Liaison, Implementation & Data	Concept Design	1	1
		Managing Negative Impacts of the Project	Concept Design	2	1
Le 04	Change & Enhancement of Ecological Value	Identification & Understanding the Risks & Opportunities of the Site	Concept Design	**P**	**P**
		Liaison, Implementation & Data Collection	Concept Design	1	1
		Enhancement of Ecology	Concept Design	3	0
Le 05	Long Term Ecology Management & Maintenance	Roles & Responsibilities, Implementation, Statutory Obligations	Concept Design	**P**	**P**
		Planning, Liaison, Data, Monitoring & Review Management & Maintenance	Concept Design	1	1
		Landscape & Ecology Management Plan Development	Concept Design	1	1
			Section Total	13	8
			Section Score %	15.00	9.23
			Single Credit Value %	1.15	

POLLUTION				AVAILABLE	TARGET
Pol 01	Impact of Refrigerants	Pre-Requisite - BS EN 378:2018	Technical Design	**P**	**P**
		Impact of Refrigerants	Technical Design	2	1
		Leak Detection	Technical Design	1	0
Pol 02	Local Air Quality	NOx, PPM, VOC Emissions	Technical Design	2	2
Pol 03	Flood & Surface Water Management	Appropriate Consultant	Developed Design	**P**	**P**
		Flood Resilience	Developed Design	2	1
		Bespoke Surface Water Run-Off Design Solutions	Technical Design	**P**	**P**
		Surface Water Run-Off - Rate	Technical Design	1	1
		Surface Water Run-Off - Volume	Technical Design	1	1
		Minimise Watercourse Pollution	Technical Design	1	1
Pol 04	Reduction of Night Time Light Pollution	Reduction of Night Time Light Pollution	Technical Design	1	1
Pol 05	Reduction of Noise Pollution	Reduction of Noise Pollution	Developed Design	1	1
			Section Total	12	9
			Section Score %	9.00	6.75
			Single Credit Value %	0.75	

INNOVATION

				AVAILABLE	TARGET
Exemplary Performance	Man 03	Responsible Construction Practices - All Criteria	Construction	1	1
	Hea 01	Visual Comfort - Daylighting	Developed Design	1	0
	Hea 06	Security - SABRE	Concept Design	1	0
	Ene 01	Reduction of Energy Use & Carbon Emissions	Concept Design	5	0
	Wat 01	Water Consumption	Technical Design	1	0
	Mat 01	Building Life Cycle Assessment	Concept Design	3	0
	Mat 03	Responsible Sourcing of Construction Products	Construction	1	0
	Wst 01	Construction Waste Management	Construction	1	0
	Wst 02	Use of Recycled & Sustainably Sourced Aggregate	Construction	1	0
	Wst 05	Adaptation to Climate Change	Concept Design	1	0
	Le 02	Identifying & Understanding the Risks & Opportunities for the Project	Concept Design	1	0
	Le 04	Change & Enhancement of Ecological Value	Concept Design	1	0
	Inn	BRE Approved Innovations	Developed Stage	1	0
			Section Total	10	1
			Section Score %	10.00	1.00
			Single Credit Value %	1.00	

SCORE

Target Score %	72.93
Target Rating	**Excellent**

LEGEND: TREE SURVEY TO BS 5837:2012

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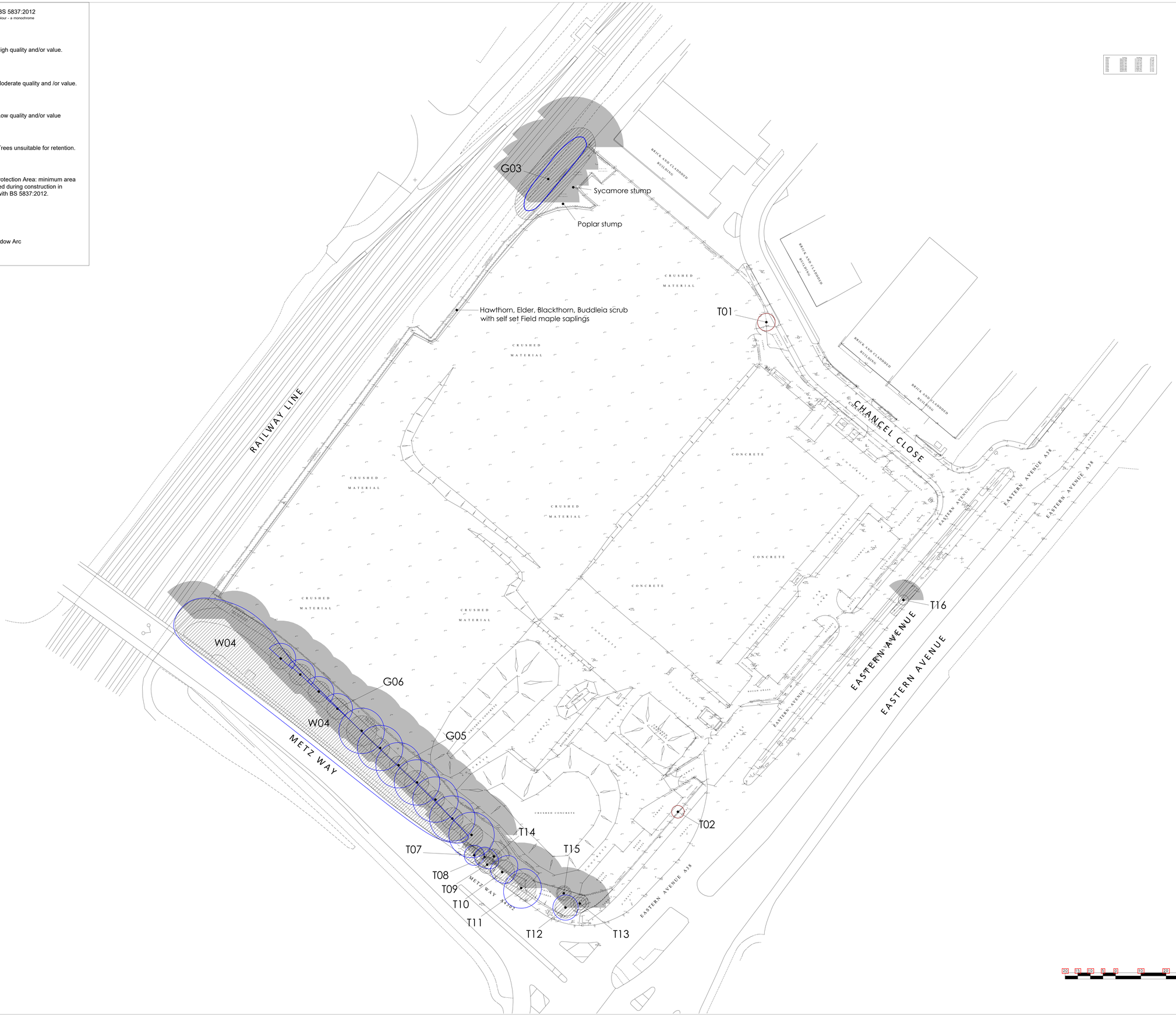
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Shadow Arc



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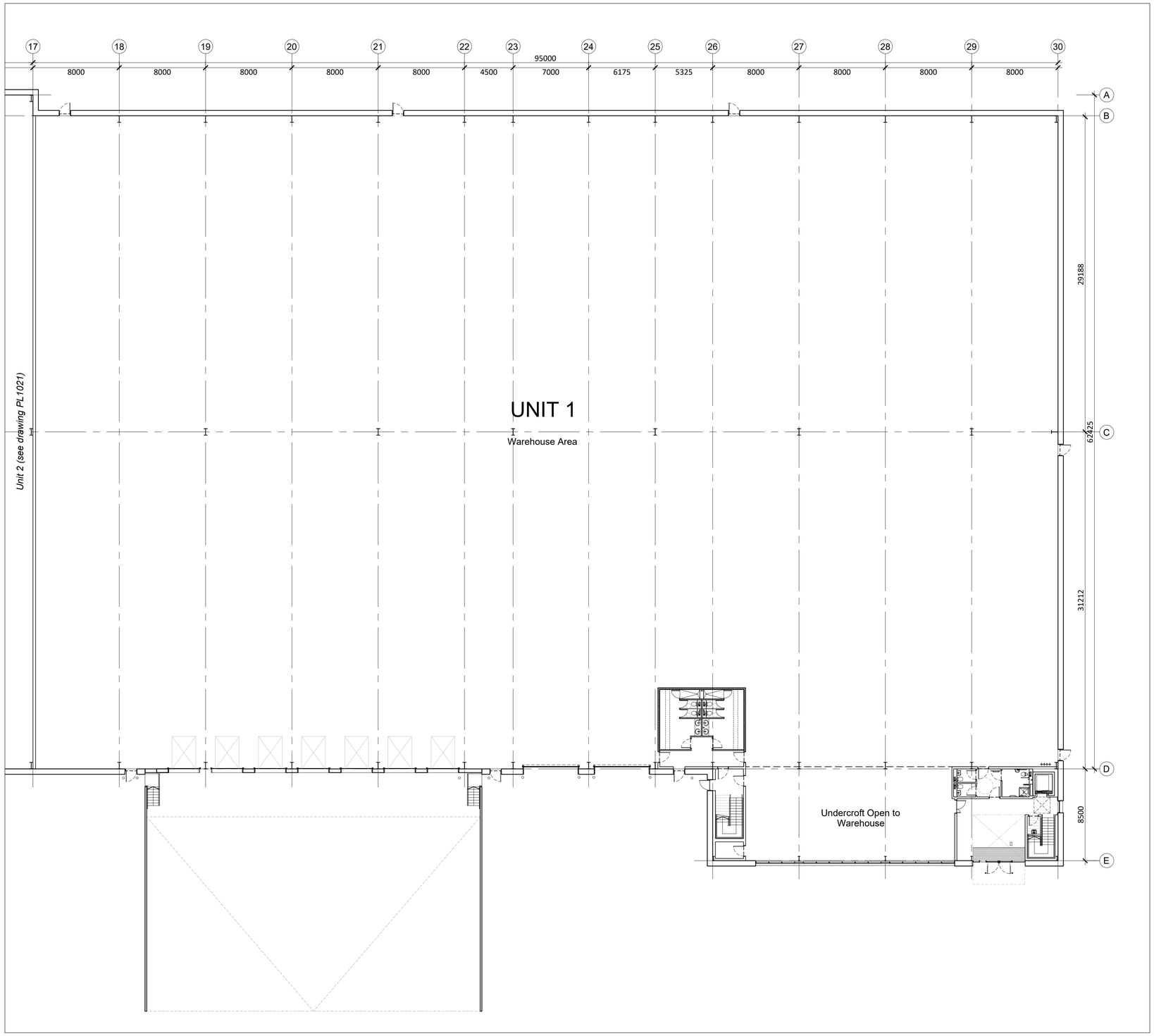
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status: PLANNING

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1:500	T.G-W	(-)

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01 Unit 1 Ground Floor GA Plan
1:200 @ A1

Disclaimer:
Information Subject to Measured Survey

Notes:

AREA SCHEDULE(GIA)

UNIT 1 (GIA)	**70,200 ft²**
Warehouse (Incl. office Undercroft)	64,600 ft²
Office (FF Only)	2,700 ft²
Office (SF Only)	2,900 ft²

N

0 2 4 6 8 10
Scale bar - 1:200m

Rev:	Notes:	Date:	Dwn:	Iss:
01	Amenity block changed	12.12.21	HT	HA
00	Planning Issue	23.11.21	HT	HA
DR	Draft Issue	17.11.21	HT	HA

Suitability Code:

Client:
CANMOOR

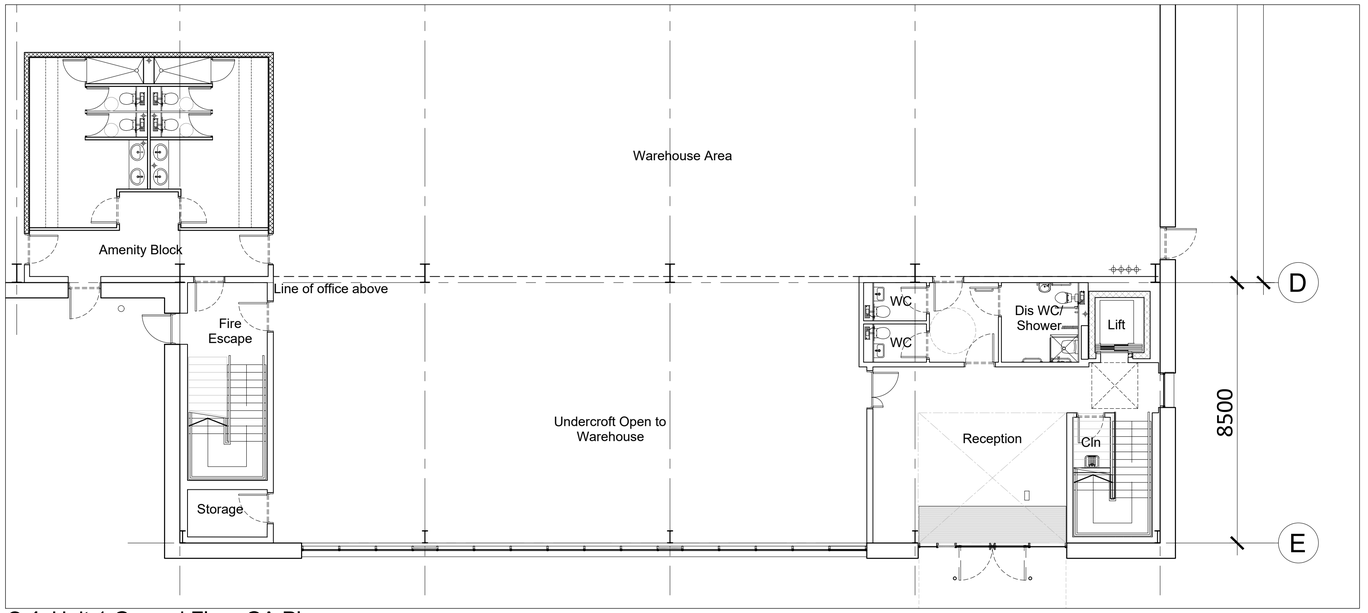
hale
ARCHITECTURE
22c Leathermarket Street, London, SE1 3HP

Project:
Access Park, Gloucester

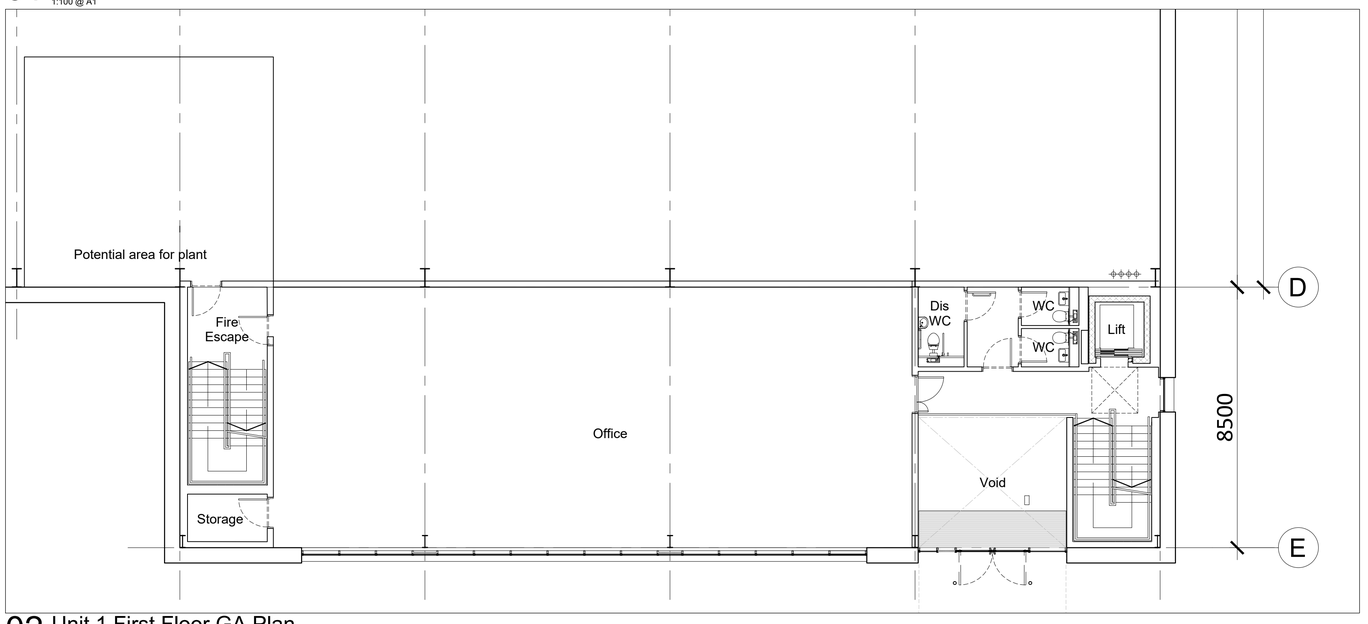
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Unit 1
GA Ground Floor Plan

Project No: 21078
Scale @ A1 / A3: 1:200 / 1:400
Revision: 01

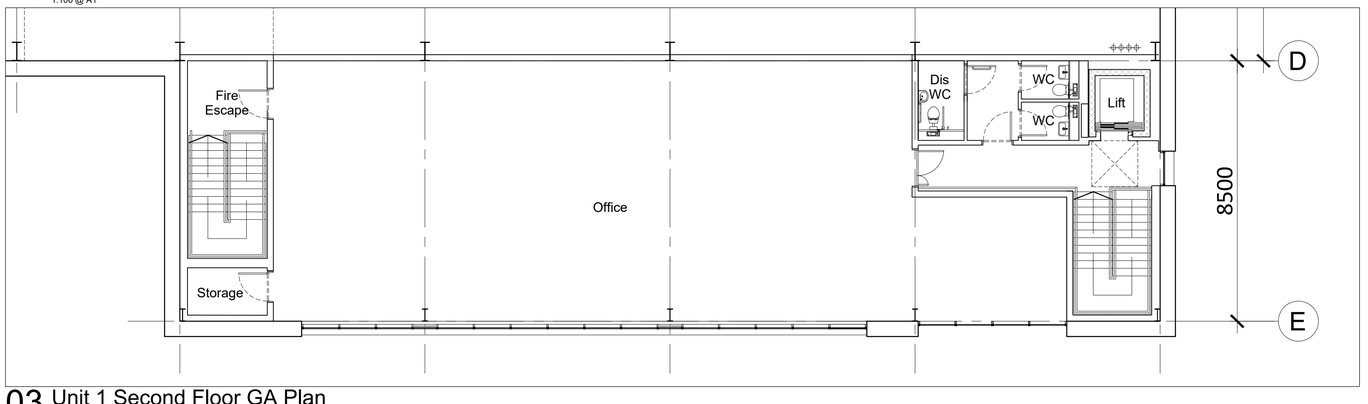
Drawing No: 21078-PL1011



01 Unit 1 Ground Floor GA Plan
1:100 @ A1



02 Unit 1 First Floor GA Plan
1:100 @ A1



03 Unit 1 Second Floor GA Plan
1:100 @ A1

Disclaimer:
Information Subject to Measured Survey

Notes:

AREA SCHEDULE(GIA)

UNIT 1 (GIA)	**70,200 ft²**
Warehouse (Incl. office Undercroft)	64,600 ft²
Office (FF Only)	2,700 ft²
Office (SF Only)	2,900 ft²

N

0 1 2 3 4 5
Scale bar - 1:100m

Rev:	Notes:	Date:	Dwn:	Iss:
01	Cores amended	12.12.21	HT	HA
00	Planning Issue	23.11.21	HT	HA
DR	Draft Issue	17.11.21	HT	HA

Suitability Code:

Client:
CANMOOR

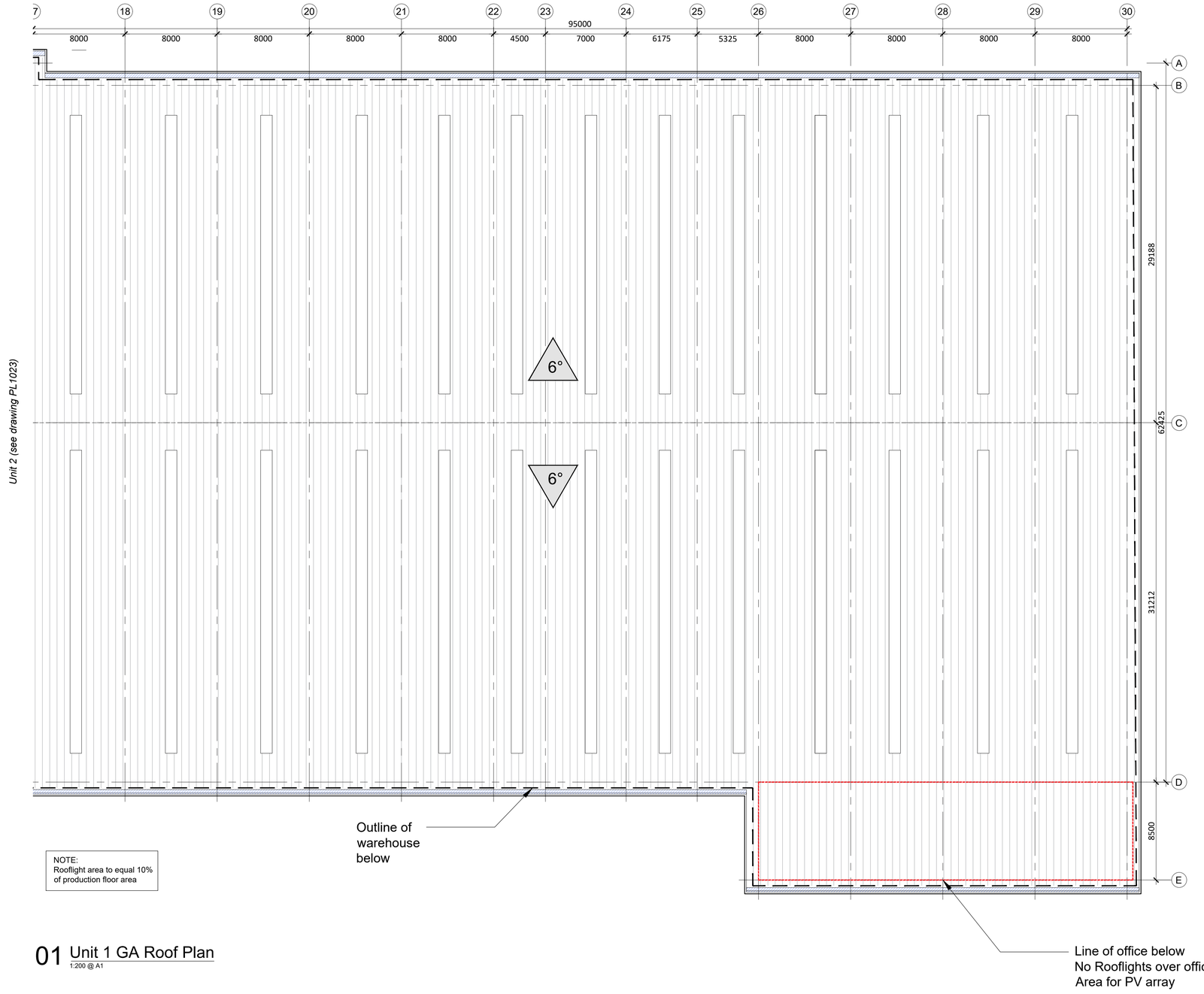
hale
ARCHITECTURE
22c Leathermarket Street, London, SE1 3HP

Project:
Access Park, Gloucester

Drawing Title:
Unit 1
GA GF Main Entrance, FF & SF Office Plan

Project No:	Scale @ A1 / A3	Revision:
21078	1:100 / 1:200	01

Drawing No:
21078-PL1012



NOTE:
Rooflight area to equal 10% of production floor area

01 Unit 1 GA Roof Plan
1:200 @ A1

Disclaimer:
Information Subject to Measured Survey

Notes:

N

0 2 4 6 8 10
Scale bar - 1:200m

Rev:	Notes:	Date:	Dwn:	Iss:
01	PV array note included	12.12.21	HT	HA
00	Planning Issue	23.11.21	HT	HA
DR	Draft Issue	17.11.21	ZG	HA

Suitability Code:

Client:
CANMOOR

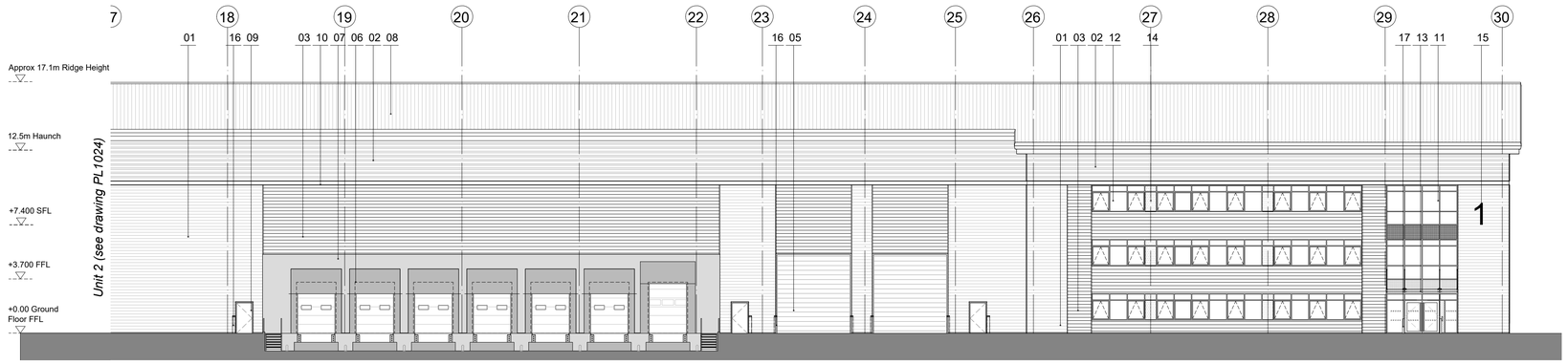
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ARCHITECTURE
22c Leathermarket Street, London, SE1 3HP

Project:
Access Park, Gloucester

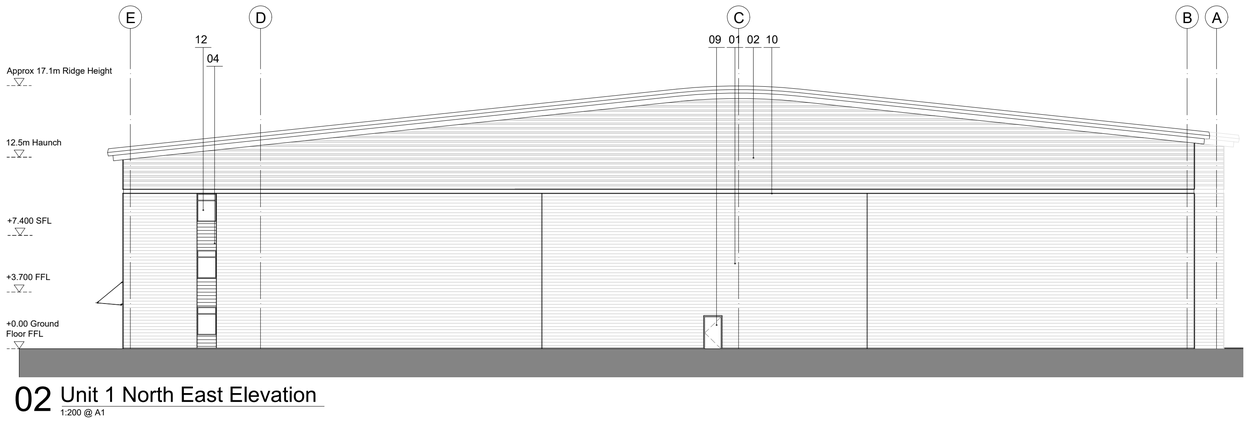
Drawing Title:
Unit 1
GA Roof Plan

Project No:	Scale @ A1 / A3	Revision:
21078	1:200 / 1:400	01

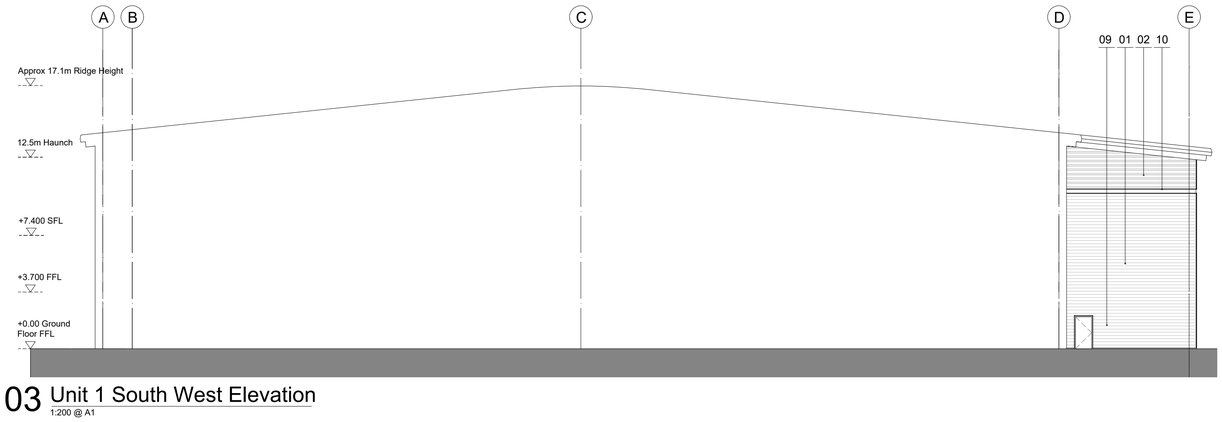
Drawing No:
21078-PL1013



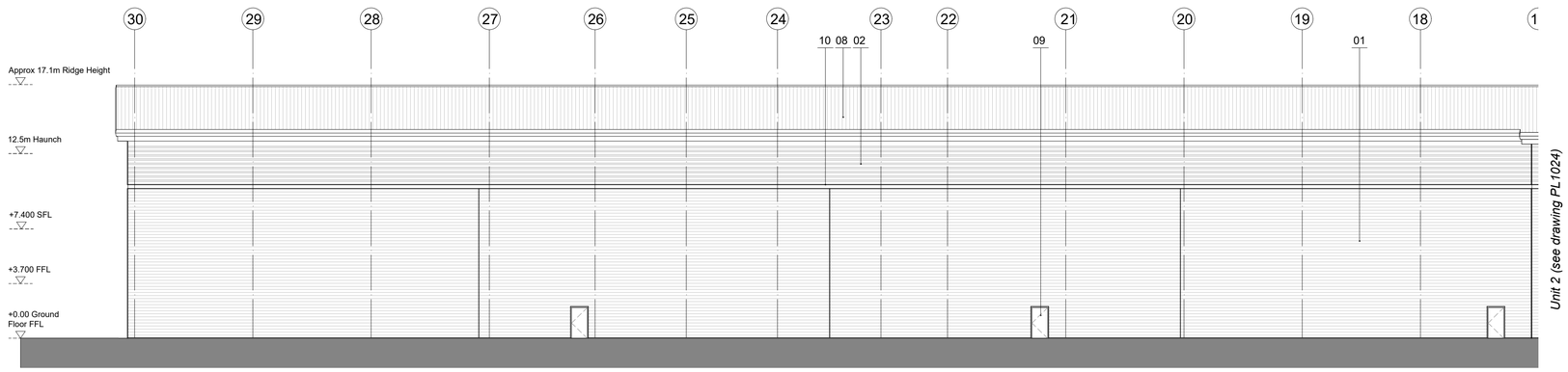
01 Unit 1 South East Elevation
1:200 @ A1



02 Unit 1 North East Elevation
1:200 @ A1



03 Unit 1 South West Elevation
1:200 @ A1



04 Unit 1 North West Elevation
1:200 @ A1

Disclaimer:
Subject to survey.

Notes:

Rev:	Notes:	Date:	Dwn:	Iss:
DR	Draft Issue	17.11.21	ZG	HA
00	Planning Issue	23.11.21	HT	HA
01	Materials key update	30.11.21	HT	HA
02	Eurodock Incl.	12.12.21	HT	HA

Scale bar - 1:200m (0 2 4 6 8 10)

MATERIALS KEY:

01 - Wall Cladding: Horizontal profiled built up steel cladding, profile trapezoidal, colour Sirius (RAL 9006)
02 - Wall Cladding High Level : Horizontal profiled built up steel cladding, profile reverse trapezoidal, colour Orion (RAL 9007)
03 - Wall Cladding Loading area: Horizontal profiled built up steel cladding, profile sinusoidal, colour Zeus (RAL7022)
04 - Wall Cladding Office Frontage: Horizontal profiled built up steel cladding, profile sinusoidal, colour Zeus (RAL7022)
05 - Level loading doors, colour Anthracite (RAL 7016)
06 - Dock Leveller doors, colour Anthracite (RAL 7016)
07 - Concrete Wall to dock Levellers - Insulated precast concrete Prowall
08 - Roof Cladding Profile built up cladding, forward profile, colour Goosewing grey (BS10A05)
09 - Metal escape and personnel doors, colour to match adjacent cladding
10 - Horizontal PPC Metal feature channel, colour Zeus (RAL7022)
11 - Curtain Wall Windows, Satin finished PPC in Anthracite (RAL7016)
12 - Framed Window System, Satin finished PPC in Anthracite (RAL 7016)
13 - Still framed, glazed canopy, Satin finished PPC in Anthracite (RAL 7016) with Fritted laminated glazing
14 - Look-a-like Ceramic Fritted glazing panels (18B29)
15 - Unit and loading door number - 3mm Aluminium with black anodise finish.
16 - Bollards - Black finished steel bollard with yellow reflective band to top
17 - Bollards - Stainless steel finish bollard to entrance door

hale
ARCHITECTURE
22c Leathermarket Street, London, SE1 3HP

Client: CANMOOR

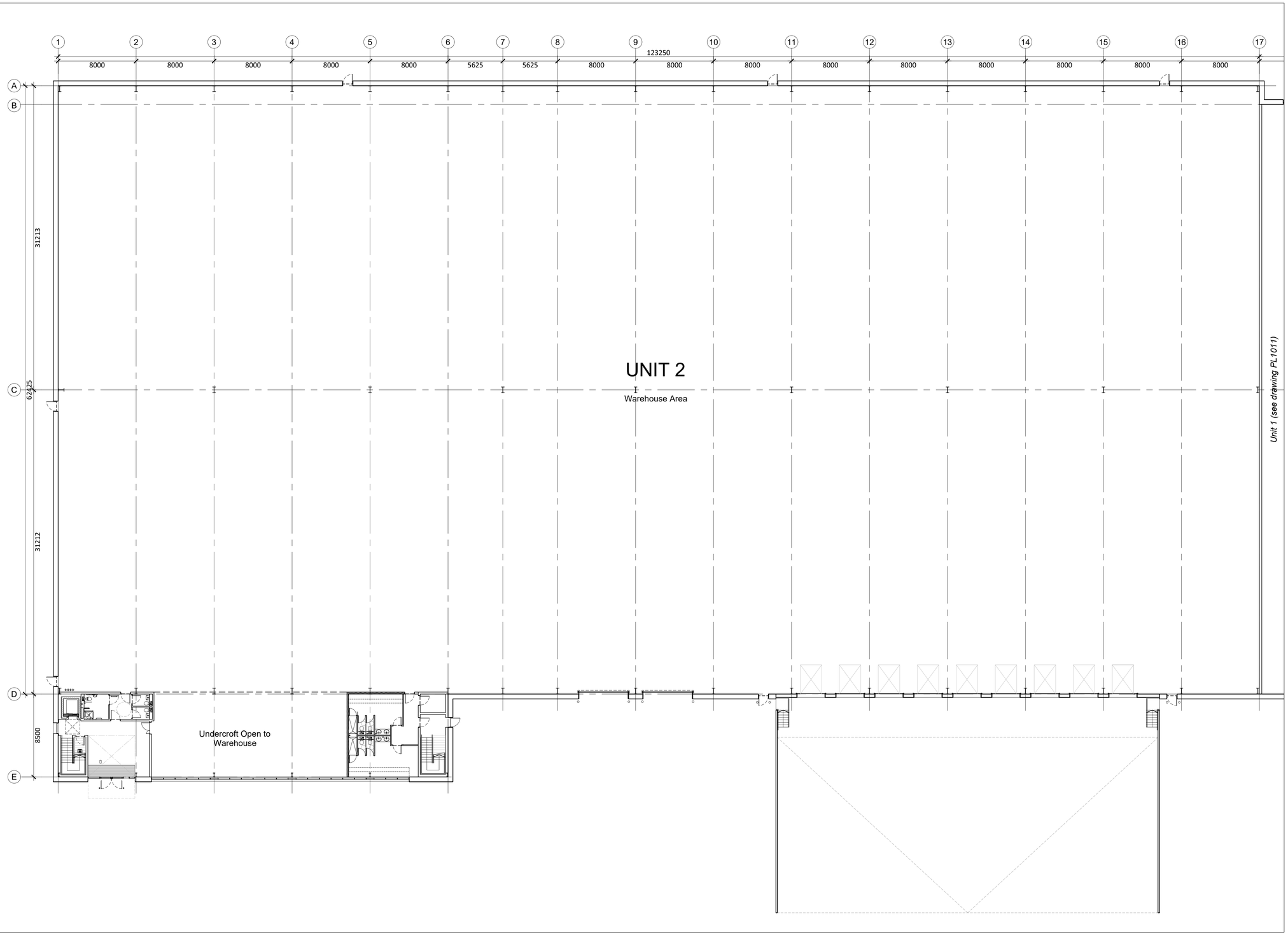
Issue Purpose:

Project: Access Park, Gloucester

Drawing Title: Unit 1 Elevations

Project No: 21078
Scale @ A1 / A3: 1:200 / 1:400
Revision: 02

Drawing No: 21078-PL1014



01 Unit 2 Ground Floor GA Plan
1:200 @ A1

Disclaimer:
Information Subject to Measured Survey

Notes:

AREA SCHEDULE(GIA)

UNIT 2 (GIA)	**93,530 ft²**
Warehouse (Incl. office Undercroft)	86,450 ft²
Office (FF Only)	3,430 ft²
Office (SF Only)	3,650 ft²

N

0 2 4 6 8 10
Scale bar - 1:200m

Rev:	Notes:	Date:	Dwn:	Iss:
01	Core amended	12.12.21	HT	HA
00	Planning Issue	23.11.21	HT	HA
DR	Draft Issue	17.11.21	HT	HA

Suitability Code:

Client:
CANMOOR

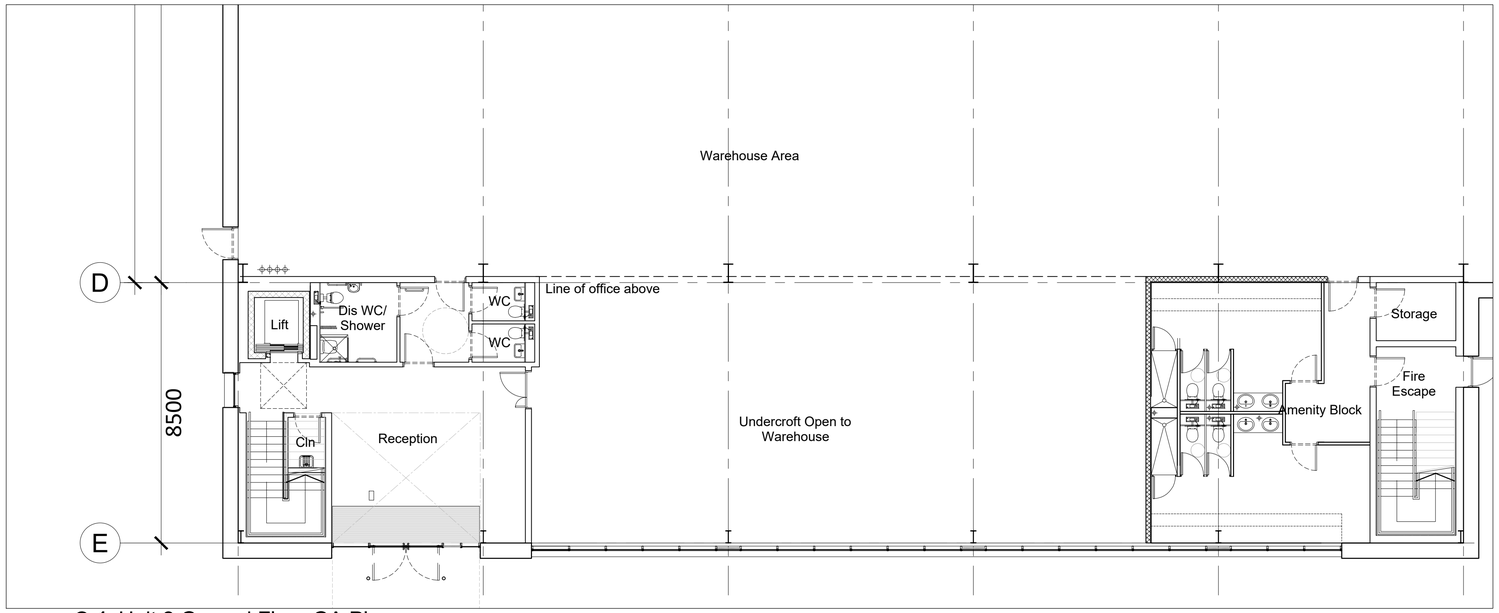
hale
ARCHITECTURE
22c Leathermarket Street, London, SE1 3HP

Project:
Access Park, Gloucester

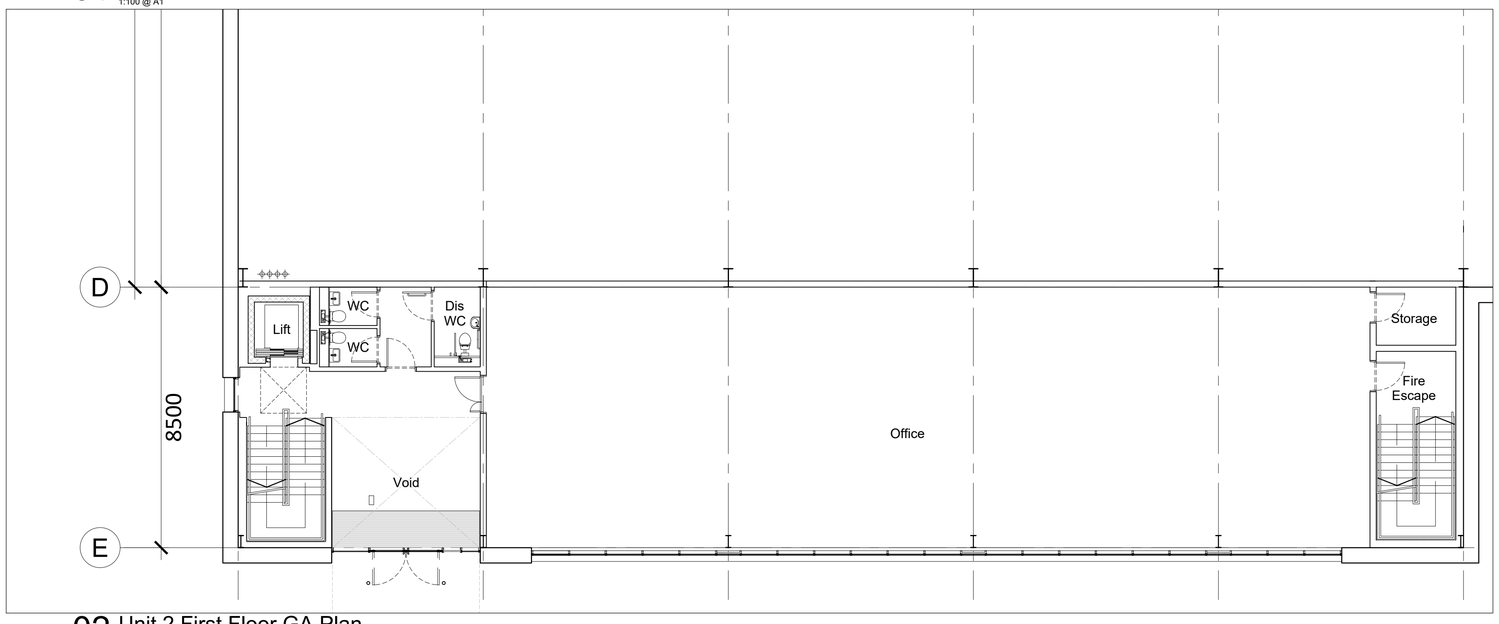
Drawing Title:
Unit 2
GA Ground Floor Plan

Project No:	Scale @ A1 / A3	Revision:
21078	1:200 / 1:400	01

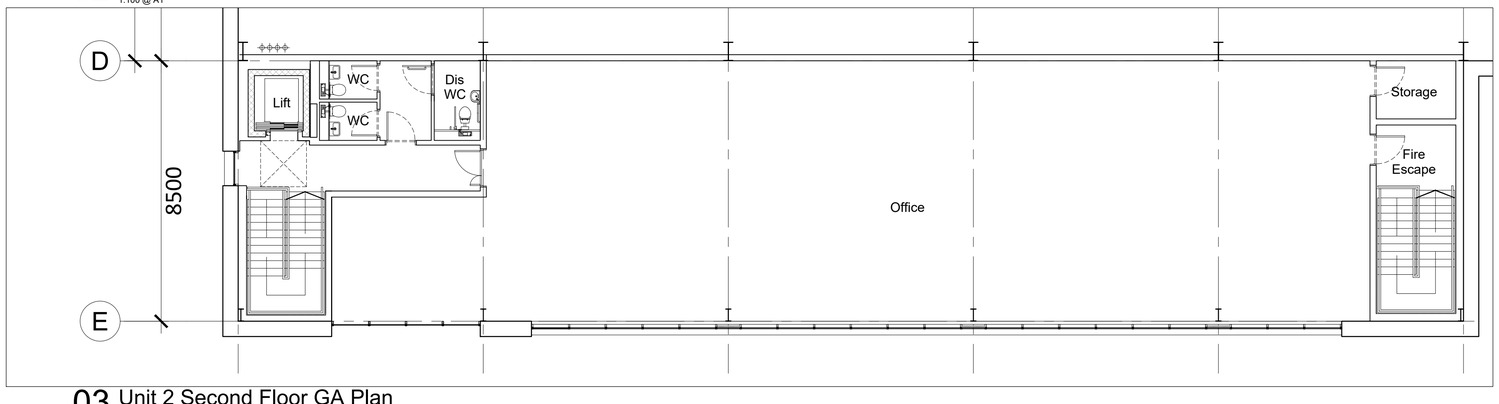
Drawing No:
21078-PL1021



01 Unit 2 Ground Floor GA Plan
1:100 @ A1



02 Unit 2 First Floor GA Plan
1:100 @ A1



03 Unit 2 Second Floor GA Plan
1:100 @ A1

Disclaimer:
Information Subject to Measured Survey

Notes:

AREA SCHEDULE(GIA)

UNIT 1 (GIA)	**70,200 ft²**
Warehouse (Incl. office Undercroft)	64,600 ft²
Office (FF Only)	2,700 ft²
Office (SF Only)	2,900 ft²

N

0 1 2 3 4 5
Scale bar - 1:100m

Rev:	Notes:	Date:	Dwn:	Iss:
01	Amenity core amended	12.12.21	HT	HA
00	Planning Issue	23.11.21	HT	HA
DR	Draft Issue	17.11.21	HT	HA

Suitability Code:

Client:
CANMOOR

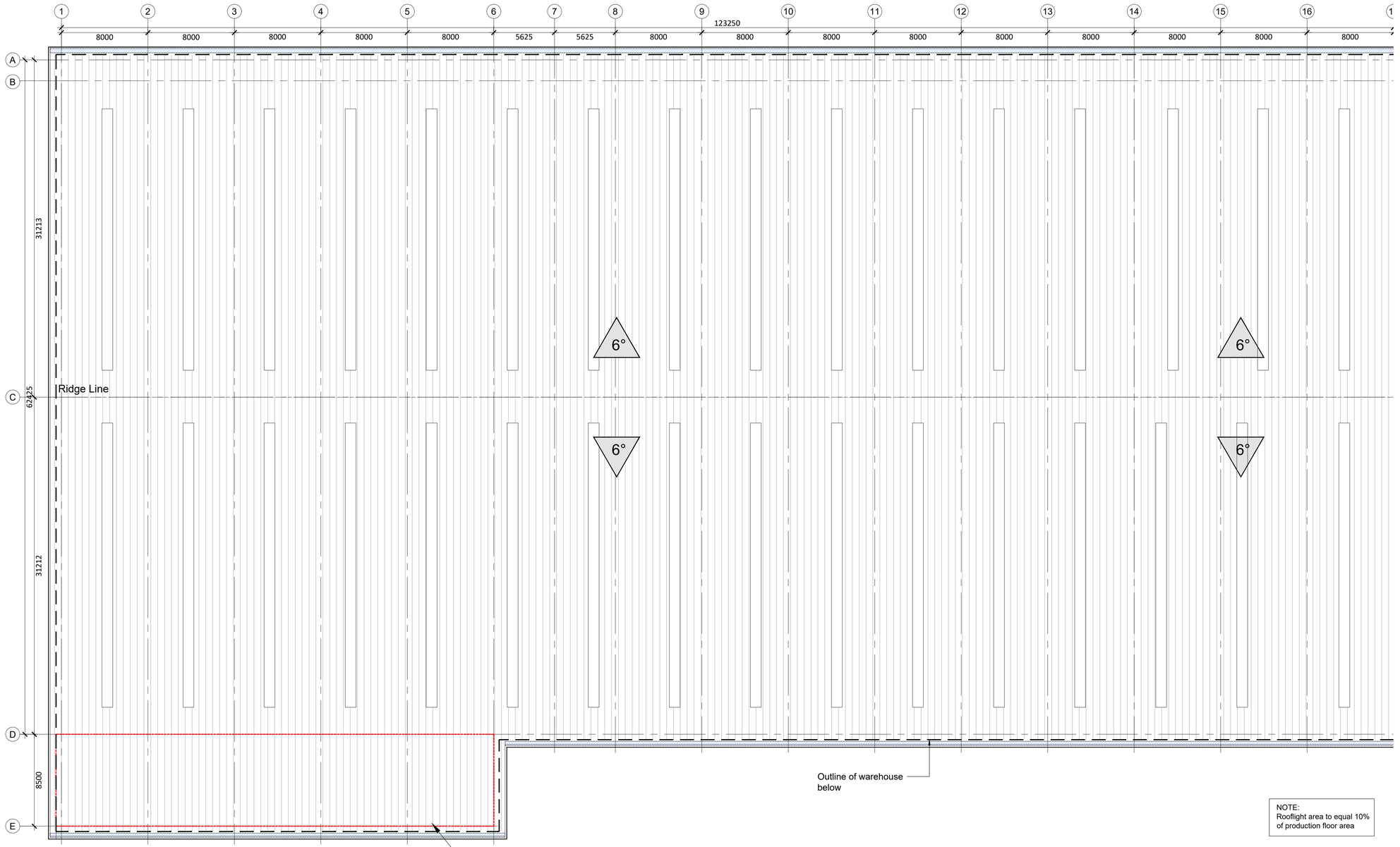
hale
ARCHITECTURE
22c Leathermarket Street, London, SE1 3HP

Project:
Access Park, Gloucester

Drawing Title:
Unit 2
GA GF Main Entrance, FF & SF Office Plan

Project No:	Scale @ A1 / A3	Revision:
21078	1:100 / 1:200	01

Drawing No:
21078-PL1022



01 Unit 2 GA Roof Plan
1:200 @ A1

Disclaimer:
Information Subject to Measured Survey

Notes:

N

0 2 4 6 8 10
Scale bar - 1:200m

Rev:	Notes:	Date:	Dwn:	Iss:
01	PV array included	12.12.21	HT	HA
00	Planning Issue	23.11.21	HT	HA
DR	Draft Issue	17.11.21	ZG	HA

Suitability Code:

Client:
CANMOOR

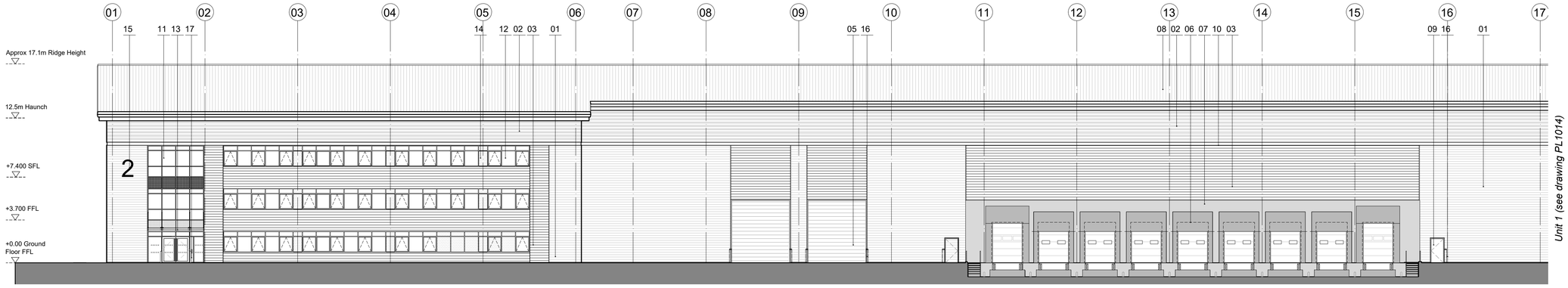
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ARCHITECTURE
22c Leathermarket Street, London, SE1 3HP

Project:
Access Park, Gloucester

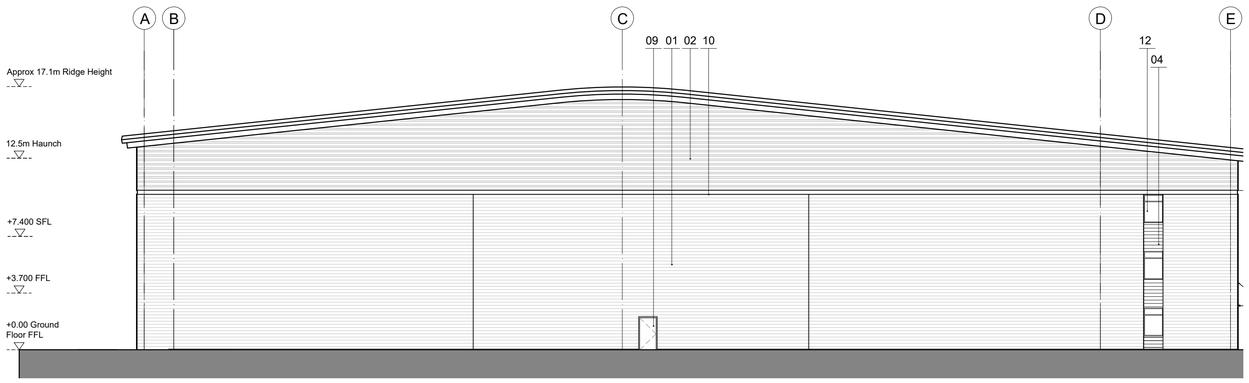
Drawing Title:
Unit 2
GA Roof Plan

Project No:	Scale @ A1 / A3	Revision:
21078	1:200 / 1:400	01

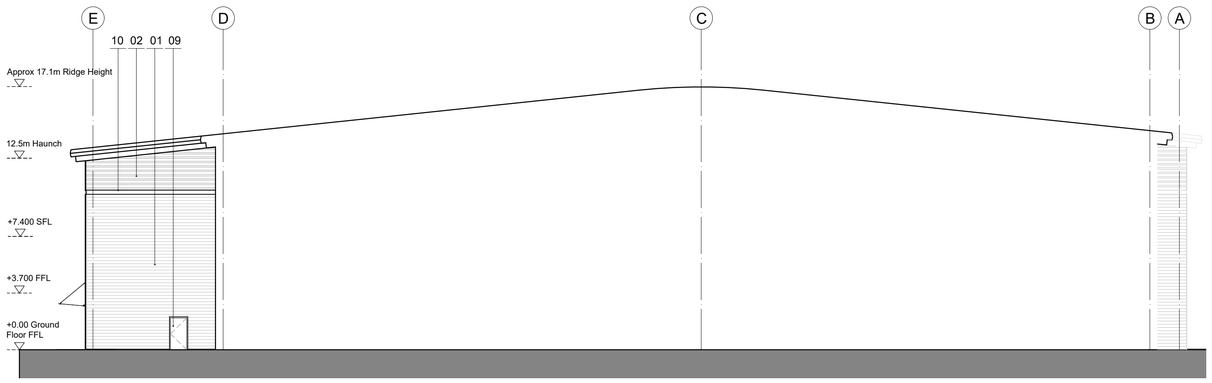
Drawing No:
21078-PL1023



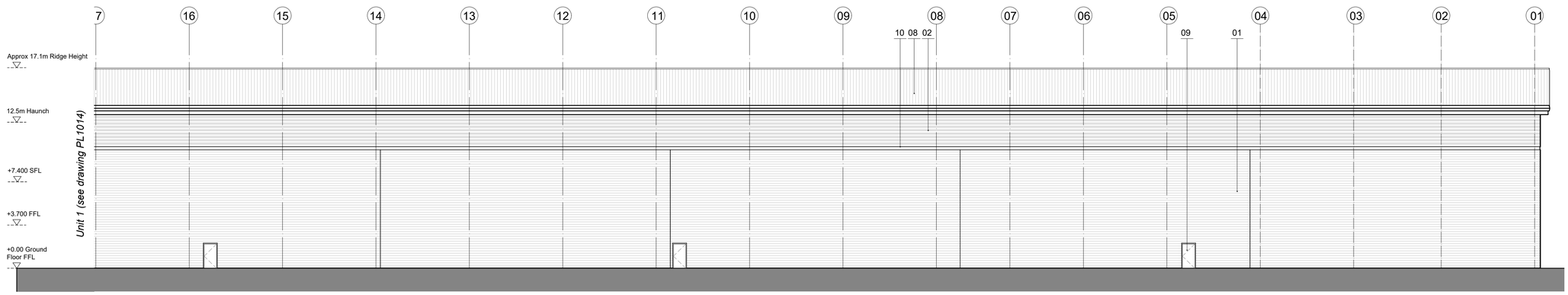
01 Unit 2 South East Elevation
1:200 @ A1



02 Unit 2 South West Elevation
1:200 @ A1



03 Unit 2 South East Elevation
1:200 @ A1



04 Unit 2 North West Elevation
1:200 @ A1

Disclaimer:
Subject to survey.

Notes:

Rev:	Notes:	Date:	Dwn:	Iss:
	Scale bar - 1:200m (0 2 4 6 8 10)			
DR	Draft Issue	17.11.21	ZG	HA
00	Planning Issue	23.11.21	HT	HA
01	Elevation materials key	30.11.21	HT	HA
02	Euro dock Incl.	12.12.21	HT	HA

MATERIALS KEY:

01 - Wall Cladding: Horizontal profiled built up steel cladding, profile trapezoidal, colour Sirius (RAL 9006)
02 - Wall Cladding High Level : Horizontal profiled built up steel cladding, profile reverse trapezoidal, colour Orion (RAL 9007)
03 - Wall Cladding Loading area: Horizontal profiled built up steel cladding, profile sinusoidal, colour Zeus (RAL7022)
04 - Wall Cladding Office Frontage: Horizontal profiled built up steel cladding, profile sinusoidal, colour Zeus (RAL7022)
05 - Level loading doors, colour Anthracite (RAL 7016)
06 - Dock Leveller doors, colour Anthracite (RAL 7016)
07 - Concrete Wall to dock Levellers - Insulated precast concrete Prowall
08 - Roof Cladding Profile built up cladding, forward profile, colour Goosewing grey (BS10A05)
09 - Metal escape and personnel doors, colour to match adjacent cladding
10 - Horizontal PPC Metal feature channel, colour Zeus (RAL7022)
11 - Curtain Wall Windows, Satin finished PPC in Anthracite (RAL7016)
12 - Framed Window System, Satin finished PPC in Anthracite (RAL 7016)
13 - Still framed, glazed canopy, Satin finished PPC in Anthracite (RAL 7016) with Fritted laminated glazing
14 - Look-a-like Ceramic Fritted glazing panels (18B29)
15 - Unit and loading door number - 3mm Aluminium with black anodise finish.
16 - Bollards - Black finished steel bollard with yellow reflective band to top
17 - Bollards - Stainless steel finish bollard to entrance door

hale
ARCHITECTURE
22c Leathermarket Street, London, SE1 3HP

Client: CANMOOR

Issue Purpose:

Project: Access Park, Gloucester

Drawing Title: Unit 2 Elevations

Project No: 21078 | Scale @ A1 / A3: 1:200 / 1:400 | Revision: 02

Drawing No: 21078-PL1024

RAILWAY LINE

METZ WAY

UNIT 2

UNIT 1

45m

S/S

CHANNEL CLOSE

UNIT 3

37m

UNIT 4 UNIT 5 UNIT 6 UNIT 7 UNIT 8

15m

7.3m

12.5m

UNIT 9 UNIT 10 UNIT 11 UNIT 12 UNIT13 UNIT 14

EASTERN AVENUE

EASTERN AVENUE

Disclaimer:
Information Subject to Measured Survey

Notes:

KEY

PLANNING APPLICATION SITE BOUNDARY
(Approx 53,142 m² / 13.13 acres)

Existing Fence Line to be retained 2.4m
Metal Palisade Fence

Proposed Fence Line
2.4m Paladin Mesh Fence, colour; black

N

0 5 10 15 20 25

Rev:	Notes:	Date:	Dwn:	Iss:
01	Site plan update	14.12.21	HT	HA
00	Site plan update	30.11.21	HT	HA
DR	DR Issue	17.11.21	HT	HA

Suitability Code:

Client:
CANMOOR

hale
ARCHITECTURE
22c Leathermarket Street, London, SE1 3HP

Project:
Access Park, Gloucester

Drawing Title:
Proposed Fence Line

Project No: 21078

Scale @ A1 / A3: 1:500 / 1:1000

Revision: 01

Drawing No: 21078-PL1005

RAILWAY LINE

METZ WAY

UNIT 2

UNIT 1

45m

S/S

CHANNEL CLOSE

UNIT 3

37m

UNIT 4 UNIT 5 UNIT 6 UNIT 7 UNIT 8

15m

7.3m

12.5m

UNIT 9 UNIT 10 UNIT 11 UNIT 12 UNIT13 UNIT 14

S/S

EASTERN AVENUE

EASTERN AVENUE

Disclaimer:
Information Subject to Measured Survey

Notes:

KEY

PLANNING APPLICATION SITE BOUNDARY
(Approx 53,142 m² / 13.13 acres)

Refuse and recycling area

Proposed collection route

N

0 5 10 15 20 25

Rev:	Notes:	Date:	Dwn:	Iss:
01	Updated Site Plan	14.12.21	HT	HA
DR	Planning Issue	01.12.21	HT	HA

Suitability Code:

Client:
CANMOOR

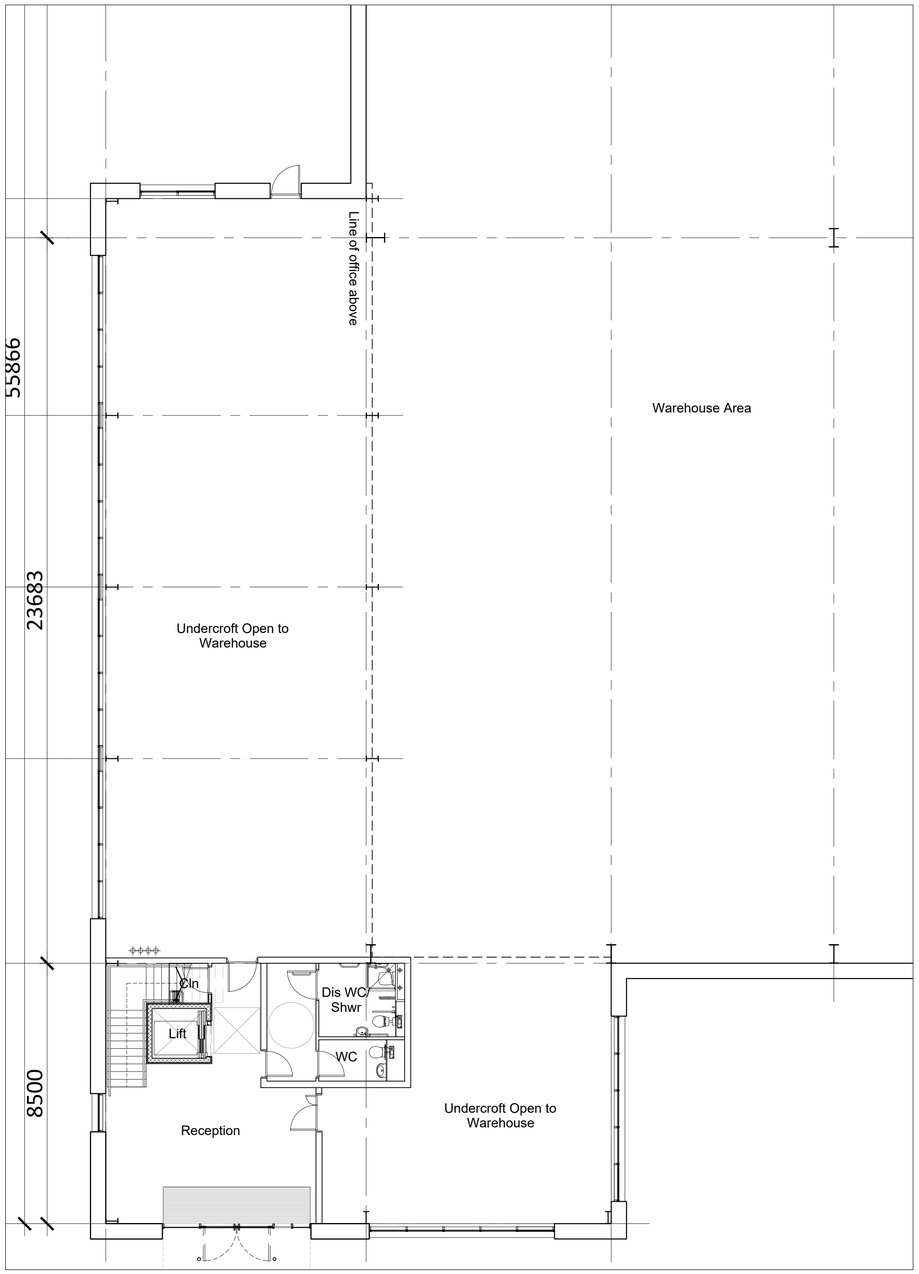
hale
ARCHITECTURE
22c Leathermarket Street, London, SE1 3HP

Project:
Access Park, Gloucester

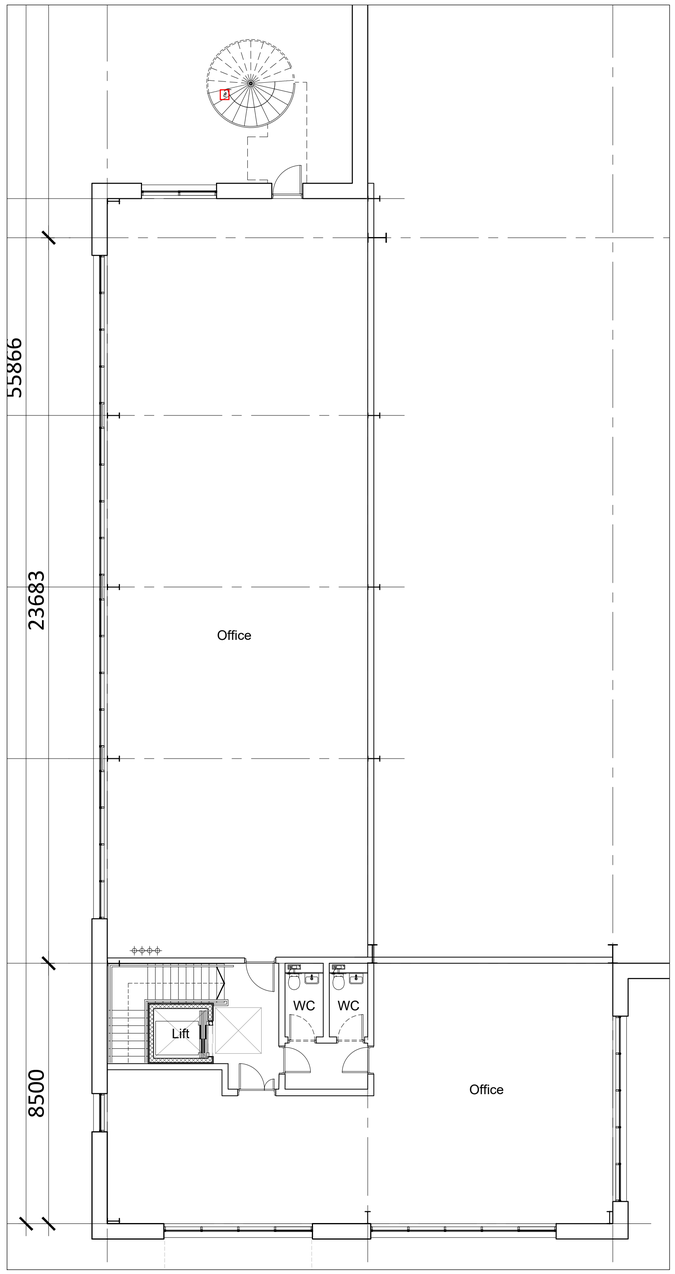
Drawing Title:
Waste Mangement Plan

Project No:	Scale @ A1 / A3	Revision:
21078	1:500 / 1:1000	01

Drawing No:
21078-PL1006



01 Unit 3 Ground Floor GA Main Entrance
1:100 @ A1



02 Unit 3 First Floor GA Office Plan
1:100 @ A1

Disclaimer:
Information Subject to Measured Survey

Notes:

AREA SCHEDULE(GIA)

UNIT 3 (GIA)	**40,150 ft²**
Warehouse (Incl. office Undercroft)	36,375 ft²
Office (FF Only)	3,775 ft²

N

0 1 2 3 4 5
Scale bar - 1:100m

Rev:	Notes:	Date:	Dwn:	Iss:
02	Cores amended	12.12.21	HT	HA
01	Area schedule updated	09.12.21	HT	HA
00	Planning Issue	23.11.21	HT	HA
DR	Draft Issue	17.11.21	HT	HA

Suitability Code:

Client:
CANMOOR

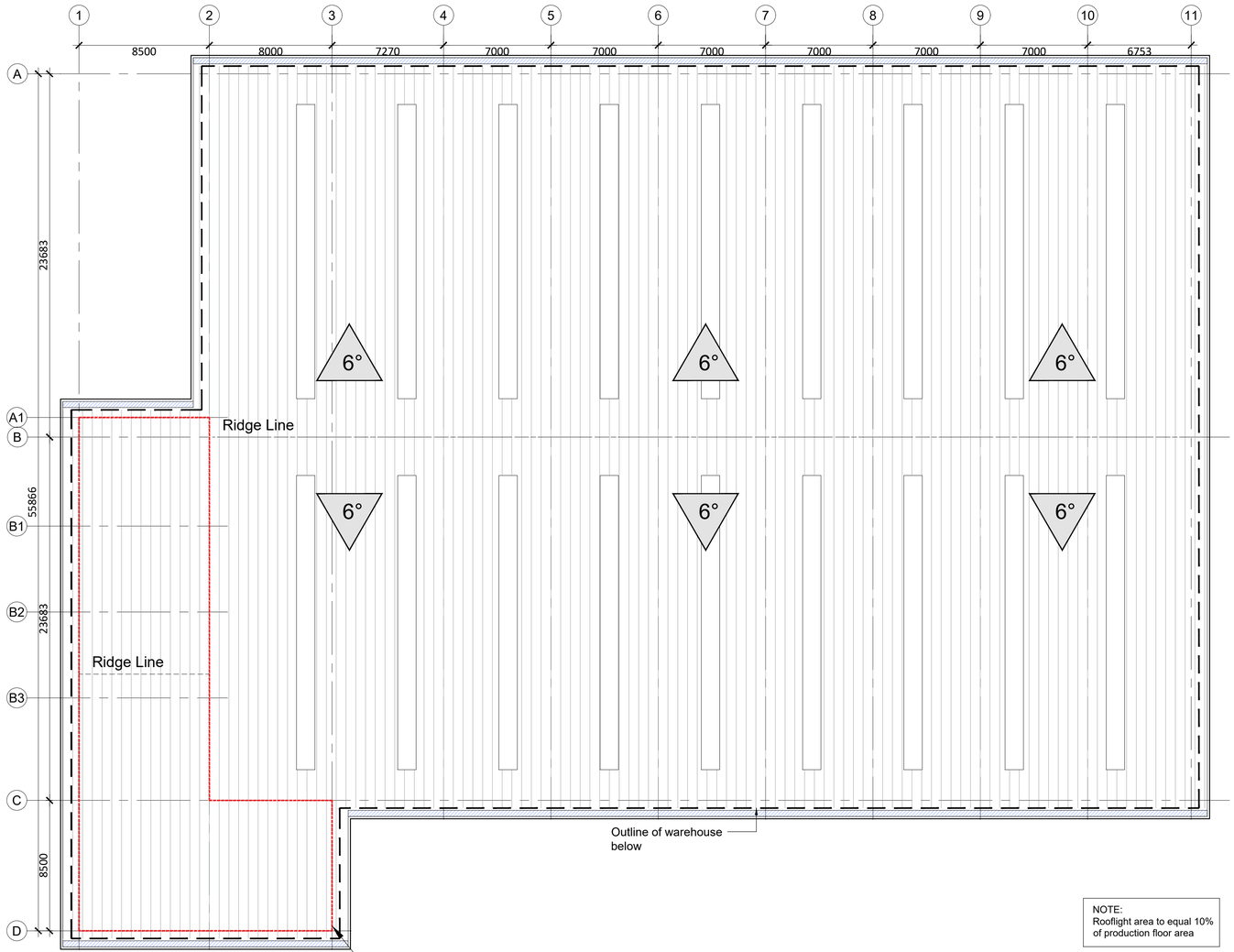
hale
ARCHITECTURE
22c Leathermarket Street, London, SE1 3HP

Project:
Access Park, Gloucester

Drawing Title:
Unit 3
GA GF Main Entrance & FF Office Plan

Project No:	Scale @ A1 / A3	Revision:
21078	1:100 / 1:200	02

Drawing No:
21078-PL1032



NOTE:
Rooflight area to equal 10% of production floor area

01 Unit 3 - Proposed Roof Plan
1:200 @ A1 / 1:400 @ A3

Disclaimer:
Information Subject to Measured Survey

Notes:

N

0 2 4 6 8 10
Scale bar - 1:200m

Rev:	Notes:	Date:	Dwn:	Iss:
01	PV area updated	12.12.21	HT	HA
00	Planning Issue	23.11.21	HT	HA
DR	Notes updated	17.11.21	ZG	HA

Suitability Code:

Client:
CANMOOR

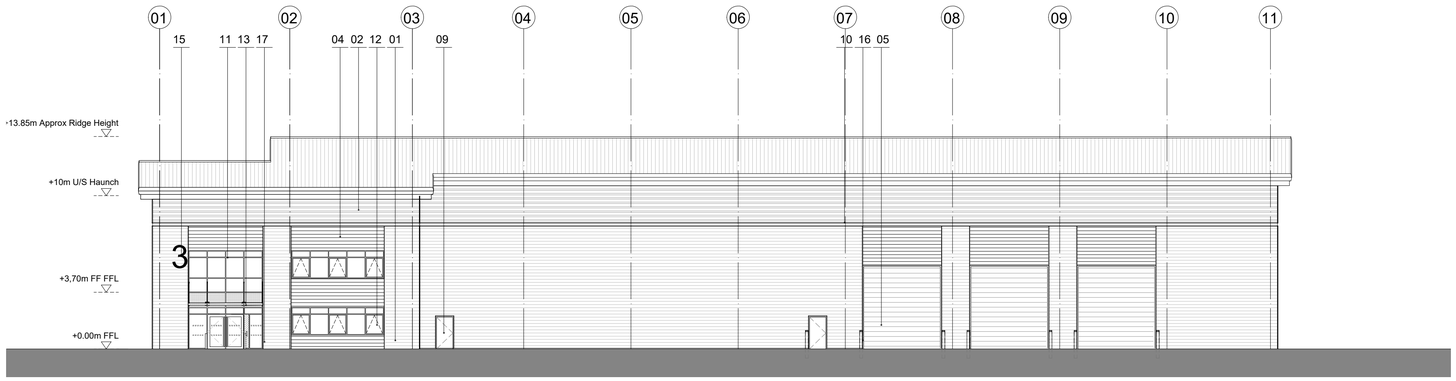
hale
ARCHITECTURE
22c Leathermarket Street, London, SE1 3HP

Project:
Access Park, Gloucester

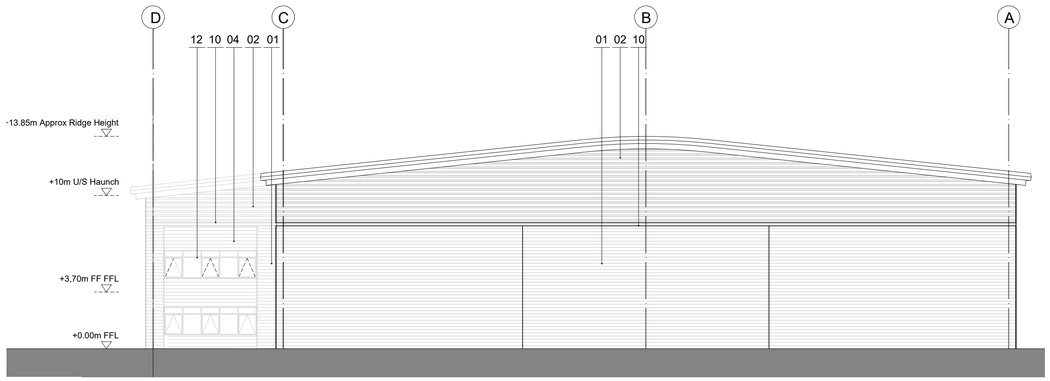
Drawing Title:
Unit 3
Proposed GA
Roof Plan

Project No:	Scale @ A1/A3:	Revision:
21078	1:200/1:400	01

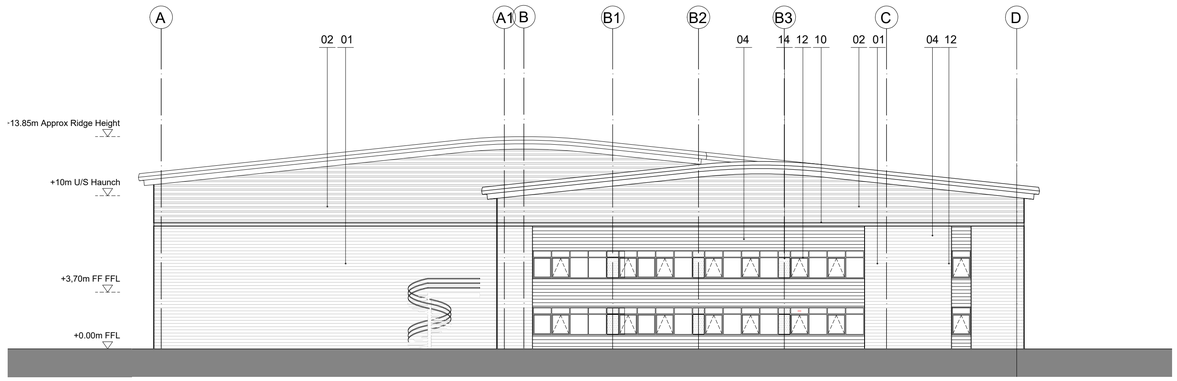
Drawing No:
PL1033



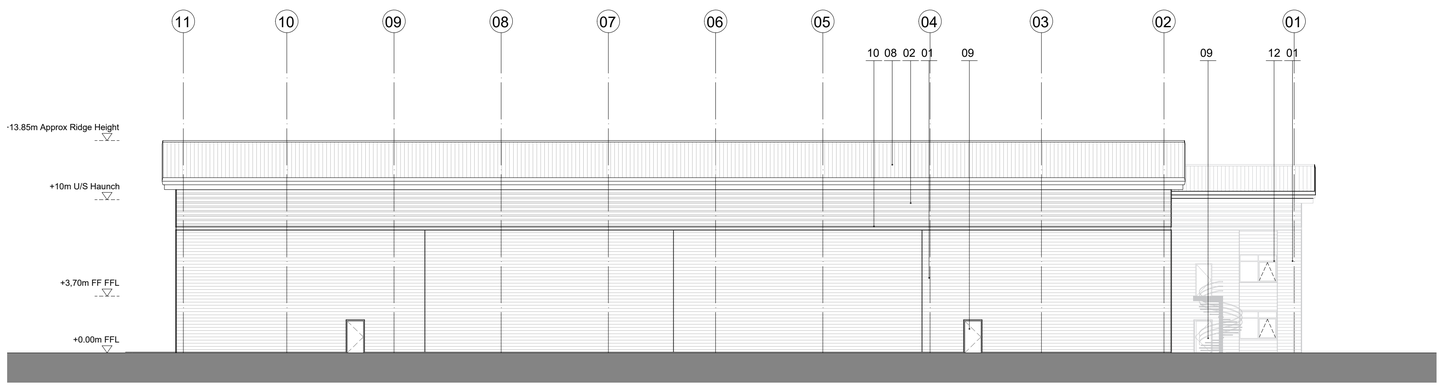
01 Unit 3 North East Elevation
1:200 @ A1



02 Unit 3 North West Elevation
1:200 @ A1



03 Unit 3 South East Elevation
1:200 @ A1



04 Unit 3 South West Elevation
1:200 @ A1

Disclaimer:
Subject to survey.

Notes:

Rev:	Notes:	Date:	Dwn:	Iss:
	Scale bar - 1:200m (0 2 4 6 8 10)			
DR	Draft Issue	17.11.21	ZG	HA
00	Planning Issue	23.11.21	HT	HA
01	Elevation materials key	30.11.21	HT	HA
02	Elevations updated as per unit	12.12.21	HT	HA

MATERIALS KEY:

01 - Wall Cladding: Horizontal profiled built up steel cladding, profile trapezoidal, colour Sirius (RAL 9006)
02 - Wall Cladding High Level : Horizontal profiled built up steel cladding, profile reverse trapezoidal, colour Orion (RAL 9007)
03 - Wall Cladding Loading area: Horizontal profiled built up steel cladding, profile sinusoidal, colour Zeus (RAL7022)
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14 - Look-a-like Ceramic Fritted glazing panels (18B29)
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16 - Bollards - Black finished steel bollard with yellow reflective band to top
17 - Bollards - Stainless steel finish bollard to entrance door

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ARCHITECTURE
22c Leathermarket Street, London, SE1 3HP

Client: CANMOOR

Issue Purpose:

Project: Access Park, Gloucester

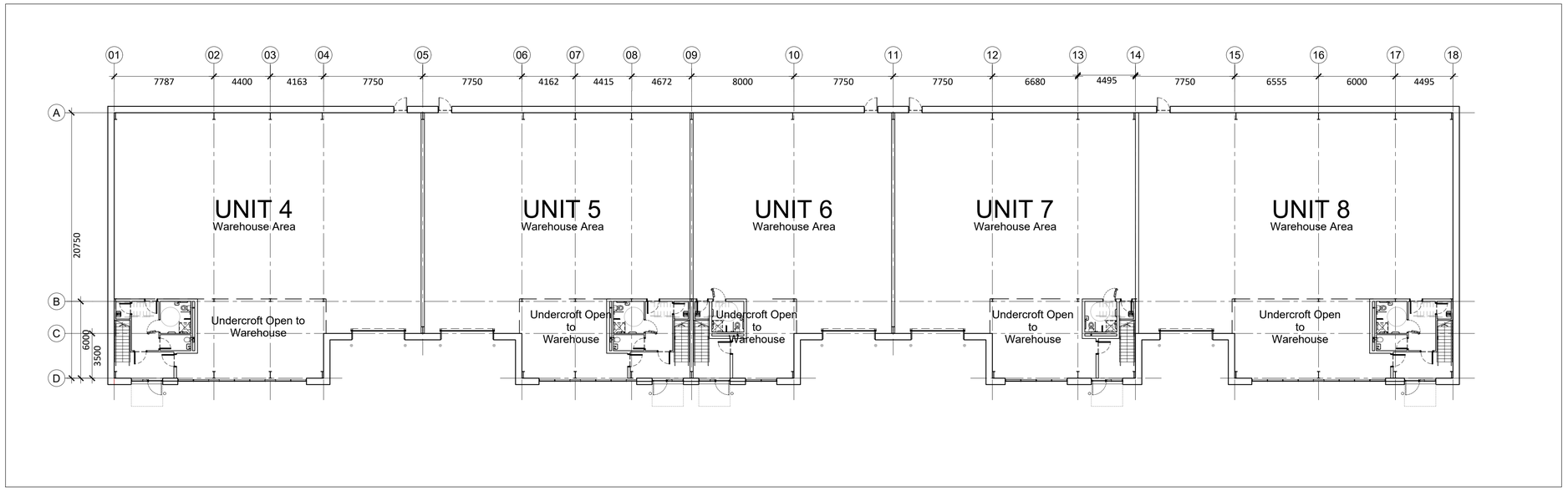
Drawing Title: Unit 3 Elevations

Project No: 21078

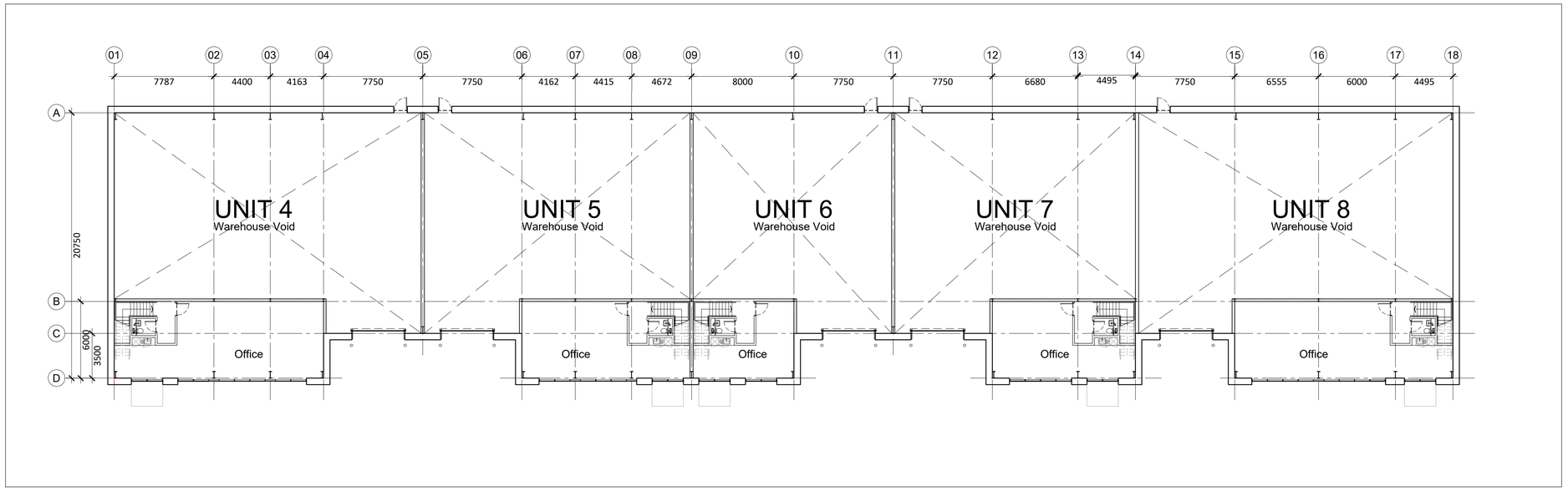
Scale @ A1 / A3: 1:200 / 1:400

Revision: 02

Drawing No: 21078-PL1034



01 Unit 4 to 8 Ground Floor GA Plan
1:200 @ A1



02 Unit 4 to 8 First Floor GA Plan
1:200 @ A1

Disclaimer:
Information Subject to Measured Survey

Notes:

UNIT 4 (GIA)	**6,100 ft²**
Warehouse (Incl. office Undercroft)	5,050 ft²
Office (FF Only)	1,050 ft²
Car parking spaces	*6*
UNIT 5 (GIA)	**5,170 ft²**
Warehouse (Incl. office Undercroft)	4,330 ft²
Office (FF Only)	840 ft²
Car parking spaces	*5*
UNIT 6 (GIA)	**3,660 ft²**
Warehouse (Incl. office Undercroft)	3,160 ft²
Office (FF Only)	500 ft²
Car parking spaces	*3*
UNIT 7 (GIA)	**4,620 ft²**
Warehouse (Incl. office Undercroft)	3,900 ft²
Office (FF Only)	720 ft²
Car parking spaces	*4*
UNIT 8 (GIA)	**6,290 ft²**
Warehouse (Incl. office Undercroft)	5,195 ft²
Office (FF Only)	1,095 ft²
Car parking spaces	*6*

N

0 2 4 6 8 10
Scale bar - 1:200m

Rev:	Notes:	Date:	Dwn:	Iss:
01	Unit 6 & 7 core amended	12.12.21	HT	HA
00	Planning Issue	24.11.21	HT	HA
DR	Draft Issue	17.11.21	HT	HA

Suitability Code:

Client:
CANMOOR

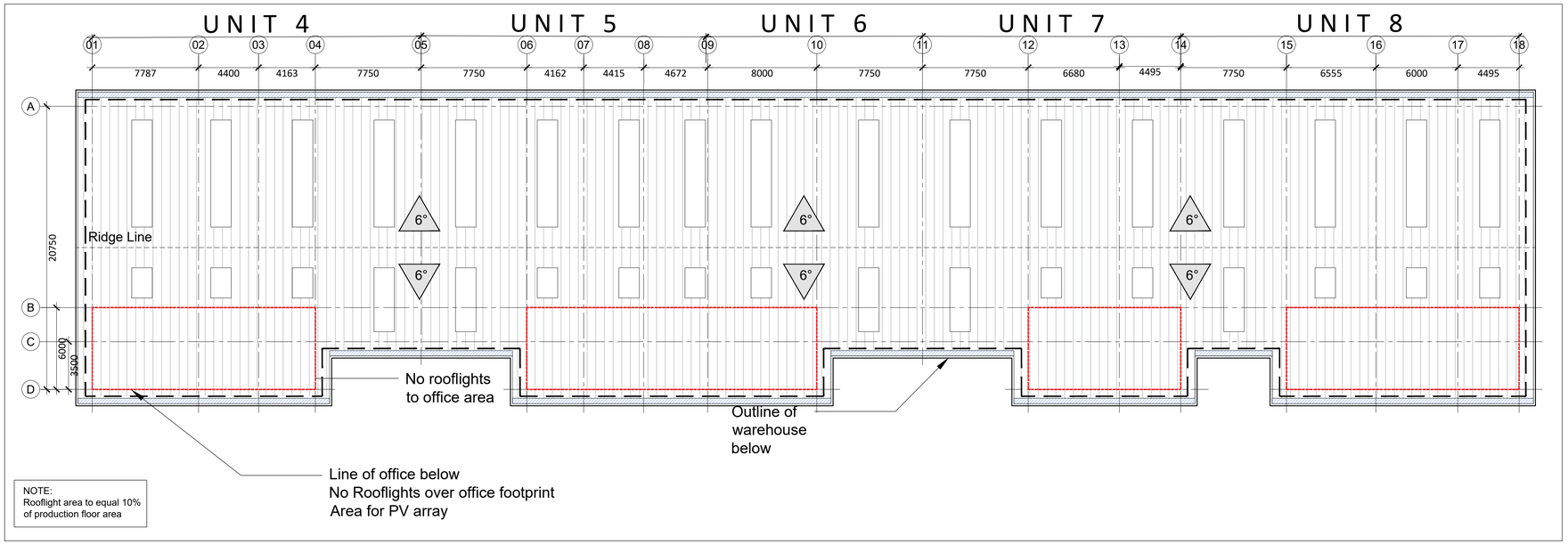
hale
ARCHITECTURE
22c Leathermarket Street, London, SE1 3HP

Project:
Access Park, Gloucester

Drawing Title:
Unit 4 to 8
GA Ground & First Floor Plan

Project No:	Scale @ A1 / A3	Revision:
21078	1:200 / 1:400	01

Drawing No:
21078-PL1041



01 Unit 4 to 8 GA Roof Plan
1:200 @ A1

Disclaimer:
Information Subject to Measured Survey

Notes:

UNIT 4 (GIA)	**6,100 ft²**
Warehouse (Incl. office Undercroft)	5,050 ft²
Office (FF Only)	1,050 ft²
Car parking spaces	*6*
UNIT 5 (GIA)	**5,170 ft²**
Warehouse (Incl. office Undercroft)	4,330 ft²
Office (FF Only)	840 ft²
Car parking spaces	*5*
UNIT 6 (GIA)	**3,660 ft²**
Warehouse (Incl. office Undercroft)	3,160 ft²
Office (FF Only)	500 ft²
Car parking spaces	*3*
UNIT 7 (GIA)	**4,620 ft²**
Warehouse (Incl. office Undercroft)	3,900 ft²
Office (FF Only)	720 ft²
Car parking spaces	*4*
UNIT 8 (GIA)	**6,290 ft²**
Warehouse (Incl. office Undercroft)	5,195 ft²
Office (FF Only)	1,095 ft²
Car parking spaces	*6*

N

0 2 4 6 8 10
Scale bar - 1:200m

Rev:	Notes:	Date:	Dwn:	Iss:
01	Pv area note incl.	12.12.21	HT	HA
00	Planning Issue	24.11.21	ZG	HA
DR	Draft Issue	17.11.21	ZG	HA

Suitability Code:

Client:
CANMOOR

hale
ARCHITECTURE
22c Leathermarket Street, London, SE1 3HP

Project:
Access Park, Gloucester

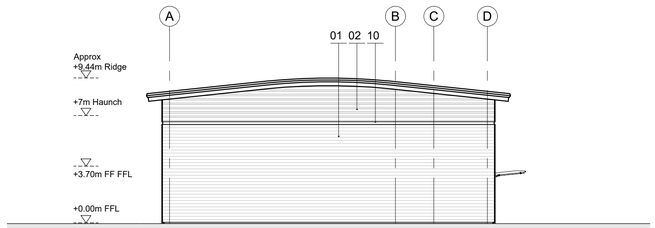
Drawing Title:
Unit 4 to 8
GA Roof Plan

Project No:	Scale @ A1 / A3	Revision:
21078	1:200 / 1:400	01

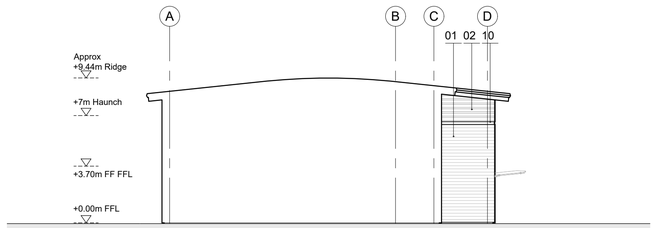
Drawing No:
21078-PL1043



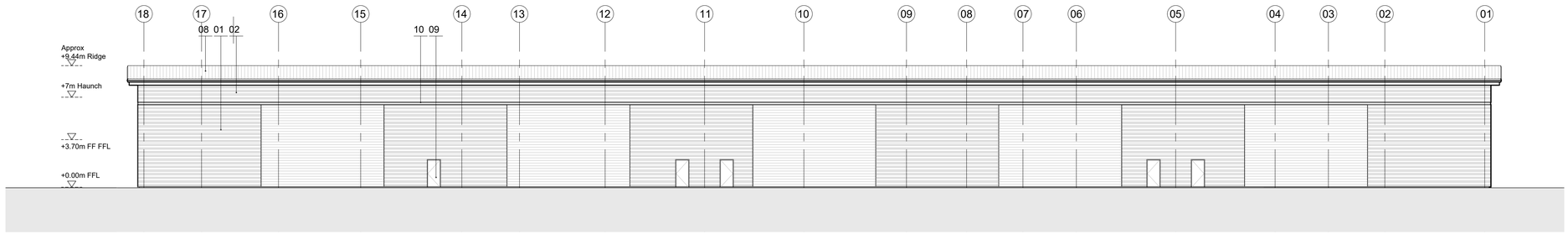
01 Unit 4 to 8 South East Elevation
1:200 @ A1



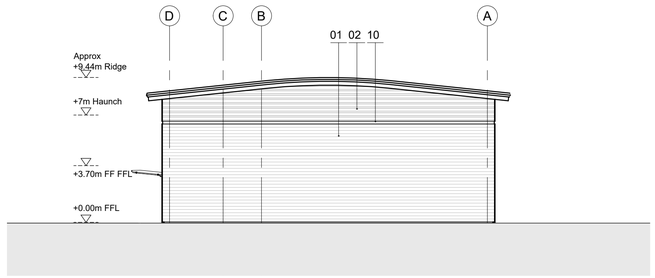
02 Unit 4 to 8 South West Elevation
1:200 @ A1



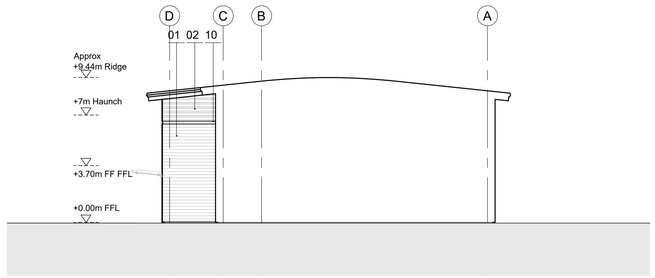
03 Unit 4 to 8 South West Elevation
1:200 @ A1



04 Unit 4 to 8 North West Elevation
1:200 @ A1



05 Unit 4 to 8 North East Elevation
1:200 @ A1



06 Unit 4 to 8 North East Elevation
1:200 @ A1

Disclaimer:
Information Subject to Measured Survey

Notes:

MATERIALS KEY:

01 - Wall Cladding: Horizontal profiled built up steel cladding, profile trapezoidal, colour Sirius (RAL 9006)
02 - Wall Cladding High Level : Horizontal profiled built up steel cladding, profile reverse trapezoidal, colour Orion (RAL 9007)
03 - Wall Cladding Loading area: Horizontal profiled built up steel cladding, profile sinusoidal, colour Zeus (RAL7022)
04 - Wall Cladding Office Frontage: Horizontal profiled built up steel cladding, profile sinusoidal, colour Zeus (RAL7022)
05 - Level loading doors, colour Anthracite (RAL 7016)
06 - Dock Leveller doors, colour Anthracite (RAL 7016)
07 - Concrete Wall to dock Levellers - Insulated precast concrete Prowall
08 - Roof Cladding Profile built up cladding, forward profile, colour Goosewing grey (BS10A05)
09 - Metal escape and personnel doors, colour to match adjacent cladding
10 - Horizontal PPC Metal feature channel, colour Zeus (RAL7022)
11 - Curtain Wall Windows, Satin finished PPC in Anthracite (RAL7016)
12 - Framed Window System, Satin finished PPC in Anthracite (RAL 7016)
13 - Still framed, glazed canopy, Satin finished PPC in Anthracite (RAL 7016) with Fritted laminated glazing
14 - Look-a-like Ceramic Fritted glazing panels (18B29)
15 - Unit and loading door number - 3mm Aluminium with black anodise finish.
16 - Bollards - Black finished steel bollard with yellow reflective band to top
17 - Bollards - Stainless steel finish bollard to entrance door

Scale bar - 1:200m
0 2 4 6 8 10

Rev:	Notes:	Date:	Dwn:	Iss:
03	Rear elevations	12.12.21	HT	HA
02	Elevation canopy amended	08.12.21	HT	HA
01	Elevation materials key	30.11.21	HT	HA
00	Planning Issue	24.11.21	HT	HA
DR	Draft Issue	17.11.21	HT	HA

Suitability Code:

Client:
CANMOOR

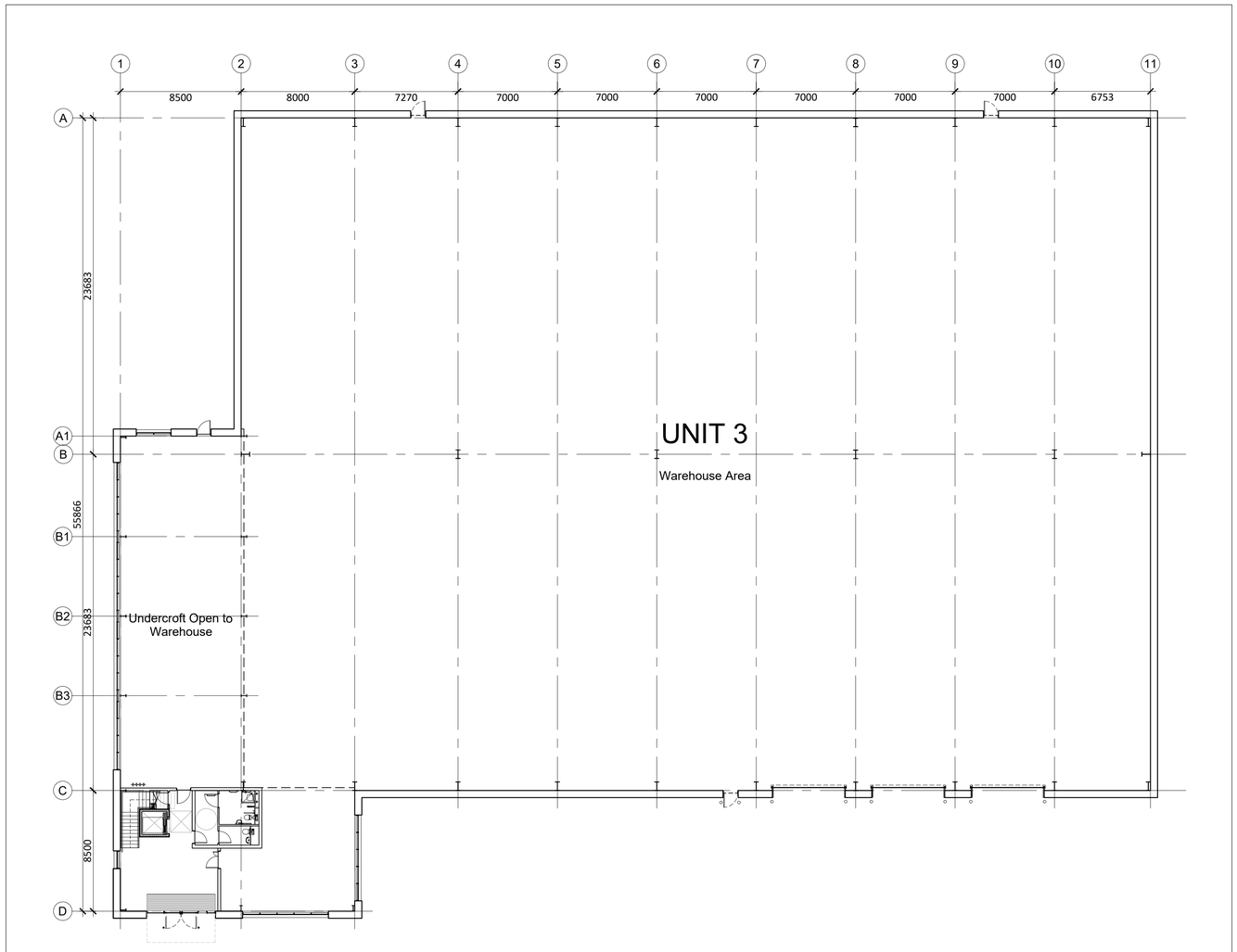
hale
ARCHITECTURE
22c Leathermarket Street, London, SE1 3HP

Project:
Access Park, Gloucester

Drawing Title:
Unit 4 to 8
Elevations

Project No:	Scale @ A1 / A3	Revision:
21078	1:200 / 1:400	03

Drawing No:
21078-PL1044



01 Unit 3 Ground Floor GA Plan
1:200 @ A1

Disclaimer:
Information Subject to Measured Survey

Notes:

AREA SCHEDULE(GIA)

UNIT 3 (GIA)	**40,150 ft²**
Warehouse (Incl. office Undercroft)	36,375 ft²
Office (FF Only)	**3,775 ft²**

N

0 2 4 6 8 10
Scale bar - 1:200m

Rev:	Notes:	Date:	Dwn:	Iss:
02	Amenity removed & core amended	12.12.21	HT	HA
01	Area key updated	09.12.21	HT	HA
00	Planning Issue	23.11.21	HT	HA
DR	Draft Issue	17.11.21	HT	HA

Suitability Code:

Client:
CANMOOR

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ARCHITECTURE
22c Leathermarket Street, London, SE1 3HP

Project:
Access Park, Gloucester

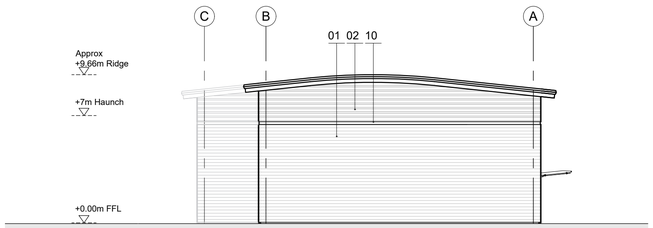
Drawing Title:
Unit 3
GA Ground Floor Plan

Project No:	Scale @ A1 / A3	Revision:
21078	1:200 / 1:400	02

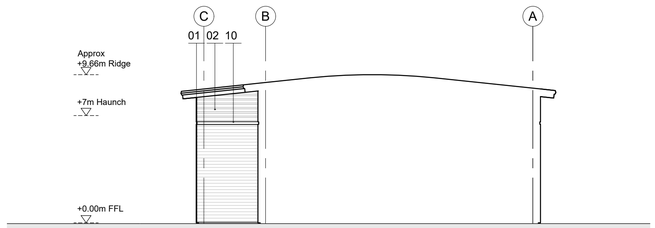
Drawing No:
21078-PL1031



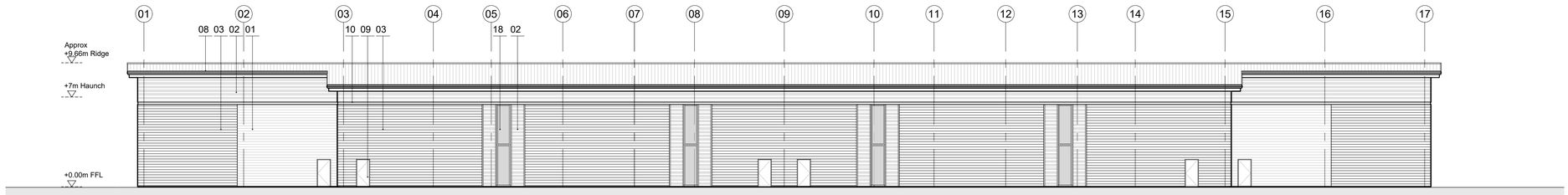
01 Unit 9 to 14 North West Elevation
1:200 @ A1



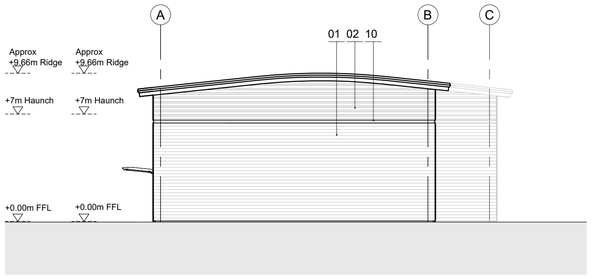
02 Unit 9 to 14 North East Elevation
1:200 @ A1



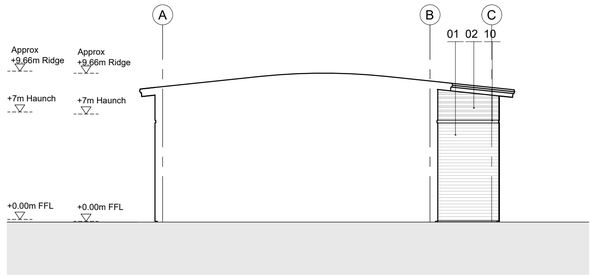
03 Unit 9 to 14 North East Elevation
1:200 @ A1



04 Unit 9 to 14 South East Elevation
1:200 @ A1



05 Unit 9 to 14 South East Elevation
1:200 @ A1



06 Unit 9 to 14 South West Elevation
1:200 @ A1

Disclaimer:
Information Subject to Measured Survey

Notes:

MATERIALS KEY:

01 - Wall Cladding: Horizontal profiled built up steel cladding, profile trapezoidal, colour Sirius (RAL 9006)
02 - Wall Cladding High Level : Horizontal profiled built up steel cladding, profile reverse trapezoidal, colour Orion (RAL 9007)
03 - Wall Cladding Loading area: Horizontal profiled built up steel cladding, profile sinusoidal, colour Zeus (RAL7022)
04 - Wall Cladding Office Frontage: Horizontal profiled built up steel cladding, profile sinusoidal, colour Zeus (RAL7022)
05 - Level loading doors, colour Anthracite (RAL 7016)
06 - Dock Leveller doors, colour Anthracite (RAL 7016)
07 - Concrete Wall to dock Levellers - Insulated precast concrete Prowall
08 - Roof Cladding Profile built up cladding, forward profile, colour Goosewing grey (BS10A05)
09 - Metal escape and personnel doors, colour to match adjacent cladding
10 - Horizontal PPC Metal feature channel, colour Zeus (RAL7022)
11 - Curtain Wall Windows, Satin finished PPC in Anthracite (RAL7016)
12 - Framed Window System, Satin finished PPC in Anthracite (RAL 7016)
13 - Still framed, glazed canopy, Satin finished PPC in Anthracite (RAL 7016) with Fritted laminated glazing
14 - Look-a-like Ceramic Fritted glazing panels (18B29)
15 - Unit and loading door number - 3mm Aluminium with black anodise finish.
16 - Bollards - Black finished steel bollard with yellow reflective band to top
17 - Bollards - Stainless steel finish bollard to entrance door
18 - Kingspan Day-Lite Klick Panels

0 2 4 6 8 10
Scale bar - 1:200m

Rev:	Notes:	Date:	Dwn:	Iss:
03	Rear elevations	12.12.21	HT	HA
02	Elevation canopy amended	08.12.21	HT	HA
01	Unit areas amended & El mat key	30.11.21	HT	HA
00	Planning Issue	24.11.21	HT	HA
DR	Draft Issue	17.11.21	ZG	HA

Suitability Code:

Client:
CANMOOR

hale
ARCHITECTURE
22c Leathermarket Street, London, SE1 3HP

Project:
Access Park, Gloucester

Drawing Title:
Unit 9 to 14
Elevations

Project No:	Scale @ A1 / A3	Revision:
21078	1:200 / 1:400	03

Drawing No:
21078-PL1094



01 Unit 1 GA Roof Plan
1:200 @ A1

Disclaimer:
Information Subject to Measured Survey

Notes:

N

0 2 4 6 8 10
Scale bar - 1:200m

Rev:	Notes:	Date:	Dwn:	Iss:
00	Planning Issue	12.12.21	HT	HA

Suitability Code:

Client:
CANMOOR

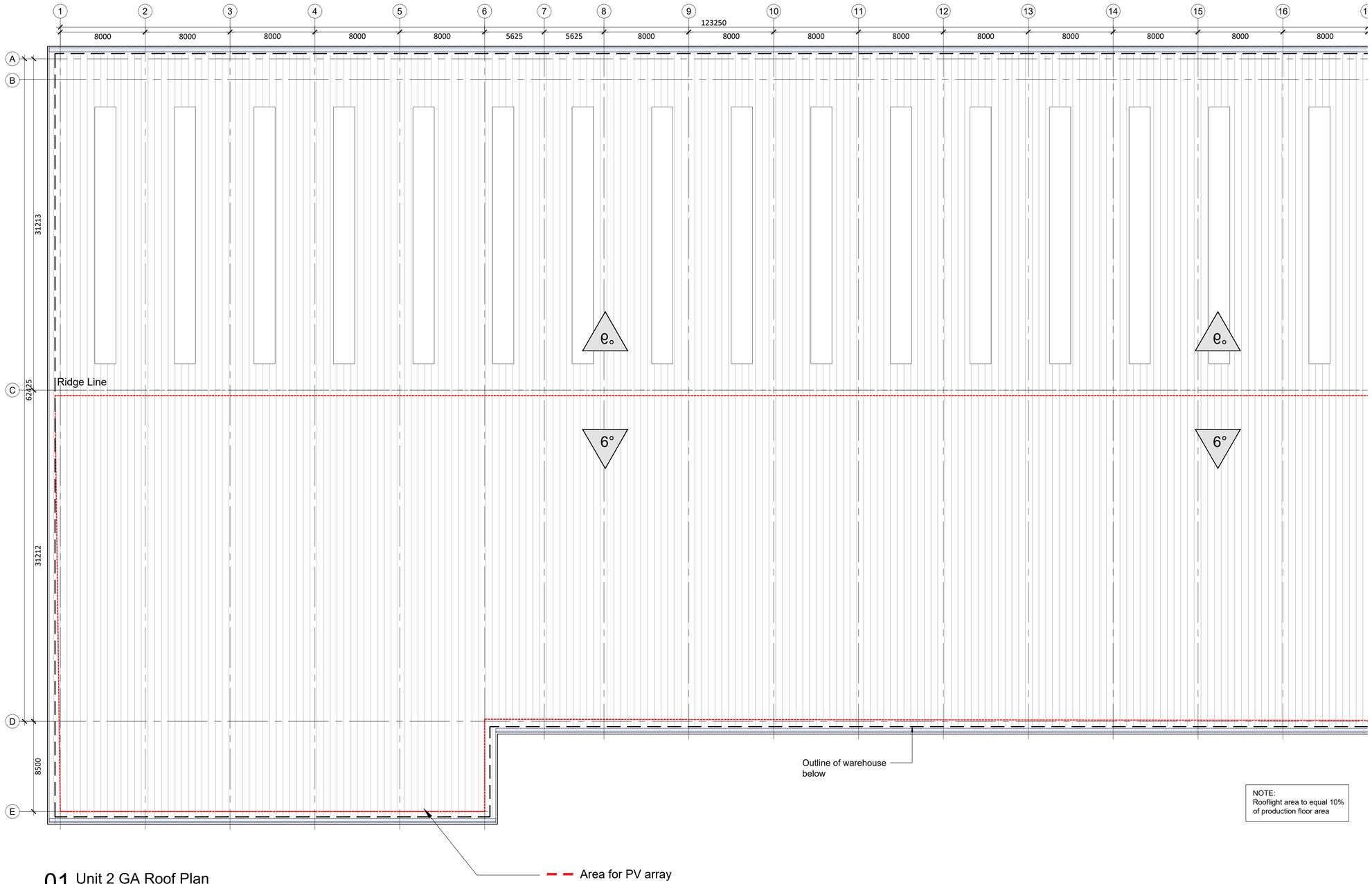
hale
ARCHITECTURE
22c Leathermarket Street, London, SE1 3HP

Project:
Access Park, Gloucester

Drawing Title:
Unit 1
GA Roof Plan
Alternative PV Layout

Project No:	Scale @ A1 / A3	Revision:
21078	1:200 / 1:400	00

Drawing No:
21078-PL1113



01 Unit 2 GA Roof Plan
1:200 @ A1

Disclaimer:
Information Subject to Measured Survey

Notes:

N

0 2 4 6 8 10
Scale bar - 1:200m

Rev:	Notes:	Date:	Dwn:	Iss:
00	Planning Issue	12.12.21	HT	HA

Suitability Code:

Client:
CANMOOR

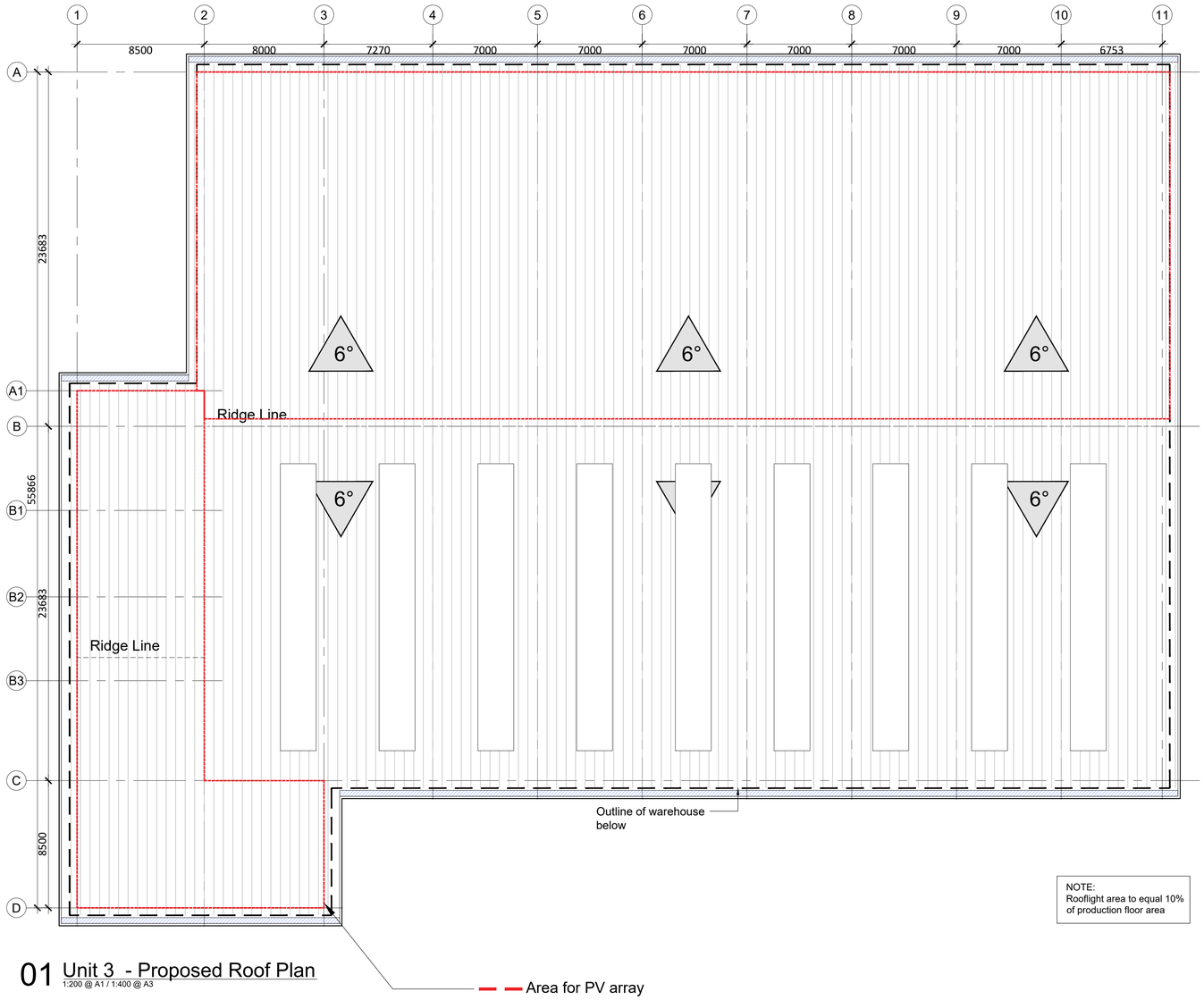
hale
ARCHITECTURE
22c Leathermarket Street, London, SE1 3HP

Project:
Access Park, Gloucester

Drawing Title:
Unit 2
GA Roof Plan
Alternative PV Layout

Project No:	Scale @ A1 / A3	Revision:
21078	1:200 / 1:400	00

Drawing No:
21078-PL1123



01 Unit 3 - Proposed Roof Plan
1:200 @ A1 / 1:400 @ A3

Disclaimer:
Information Subject to Measured Survey

Notes:

N

0 2 4 6 8 10
Scale bar - 1:200m

Rev:	Notes:	Date:	Dwn:	Iss:
00	Planning Issue	12.12.21	HT	HA

Suitability Code:

Client:
CANMOOR

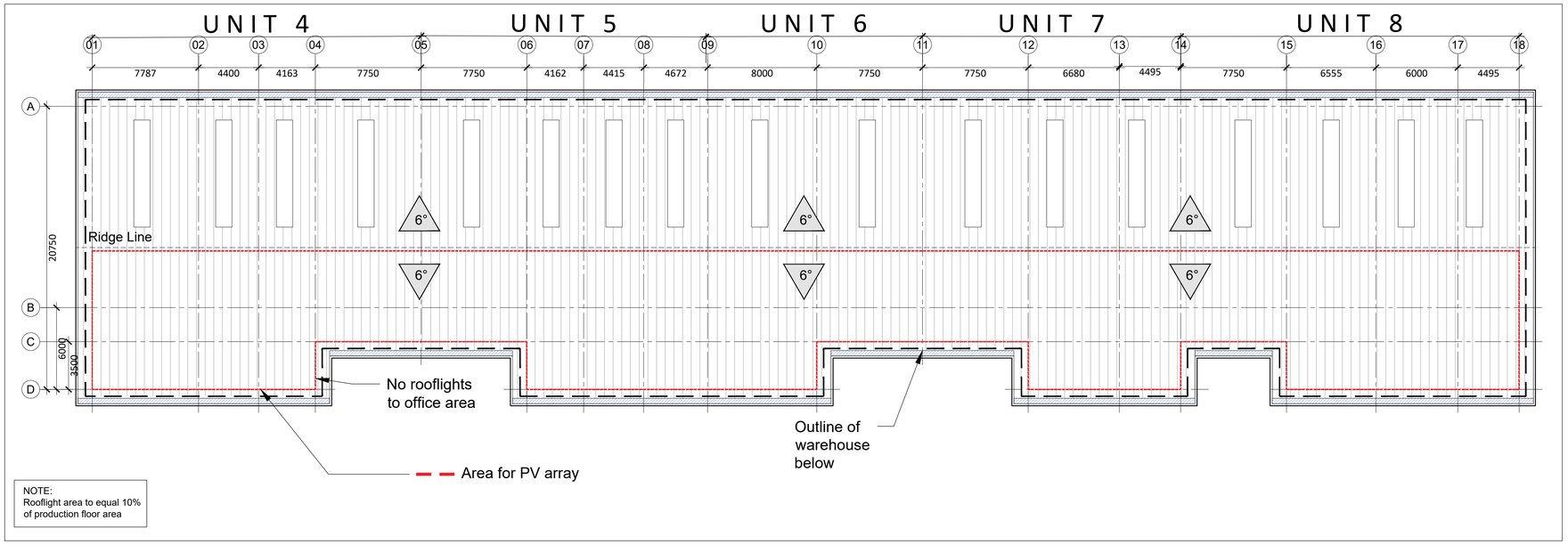
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ARCHITECTURE
22c Leathermarket Street, London, SE1 3HP

Project:
Access Park, Gloucester

Drawing Title:
Unit 3
Proposed GA Roof Plan
Alternative PV Layout

Project No:	Scale @ A1/A3:	Revision:
21078	1:200/1:400	01

Drawing No:
PL1133



NOTE:
Rooflight area to equal 10% of production floor area

01 Unit 4 to 8 GA Roof Plan
1:200 @ A1

Disclaimer:
Information Subject to Measured Survey

Notes:

UNIT 4 (GIA)	**6,100 ft²**
Warehouse (Incl. office Undercroft)	5,050 ft²
Office (FF Only)	1,050 ft²
Car parking spaces	*6*
UNIT 5 (GIA)	**5,170 ft²**
Warehouse (Incl. office Undercroft)	4,330 ft²
Office (FF Only)	840 ft²
Car parking spaces	*5*
UNIT 6 (GIA)	**3,660 ft²**
Warehouse (Incl. office Undercroft)	3,160 ft²
Office (FF Only)	500 ft²
Car parking spaces	*3*
UNIT 7 (GIA)	**4,620 ft²**
Warehouse (Incl. office Undercroft)	3,900 ft²
Office (FF Only)	720 ft²
Car parking spaces	*4*
UNIT 8 (GIA)	**6,290 ft²**
Warehouse (Incl. office Undercroft)	5,195 ft²
Office (FF Only)	1,095 ft²
Car parking spaces	*6*

N

0 2 4 6 8 10
Scale bar - 1:200m

Rev:	Notes:	Date:	Dwn:	Iss:
00	Planning Issue	12.12.21	HT	HA

Suitability Code:

Client:
CANMOOR

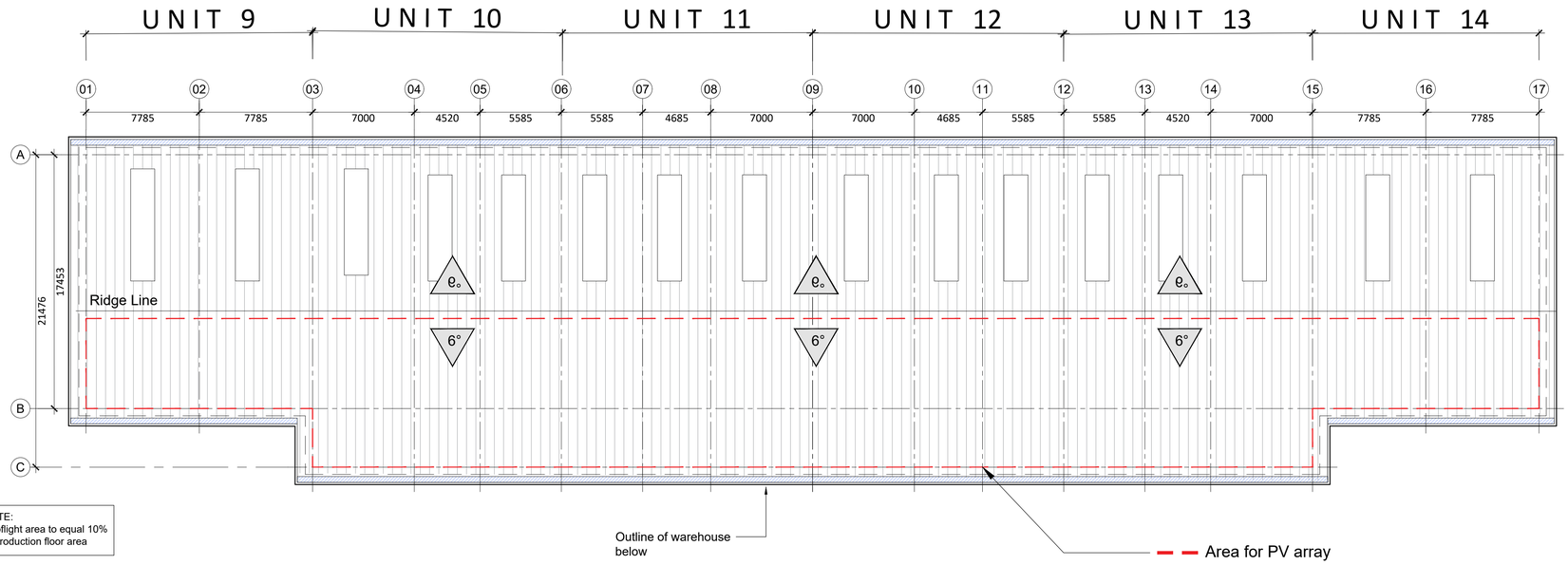
hale
ARCHITECTURE
22c Leathermarket Street, London, SE1 3HP

Project:
Access Park, Gloucester

Drawing Title:
Unit 4 to 8
GA Roof Plan
Alternative PV Layout

Project No:	Scale @ A1 / A3	Revision:
21078	1:200 / 1:400	00

Drawing No:
21078-PL1143



NOTE:
Rooflight area to equal 10% of production floor area

01 Unit 9 to 14 Ground Floor GA Plan
1:200 @ A1

Disclaimer:
Information Subject to Measured Survey

Notes:

N

0 2 4 6 8 10
Scale bar - 1:200m

Rev:	Notes:	Date:	Dwn:	Iss:
00	Planning Issue	12.12.21	HT	HA

Suitability Code:

Client:
CANMOOR

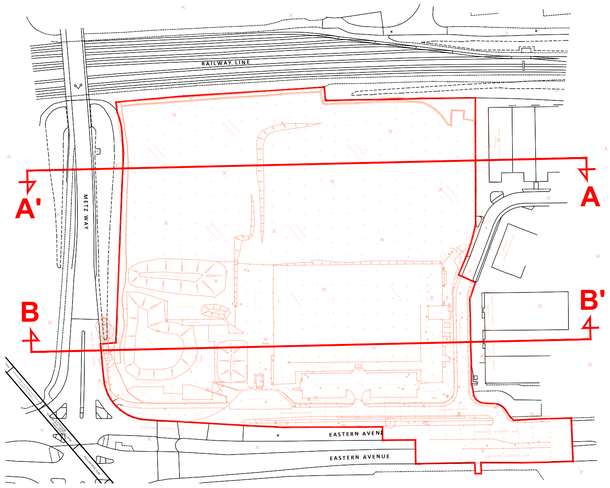
hale
ARCHITECTURE
22c Leathermarket Street, London, SE1 3HP

Project:
Access Park, Gloucester

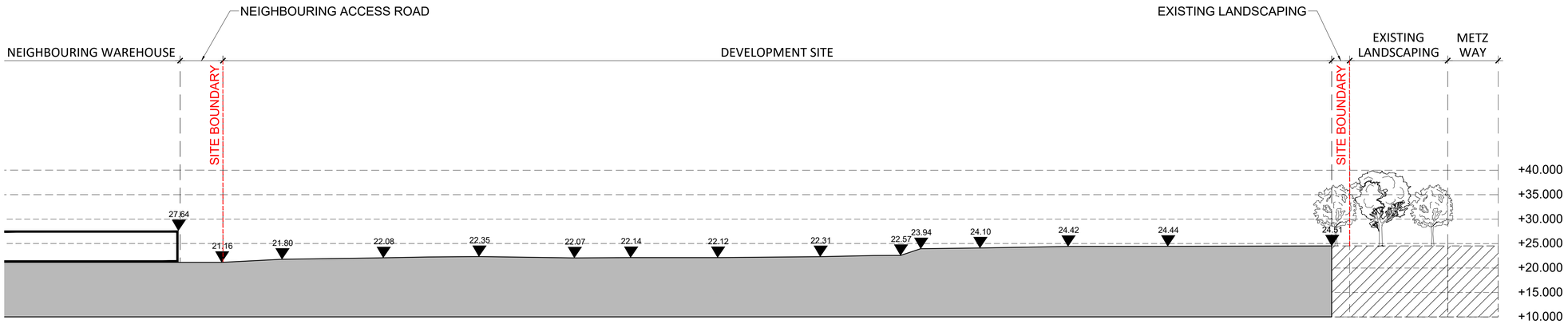
Drawing Title:
Unit 9 to 14
GA Roof Plan
Alternative PV Layout

Project No:	Scale @ A1 / A3	Revision:
21078	1:200 / 1:400	00

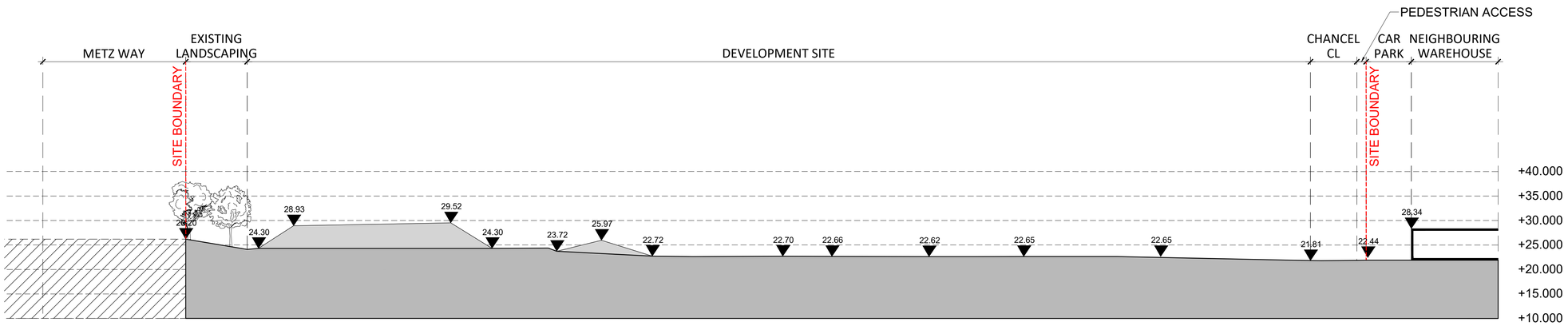
Drawing No:
21078-PL1193



01 Site Plan Reference
1:2000 @ A1



02 Section A-A'
1:500 @ A1



03 Section B-B'
1:500 @ A1

Disclaimer:
Subject to survey.

Notes:
The topographical information shown is based on the topographical survey by Ellam Surveys, Dwg no. 8362_2D/1, dated.Nov21

0 5 10 15 20 25
Scale bar 1:500

Rev:	Notes:	Date:	Dwn:	Iss:
00	Planning Issue	30.11.21	KH	HA
01	scale bar amendment	09.12.21	HT	HA

KEY

- PLANNING APPLICATION SITE BOUNDARY (Approx 52,965 m² / 13.1 acres)
- EXISTING BUILDING OUTLINE
- UNSURVEYED AREA
- CRUSHED CONCRETE PILES

hale
ARCHITECTURE
22c Leathermarket Street, London, SE1 3HP

Client: CANMOOR

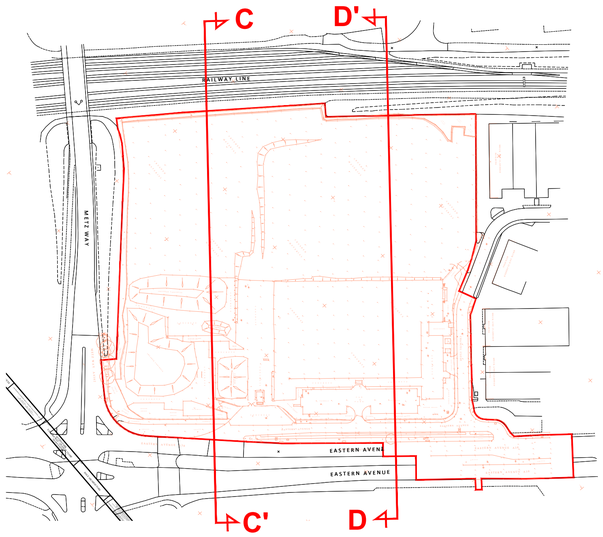
Issue Purpose:

Project: Access Park, Gloucester

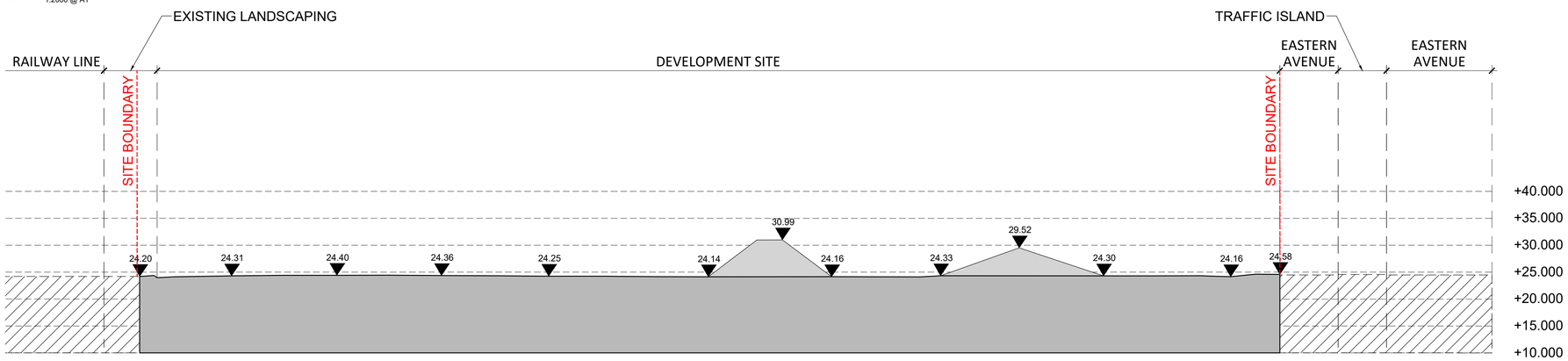
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Project No: 21078 | Scale @ A1: VARIES | Revision: 01

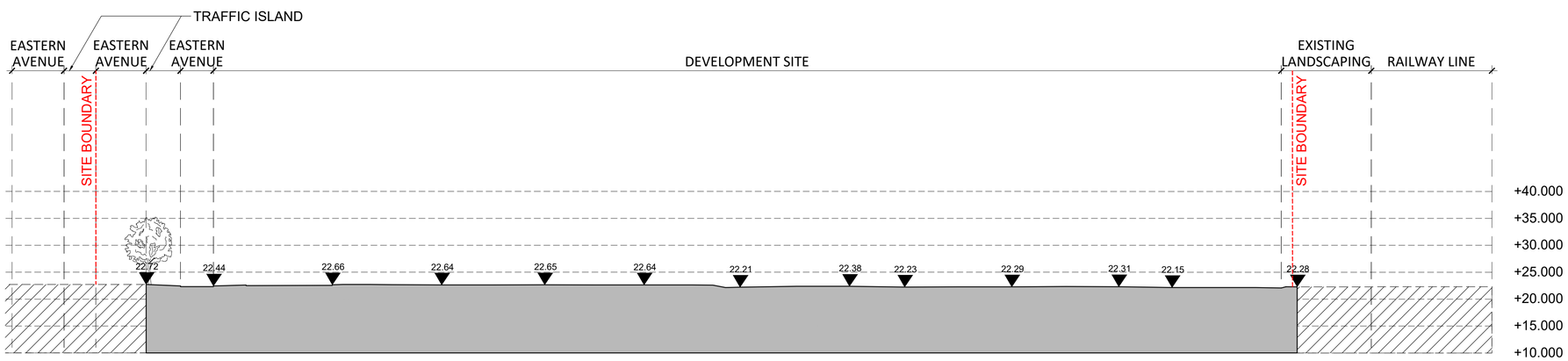
Drawing No: 21078-PL1201



01 Site Plan Reference
1:2000 @ A1



02 Section C-C'
1:500 @ A1



03 Section D-D'
1:500 @ A1

Disclaimer:
Subject to survey.

Notes:
The topographical information shown is based on the topographical survey by Ellam Surveys, Dwg no. 8362_2D/1, dated.Nov21

0 5 10 15 20 25
Scale bar 1:500

Rev:	Notes:	Date:	Dwn:	Iss:
00	Planning Issue	30.11.21	HT	HA
01	scale bar amendment	09.12.21	HT	HA

KEY
- PLANNING APPLICATION SITE BOUNDARY (Approx 52,965 m² / 13.1 acres)
- EXISTING BUILDING OUTLINE
- UNSURVEYED AREA
- CRUSHED CONCRETE PILES

hale
ARCHITECTURE
22c Leathermarket Street, London, SE1 3HP

Client: CANMOOR

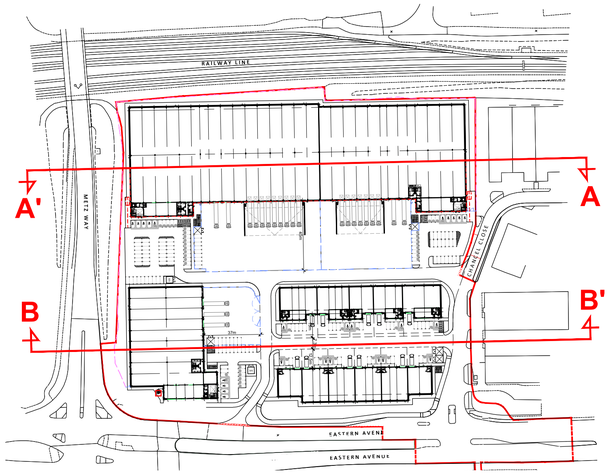
Issue Purpose:

Project: Access Park, Gloucester

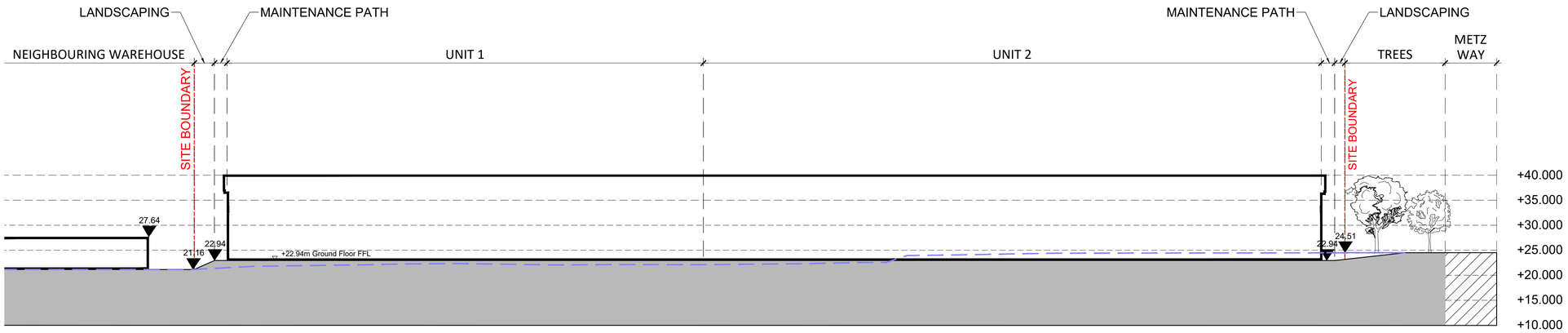
Drawing Title: Existing Site Sections C-C' & D-D'

Project No: 21078 | Scale @ A1: VARIES | Revision: 01

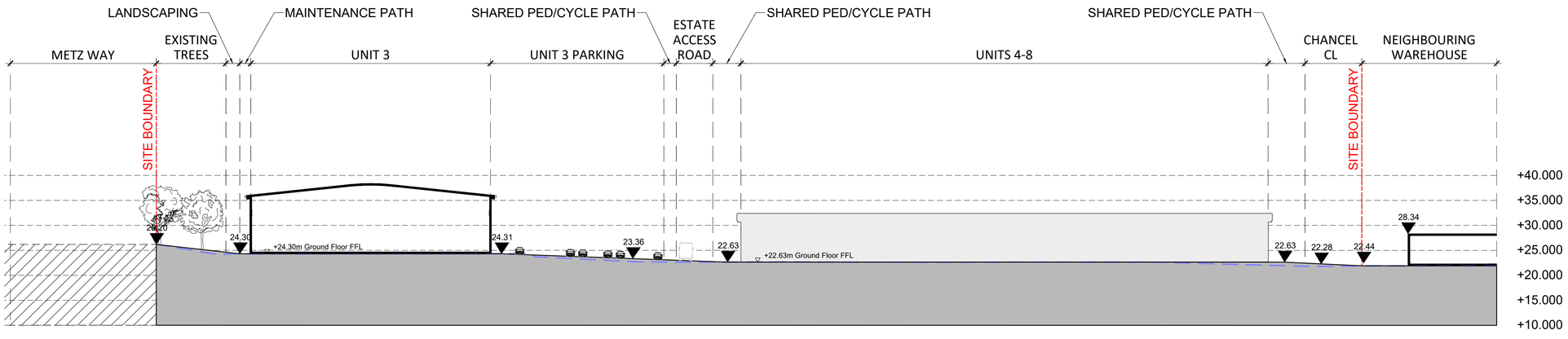
Drawing No: 21078-PL1202



01 Site Plan Reference
1:2000 @ A1



02 Section A-A'
1:500 @ A1



03 Section B-B'
1:500 @ A1

Disclaimer:
Subject to survey.

Notes:
The topographical information shown is based on the topographical survey by Ellam Surveys, Dwg no. 8362_2D/1, dated.Nov21

0 5 10 15 20 25
Scale bar 1:500

Rev:	Notes:	Date:	Dwn:	Iss:
00	Planning Issue	30.11.21	HT	HA
01	scale bar amendment	09.12.21	HT	HA

KEY
- PLANNING APPLICATION SITE BOUNDARY (Approx 52,965 m² / 13.1 acres)
- EXISTING BUILDING OUTLINE
- UNSURVEYED AREA
- EXISTING SITE GROUND LINE

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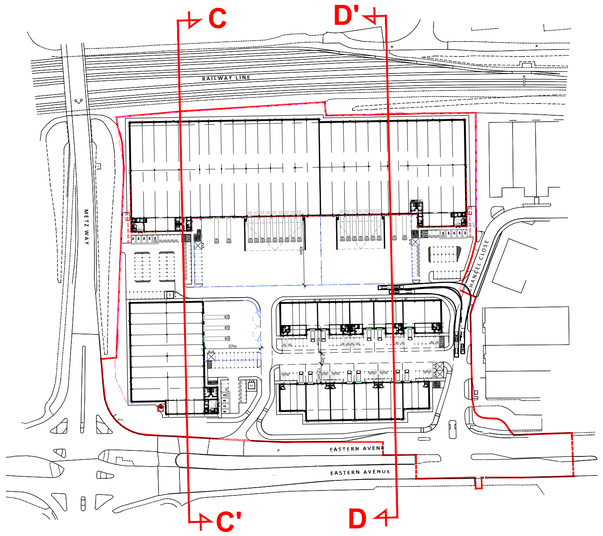
Issue Purpose:

Project: Access Park, Gloucester

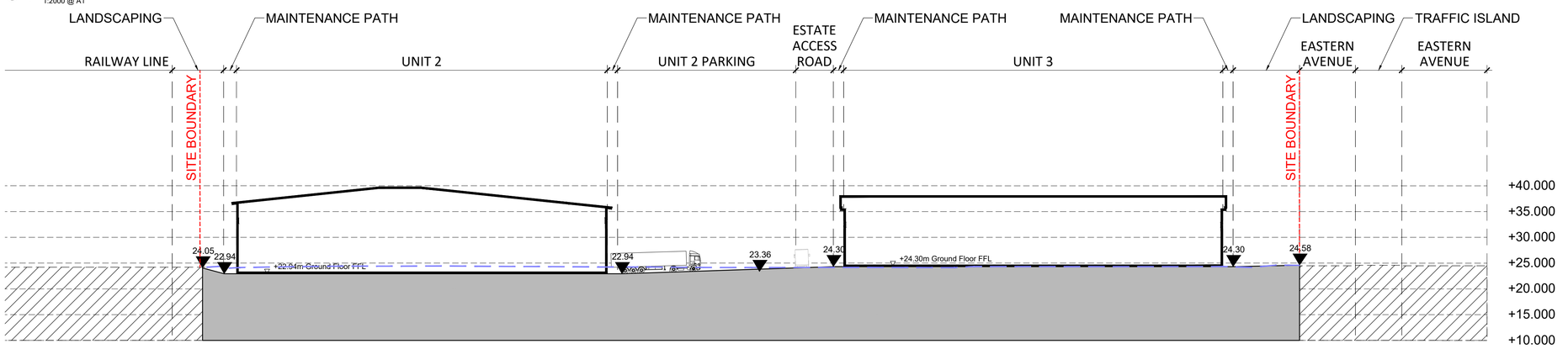
Drawing Title: Proposed Site Sections A-A' & B-B'

Project No: 21078 | Scale @ A1: VARIES | Revision: 01

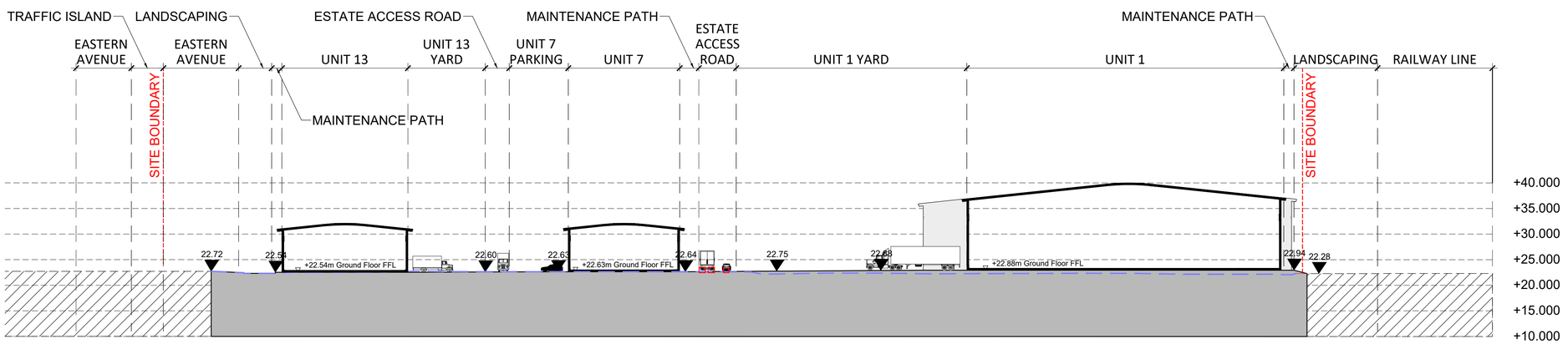
Drawing No: 21078-PL1203



01 Site Plan Reference
1:2000 @ A1



02 Section C-C'
1:500 @ A1



03 Section D-D'
1:500 @ A1

Disclaimer:
Subject to survey.

Notes:
The topographical information shown is based on the topographical survey by Ellam Surveys, Dwg no. 8362_2D/1, dated.Nov21

0 5 10 15 20 25
Scale bar 1:500

Rev:	Notes:	Date:	Dwn:	Iss:
00	Planning Issue	30.11.21	KH	HA
01	scale bar amendment	09.12.21	HT	HA

KEY
- PLANNING APPLICATION SITE BOUNDARY (Approx 52,965 m² / 13.1 acres)
- EXISTING BUILDING OUTLINE
- UNSURVEYED AREA
- EXISTING SITE GROUND LINE

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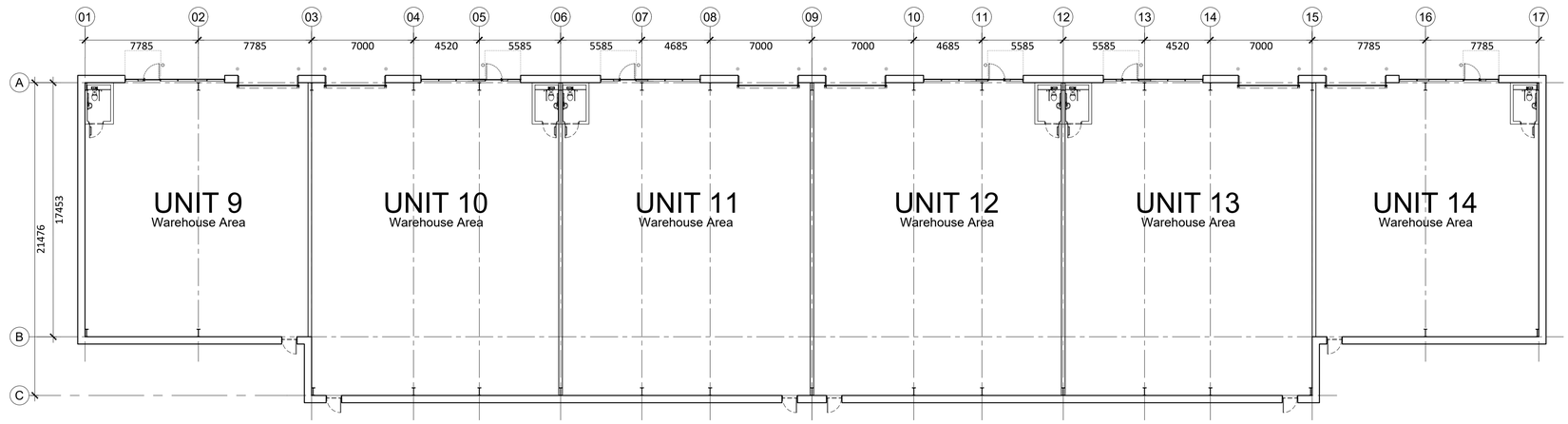
Issue Purpose:

Project: Access Park, Gloucester

Drawing Title: Proposed Site Sections C-C' & D-D'

Project No: 21078 | Scale @ A1: VARIES | Revision: 01

Drawing No: 21078-PL1204



01 Unit 9 to 14 Ground Floor GA Plan

1:200 @ A1

Disclaimer:
Information Subject to Measured Survey

Notes:

UNIT 9 (GIA)	**2,875 ft²**
Warehouse (Incl. office Undercroft)	2,875 ft²
Car parking spaces	*3*
UNIT 10 (GIA)	**3,915 ft²**
Warehouse (Incl. office Undercroft)	3,915 ft²
Car parking spaces	*3*
UNIT 11 (GIA)	**3,925 ft²**
Warehouse (Incl. office Undercroft)	3,925 ft²
Car parking spaces	*3*
UNIT 12 (GIA)	**3,925 ft²**
Warehouse (Incl. office Undercroft)	3,925 ft²
Car parking spaces	*3*
UNIT 13 (GIA)	**3,915 ft²**
Warehouse (Incl. office Undercroft)	3,915 ft²
Car parking spaces	*3*
UNIT 14 (GIA)	**2,875 ft²**
Warehouse (Incl. office Undercroft)	2,875 ft²
Car parking spaces	*3*

N

0 2 4 6 8 10
Scale bar - 1:200m

Rev:	Notes:	Date:	Dwn:	Iss:
03	Core amended	12.12.21	HT	HA
02	Area key amended	09.12.21	HT	HA
01	Unit sizes amended	30.11.21	HT	HA
00	Planning Issue	24.11.21	HT	HA
DR	Draft Issue	17.11.21	HT	HA

Suitability Code:

Client:
CANMOOR

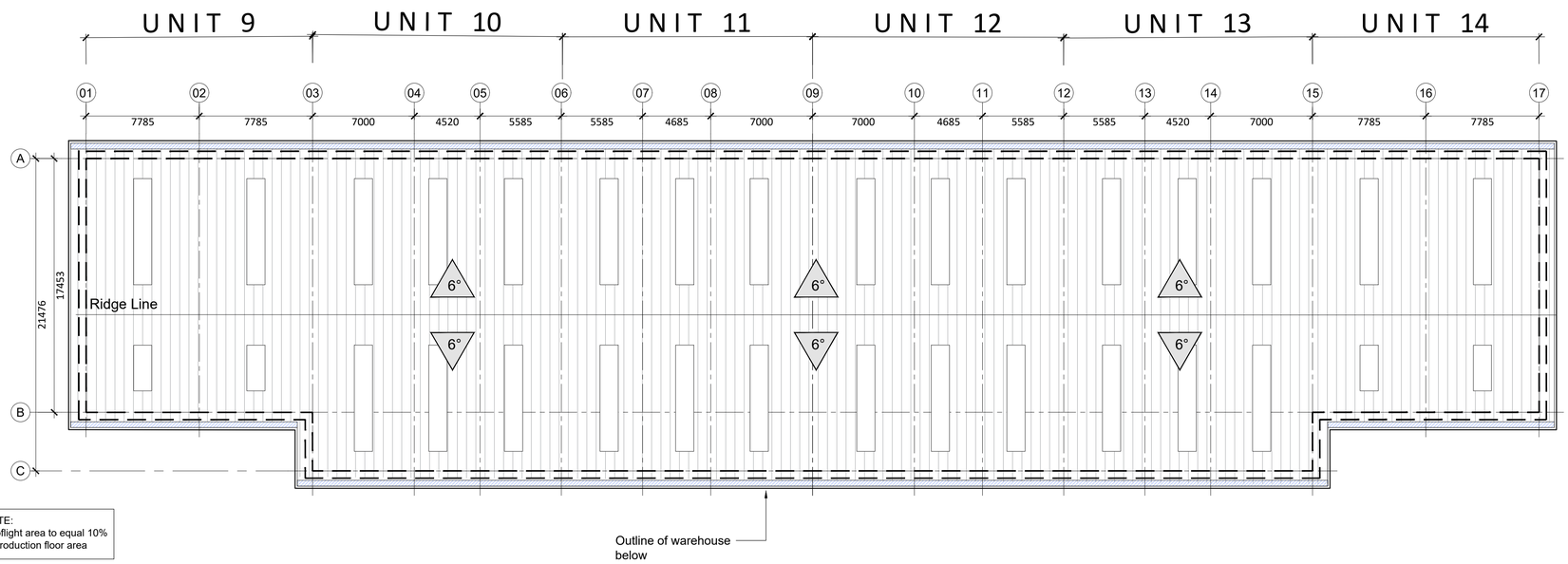
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ARCHITECTURE
22c Leathermarket Street, London, SE1 3HP

Project:
Access Park, Gloucester

Drawing Title:
Unit 9 to 14
GA Ground Floor Plan

Project No:	Scale @ A1 / A3	Revision:
21078	1:200 / 1:400	03

Drawing No:
21078-PL1091



NOTE:
Rooflight area to equal 10% of production floor area

01 Unit 9 to 14 Ground Floor GA Plan
1:200 @ A1

Disclaimer:
Information Subject to Measured Survey

Notes:

N

0 2 4 6 8 10
Scale bar - 1:200m

Rev:	Notes:	Date:	Dwn:	Iss:
01	Unit areas updated	30.11.21	HT	HA
00	Planning Issue	24.11.21	ZG	HA
DR	Draft Issue	17.11.21	ZG	HA

Suitability Code:

Client:
CANMOOR

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Project:
Access Park, Gloucester

Drawing Title:
Unit 9 to 14
GA Roof Plan

Project No:	Scale @ A1 / A3	Revision:
21078	1:200 / 1:400	01

Drawing No:
21078-PL1093