

Land north of Cambridge North Station, Cambridge
Brookgate Land Limited on behalf of The Chesterton Partnership
PINS Reference: APP/W0530/W/23/3315611
Local Authority Reference: 22/02771/OUT
May 2023



UPDATED STATEMENT OF COMMON GROUND BETWEEN APPELLANT AND LPA

Authorised Signatures to Agree the Statement of Common Ground

Signed on behalf of SCDC

Fiona Bradley

.....

South Cambridgeshire District Council

Date:... 23.05.2023.....

Signed on behalf of the Appellant

Awright

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Brookgate Land Limited on behalf of The Chesterton Partnership

Date:.....23.05.2023.....

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APPENDIX 1 : TECHNICAL NOTE BY PJA CIVIL ENGINEERING LTD (REF:05425 VERSION E DATED 17 APRIL 2023)

APPENDIX 2 : TECHNICAL NOTE BY TEMPLE GROUP LTD (REF:T6118 DATED 20 APRIL 2023)

APPENDIX 3 : TECHNICAL NOTE BY RPS CONSULTING SERVICES LTD (REF: ECO00253 CN PHASE 2 DATED 5 MA Y 2023)

APPENDIX 4 : 2023 BAT EMERGENCE SURVEY REPORT DATED 16 MAY 2023

1.0 Introduction

1.1 This is the Statement of Common Ground agreed between Brookgate Land Limited on behalf of The Chesterton Partnership [“the Appellant”] and South Cambridgeshire District Council [“the LPA”, “the Council”].

1.2 It refers to an appeal lodged in respect of the failure of the LPA to determine a hybrid planning application for planning permission with reference 22/02771/OUT at Land to the north of Cambridge North Station [“the Site”].

1.3 The Appellant and the LPA have agreed a minor amendment to the description of development when compared to that stated on the original application form. The new description of development is:

“A hybrid planning application for: a) An outline application (all matters reserved apart from access and landscaping) for the construction of: three new residential blocks providing for up to 425 residential units and providing flexible Class E and Class F uses on the ground floor (excluding Class E (g) (iii)); and two commercial buildings for Use Classes E(g) i (offices), ii (research and development) providing flexible Class E and Class F uses on the ground floor (excluding Class E (g) (iii)), together with the construction of basements for parking and building services, car and cycle parking and infrastructure works and demolition of existing structures.

b) A full application for the construction of three commercial buildings for Use Classes E(g) i (offices) ii (research and development), providing flexible Class E and Class F uses on the ground floor (excluding Class E (g) (iii)) with associated car and cycle parking, the construction of a multi storey car and cycle park building, together with the construction of basements for parking and building services, car and cycle parking and associated landscaping, infrastructure works and demolition of existing structures”

1.4 The Appellant and LPA have also agreed minor updates to 6 no. landscaping drawings to reflect minor updates to the drainage scheme in response to comments from the Lead Local Flood Authority (LLFA). These drawings are referred to within Table 5.2 of this Statement and will be included within the Core Documents.

1.5 This Statement of Common Ground sets out all matters of agreement and disagreement between the Appellant and the Council.

2.0 The Site and Context

- 2.1 The Site lies within the jurisdiction of South Cambridgeshire District Council ["SCDC"] and extends to approximately 9.9 hectares (ha). Cambridgeshire County Council is the highways authority for the Site.
- 2.2 The Site is for all intents and purposes previously developed land that comprises the existing surface level Cambridge North railway station car park of 428 spaces, areas of hardstanding and areas of scrubland.
- 2.3 The Site is bound to the north by the remainder of the former Chesterton Sidings site, to the east by the railway line, to the south by the recently constructed 'One Cambridge Square' office building and 'Two Cambridge Square' Novotel hotel building, and to the west and north-west by the Cambridgeshire Guided Busway ["CGB"] and Cambridge Business Park. Further south of the Site lies Cambridge North railway station, which opened in 2017.
- 2.4 The existing vehicular access to the Site is from Cowley Road which links Milton Road in the north down to Cambridge North station in the south. Upon entering the Site the road name changes to Milton Avenue. Cowley Road itself is single carriageway without footways. A shared footway/cycleway is located to the south of the road, segregated from the carriageway by an area of vegetation and the First Public Drain. Within the Site, Milton Avenue has footways on both sides of the road and a segregated cycleway to the west.
- 2.5 There is also pedestrian and cycle access to the Site from the CGB to the west and from Moss Bank to the south.
- 2.6 The Site is not located within the Cambridge Green Belt.
- 2.7 The Cambridge Green Belt lies to the east of the Site, to the east of the railway line, and further south and south-east of the Site.
- 2.8 To the east of the Site, the land between the railway lines and the River Cam is occupied by a, low-rise development of caravan parks and low-grade industrial units accessed from Fen Road.
- 2.9 To the west of the Site is the Bramblefields Local Nature Reserve and Discovery Way which comprises residential development.
- 2.10 The Site does not contain any heritage assets and no non-designated heritage assets are affected by the proposed development.
- 2.11 Fen Ditton Conservation Area and the Riverside and Stourbridge Common Conservation Area are the closest heritage assets to the Site, with parts of their boundaries lying approximately 500m from the Site.
- 2.12 Baits Bite Lock Conservation Area is located to the north east of the Site, approximately 900m from the Site.

- 2.13 Anglesey Abbey registered park and garden lies approximately 5 kilometres to the northeast of the Site.
- 2.14 The Site is located on the north-east edge of Cambridge and immediately adjoins the administrative boundary of Cambridge City Council to the south-west. It is approximately 3km from the city centre. The Site benefits from access to a range of public transport services which connect the Site with Cambridge City Centre, local regional destinations and national destinations via the rail and bus network.
- 2.15 A full description of the Site and its context is set out within the application documentation and officer report to the 22 March 2023 meeting of the Councils' Joint Development Control Committee, at paragraphs 2.1 to 2.7.

3.0 Planning History

3.1 The relevant Planning History for the Site and adjoining area is set out in Table 1 and Table 2 below.

Table 1: Relevant planning history of the Site

APPLICATION SITE REFERENCE	DESCRIPTION	OUTCOME
S/1714/17/E1	Screening opinion in relation to the proposed redevelopment of Phase 1b	EIA Screening required decision issued 6 July 2017
20/03464/SCOP	Request for a Formal Scoping Opinion in respect of mixed-use development to comprise: Approximately 700 private rental sector (PRS) apartments; Approximately 1,450sqm of retail use (Use Classes A1/A2/A3/A4/A5); Approximately 11,000sqm of office space (Class B1(a)); A specialist Maths College "Meanwhile" uses; and landscaping and associated works.	Scoping Opinion Issued 8 October 2020
21/05178/SCOP	Request for a formal scoping opinion for Hybrid Planning Application comprising Full Planning Permission for c47,280sqm (GEA) of Class E floorspace comprising an office building (One Milton Avenue) and two lab buildings together with ground floor amenity uses, a Mobility Hub comprising of c1031 car parking spaces including 254sqm of Class E floorspace at ground floor level, a temporary car park of c379 spaces, a wildlife habitat area, Network Rail compound area, enabling works and associated infrastructure; and Outline Planning Permission for c41,940 sqm (GEA) of Class E floorspace comprising one lab building and one office building, together with ground floor amenity uses, enabling works and associated infrastructure.	Scoping Opinion Issued 9 February 2022

Table 2: Relevant planning history of adjoining land (including the development of the rail station, hotel and office buildings)

ADDRESS	REFERENCE	DESCRIPTION	OUTCOME
Land at Chesterton Sidings, Cowley Road	S/3102/15/FL & 15/2317/FUL	Proposed Development for a new 450 sq m station building (including passenger waiting facilities toilets staffed ticket office shop unit(s) amenity space rail staff accommodation and facilities) two main line platforms (254m with the provision for extension to 270m in length and capable of accommodating a 12 car train) and a bay platform a pedestrian cycle bridge linking the station building and platforms over the	Approved on 26 September 2016 Cambridge North Station opened May 2017

		main line a landscaped 450 space car park and 1000 cycle park new pedestrian and cycle links to surrounding areas and the extension of the bus lane and cycle route from the Cambridge Guided Busway into the site along the alignment of the former St Ives Branch Line.	
One Cambridge Square, Milton Avenue	S/2403/17/FL	Erection of building comprising office B1 (a) floorspace and ancillary ground floor retail (A1/A3) floorspace associated landscaping and public realm improvements and a 125 space car park.	Refused on 27 November 2017
Two Cambridge Square, Milton Avenue	S/2372/17/FL	Erection of 217-bed hotel with ancillary ground floor retail (Use Class A1/A3) floorspace associated landscaping and public realm improvements and a 20 space car park.	Approved on 2 August 2018 The hotel has been built and is operational
One Cambridge Square, Milton Avenue	S/4478/17/FL	Erection of building comprising office B1 (a) floorspace and ancillary ground floor retail (A1/A3) floorspace a cycle storage pavilion associated landscaping access and a 125 space car park.	Approved on 2 August 2018 Not implemented given subsequent S73 application (S/4824/18/VC)
One Cambridge Square, Milton Avenue	S/4824/18/VC	Application under Section 73 of the Town and Country Planning Act 1990 to vary Condition 20 (EV charging plan) and Condition 38 (approved plans) and remove Condition 36 (wayfinding signage) pursuant to S/4478/17 (Erection of building comprising office B1 (a) floorspace and ancillary ground floor retail (A1/A3) floorspace a cycle storage pavilion associated landscaping access and a 125 space car park)	Approved on 17 April 2019 Building currently under construction
One Cambridge Square, Milton Avenue	22/04536/FUL	Change of Use from Class B1 (a) and Class A1/A3 to Class E.	Approved on 18 January 2023 Building currently under construction
Land at Chesterton Sidings, Cowley Road	S/1084/18/VC and 18/0450/S73	Removal of Condition 38 (2.5 metre footway along Cowley Road) from Planning Consent S/3102/15/FL and	Validated 27 March 2018. Not yet determined.

		Section 73 application to remove Condition 17 (route along Cowley Road) of permission 15/2317/FUL.	
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4.0 Proposed Development

- 4.1 The proposals are intended to form the next phase of the Cambridge North redevelopment further to that created by the Cambridge North Station development and the adjoining hotel development constructed under planning permissions S/3102/15/FL, 15/2317/FUL and S/2372/17/FL and office development which is currently under construction pursuant to planning permission S/4824/18/VC.
- 4.2 The Residential Quarter will comprise up to 425 homes across three blocks, including ground floor amenity uses. The commercial accommodation extends across five buildings, including ground floor amenity uses. A Multi Storey Car Park (also referred to as Mobility Hub) is also proposed. A hybrid planning application was submitted to the local planning authority (LPA) South Cambridgeshire District Council (SCDC) on 15 June 2022 and was valid on receipt, with some elements in outline and some in full.

Outline Element

- 4.3 The outline application is for all matters to be reserved apart from access and landscaping. A suite of parameter plans was submitted with the application to detail the proposed land uses, building heights, access and movement and open space and landscaping. The supporting Design and Access Statement (DAS) includes illustrative material which demonstrates how the proposals could be delivered within the proposed parameters. Drawings for the detailed matters, landscape and access, were submitted.

Land Use

- 4.4 The outline application comprises:
- **The Residential Quarter** (S11-S12), (S13-S16), (S17-S21)
 - **The Triangle Site**, comprising One Chesterton Square (S09) and Two Milton Avenue (S08)
- 4.5 The Residential Quarter is proposed to accommodate up to 425 homes within three perimeter blocks. Unit sizes range from 1 bedroom to 3 bedroom homes. 155 of the homes will be open market and affordable units (within block S13-S16). The remaining 270 homes will be Build to Rent units (BtR) (within block S11-S12 and block S17-S21). Block S17-S21 and block S11 – S12 are proposed to accommodate a number of amenities located at ground floor level.
- 4.6 The Triangle Site is proposed to accommodate two commercial buildings (Use Class E (g) (i) / (ii)), referred to as One Chesterton Square (S09) and Two Milton Avenue (S08). Both buildings are proposed to accommodate amenity provision at ground floor level and a basement level to accommodate car parking, cycle parking, shower facilities and associated changing rooms and drying rooms, plant and storage.

Building Heights

- 4.7 The Building Height Parameter Plan identifies the maximum building heights permitted across the Site. Heights will range between 4 and 8 storeys (13.40m to 30m including plant). Lower heights are proposed to be located on the eastern edge of the Site along the railway edge and on the western edge of the Site with the tallest buildings to be located along Milton Avenue.

Movement and Access

- 4.8 The Access Parameter Plan identifies the indicative alignments of the roads within the Site, together with the preferred alignment of the proposed cycle and pedestrian network.
- 4.9 Means of access and detailed junction design are proposed as part of this application, including:
- **Proposed Cowley Road/Milton Avenue Junction ‘Cowley Circus’** – a new crossroad design; this has been subject to a Road Safety Audit undertaken by the local highway authority,
 - **Proposed Milton Avenue/The Link/Cowley Road East Junction** – amendment of existing junction to incorporate an extended raised table, a new arm to the east providing access to the Mobility Hub and for servicing vehicles to access the rear of One and Three Station Row and a crossing of the Station Row cycle route over Milton Avenue to tie in with the route along the western side which provides connections north and south.
- 4.10 The Appellant submitted a Road Safety Audit (RSA) Stage 1 to the County Council in its role as Local Highway Authority (LHA). The RSA Stage 1 has been completed. The LHA development management team has confirmed that the appeal proposal is acceptable, subject to agreement on condition wording.
- 4.11 The Primary Road of the Site will be the existing Cowley Road/Milton Avenue. However, the footway/cycleway on the western side are proposed to be switched from the current situation so that the cycleway is located closest to the carriageway to tie into the masterplan proposals. Additionally, space within the verges would be provided to accommodate disabled parking and loading bays.
- 4.12 Secondary roads will comprise a road from Cowley Road to the Cambridge North railway station car park (referred to in the masterplan as ‘Cowley Road north’), a road along the eastern edge of the Site (referred to in the masterplan as ‘Cowley Road east’) and the existing link road from Cowley Road to the CGB (referred to in the masterplan as ‘The Link’).
- 4.13 The proposed Tertiary streets are more compact in nature and enclose the Residential Quarter, with the existing CGB) (referred to in the masterplan as ‘Chesterton Way’) forming the western edge and a new street referred to in the masterplan as ‘Bramblefields Way’ forming the northern edge.

Landscape and Public Realm

- 4.14 Details of landscaping is proposed as part of the application. The Landscape Masterplan demonstrates the location, quantum and function of green spaces within the Site. In addition, the phased construction of the development provides opportunities for 'meanwhile' uses providing active and attractive temporary spaces for the new occupants of early phases.
- 4.15 The key areas comprise:
- **Chesterton Gardens** – a central park within the residential quarter which comprises extensive tree planting, lawn mounds, sinuous paths, planting, play areas, pergolas for gatherings and seating areas;
 - **Chesterton Square** – a public square within the commercial quarter which comprises trees, water feature jets and 'sky mirror', raised beds, planting, seating, and a 'follow me' paving band;
 - **Station Row** – a linear swale with ecologically diverse plantings, seating-steps and causeway crossings;
 - **Piazza** – a pocket park at the termination of Station Row, with a wide path to One Milton Avenue and the Residential Quarter;
 - **Milton Way** – a pocket park and passageway for cyclists, with spill-out space for office workers and residents. Raised planters sit over basements, with integrated seating;
 - **Courtyards** - West-facing residents' courtyards, overlooking a tree belt, to include seating and tree planting; and
 - **Wild Park** – areas of retained Open Mosaic habitat and new Open Mosaic restoration, a balancing pond, a circular recreational walk and areas of natural play.

Full Element

- 4.16 The hybrid application includes a full application for;
- One Milton Avenue (building S04);
 - Mobility Hub (building S05); and
 - One and Three Station Row (buildings S06 and S07).

One Milton Avenue (S04)

- 4.17 One Milton Avenue is a proposed office building (GEA of 18,575 m²) and has been designed to achieve a BREEAM Excellent rating. The building includes space for retail use at ground floor level (84 m² GIA), accessed via Milton Avenue.
- 4.18 The building is seven storeys in height plus plant (30.835m). The building steps back to the north and west from level 05 upwards, offering amenity space to the building users.
- 4.19 Buff brick stock is proposed with two tones of metallic panels. The lighter bronze finish provides contrast between the brick and the glazed areas, whilst the darker bronze finish will highlight key architectural features.

Mobility Hub (S05)

- 4.20 The Mobility Hub is proposed to accommodate 725 car parking spaces across 5 levels (including ground floor) between 14.15m and 15.81m in height, with the covered stairways on the northern and southern ends being 18.31m high. 622 of these spaces would be provided for rail users, re-providing the existing 428 surface car parking spaces, and accommodating a further 194 spaces for potential rail-related use should further growth in passenger demand occur in the future. The remaining 103 spaces of the parking capacity would be provided at basement level of the mobility hub for the use of the commercial development.
- 4.21 The proposals seek to retain the flexibility to provide further parking for Network Rail. However, the time period over which passenger demand might grow, and hence trigger the potential need for additional spaces, is still uncertain.
- 4.22 It is therefore proposed that the additional 194 spaces are used flexibly over time in accordance with a car parking management plan as summarised below:
- The spaces would continue to be safeguarded for potential rail-use in the longer term.
 - Initially, the additional spaces would be used by early tenants of buildings proposed in the current planning application – Cambridgeshire County Council accepts there might be a need for higher levels of trip-making in the short to medium term as the NEC area transitions to a low car future, subject to the end-state still operating within the vehicle trip budget.
 - As future phases of development at the Site come forward, the use of those spaces would be de-allocated from current users and reallocated to future occupants.
 - At the same time, the use of the current levels of rail-related parking (428-spaces) would be monitored. Should demand approach 85% of capacity, and subject to the appropriate approvals at that time, the spaces could then be reallocated for rail passenger use and de-allocated from other users.
 - It is proposed that this arrangement can be secured as part of the proposed planning conditions or S106 agreement for the development.
- 4.23 The Mobility Hub also provides three flexible Class E use units at ground floor level on the western frontage of the building, facing onto Station Row.
- 4.24 Vehicular access to the Mobility Hub will be via the new 'Cowley Road east' which will run along the eastern boundary of the Site.
- 4.25 The Mobility Hub will feature folded metal panels on the western façade and perforated metal panels on the eastern façade. The western façade includes a feature stair at the south western corner to signal the gateway leading towards the rest of the development. This elevation forms one of the main pedestrian flows from the station. Active frontages are provided.

One and Three Station Row (S6 and S7)

- 4.26 One and Three Station Row are laboratory buildings and have been designed to achieve a BREEAM Excellent rating. One Station Row (excluding the basement) has a GEA of 11,407 m² and Three Station Row has a GEA of 12,061 m².

- 4.27 Both One and Three Station Row are four storeys in height, plus plant (up to 22.1m high). The building blocks step back to the east and west at level three, offering amenity space for the building users.
- 4.28 Flexible retail provision (and other complementary ground floor uses) are proposed at ground floor level, accessed off 'Station Row' Passage to the west (1,168 m² GIA). The retail uses seek to ensure an activated frontage to Station Row Passage. The side passages contain areas of public realm and visitor cycle parking.
- 4.29 The design development of the façades revolves around the introduction of two planning grids. These articulate the alternating fingers, provide legible ground floor entrances, and define the recessed terraces. The larger, more civic grid is composed of a precast composition, and is continuous from the ground to the screened plant level. The smaller, more vertical grid is composed of brick piers and contains the building cantilevers, marking the entrances and stepping back to reveal the level 03 amenity terrace and the level 04 plant room screen.
- 4.30 Brick stock is proposed with natural pre-cast concrete / stone panels to provide a visual contrast between the alternating blocks. Complimentary coloured metal spandrels are proposed for the opaque elements, as well as the lining to the brick piers.

5.0 Appeal Documents

5.1 The application and appeal comprise of the following documents:

Table 5.1 – Application Documents

APPLICATION DOCUMENTS	DATE
Planning Application Form and Certificates	June 2022
Design and Access Statement	June 2022
Planning Statement, including first draft Heads of Terms	June 2022
Environmental Statement (ES) comprising of: Volume 1 – Main Report (main body of the Assessment) Volume 2 – Complete technical appendices comprising: - Appendix 2.1, Scoping Report - Appendix 2.2, Scoping Opinion - Appendix 4.1 Plans and Drawings - Appendix 4.2 Outline Construction Environmental Management Plan - Appendix 6.1 Construction Phase Assessment inc Dust Risk Assessment - Appendix 6.2 Detailed Dispersion Modelling Assessment Method - Appendix 7.1 Relevant Expertise and Qualifications - Appendix 7.2 Policy, Guidance and Legislation - Appendix 7.3 Carbon Assessment Data - Appendix 7.4 In-Combination Climate Change Impact Assessment Results - Appendix 7.5 Climate Change Resilience Assessment Results - Appendix 7.6 Design Guide Input - Appendix 8.1 Heritage Assets Maps - Appendix 8.2 Historic Maps - Appendix 8.3 Cultural Heritage Statement - Appendix 9.1 Ecology Survey Report CB4 Phase 2 - Appendix 9.2 Ecological Design Strategy - Appendix 9.3 Biodiversity Net Gain Report Phase 2 - Appendix 10.1 FRA and Drainage Strategy - Appendix 10.2 Water Resource Addendum - Appendix 11.1 Cam North HUDU - Appendix 11.2 Health and Wellbeing Policy - Appendix 11.3 Study Area Health Profiles - Appendix 12.1 LVIA Methodology - Appendix 12.2 Parts 1 – 2 of Mapping - Appendix 12.3 Viewpoints - Appendix 12.4 Visualisations - Appendix 12.5 Correspondence - Appendix 13.1 Daylight and Sunlight Assessment	June 2022

- Appendix 13.2 Obstructive Lighting Assessment	
- Appendix 13.3 Reflective Solar Glare Assessment	
- Appendix 14.1 Noise and Vibration Technical Appendices	
- Appendix 14.2 NIA for Residential Planning	
- Appendix 16.1 Phase 1	
- Appendix 16.2 Prob.Cons.Risk	
- Appendix 16.3 Sensitivity Magnitude Significance	
- Appendix 16.4 CSM	
- Appendix 17.1 Transport Assessment	
- Appendix 17.2 Outline Travel Plan	
- Appendix 17.3 Low Emission Strategy	
- Appendix 18.1 CFD Analysis	
- Volume 3 – Non-Technical Summary	
Statement of Environmental Statement (ES) Conformity	October 2022
Office and Laboratory Occupational Market Update	June 2022
Build to Rent Market Report – Private Rented Sector	June 2022
Cambridge Retail and Leisure Update	June 2022
Landscape and Open Space Report	June 2022
Statement of Community Involvement	June 2022
Public Art Strategy	June 2022
Arboricultural Implications Assessment Report	June 2022
Odour Report	June 2022
Utilities Statement	June 2022
Sustainability Strategy, including a BREEAM Pre-Assessment for One Milton Avenue (S04), and One and Three Station Row (S06 and S07).	June 2022
Energy Statement (detailed element)	June 2022
Energy Strategy for 1 Milton Avenue (S4) and 1-3 Station Row (S6 and S7) Rev 03	June 2022
Preliminary Operational waste management plan (P-OWP)	June 2022
Site Waste Management and Materials Management Plan	June 2022
Archaeology Desk-Based Assessment	June 2022
Planning Access Statement Parts 1 to 8 (8 is the complete document)	June 2022
Fire Safety Statement	June 2022
Framework Travel Plan (May 2022)	June 2022
Social Value Statement	June 2022
Highways Technical Note	October 2022
Highways Safety Audit Documents	October 2022
Response to the comments of Cam Cycle	October 2022
Response to the comments of the Access Officer	October 2022
Flood Risk Assessment (FRA) Addendum	October 2022
Water Resources Addendum (Rev 1)	October 2022
Updated Biodiversity Net Gain (BNG) Assessment	October 2022
Ecology Survey Report Update	October 2022

Landscape and Open Space Updates Plan	October 2022
Statement in response to the comments of the Minerals and Waste Authority	October 2022
Updated Low Emission Strategy	October 2022
Energy Strategy Addendum	October 2022
Addendum to Sustainability Strategy	October 2022
Response to comments from Waste Services	October 2022
Updated Preliminary Operational Waste Management Plan (P-OWMP)	October 2022
Cambridge, Past, Present and Future Feedback Response	October 2022
Response to the comments of Urban Design Officer	October 2022
Phase 2 Ecology Survey Calculation Results 22 December 2022	December 2022
Letter on BNG Position 9 January 2023	January 2023

5.2 The table below contains an up-to-date list of drawings. Where drawings have been amended or replaced, the updated drawing revision is recorded below.

Table 5.2 – Drawing List – Drawings for Approval

DRAWING REFERENCE	TITLE	DATE
Site-Wide - General		
239-ACME-PLA-S00-0010	Location Plan	June 2022
239-ACME-PLA-S00-0011	Site Plan	June 2022
Site-Wide Parameter Plans - Outline		
239-ACME-PLA-S01-0101 Rev A	Existing Site Conditions	October 2022
239-ACME-PLA-S01-0102 Rev A	Building Layout and Application Type	October 2022
239-ACME-PLA-S01-0103 Rev A	Maximum Building Envelope – Basement	October 2022
239-ACME-PLA-S01-0104 Rev A	Maximum Building Envelope – Ground Floor Level	October 2022
239-ACME-PLA-S01-0105 Rev A	Maximum Building Envelope – Typical Level	October 2022
239-ACME-PLA-S01-0106 Rev A	Building Heights Plan	October 2022
239-ACME-PLA-S01-0107 Rev A	Proposed Uses – Ground Floor	October 2022
239-ACME-PLA-S01-0108 Rev A	Access Plan	October 2022
239-ACME-PLA-S01-0109 Rev A	Landscape and Open Spaces Plan	October 2022
239-ACME-PLA-S01-0300	Parameter Plans Area Schedule	June 2022
Site-Wide Landscape Plans - Detail		
630_01(MP)001 P5	Landscape Masterplan	October 2022
630_01(MP)002 P3	Ecology Strategy Ground Floor	October 2022
630_01(MP)003 P1	Ecology Strategy Roof	June 2022
630_01(MP)004 P3	Public Open Space Provision	October 2022

630_01(MP)005 P2	Hard Landscape Strategy (West)	October 2022
630_01(MP)006 P2	Hard Landscape Strategy (East)	October 2022
630_01(MP)007 P2	Hard Landscape Strategy (Wild Park)	October 2022
630_01(MP)008 P2	Tree Strategy	October 2022
630_01(MP)009 P1	Planting Strategy (West)	June 2022
630_01(MP)010 P1	Planting Strategy (East)	June 2022
630_01(MP)011 P1	Levels and Drainage (West)	June 2022
630_01(MP)012 P1	Levels and Drainage (East)	June 2022
630_01(MP)013 P1	Levels and Drainage (Wild Park)	June 2022
630_01(MP)014 P3	Attenuation Strategy	October 2022
630_01(MP)015 P1	Furniture Strategy (West)	June 2022
630_01(MP)016 P1	Furniture Strategy (East)	June 2022
630_01(MP)017 P1	Furniture Strategy (Wild Park)	June 2022
630_01(MP)019 P1	Roof Strategy	June 2022
630_01(MP)020 P3	Tree Root Cell Extents	October 2022
630_01(MP)021 P2	Wild Park and Aggregates Yard Interface	October 2022
630_01(MP)022 P1	Cycle Strategy (West)	October 2022
630_01(MP)023 P1	Cycle Strategy (East)	October 2022
630_01(MP)024 P1	Proximity to Mineral Safeguarded areas	October 2022
630_01(MP)101 P1	Milton Avenue 1 of 2	June 2022
630_01(MP)102 P1	Milton Avenue 2 of 2	June 2022
630_01(MP)103 P2	Chesterton Way 1 of 3	October 2022
630_01(MP)104 P2	Chesterton Way 2 of 3	October 2022
630_01(MP)105 P2	Chesterton Way 3 of 3	October 2022
630_01(MP)106 P2	Cowley Road North	October 2022
630_01(MP)107 P2	Cowley Road East	October 2022
630_01(MP)108 P1	The Link	June 2022
630_01(MP)109 P2	Bramblefields Way	October 2022
630_01(MP)201 P2	1 Milton Avenue and Milton Walk	October 2022
630_01(MP)202 P2	Chesterton Square	October 2022
630_01(MP)203 P2	Station Row	October 2022
630_01(MP)204 P1	Station Row Features	June 2022
630_01(MP)205 P2	Piazza	October 2022
630_01(MP)206 P1	Station Row Passage	June 2022
630_01(MP)207 P1	Chesterton Passage	June 2022
630_01(MP)208 P1	Cowley Circus	June 2022

630_01(MP)209 P3	Wild Park	October 2022
630_01(MP)210 P2	Typical Meanwhile Use for Pocket Park	October 2022
630_01(MP)212 P1	Roof Garden – Labs	June 2022
630_01(MP)213 P1	Roof Garden – 1 Milton Avenue	June 2022
630_01(MP)301 P1	Residential Masterplan	June 2022
630_01(MP)304 P1	Play Areas – LEAP and LAP	June 2022
630_01(MP)305 P1	Play Areas – Natural Play	June 2022
630_01(MP)306 P1	Play Areas – Wild Park	June 2022
630_01(MP)307 P1	Residential Roof Garden Masterplan	June 2022
630_01(MP)308 P1	Roof Garden Features	June 2022
630_01(CD)001 P1	Typical Tree pit in hard landscaping	June 2022
630_01(CD)002 P1	Typical Tree pit in soft landscaping	June 2022
630_01(CD)003 P1	Typical Tree pit in raised planter over basement	June 2022
630_01(CD)004 P1	Rain garden kerb detail	June 2022
630_01(CD)005 P1	Biodiverse Roof typical detail	June 2022
630_01(CD)007 P1	Chesterton Square paving detail	June 2022
630_01(CD)008 P1	Chesterton Gardens paving detail	June 2022
630_01(SC)001 P2	Chesterton Square	October 2022
630_01(SC)002 P1	Station Row – Causeway	June 2022
630_01(SC)003 P1	Station Row – Steps	June 2022
630_01(SC)004 P1	Station Row – Banks and bench seating	June 2022
630_01(SC)006 P2	1 Milton Avenue	October 2022
630_01(SC)007 P1	Milton Avenue	June 2022
630_01(SC)009 P2	Cowley Road East	October 2022
630_01(SC)010 P1	Chesterton Gardens: Pergola	June 2022
630_01(SC)012 P1	Chesterton Gardens: Earth mounds	June 2022
22_02771_OUT Tree Survey Drawing	Chesterton Sidings Cambridge Plans	October 2022
Site-Wide Highways Plans - Detail		
05425-C-2103-P7	Lab Servicing Access SPA	October 2022
05425-C-2110-P4	Milton Avenue Cycle	October 2022
05425-C-2113- P7	Cowley Circus	October 2022
05425-C-2203-P2	Fire Tender Tracking (Sheet 1 of 2)	October 2022
05425-C-2204-P2	Fire Tender Tracking (Sheet 2 of 2)	October 2022

05425-C-2205-P1	Lab Servicing Access Swept Path Analysis Refuse Vehicle	June 2022
05425-C-2206-P2	Rigid Truck Tracking	October 2022
05425-C-2207-P1	Refuse Vehicle Tracking (Plan)	June 2022
05425-C-2208-P0	Whole Site Refuse Vehicle Tracking	October 2022
S4 - Full		
1781-MAKE-S04-PA1999 Rev 01	S4 Basement Plan	October 2022
1781-MAKE-S04-PA2000 Rev 01	S4 Ground Floor Plan	October 2022
1781-MAKE-S04-PA2001 Rev 01	S4 Level 01 Plan	October 2022
1781-MAKE-S04-PA2002 Rev 01	S4 Levels 02-04 Typical Plan	October 2022
1781-MAKE-S04-PA2005 Rev 01	S4 Level 05 Plan	October 2022
1781-MAKE-S04-PA2006 Rev 01	S4 Level 06 Plan	October 2022
1781-MAKE-S04-PA2007 Rev 01	S4 Level 07 Plan: Plant	October 2022
1781-MAKE-S04-PA2008 Rev 01)	S4 Roof Plan	October 2022
1781-MAKE-S04-PA2200	S4 Proposed East Elevation	June 2022
1781-MAKE-S04-PA2201	S4 Proposed South-East Elevation	June 2022
1781-MAKE-S04-PA2202	S4 Proposed South-West Elevation	June 2022
1781-MAKE-S04-PA2203	S4 Proposed North-West Elevation	June 2022
1781-MAKE-S04-PA2250 Rev 01	S4 Proposed Section AA and Section BB (Short and Long Section)	October 2022
S5		
239-ACME-PLA-S05-0100	S5 Location Plan	June 2022
239-ACME-PLA-S05-1100	S5 Ground Floor Plan	June 2022
239-ACME-PLA-S05-1101	S5 First Floor Plan	June 2022
239-ACME-PLA-S05-1102	S5 Second Floor Plan	June 2022
239-ACME-PLA-S05-1103	S5 Third Floor Plan	June 2022
239-ACME-PLA-S05-1104	S5 Fourth Floor Plan	June 2022
239-ACME-PLA-S05-1105	S5 Roof Plan	June 2022
239-ACME-PLA-S05-1110	S5 Basement Plan Acme	June 2022
239-ACME-PLA-S05-1200	S5 Mobility Hub Section	June 2022

239-ACME-PLA-S05-1300	Western And Eastern Elevations	June 2022
239-ACME-PLA-S05-1301	Northern And Southern Elevations	June 2022
S6 and S7		
1818-MAKE-S06-PA1949 Rev 01	S6 and S7 Combined Basement Plan	October 2022
1818-MAKE-S06-PA1950 Rev 02	S6 and S7 Combined Ground Floor Plan	October 2022
1818-MAKE-S06-PA1999 Rev 01	S6 Basement Plan	October 2022
1818-MAKE-S06-PA2000 Rev 02	S6 Ground Floor Plan	October 2022
1818-MAKE-S06-PA2001	S6 Levels 01-02 Typical Plan	June 2022
1818-MAKE-S06-PA2003	S6 Level 03 Plan	June 2022
1818-MAKE-S06-PA2004	S6 Level 04 Plan: Plant	June 2022
1818-MAKE-S06-PA2005	S6 Roof Plan	June 2022
1818-MAKE-S07-PA1999 Rev 01	S7 Basement Plan	October 2022
1818-MAKE-S07-PA2000 Rev 02	S7 Ground Floor Plan	October 2022
1818-MAKE-S07-PA2001	S7 Levels 01-02 Typical Plan	June 2022
1818-MAKE-S07-PA2003	S7 Level 03 Plan	June 2022
818-MAKE-S07-PA2004	S7 Level 04 Plan: Plant	June 2022
818-MAKE-S07-PA2005	S7 Roof Plan	June 2022
1818-MAKE-S06-PA2150 Rev 01	S6 and S7 Combined North-West Elevation	October 2022
1818-MAKE-S06-PA2151 Rev 01	S6 and S7 Combined South-East Elevation	October 2022
1818-MAKE-S06-PA2200 Rev 01	S6 Proposed North-West Elevation	October 2022
1818-MAKE-S06-PA2201	S6 Proposed North-East Elevation	June 2022
1818-MAKE-S06-PA2202 Rev 01	S6 Proposed South-East Elevation	October 2022
1818-MAKE-S06-PA2203	S6 Proposed South-West Elevation	June 2022
1818-MAKE-S06-PA2240	S6 and S7 Proposed Combined Section AA (Long Section)	June 2022
1818-MAKE-S06-PA2250	S6 Proposed Section BB and Section CC (Short and Long Section)	June 2022
1818-MAKE-S07-PA2200 Rev 01	S7 Proposed North-West Elevation	October 2022

1818-MAKE-S07-PA2201 Rev 01	S7 Proposed North-East Elevation	October 2022
1818-MAKE-S07-PA2202 Rev 01	S7 Proposed South-East Elevation	October 2022
1818-MAKE-S07-PA2203	S7 Proposed South-West Elevation	June 2022
1818-MAKE-S07-PA2250	S7 Proposed Section DD and Section EE (Short and Long Section)	June 2022

Table 5.3 – Drawings for Illustrative Purposes Only

ILLUSTRATIVE DRAWING REFERENCE	TITLE	DATE
239-ACME-PLA-S00-0012 Rev B	Illustrative Masterplan – Roof	October 2022
239-ACME-PLA-S00-0013 Rev B	Illustrative Masterplan – Ground Floor	October 2022
239-ACME-PLA-S00-0014 Rev B	Illustrative Masterplan – Typical Floor	October 2022
239-ACME-PLA-S00-0020	Strategic Masterplan – Illustrative Only	October 2022
239-ACME-PLA-S00-0021	Strategic Masterplan (Emerging NEC AAP) – Illustrative Only	October 2022

6.0 Development Plan

- 6.1 So far as material, the relevant development plan in this case comprises the following:
- Adopted South Cambridgeshire District Council Local Plan (2018) (SCLP) and Proposals Map (2018)
 - Cambridgeshire and Peterborough Minerals and Waste Local Plan (2021)
- 6.2 The Site forms part of the Major Development Site allocation within the SCLP referred to as 'Cambridge Northern Fringe East and Cambridge North railway station', as identified under Policy SS/4 of the SCLP.
- 6.3 In accordance with parts (1) and (2) of Policy SS/4 of the SCLP, the development proposal is for a mixed-use, employment-led scheme, together with a range of supporting uses.
- 6.4 In accordance with part (4a) of Policy SS/4 of the SCLP, the planning application is supported by a suite of technical assessments which consider the existing site conditions and environmental and safety constraints. These are explained in the application supporting documentation.
- 6.5 In accordance with part (4b) of Policy SS/4 of the SCLP, the Addendum Report – Updated odour dispersion modelling for Cambridge Water Recycling Centre (December 2020), prepared by Olfasense UK Ltd and commissioned by South Cambridgeshire District Council to inform the emerging NEC AAP, confirms that the Site falls outside of the odour contours of the Cambridge Water Recycling Centre. Furthermore, an odour statement has been prepared in support of the application and confirms there are no predicted significant odour impacts at the Site from the CWRC. Therefore, no odour mitigation is considered to be required and is not proposed. There are no other environmental or health impacts arising from the Cambridge Water Recycling Centre requiring mitigation for occupants of the Appeal scheme.
- 6.6 In accordance with part (4c) of Policy SS/4 of the SCLP, the illustrative masterplan and Access Parameter Plan includes a comprehensive network of dedicated footways, footpaths and cycle paths throughout the Site to ensure maximum connectivity through the development and to the surrounding areas.
- 6.7 In accordance with part (4d) of Policy SS/4 of the SCLP, ecological surveys have been completed to inform the development proposals for the Site and identified appropriate mitigation, compensation and enhancement measures.
- 6.8 In accordance with part (4e) of Policy SS/4 of the SCLP, two illustrative strategic masterplans have been submitted with the application. These expand on information submitted within the Design and Access Statement and illustrate how the Site relates to the wider context both in terms of the remainder of the 'Cambridge North' site under the control of Brookgate Land Ltd and the wider area within the emerging NEC AAP.
- 6.9 It is agreed, in relation to the appeal proposals, that the relevant policies of the SCLP include the following:
- S/2: Objectives of the Local Plan

- S/3: Presumption in Favour of Sustainable Development
- S/5: Provision of New Jobs and Homes
- S/6: The Development Strategy to 2031
- SS/4: Cambridge Northern Fringe East and Cambridge North railway station
- CC/1: Mitigation and Adaption to Climate Change
- CC/3: Renewable and Low Carbon Energy in New Developments
- CC/4: Water Efficiency
- CC/6: Construction Methods
- CC/7: Water Quality
- CC/8: Sustainable Drainage Systems;
- CC/9: Managing Flood Risk
- HQ/1: Design Principles
- HQ/2: Public Art and New Development
- NH/2: Protecting and enhancing Landscape Character
- NH/4: Biodiversity
- NH/6: Green Infrastructure
- NH/8: Mitigating the Impact of Development in and Adjoining the Green Belt
- NH/14: Heritage Assets
- H/8: Housing Density
- H/9: Housing Mix
- H/10: Affordable Housing
- H/12: Residential Space Standards
- E/9: Promotion of Clusters
- E/10: Shared Social Spaces in Employment Areas
- E/22: Applications for New Retail Development
- SC/2: Health Impact Assessment
- SC/4: Meeting Community Needs
- SC/6: Indoor Community Facilities
- SC/7: Outdoor Play Space, Informal Open Space and New Development
- SC/9: Lighting Proposals
- SC/10: Noise Pollution
- SC/11: Contaminated Land
- SC/12: Air Pollution
- SC/14: Odour and Other Fugitive Emissions to Air
- TI/2: Planning for Sustainable Travel

- TI/3: Parking Provision
- TI/8: Infrastructure and New Developments
- TI/10: Broadband

Cambridgeshire and Peterborough Minerals and Waste Local Plan (2021)

- 6.10 The Cambridgeshire and Peterborough Minerals and Waste Local Plan sets out several allocations which cover the Site. These identify the Site as being within:
- I. the Consultation Area (CA) for the Cambridge Northern Fringe Aggregates Railheads (Transport Infrastructure Area) (TIA) (Policy 16 (Consultation Areas));
 - II. the Consultation Area (CA) for the Cowley Road Waste Management Area (WMA), also known as the Cambridge Waste Transfer Station (Policy 16 (Consultation Areas));
 - III. the Consultation Area (CA) for the Cambridge Water Recycling Area (WRA) (Policy 16 (Consultation Areas)); and
 - IV. a Sand and Gravel Mineral Safeguarding Area (Policy 5).
- 6.11 It is agreed, in relation to the appeal proposals, that the relevant policy of the Cambridgeshire and Peterborough Minerals and Waste Local Plan is Policy 16: Consultation Areas (CAS).

7.0 Statutory consultee responses received to date

7.1 Statutory consultee responses received to date are summarised in Table 3 below.

Table 3 : Statutory consultee responses received to date

CONSULTEE	DATE	CONSULTEE RESPONSE	APPLICANT AND LPA POSITION
LPA Tree Officer	10.11.22	No objection, subject to conditions	Applicant and LPA to agree conditions
LPA Ecology Officer	02.08.22	Objection due to insufficient information to determine the application	Applicant and LPA to agree conditions
	07.12.22	Further survey work and amendments needed to determine application	
	April 2023	Technical Note agreed to ensure application provides sufficient information to adequately assess the ecological impact of the proposals	
LPA Environmental Health Officer (Air Quality, Noise and Vibration, Lighting)	26.07.22	No objection, subject to conditions	Applicant and LPA to agree conditions
	21.11.22	The amendments do not adversely affect/impact original comments dated 26.07.2022. Previous comments remain relevant and up to date.	
LPA Environmental Health Officer (Noise, Odour, Lighting)	27.07.22	No objection, subject to conditions	Applicant and LPA to agree conditions
	08.12.22	No further comments	
LPA Environmental Health Officer (Contaminated Land)	13.07.22	No objection, subject to conditions	Applicant and LPA to agree conditions
LPA Sustainability Officer	03.08.22	Request for further information and clarification	Applicant and LPA to agree conditions where appropriate.
	08.12.22	Further to previous comments a number of amendments and clarifications have been made to the proposals. The	

		amendments and clarifications are welcomed, subject to agreement on condition wording	
LPA Conservation Officer	October 2022	Objection due to the proposal not being compliant with Policy NH/14	This will be addressed in evidence.
LPA Urban Design Officer	12.10.22	Request for further information and clarification	Further information was provided in the re-submission pack consulted upon on 09.11.22 This will be addressed in evidence.
	November 2022	Issues raised in the original response and summarised in Point 1-12 have not been addressed.	
LPA Landscape Officer	27.09.22	Objection on the grounds of non-compliance with SCLP policies SS/4 (4c, 4e), HQ/1 (1a, 1b, 1c, 1d, 1e, 1f, 1h, 1i, 1j, 1m, 2), NH/2, NH/8 (2,3), SC/7 (4), TI/2 (1, 2a, 2d), and TI/3.	Further information was provided in the re-submission pack consulted upon on 09.11.22 This will be addressed in evidence.
	15.12.22	Officer remains of the view of not being able to support the scheme on the grounds of non-compliance with SCLP policies SS/4 (4c, 4e), HQ/1 (1a, 1b, 1c, 1d, 1e, 1f, 1h, 1i, 1j, 1m, 2), NH/2, NH/8 (2,3), SC/7 (4), TI/2 (1, 2a, 2d), and TI/3	
LPA Sustainable Communities Officer	31.08.22	Request for further information and clarification	Further information was provided in the re-submission pack consulted upon on 09.11.22 No further response received.
LPA Access Officer	25.08.22	Objection due to insufficient information and / or detail.	Further information was provided in the re-submission pack consulted upon on 09.11.22 Applicant and LPA to agree conditions.
	22.11.22	Objection maintained by the Access Officer.	
LPA Health Officer	31.08.22	No objection – confirmation that the development has been assessed as Grade B which	N/A

		meets the required standard of the HIA SPD policy	
LPA Strategic Housing Officer	27.09.22	No objection, subject to conditions and s106	Applicant and LPA to agree conditions and s106
	07.12.22	No objection, subject to conditions and s106	
LPA Shared Waste Service	27.09.22	Request for further information and clarification	Further information was provided in the re-submission pack consulted upon on 09.11.22 Applicant and LPA to agree conditions and s106.
	24.02.23	Further information and clarification required.	
LPA Drainage Engineer	27.09.22	Objection and request for further information in respect to First Public Drain, Climate Change Allowances, Discharge Rates and SuDS	Applicant and LPA to agree conditions
	03.03.23	Objections maintained regarding climate change allowance.	
	20.04.23	Following receipt of further information, no objection subject to conditions.	
Cambridgeshire County Council (Education)	16.09.22	No objection, subject to agreement on financial contributions	Applicant and LPA to agree s106
Minerals and Waste Planning Authority	03.08.22	Objection owing to a lack of information demonstrating the compatibility of the development with the safeguarded aggregates railhead (TIA), and the Cowley Road Waste Management Area (WMA)	Further information was provided in the re-submission pack consulted upon on 09.11.22 Applicant and LPA to agree conditions.
	14.12.22	Require more information to remove objection	
	20.04.2023	Following receipt of further information, no objection subject to conditions.	
Cambridgeshire County Council Archaeologist	08.07.22	No objection or requirement for further archaeology work	N/A
	09.11.22	As per original response	

Natural England	28.10.22	Request for further information	Further information was provided in the re-submission pack consulted upon on 09.11.22 To be addressed in evidence.
	24.11.23	Request for further information.	
Environment Agency	27.06.22	No objection but query whether sustainable water supplies can be provided and whether Anglian Water can receive the foul drainage without exceeding their permits with the EA or that any necessary infrastructure updates are made ahead of occupation of the development	Further information was provided in the re-submission pack consulted upon on 09.11.22 Anglian Water is obligated to accept new flows. Anglian Water has confirmed that Cambridge Water Recycling Centre does not currently have capacity to treat flows from the development site but the required reinforcement works are the responsibility of Anglian Water and do not fall under the remit of the individual developer To be addressed in evidence
	07.11.22	No objection but raised concerns regarding the impact of increased abstraction on water bodies.	
	27.02.23	Objection as the proposals may, through increased demand for potable water, increase abstraction and risk deterioration to water bodies.	
Cadent Gas	27.06.22	No objection, subject to standard informative relating to protection of Cadent Gas assets	Applicant and LPA to agree conditions
Anglian Water	05.07.22	No objection though acknowledgement that Cambridge Water Recycling Centre does not currently have capacity to treat flows from the development site	Anglian Water is obligated to accept new flows and Anglian Water has confirmed that Cambridge Water Recycling Centre does not currently have capacity to treat flows from the development site but the required reinforcement works are the responsibility of Anglian Water and do not
	11.11.22	As per original response	

			fall under the remit of the individual developer
Sport England	08.07.22	No objection, subject to agreement of requested s106 contribution	Applicant and LPA to agree s106
	27.09.22	Agreed to revised s106 contribution following liaison with Applicant	
Local Highway Authority (Development Management Team)	12.07.22	Objection on the grounds of highway safety. Request for Stage 1 Road Safety Audit (RSA) for proposed new access to Cowley Road and Milton Avenue Recommended conditions	Applicant and LPA to agree conditions
	08.12.22	The submitted amended documents do not change the Highway Authority comments of 12th July 2022. The Road Safety Audit Stage 1 process is ongoing	
	27.02.23	No objection raised subject to condition to be agreed.	
Local Highway Authority (Transport Assessment Team)	08.09.22	Objection as insufficient detail has been presented to make a sound assessment	Mitigation package is the subject of ongoing discussions between the LHA, Applicant and LPA.
	22.02.23	Further response received, no objection subject to mitigation package.	
National Highways	06.01.23	Confirmed that National Highways are now in a position to lift the holding objection	Applicant and LPA to agree conditions and s106.
Historic England	05.09.22	Objection due to the application not meeting the requirements of the NPPF, in particular para 194,200	To be addressed in evidence.
Lead Local Flood Authority (LLFA)	15.08.22	Objection and request for further information	Applicant and LPA to agree conditions.
	22.02.23	Objection regarding climate change allowance	

	20.04.23	Following receipt of further information, no objection subject to conditions.	
Network Rail	18.08.22	No objection	N/A
Milton Parish Council	06.07.22	Objection as consider the proposals constitute overdevelopment with excessive heights and also that the development lacks amenities (eg. Recreational and informal spaces)	To be addressed in evidence.
	23.11.22	No recommendations on the amendments	
Fen Ditton Parish Council	11.10.22	Objection on basis proposal is contrary to Policy HQ/1 and Section 12 of the Framework	To be addressed in evidence.

8.0 Matters in Agreement

8.1 It is agreed between the Appellant and the LPA that the following matters are not in dispute.

Development Plan

8.2 Planning decisions must be taken in accordance with the development plan unless there are material considerations that indicate otherwise as set out at section 38(6) of the Planning and Compulsory Purchase Act 2004.

8.3 In this respect, the development plan is formed of the South Cambridgeshire Local Plan (2018) and the Cambridgeshire and Peterborough Minerals and Waste Local Plan (2021).

8.4 The Appellant and LPA agree that the appeal proposal is compliant with the following policies;

- S/5: Provision of New Jobs and Homes;
- SS/4 : Cambridge Northern Fringe East and Cambridge North railway station;
 - Part 1
 - Part 4, sub paragraph (b)
 - Part 4, sub paragraph (d)
 - Part 4, sub paragraph (e)
- CC/1 : Mitigation and Adaptation to Climate Change;
- CC/3 : Renewable and Low Carbon Energy;
- CC/4 : Water Efficiency;
- CC/8 : Sustainable Drainage Systems;
- CC/9: Managing Flood Risk;
- NH/4: Biodiversity;
- NH/6 : Green Infrastructure;
- H/9: Housing Mix;
- H/10: Affordable Housing;
- H/12 : Residential Space Standards;
- E/9: Promotion of Clusters;
- E/10: Shared Social Spaces in Employment Areas;
- SC/2: Health Impact Assessment;
- SC/4: Meeting Community Needs;
- SC/6: Indoor Community Facilities;
- SC/7: Outdoor Play Space, Informal Open Space and New Developments;
- SC/9 : Lighting;
- SC/10: Noise Pollution;

- SC/11: Contaminated Land;
- SC/12: Air Quality;
- SC/14: Odour and Other Fugitive Emissions to Air;
- TI/1: Chesterton Rail Station;
- TI/2: Planning for Sustainable Travel; and
- TI/3: Parking Provision.

8.5 In respect of SS/4 Part 3, this refers to the preparation of an AAP to establish the amount of development, site capacity, viability, time scales and phasing of development. The LPA and Appellant agree that the AAP is at an early stage in its preparation. The Appellant considers it attracts very limited weight. The LPA considers it attracts “limited” (i.e. little) weight as a material consideration in planning decision making and advice.

The Emerging North East Cambridge Area Action Plan (NEC AAP) and its evidence base

8.6 The Site falls within the boundary of the emerging North East Cambridge Area Action Plan (NEC AAP).

8.7 Work on the NEC AAP began in 2013, with the most recent consultation taking place between July 2020 and October 2020 on the Draft version of the Plan (Regulation 18).

8.8 Outstanding objections, including those by the Appellant, remain in respect of the emerging AAP, in particular in relation to quantum, heights, density, scale and massing.

8.9 The Proposed Submission version of the emerging NEC AAP (Regulation 19) was reported to the respective decision-making committees of SCDC and Cambridge City Council over December 2021 to January 2022 and was approved for public consultation.

8.10 However, the NEC AAP is predicated on the relocation of the Cambridge Waste Water Treatment Plant taking place and will not proceed to the Proposed Submission Stage (Regulation 19) unless and until the Development Consent Order (DCO) has been approved.

8.11 The Planning Inspectorate website¹ confirms that the DCO application was received by the Planning Inspectorate on 28 April 2023.

8.12 The Proposed Submission AAP has not been the subject of publication and consultation. The Appellant considers it attracts very limited weight. The LPA considers it attracts “limited” (i.e. little) weight as a material consideration in planning decision making and advice.

¹ [Cambridge Waste Water Treatment Plant Relocation | National Infrastructure Planning \(planninginspectorate.gov.uk\)](https://planninginspectorate.gov.uk)

- 8.13 The Councils have published a number of evidence papers to support the draft policies and proposals of the Proposed Submission version of the emerging NEC AAP, together with a series of Development Management Guidance documents. The evidence base is also subject to objection from landowners within the AAP boundary including the Appellant.

The Emerging Greater Cambridge Local Plan and its evidence base

- 8.14 The emerging Greater Cambridge Joint Local Plan is at an early stage in its preparation and carries very limited weight.
- 8.15 The Councils have published a number of evidence papers to support the emerging Greater Cambridge Local Plan.

National Planning Policy Framework (NPPF)

- 8.16 The NPPF is a significant material consideration which must be taken into account where it is relevant to a planning application/appeal.
- 8.17 The NPPF sets out a presumption in favour of sustainable development. This includes that development proposals that accord with an up-to-date development plan, should be approved without delay.
- 8.18 At a high level there are three overarching objectives to sustainable development. These are economic, social and environmental.
- 8.19 The planning system is plan led and the development plan is therefore required to set a vision for the future of its area and provide a framework for addressing housing, economic, social and environmental needs.

Employment-led Development

- 8.20 The development proposal is primarily for employment use in accordance with Policy SS/4 of the SCLP.

Residential Development

- 8.21 The residential development is acceptable in principle, in accordance with Policy SS/4 of the SCLP.
- 8.22 The housing mix proposed is acceptable in principle and provides the choice, type and mix of housing sought in Policy H/9 of the SCLP.
- 8.23 The overall unit numbers, together with the mix of tenures and unit sizes is acceptable.

Need and Economic Development

- 8.24 The Economy chapter (Chapter 8) of the SCLP provides a set of policies that focus on delivering the types of employment appropriate to both support the Cambridge cluster and to provide a diverse range of local jobs to ensure a strong and vibrant local economy into the future.
- 8.25 The Appeal Site is a specific site identified in Chapter 8 of the SCLP as an employment land allocation especially suited for cluster development – under Policy E/9 of the SCLP.
- 8.26 In 2020 Cambridge City Council (in partnership with South Cambridgeshire District Council) commissioned a consortium of consultants to assess employment land supply and demand. The resulting Employment Land and Economic Development Study 2020 (ELEDs) was published in November 2020. It identified four key office submarkets. The application Site is within the submarket area identified as the North East Cambridge AAP submarket at Figure 9.
- 8.27 The ELEDs confirms that the North East Cambridge AAP submarket is key for R&D due to Cambridge Science Park. Agents explained that the recent opening of Cambridge North station in 2017 will continue to create more development opportunities, and thus many other high-value companies have now started looking to Cambridge North for easy transport links (paragraph 2.80). The Evidence Study recommends that the LPA continues to respond positively to proposals that can be considered on their merits, or through further allocation.
- 8.28 The Appeal scheme is forecast to generate approximately 2,000 additional construction roles over the five-year construction period and approximately 4,300 additional on-site jobs after the Site is complete and the development fully operational. It is agreed that the development will make a significant contribution to the local economy, especially as a proposal to support the knowledge-based Research and Development cluster in North East Cambridge.
- 8.29 The Greater Cambridge Employment and Housing Evidence Update (January 2023) confirms that demand for labs has reached an all time high with significant capital available for life sciences research but there is severe shortage of available lab move in space. Immediately available space has fallen to almost zero against this background of high demand. For offices, there is still good demand from businesses wishing to locate in central and north Cambridge in high quality premises, and this trend is expected to continue.
- 8.30 The importance of the Life Science sector was recognised in the Government's Spring Budget 2023;

“3.98 The UK is a world-leader in the life sciences industry, with significant R&D hubs such as Cambridge's Biomedical Campus. East West Rail – the rail line joining Oxford and Cambridge - will support further growth in life sciences and other high-productivity sectors across the region, connecting businesses and talent. In May, the government will confirm the route for the new Bedford-Cambridge section, and will provide capacity funding to support local authorities to develop their plans for strategic economic growth around new stations.

3.99 Boosting the supply of commercial development, in particular lab space, is key to supporting R&D needs and driving investment into high value industries across England, such as the life sciences and advanced manufacturing sectors in the Oxford-Cambridge corridor. Following the

recent National Planning Policy Framework consultation the government will set out further details for supporting growth in this area in due course.'

Sustainable Development

- 8.31 The Site is within a highly sustainable and accessible location. The Site is within easy walking distance of the railway station and bus interchange.
- 8.32 The Site continues to form an important part of the development strategy for the emerging Greater Cambridge Local Plan. The Greater Cambridge Local Plan : Development Strategy Update (Regulation 18 Preferred Options) (January 2023) prepared by the Greater Cambridge Shared Planning service confirms the development strategy for the new joint Local Plan. At paragraph 4.3.1 it states that North East Cambridge, of which the Site forms part, is '*identified in the First Proposals strategy as the most sustainable location for strategic scale development available within Greater Cambridge*'.
- 8.33 The development will deliver 425 new homes, which will help to maintain the Greater Cambridge five-year housing land supply and deliver affordable homes.
- 8.34 The proposals include provision for community and retail facilities and open space.
- 8.35 National planning policy places a clear emphasis on the importance of economic growth and delivering economic benefits as a key component of sustainable development. The proposal will generate positive economic impacts during the construction and operational phases of the development.

Landscape and Townscape Impacts

- 8.36 The Appeal scheme is supported by a comprehensive Landscape and Visual Impact Assessment (LVIA) which considers the likely significant effects of the development upon local townscape, the Cambridge skyline, landscape character, the landscape resource, specific views, and visual amenity. The viewpoints included within this assessment were agreed between the Appellant and the LPA in advance of the assessment being completed.
- 8.37 The parties agree that there would be no visual effects upon long distance viewpoints 10, P1, P4, P5 and P6 within the LVIA.

Heritage

- 8.38 The Site does not contain any heritage assets.
- 8.39 Fen Ditton Conservation Area and the Riverside and Stourbridge Common Conservation Area are the closest heritage assets to the Site, with parts of their boundaries lying approximately 500m from the Site. Anglesey Abbey registered park and garden lies approximately 5km to the northeast. Baits Bite Lock Conservation Area is located to the north east of the Site, approximately 900m from the Site, with the grade II* listed building The Biggin located within it.

- 8.40 No non-designated heritage assets are affected by the proposed development.
- 8.41 As such, whilst Section 72 of the Planning (Listed Buildings & Conservation Areas) Act 1990 does not apply as the Site is not within a Conservation Area, the appropriate policies of the NPPF are relevant in assessing the impact of the proposed development on a Conservation Area's setting.
- 8.42 The impacts of the development on the significance of any heritage assets affected have been assessed in accordance with the requirements of Chapter 16 of the NPPF
- 8.43 It is agreed that the development proposals would cause "less than substantial" harm to the significance of the Fen Ditton Conservation Area and the Riverside and Stourbridge Common Conservation Area, for the purposes of the Framework.

Public Realm and Landscape

- 8.44 The Appeal scheme makes a contribution to the public realm.
- 8.45 The Appeal scheme meets the space requirement for Informal open space and Informal Children's Play, both set within Chesterton Gardens.
- 8.46 The location of the allotments is acceptable adjacent to the rail line.

Proposed Uses

- 8.47 The mix of uses proposed is acceptable.

Housing Provision

- 8.48 The housing provision overall is considered to be acceptable and meet the needs of the local community. The Greater Cambridge Housing Trajectory and Five Year Housing Land Supply Report (1 April 2022) concludes that the councils jointly have 6.5 years of housing land supply for the 2022-2027 five-year period. This conclusion is based on our five-year housing land supply being calculated jointly, using the Liverpool methodology, and applying a 5% buffer.

Mobility Hub

- 8.49 The height of the bulk of the building varies between 14.2m and 15.8m. The provision of space for amenity and retail uses to activate the ground floor along Station Row is considered essential in making the introduction of a multi-storey car park in this location acceptable. The additional floor to floor heights allow for the future conversion into alternative uses and this is supported. The external architecture, including the external staircase, together with the design, colour and proposed materials work well to achieve a well-considered and high quality multi storey car park design.

Affordable Housing

- 8.50 The provision of 40% affordable housing for the open market units and tenure mix and 20% affordable private rent for the Build to Rent (BtR) units is agreed.

Transport and Access

- 8.51 The methodology and extent of related surveys to assess the development impact by way of Transport Assessment (TA) is agreed as a basis to understand and assess the proposals.
- 8.52 An Outline Travel Plan (TP) has been prepared alongside the Transport Assessment. The requirement for a Full Travel Plan to be prepared and implemented will be secured through the Section 106 Agreement.
- 8.53 The level of car parking proposed is agreed for the development and the Railway Station and is within the car parking budget assigned to the Cambridge North allocation ('Chesterton Sidings' site) in the emerging NEC AAP.
- 8.54 The development is forecast to operate within the vehicle trip budget assigned to the Cambridge North allocation ('Chesterton Sidings' site) in the emerging NEC AAP. The amount of cycle parking proposed is in accordance with the requirements of SCLP Policies TI/2 and TI/3 and exceeds the level of provision suggested by the standards within LTN 1/20 for visitor provision. The mix of Sheffield stands, double stacked spaces, parking for non-standard cycles and parking at street level for the commercial uses; and, the principles of the cycle parking provision for the residential use are agreed.
- 8.55 The following matters are agreed:
- The quantum of cycle parking.
 - The office trip generation profile adopted by the assessment.
 - Assumptions on the level of car parking occupied prior to 0700 and the peak occupancy of 85%.
 - That the ground floor uses would not contribute to the vehicle trip generation assessment.
 - The residential trip generation profile.
 - The principle of the residential development being car free.
 - Junction capacity assessment is not required on the basis that the development operates within the LHA's vehicle trip budget.
 - The distribution of development trips.
 - The mode share of development trips.
- 8.56 The development proposes a suite of transport mitigation measures to encourage access to the site by sustainable modes of transport. The mechanisms and timing of these improvements and financial contributions will be secured by way of planning conditions and Section 106 Agreement.

- 8.57 It is agreed that the development is not anticipated to result in an unacceptable impact on road safety, and that the residual cumulative impacts of the development on the road network are not anticipated to be severe. It is agreed that any residual impacts that have been identified in the transport assessment can be adequately mitigated through the contribution to strategic off site transport infrastructure and the suite of measures proposed (once fully agreed).

Trees

- 8.58 The Appellant has completed a comprehensive tree survey and impact assessment. The LPA agrees with the findings of the survey, which concludes that there will be no impact upon trees of value.
- 8.59 The parties agree that there are no arboricultural constraints that preclude the proposed development and the proposals therefore accord with Policies NH/2, NH/6 and NH/8 of the Local Plan.

Flood Risk and Drainage

- 8.60 Further information was provided by the Appellant in the form of a Technical Note by PJA Civil Engineering Ltd, Ref:05425 Version E, Dated: 17 April 2023. This is enclosed at **Appendix 1**.
- 8.61 It is agreed that it has been demonstrated that the drainage system can be designed to accommodate the full 40% uplift for climate change allowances in the 1% Annual Exceedance Probability storm. This has increased attenuation areas, which can be accommodated within the Site.
- 8.62 It is therefore agreed the development is acceptable in respect of flood risk.
- 8.63 Accordingly, the LPA withdraws reason for refusal 6, will not defend it and will not offer any evidence in support of reason for refusal 6.

Safeguarded sites

- 8.64 Further information was provided by the Appellant in the form of a Technical Note T6118 by Temple Group Ltd dated 20 April 2023, included updated Proximity to Mineral Safeguarded Areas Plan (630.01(MP)024 Rev P2). This is enclosed at **Appendix 2**.
- 8.65 It is agreed that sufficient information has now been submitted to demonstrate that the interaction between the proposed commercial use and the aggregates railhead will not prejudice the existing or future uses of the transport infrastructure area.
- 8.66 Accordingly, the LPA withdraws reason for refusal 8, will not defend it and will not offer any evidence in support of reason for refusal 8.

Ecology

- 8.67 Further information was provided by the Appellant, including a Technical Note ECO00253 CN Phase 2 by RPS Consulting Services Ltd (RPS) dated 5 May 2023. The Technical Note is appended to the Proof of Evidence of Mike Barker but is also enclosed within this Statement of Common Ground at **Appendix 3** for completeness. The 2023 Bat Emergence Survey Report is also enclosed at **Appendix 4**.
- 8.68 It is agreed that the application now provides sufficient information to adequately assess the ecological impact of the proposals.
- 8.69 Accordingly, the LPA withdraws reason for refusal 7, will not defend it and will not offer any evidence in support of reason for refusal 7.

Comprehensive Development

- 8.70 With regard to reason for refusal 4 (comprehensive development), the relevant financial contributions to ensure the comprehensive development required through local plan policy SS/4, have continued to be discussed between the Council, Appellant and Cambridgeshire County Council. The Appellant and County Council have agreed a package of measures which includes strategic highway contributions which satisfy the provisions of SS/4.
- 8.71 Accordingly, the LPA withdraws reason for refusal 4, will not defend it and will not offer any evidence in support of reason for refusal 4.

Section 106 Agreement

- 8.72 The LPA has agreed that reason for refusal 5 will be withdrawn on signing of the Section 106 Agreement. Heads of terms for the Section 106 Agreement have been agreed between the parties.

Environmental Considerations

- 8.73 It is agreed there are no unacceptable impacts in terms of the following, subject to appropriate conditions;
- a) Air Quality
 - b) Vibration and Noise
 - c) Odour
 - d) Land Contamination
 - e) Lighting
 - f) Human Health
 - g) Archaeology
 - h) Utilities

- 8.74 The Environment Agency objected to the proposed development in a letter dated 27 February 2023 and stated that the proposals “*may, through the additional demand for potable water use, increase abstraction and risk deterioration to water bodies in the Greater Cambridge area*”.

Environmental Impact Assessment

- 8.75 The Appellant prepared an Environmental Statement in accordance with the Town and Country Planning (Environmental Impact Assessment) (EIA) Regulations 2017 (as amended).
- 8.76 The LPA agrees that the Environmental Statement [“ES”] was prepared in accordance with Scoping Opinion 21/05178/SCOP. The Environmental Statement considers the likely significant effects of the proposed development during its construction and once it is complete and operational.
- 8.77 It is agreed between the parties, that the Environmental Statement complies with the 2017 EIA Regulations.
- 8.78 A Statement of ES Conformity was submitted alongside a formal resubmission to ensure that the assessments and conclusions in the ES remain valid.

Benefits

- 8.79 It is agreed that the benefits arising from the scheme include:

Economic benefits:

- The provision of 48,347 sqm (NIA) of Grade A office, lab and R&D floorspace in North East Cambridge;
- Supporting the Cambridge innovation and tech cluster;
- The provision of 2,000 additional construction roles over the five-year construction period, equivalent of 202 FTE jobs (“full time equivalent”);
- After the site is complete and the development is fully operational, the provision of approximately 4,300 on-site additional jobs.

Social benefits:

- The delivery of a significant number of new homes (up to 425 units), including 40% affordable housing on the open market units (up to 62 units) and 20% affordable private rent on the Build to Rent units (up to 54);
- Provision of new areas of public realm and open space;
- Provision of amenity and meanwhile uses, including community and retail provision;
- Provision of buildings with facilities integrated to promote health and wellbeing and the provision of walking and cycling infrastructure;

Environmental benefits:

- Making use of previously developed land in an accessible and highly sustainable location;
- The delivery of a scheme with BREEAM 2018 Excellent certification as a minimum with an aspiration to target 'Outstanding' as the design develops. All offices designed to target an EPC rating of A. LETI 2025, or LETI 2030 targets for in-use emissions in residential buildings;
- The delivery of 80.27% biodiversity net gain across the Site;
- Provision of new areas of open space (2.005ha in total) including retained habitats and new/enhanced habitats;
- To facilitate a modal shift to non-car mode of transport, a wide range of measures are proposed to support public transport use and active travel.

9.0 Matters in Dispute

9.1 The Appellant and District Council dispute the following matters:

Development Plan

9.2 Whether the appeal proposal complies with the following policies;

- SS/4 : Cambridge Northern Fringe East and Cambridge North railway station;
 - Part 2
 - Part 4, sub paragraph (a)
 - Part 4, sub paragraph (c)
- HQ/1 : Design Principles;
- NH/2 : Protecting and Enhancing Landscape Character;
- NH/8 : Mitigating the Impact of Development in and adjoining the Green Belt; and
- NH/14 : Heritage Assets.

Regarding Reason for Refusal 1: The impact of the development on the landscape character and visual amenity of the area

9.3 That the proposals fail to enhance or preserve the character of the area and whether the proposals are not sympathetic to or in keeping with the Site's context in the wider landscape including the setting of the City.

9.4 That the appeal scheme is not considered to result in high quality development that delivers a well designed place that responds positively to the surrounding context. Whether the proposal is considered to have an overbearing presence on the existing development to the east of the development on Fen Road, along the River Cam Corridor, Fen Ditton and public rights of way and footpaths where the development is highly visible.

9.5 That the proposal is considered to have an overbearing presence on the existing residential development to the south and west of the development particularly on Discovery Way and Bourne Road/ Fairbairn Road/ Long Reach Road.

9.6 That the level of effect upon the surrounding landscape and Green Belt, particularly on the eastern edge of the Site, and to the urban area and its relationship with the wider North East Cambridge Area, the City skyline and the landscape beyond is not agreed.

Regarding Reason for Refusal 2: The impact on designated heritage assets

9.7 The parties do not agree as to the level of harm to the significance of the designated heritage assets within the "less than substantial harm" scale, for the purposes of the National Planning Policy Framework (NPPF). The LPA consider the level of harm to be at the moderate end of "less

than substantial". The Appellant considers the level of harm to be at the "very lowest end" of "less than substantial". Historic England considers there is "a moderate level of harm at a less than substantial level to the significance of Fen Ditton, Baits Bite Lock and Riverside and Stourbridge Common Conservation Areas".

9.8 That the public benefits of the proposal outweigh the heritage harm.

Regarding Reason for Refusal 3: Design

9.9 That the planning application fails to provide high quality public open space or a public realm which would result in a well-designed coherent sense of place that contributes to local distinctiveness.

9.10 That the proposals fail to provide sufficient formal children's play space which is convenient for residents to use, clearly distinguished from the public realm and not bisected by vehicular routes.

9.11 That the shape and form of buildings within the outline application are considered to appropriately respond to their locations and whether this results in potential incompatible building designs fronting streets and open spaces.

9.12 That Building S4 (One Milton Avenue) is overly large and bulky for its location, which its architectural detailing and articulation fails to overcome.

9.13 That the proposed development fails to provide convenient and accessible provision for cycle parking and does not sufficiently promote active travel. That there is an over reliance on two tier cycle parking provision and that there is a poor relationship of some cycle access points in relation to cycle ways.

9.14 That the proposed residential blocks provide acceptable levels of amenity for future occupiers of the Site with regards to the proportion of single aspect north-facing apartments.

Employment Need

9.15 The role of the Site in meeting employment need is not agreed.

9.16 In employment land need terms, whether there is a shortage of land for the proposed uses in the timeframe of project delivery.

9.17 In employment benefit terms, whether the net additionality of the proposal has been properly assessed in line with best practice (HM Treasury Green Book / HCA Additionality Guide) and what the implications are for the net employment benefit.

Overall Planning Balance

9.18 The weight to be attached to the benefits of the scheme.

The weight to be attached to the benefits is set out in Table 4 below.

Table 4 : Summary of weights attached to benefits

SUMMARY OF BENEFIT	APPELLANT'S WEIGHTING	LPA WEIGHTING
Economic		
Need for Offices, Labs and R&D Space	Great	Considerable
The 'cluster' effect	Considerable	Considerable
Additional Employment	Considerable	Considerable
Social		
Housing Need	Considerable	Considerable
Public Realm and Open Spaces	Considerable	Limited
Amenity and Meanwhile Uses	Moderate	Moderate
Wellbeing and Social Inclusion	Moderate	Limited
High Quality Infrastructure	Great	Moderate
Environmental		
Making effective use of land	Considerable	Not considered a benefit, no weight attached
Accessible and sustainable location	Great	Great
Response to the climate emergency	Great	Great
Response to the biodiversity emergency	Considerable	Considerable
Cumulative total	Very great	Considerable

10.0 Outline Heads of Terms

- 10.1 Heads of Terms for the Section 106 Agreement have been agreed between the parties – see separate Heads of Terms document.

11.0 Core Documents

- 11.1 To aid the Inspector and all those taking part with the Inquiry, it is proposed to adopt a single comprehensive set of core reference documents. The agreed Core Documents will be provided in due course.

**APPENDIX 1 : TECHNICAL NOTE BY PJA CIVIL
ENGINEERING LTD (REF:05425 VERSION E
DATED 17 APRIL 2023)**

Technical Note

Project: Cambridge North Development

Subject: LLFA Planning Objection

Client:	Brookgate	Version:	E
Project No:	05425	Author:	Malcolm Crowther
Date:	17/04/2023	Approved:	Andrea Nelmes

I Purpose of this Technical Note

1.1.1 This technical note has been written in response to the following documents:

- the objection received to the proposed Cambridge North development (planning reference 22/02771/OUT) from the Lead Local Flood Authority (LLFA) Cambridgeshire County Council dated 22/02/2023 with letter reference FR/22-000248 (refer to Appendix A for a copy of this letter).
- the consultation response from Cambridge City Council’s (CCC) Drainage Engineer dated 03/03/2023 recommending refusal (refer to Appendix A for a copy of this document).

1.1.2 This technical note addresses both responses which relate to the same issue.

1.1.3 The LLFA objection states the following:

Climate Change Allowances

‘Clarity on the climate change allowances utilised must be provided. It is noted that the commercial, retail and laboratory areas have only been accounted for a shorter lifetime than the surrounding residential areas, utilising a 20% climate change allowance on the 100 year storm. However, it is likely that these structures will be contributing to the impermeable areas for the lifetime of the development, either redeveloped or use of the buildings changed. Whilst it is acknowledged that the proposals include a sunken area for informal flooding, the proposed SuDS system on site should be designed to accommodate the lifetime that these areas will be impermeable and therefore contributing to the drained area.’

1.1.4 The CCC Drainage Engineer’s Response states the following:

Climate Change Allowances

The applicant is only using the 40% climate change allowance on the 1 in 100 year storm for a proportion of the development. The expected lifetime of this development in terms of the impermeable area created will be in excess of 100 years and therefore we do not support the use of the lower climate change allowances for the commercial and retail aspects of the proposal.

- 1.1.5 It is noted that either redevelopment or change of use of the commercial, retail and laboratory buildings would likely be subject to planning permission at the appropriate time in the future. This would typically be the time to design and retrofit additional surface water attenuation if required, taking into account any planning policy and guidance requirements relevant at that time.

2 Summary of Current Position

- 2.1.1 The current planning submission for the mixed-use development at Land North of Cambridge North Station, Milton Avenue, Cambridge includes the following supporting documents relating to flood risk and drainage:

- 1) Cambridge North Development Flood Risk Assessment and Drainage Strategy (document ref. 05425-R-03-C-FRA) dated June 2022
- 2) Cambridge North Development Flood Risk Assessment Addendum (document ref. 05425-R-04-D-FRA) dated October 2022

- 2.1.2 The climate change allowances applied to the peak rainfall intensities currently, as detailed within these documents, are as follows:

- Residential Development 1% annual exceedance rainfall event (AEP) **40%**
- Commercial and Retail Development 1% annual exceedance rainfall event (AEP) **25%**.

2.2 Relevant policy and guidance

- 2.2.1 The UK government advice on Flood Risk and Coastal Change (<https://www.gov.uk/guidance/flood-risk-and-coastal-change>) states in Paragraph 06 that *“Residential development can be assumed to have a lifetime of at least 100 years, unless there is specific justification for considering a different period. The lifetime of a non-residential development depends on the characteristics of that development but a period of at least 75 years is likely to form a starting point for assessment.”* 75 years would typically be at the upper end for lifespan for commercial buildings, particularly if they could be regarded as high specification such as laboratories. On this basis the design life for the proposed commercial buildings at

Cambridge North have been set within the timeframe of 50 to 75 years which indicates an end of lifespan before the year 2100.

2.2.2 The UK Government’s advice provided through the National Planning Practice Framework Planning Practice Guidance (NPPF PPG) on Flood risk assessments: Climate Change Allowances (<https://www.gov.uk/guidance/flood-risk-assessments-climate-change-allowances#peak-rainfall-intensity-allowance>) states that “For development with a lifetime between 2061 and 2100 take the same approach but use the central allowance for the 2070s epoch (2061 to 2125)” to determine the climate change allowance applied to the 1% annual exceedance rainfall event.

2.2.3 As shown on Figure 1 below, within the Cam and Ely Ouse Management Catchment, which the Site is located in, the climate change allowance set for the 2070s epoch is 25% for the 1% annual exceedance rainfall event. On this basis, an allowance of 25% has been applied to the surface water drainage system serving the non-residential area of the development as set out in the Cambridge North Flood Risk Assessment Addendum (document ref. 05425-R-04-D-FRA) dated October 2022.

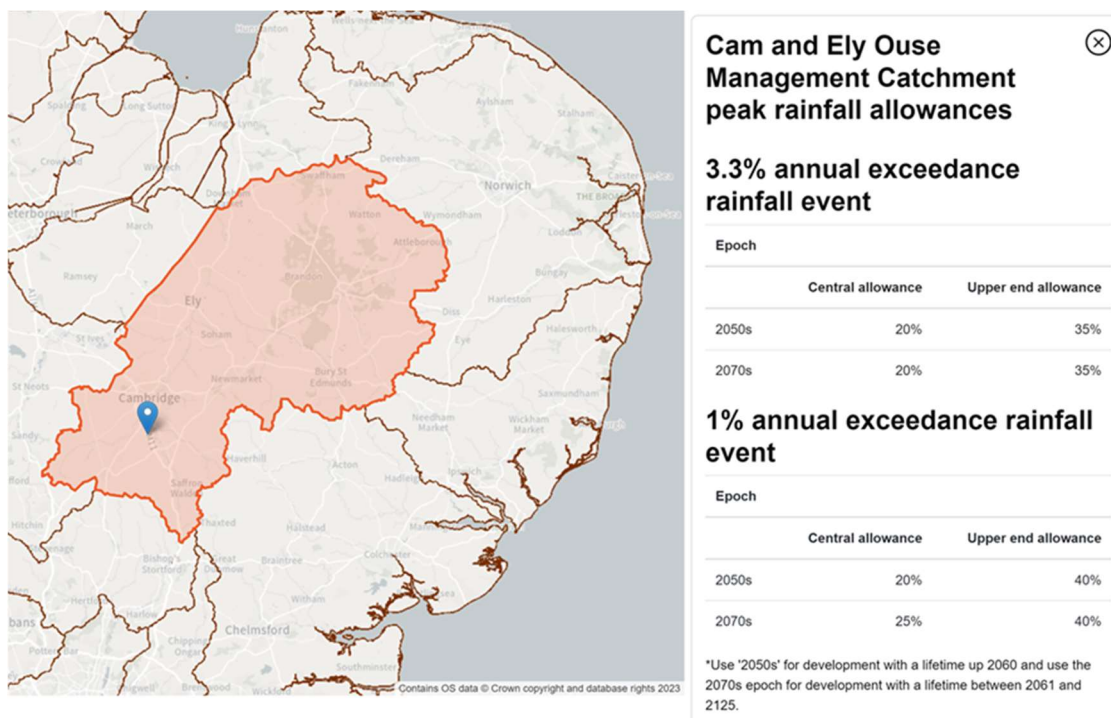


Figure 1 DEFRA’s Climate Change Allowances for the Cam and Ely Ouse Management Catchment

3 Amendments to the Drainage Strategy

- 3.1.1 It is therefore considered that the proposed Drainage Strategy for Cambridge North development as set out in the submitted document Cambridge North Flood Risk Assessment Addendum (document ref. 05425-R-04-D-FRA) dated October 2022, complies with relevant national policy and guidance in regard to climate change allowances.
- 3.1.2 The comments from the LLFA have been considered and to provide additional comfort the Appellant is prepared to accept a condition requiring compliance with the higher standard of flood protection requested. The condition would require the submission and approval of a detailed surface water drainage strategy and its subsequent implementation. The detailed strategy would be based on the revised proposals explained below.
- 3.1.3 The drainage strategy can be revised to provide additional surface water attenuation in the following locations (refer to Appendix B PJA Drawing 05425-C-1003):
- Catchment 1, additional tank volume under Busway hard shoulder and additional volume for the attenuation basin receiving the pumped flow;
 - Catchment 2, controlled surface flooding in the residential courtyard for events in excess of 1 in 100 years plus 20% climate change allowance replaced with additional below ground tank volume;
 - Catchment 3/7, additional tank volume under the highway north of Building S9; and
 - Catchment 4, additional tank volume under the highway adjacent to the railway lines.
- 3.1.4 The sunken area referred to in the LLFA objection for surface flooding has been replaced with additional below ground storage tank volume. MicroDrainage calculations confirming that a climate change allowance of 40% has been applied to the design of the surface water drainage system across the whole development are included in Appendix C..
- 3.1.5 As such, an update to the Flood Risk and Drainage Strategy can meet the requirements of the LLFA and CCC and address their objection. To demonstrate that this can be incorporated as part of the surface water drainage strategy and development layout, a draft update of the Surface Water Drainage Strategy drawing is included within Appendix B which identifies where the capacity of proposed SuDS features serving the commercial catchments can be increased to cater for the additional runoff as a direct result of the increase in climate change allowance.
- 3.1.6 Subject to approval of the final drainage strategy by CCC pursuant to the planning condition proposed above, the Appellant would like to retain flexibility to vary the design should a more efficient way of delivering the attenuation become apparent during detailed design. This would

not affect the commitment to meeting the 40% climate change design standard throughout the development.

4 Conclusion

4.1.1 It is considered therefore that the supporting evidence within the technical note demonstrates that the proposed surface water drainage strategy has been updated to cater for the 1% annual exceedance rainfall event with a 40% allowance for climate change allowance across the whole development:

- a Without increasing flood risk elsewhere; and
- b Ensuring the development will be safe from surface water flooding.

4.1.2 This technical note confirms that the additional surface water attenuation is:

- practically deliverable. The strategy has been cross-referenced against ecology, landscape, structural and utility constraints to ensure it is viable;
- results in no changes to the conclusions of the Environmental Statement which does not state specific climate change percentages or surface water attenuation volumes; and
- does not have any consequences for the remainder of the development/application documents.

4.1.3 On this basis it is considered that the objections of the LLFA and CCC can be addressed through a condition and their planning objection should be removed.



Appendix A LLFA's Planning Response

My ref: FR/22-000248
Your ref: 22/02771/OUT
Date: 22/02/2023
Doc no: 201108737
Officer: Harry Pickford
E Mail: harry.pickford@cambridgeshire.gov.uk

Steve Cox: Executive Director
Place and Sustainability
Planning, Growth & Environment

Fiona Bradley
Greater Cambridge Shared Planning
South Cambridge Hall
Cambourne Business Park
CB23 6EA

New Shire Hall
Emery Crescent
Enterprise Campus
Alconbury Weald
PE28 4YE

Proposal: A hybrid planning application for: a) An outline application (all matters reserved apart from access and landscaping) for the construction of: three new residential blocks providing for up to 425 residential units and providing flexible Class E and Class F uses on the ground floor (excluding Class E (g) (iii)); and two commercial buildings for Use Classes E(g) i(offices), ii (research and development) providing flexible Class E and Class F uses on the ground floor (excluding Class E (g) (iii)), together with the construction of basements for parking and building services, car and cycle parking and infrastructure works. b) A full application for the construction of three commercial buildings for Use Classes E(g) i (offices) ii (research and development), providing flexible Class E and Class F uses on the ground floor (excluding Class E (g) (iii)) with associated car and cycle

Land North Of Cambridge North Station Milton Avenue Cambridge

Comments from Lead Local Flood Authority (LLFA)

Dear Fiona,

Thank you for your re-consultation.

At present we **maintain our objection** to the grant of planning permission for the following reasons:

1. Climate Change Allowances

Clarity on the climate change allowances utilised must be provided. It is noted that the commercial, retail and laboratory areas have only been accounted for a shorter lifetime than the surrounding residential areas, utilising a 20% climate change allowance on the 100 year storm. However, it is likely that these structures will be contributing to the impermeable areas for the lifetime of the development, either redeveloped or use of the buildings changed. Whilst it is acknowledged that the proposals include a sunken area for informal flooding, the proposed SuDS system on site should be designed to accommodate the lifetime that these areas will be impermeable and therefore contributing to the drained area.

Informatives

Ordinary Watercourse Consent

Constructions or alterations within an ordinary watercourse (temporary or permanent) require consent from the Lead Local Flood Authority under the Land Drainage Act 1991. Ordinary watercourses include every river, drain, stream, ditch, dyke, sewer (other than public sewer) and passage through which water flows that do not form part of Main Rivers (Main Rivers are regulated by the Environment Agency). The applicant should refer to Cambridgeshire County Council's Culvert Policy for further guidance:

<https://www.cambridgeshire.gov.uk/business/planning-and-development/water-minerals-and-waste/watercourse-management/>

Please note the council does not regulate ordinary watercourses in Internal Drainage Board areas.

Green Roofs

All green roofs should be designed, constructed and maintained in line with the CIRIA SuDS Manual (C753) and the Green Roof Code (GRO).

Pollution Control

Surface water and groundwater bodies are highly vulnerable to pollution and the impact of construction activities. It is essential that the risk of pollution (particularly during the construction phase) is considered and mitigated appropriately. It is important to remember that flow within the watercourse is likely to vary by season and it could be dry at certain times throughout the year. Dry watercourses should not be overlooked as these watercourses may flow or even flood following heavy rainfall.

Yours sincerely,



Hilary Tandy
Flood Risk Business Manager

If you have any queries regarding this application, please contact the Officer named at the [top](#) of this letter (contact details are above).

Please note: We are reliant on the accuracy and completeness of the reports in undertaking our review and can take no responsibility for incorrect data or interpretation made by the authors.

Planning Consultation Response
(Planning Applications)



Responding Officer:	Rachel Veysey Sustainable Drainage Engineer
Date:	03/03/2023
Planning Ref No:	22/02771/OUT
Description of Development:	A hybrid planning application for: a) An outline application (all matters reserved apart from access and landscaping) for the construction of: three new residential blocks providing for up to 425 residential units and providing flexible Class E and Class F uses on the ground floor (excluding Class E (g) (iii)); and two commercial buildings for Use Classes E(g) i(offices), ii (research and development) providing flexible Class E and Class F uses on the ground floor (excluding Class E (g) (iii)),together with the construction of basements for parking and building services, car and cycle parking and infrastructure works. b) A full application for the construction of three commercial buildings for Use Classes E(g) i (offices) ii (research and development), providing flexible Class E and Class F uses on the ground floor (excluding Class E (g) (iii)) with associated car and cycle parking, the construction of a multi storey car and cycle park building, together with the construction of basements for parking and building services, car and cycle parking and associated landscaping, infrastructure works and demolition of existing structures. Land North Of Cambridge North Station Milton Avenue Cambridge Cambridgeshire

Cross one:

The development proposed is **acceptable** subject to the imposition of the condition(s) outlined below.

The development proposed is **unacceptable** and should be refused for the reason(s) set out below.

It is not possible to comment on the proposed development and the additional information set out below will be required in order to provide comments.

Comments

The following documents have been reviewed in assessing this application:

FRA Technical note: Cambridge North Development 13/10/2022

Planning Consultation Response (Planning Applications)

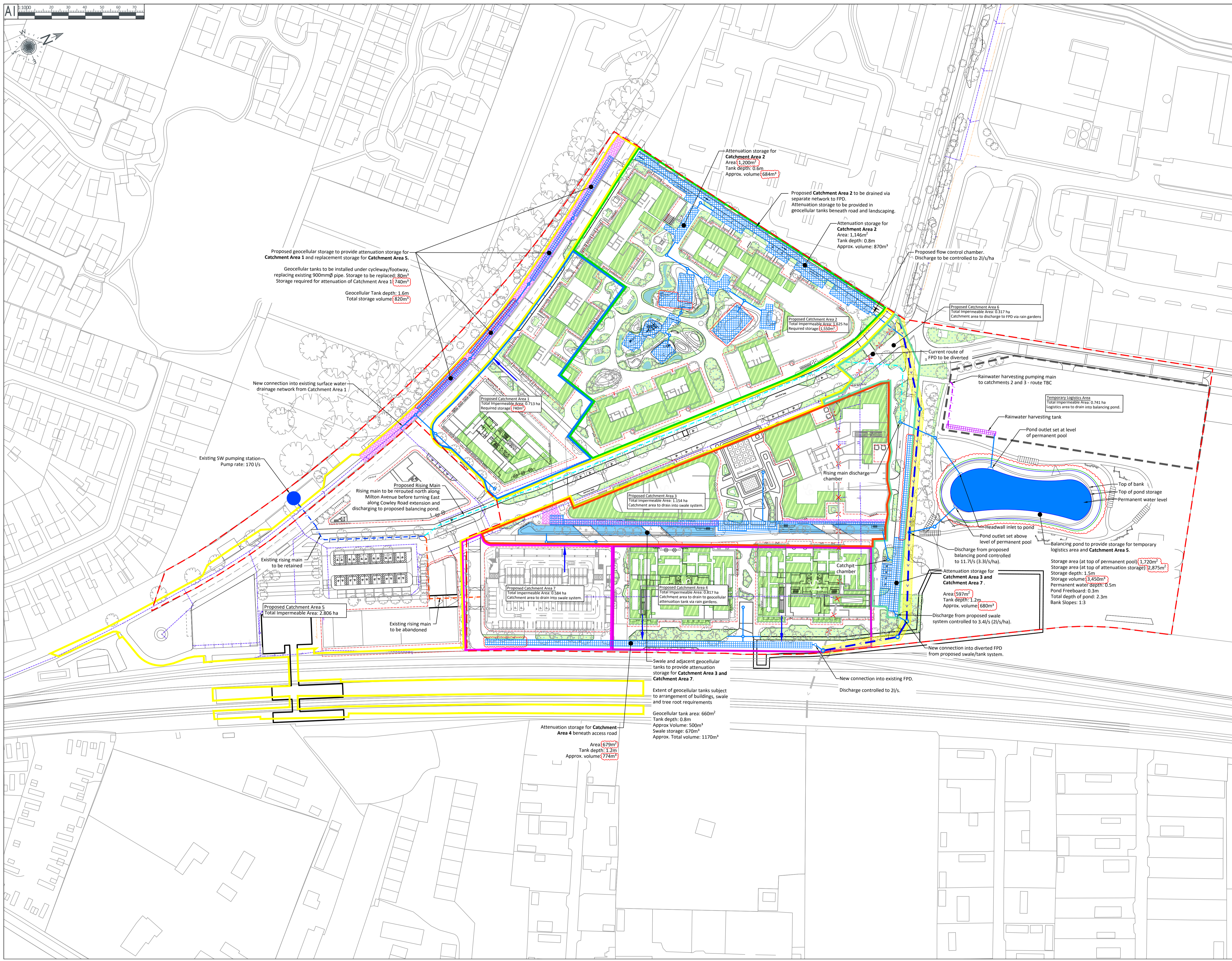
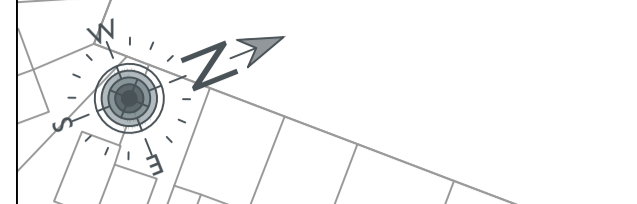


1. Climate change allowances

The applicant is only using the 40% climate change allowance on the 1 in 100 year storm for a proportion of the development. The expected lifetime of this development in terms of the impermeable area created will be in excess of 100 years and therefore we do not support the use of the lower climate change allowances for the commercial and retail aspects of the proposal.



Appendix B Updated Surface Water Drainage Strategy



NOTES
 These drawings have been produced with reference to the CDM Regulations 2015. Please note that these are pre-construction phase drawings and should be subject to further design risk management as required in accordance with Regulation 9

- NOTES**
1. Site layout provided by ACME (drawing ref. 239-ACME-PLA-500-0013 ILLUSTRATIVE MASTERPLAN - GROUND FLOOR) received 23/05/2022.
 2. The First Public Drain overflow culvert is under riparian ownership.
 3. Ordinary watercourse consent from Cambridgeshire County Council will be required for the First Public Drain overflow culvert diversion.
 4. Balancing pond is sized to attenuate runoff from the adjacent temporary logistics area North of Cowley Road in addition to the pumped flow from Catchment Area 1 and 5.
 5. Green / brown roofs to be provided on structures 54, 56, 57, 58 and 59/510.
 6. Existing rain gardens for highway drainage adjacent to Cowley Road to be retained.
 7. Tree pits to be provided with 'Arborcell' water attenuation within the sub-base.
 8. Drainage Strategy based on design return period of 100 years with a 40% allowance for climate change. For further details refer to the supporting Flood Risk Assessment (PIA ref. 05425-R-03-C), Flood Risk Assessment Addendum (PIA ref. 05425-R-04-D), and Technical Note (PIA ref. 05425-T-07-A).

- KEY**
- Catchment Area 1
 - Catchment Area 2
 - Catchment Area 3
 - Catchment Area 4
 - Catchment Area 5
 - Catchment Area 6
 - Catchment Area 7
 - Proposed Surface Water Drainage
 - Proposed Attenuation Tank
 - Proposed FPD Diversion
 - FPD 5m Easement
 - Proposed Attenuation Pond
 - Proposed Swale
 - Proposed Surface Water Rising Main
 - Existing Surface Water Rising Main to be Abandoned
 - Existing Surface Water Rising Main to be Retained
 - Proposed Green / Brown Roof Area
 - Proposed Rain Gardens
 - Proposed Permeable Paving
 - Proposed Rainwater Harvesting Tank
 - Proposed Rainwater Harvesting Pumped Outlet
 - Red Line Boundary

P8	23/03/23	Attenuation volumes amended as clouded	JG
P7	11/10/22	FPD diversion amended: Green roofs, rain gardens and permeable paving updated.	JG
P6	15/09/22	Catchment 1 attenuation storage updated	JG
P5	01/09/22	Updated according to LFLA comments: Indicative rainwater harvesting system shown.	JG
P4	27/05/22	Updated to suit revised site layout	JG
P3	30/03/22	Attenuation basin, residential attenuation tanks and rain gardens updated	DS
P2	15/02/22	Updated to suit revised masterplan	JG
P1	28/01/22	Drainage layout amended following masterplan update, attenuation basin revised, FPD easement added, Chesterton Square attenuation tank revised and green / brown roof area added	DS
P0	07/12/21	First Issue	DS

REVISION NOTE

PJA
 The Aquarium - King Street
 Reading - RG1 2AH
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 Exeter - London - Reading
 pja.co.uk

CLIENT
 Brookgate Ltd

PROJECT
 Cambridge North

DRAWING TITLE
 Proposed Drainage Strategy - Basin

DRAWING ISSUE STATUS
INFORMATION
 PJA JOB No. SUB-CODE
05425 - C - 1003 - P8
 Revision Letter: P - Prelim / A - Approval / T - Tender / C - Construction
 BIM DRAWING REFERENCE:

SCALE DRAWN REVIEWED DATE
 AI@1:1000 DS MC 07/12/2021

Appendix C MicroDrainage Calculations


Cascade Summary of Results for 05425 - Catchment 1.SRCX

Upstream Structures	Outflow To	Overflow To
(None)	05425 - Catchment 5 and temp logistics area.SRCX	(None)

Half Drain Time : 4944 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	4.174	0.474	0.0	1.0	1.0	219.2	O K
30 min Summer	4.312	0.612	0.0	1.0	1.0	282.9	O K
60 min Summer	4.446	0.746	0.0	1.0	1.0	345.1	O K
120 min Summer	4.636	0.936	0.0	1.1	1.1	433.1	O K
180 min Summer	4.752	1.052	0.0	1.2	1.2	486.5	O K
240 min Summer	4.830	1.130	0.0	1.2	1.2	522.6	O K
360 min Summer	4.924	1.224	0.0	1.2	1.2	566.3	O K
480 min Summer	4.976	1.276	0.0	1.3	1.3	590.5	O K
600 min Summer	5.007	1.307	0.0	1.3	1.3	604.5	O K
720 min Summer	5.025	1.325	0.0	1.3	1.3	612.8	O K
960 min Summer	5.039	1.339	0.0	1.3	1.3	619.3	O K
1440 min Summer	5.031	1.331	0.0	1.3	1.3	616.0	O K
2160 min Summer	4.992	1.292	0.0	1.3	1.3	597.9	O K
2880 min Summer	4.946	1.246	0.0	1.2	1.2	576.6	O K
4320 min Summer	4.872	1.172	0.0	1.2	1.2	542.0	O K
5760 min Summer	4.826	1.126	0.0	1.2	1.2	521.1	O K
7200 min Summer	4.803	1.103	0.0	1.2	1.2	510.5	O K
8640 min Summer	4.794	1.094	0.0	1.2	1.2	506.0	O K
10080 min Summer	4.794	1.094	0.0	1.2	1.2	506.2	O K
15 min Winter	4.231	0.531	0.0	1.0	1.0	245.6	O K
30 min Winter	4.385	0.685	0.0	1.0	1.0	317.0	O K
60 min Winter	4.536	0.836	0.0	1.0	1.0	386.7	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m³)	Discharge Volume (m³)	Time-Peak (mins)
15 min Summer	164.640	0.0	74.4	23
30 min Summer	106.400	0.0	73.5	38
60 min Summer	65.100	0.0	152.7	68
120 min Summer	41.090	0.0	170.7	128
180 min Summer	30.945	0.0	180.6	188
240 min Summer	25.060	0.0	186.7	248
360 min Summer	18.293	0.0	193.4	366
480 min Summer	14.453	0.0	196.4	486
600 min Summer	11.960	0.0	197.7	606
720 min Summer	10.208	0.0	197.9	726
960 min Summer	7.899	0.0	196.6	966
1440 min Summer	5.460	0.0	191.0	1444
2160 min Summer	3.762	0.0	371.5	2164
2880 min Summer	2.896	0.0	364.0	2880
4320 min Summer	2.033	0.0	345.4	3680
5760 min Summer	1.601	0.0	655.7	4440
7200 min Summer	1.349	0.0	648.5	5192
8640 min Summer	1.185	0.0	640.8	6048
10080 min Summer	1.071	0.0	628.1	6864
15 min Winter	164.640	0.0	71.8	23
30 min Winter	106.400	0.0	77.5	38
60 min Winter	65.100	0.0	161.3	68

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Seven House, High Street Longbridge Birmingham, B31 2UQ	05425 Attenuation Storage Catchment 1	
Date 23/03/2023 12:29 File 05425 - Catchment 1, 5 + LA	Designed by JG Checked by AN	
Innovyze	Source Control 2019.1	

Cascade Summary of Results for 05425 - Catchment 1.SRCX

Storm Event	Max Level (m)	Max Depth (m)	Max Infiltration (l/s)	Max Control (l/s)	Max Σ Outflow (l/s)	Max Volume (m ³)	Status
120 min Winter	4.750	1.050	0.0	1.2	1.2	485.7	O K
180 min Winter	4.880	1.180	0.0	1.2	1.2	546.0	O K
240 min Winter	4.968	1.268	0.0	1.3	1.3	586.7	O K
360 min Winter	5.076	1.376	0.0	1.3	1.3	636.4	O K
480 min Winter	5.136	1.436	0.0	1.3	1.3	664.2	O K
600 min Winter	5.171	1.471	0.0	1.3	1.3	680.7	O K
720 min Winter	5.193	1.493	0.0	1.4	1.4	690.8	O K
960 min Winter	5.212	1.512	0.0	1.4	1.4	699.5	O K
1440 min Winter	5.210	1.510	0.0	1.4	1.4	698.8	O K
2160 min Winter	5.177	1.477	0.0	1.3	1.3	683.2	O K
2880 min Winter	5.135	1.435	0.0	1.3	1.3	664.1	O K
4320 min Winter	5.061	1.361	0.0	1.3	1.3	629.7	O K
5760 min Winter	5.004	1.304	0.0	1.3	1.3	603.3	O K
7200 min Winter	4.977	1.277	0.0	1.3	1.3	590.6	O K
8640 min Winter	4.961	1.261	0.0	1.3	1.3	583.4	O K
10080 min Winter	4.955	1.255	0.0	1.3	1.3	580.8	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m ³)	Discharge Volume (m ³)	Time-Peak (mins)
120 min Winter	41.090	0.0	180.5	126
180 min Winter	30.945	0.0	190.9	186
240 min Winter	25.060	0.0	197.3	244
360 min Winter	18.293	0.0	204.1	362
480 min Winter	14.453	0.0	207.1	480
600 min Winter	11.960	0.0	208.2	600
720 min Winter	10.208	0.0	208.3	716
960 min Winter	7.899	0.0	206.5	952
1440 min Winter	5.460	0.0	199.9	1418
2160 min Winter	3.762	0.0	392.3	2104
2880 min Winter	2.896	0.0	383.4	2772
4320 min Winter	2.033	0.0	362.2	4064
5760 min Winter	1.601	0.0	696.2	4616
7200 min Winter	1.349	0.0	691.9	5544
8640 min Winter	1.185	0.0	683.0	6480
10080 min Winter	1.071	0.0	669.1	7368

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05425
Attenuation Storage
Catchment 1



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File 05425 - Catchment 1, 5 + LA

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Cascade Rainfall Details for 05425 - Catchment 1.SRCX

Rainfall Model	FEH	Winter Storms	Yes
Return Period (years)	100	Cv (Summer)	0.750
FEH Rainfall Version	2013	Cv (Winter)	0.840
Site Location	GB 547650 260850 TL 47650 60850	Shortest Storm (mins)	15
Data Type		Catchment Longest Storm (mins)	10080
Summer Storms	Yes	Climate Change %	+40

Time Area Diagram


Total Area (ha) 0.713

Time (mins)		Area	Time (mins)		Area
From:	To:	(ha)	From:	To:	(ha)
0	4	0.357	4	8	0.356

Time Area Diagram

Total Area (ha) 0.000

Time (mins)		Area
From:	To:	(ha)
0	4	0.000

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Cascade Model Details for 05425 - Catchment 1.SRCX

Storage is Online Cover Level (m) 6.500

Cellular Storage Structure

Invert Level (m) 3.700 Safety Factor 2.0
 Infiltration Coefficient Base (m/hr) 0.00000 Porosity 0.95
 Infiltration Coefficient Side (m/hr) 0.00000

Depth (m)	Area (m ²)	Inf. Area (m ²)	Depth (m)	Area (m ²)	Inf. Area (m ²)	Depth (m)	Area (m ²)	Inf. Area (m ²)
0.000	487.0	0.0	1.600	487.0	0.0	1.601	0.0	0.0

Hydro-Brake® Optimum Outflow Control

Unit Reference MD-SHE-0050-1400-1600-1400
 Design Head (m) 1.600
 Design Flow (l/s) 1.4
 Flush-Flo™ Calculated
 Objective Minimise upstream storage
 Application Surface
 Sump Available Yes
 Diameter (mm) 50
 Invert Level (m) 3.700
 Minimum Outlet Pipe Diameter (mm) 75
 Suggested Manhole Diameter (mm) 1200

Control Points	Head (m)	Flow (l/s)	Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	1.600	1.4	Kick-Flo®	0.443	0.8
Flush-Flo™	0.220	1.0	Mean Flow over Head Range	-	1.0

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	0.9	0.800	1.0	2.000	1.5	4.000	2.1	7.000	2.8
0.200	1.0	1.000	1.1	2.200	1.6	4.500	2.2	7.500	2.8
0.300	0.9	1.200	1.2	2.400	1.7	5.000	2.4	8.000	2.9
0.400	0.9	1.400	1.3	2.600	1.7	5.500	2.5	8.500	3.0
0.500	0.8	1.600	1.4	3.000	1.9	6.000	2.6	9.000	3.1
0.600	0.9	1.800	1.5	3.500	2.0	6.500	2.7	9.500	3.2

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Existing Network Details for Catchment 2

- Indicates pipe length does not match coordinates

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type
1.000	55.000#	0.225	244.4	0.255	5.00	0.0	0.600	o	375	Pipe/Conduit
1.001	37.026	0.200	185.1	0.900	0.00	0.0	0.600	o	375	Pipe/Conduit
2.000	37.213	0.300	124.0	0.130	5.00	0.0	0.600	o	300	Pipe/Conduit
2.001	45.168	0.325	139.0	0.000	0.00	0.0	0.600	o	300	Pipe/Conduit
1.002	121.860	0.160	761.6	0.340	0.00	0.0	0.600	o	375	Pipe/Conduit
1.003	22.445	0.220	102.0	0.000	0.00	0.0	0.600	o	150	Pipe/Conduit

Network Results Table

PN	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Vel (m/s)	Cap (l/s)
1.000	5.725	0.255	0.0	1.15	127.5
1.001	5.500	1.155	0.0	1.33	146.7
2.000	6.000	0.130	0.0	1.41	99.7
2.001	5.700	0.130	0.0	1.33	94.1
1.002	5.300	1.625	0.0	0.65	71.7
1.003	5.140	1.625	0.0	0.99	17.6

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Manhole Schedules for Catchment 2

MH Name	MH CL (m)	MH Depth (m)	MH Connection	MH Diam., L*W (mm)	Pipe Out		Pipes In			Backdrop (mm)
					PN	Invert Level (m)	Diameter (mm)	PN	Invert Level (m)	
S101	6.500	0.775	Open Manhole	1200	1.000	5.725	375			
S102	6.500	1.000	Open Manhole	1200	1.001	5.500	375	1.000	5.500	375
S103	7.200	1.200	Open Manhole	1200	2.000	6.000	300			
S104	7.200	1.500	Open Manhole	1200	2.001	5.700	300	2.000	5.700	300
S105	6.500	1.200	Open Manhole	1200	1.002	5.300	375	1.001	5.300	375
								2.001	5.375	300
S106	6.500	1.360	Open Manhole	1200	1.003	5.140	150	1.002	5.140	375
FPD	7.000	2.080	Open Manhole	0		OUTFALL		1.003	4.920	150

MH Name	Manhole Easting (m)	Manhole Northing (m)	Intersection Easting (m)	Intersection Northing (m)	Manhole Access	Layout (North)
S101	547445.102	260890.102	547445.102	260890.102	Required	
S102	547355.822	260888.402	547355.822	260888.402	Required	
S103	547318.715	260861.371	547318.715	260861.371	Required	
S104	547297.728	260892.101	547297.728	260892.101	Required	
S105	547334.337	260918.557	547334.337	260918.557	Required	
S106	547433.423	260989.493	547433.423	260989.493	Required	
FPD	547452.676	261001.029			No Entry	

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 Catchment 2
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PIPELINE SCHEDULES for Catchment 2

Upstream Manhole

- Indicates pipe length does not match coordinates

PN	Hyd Sect	Diam (mm)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
1.000	o	375	S101	6.500	5.725	0.400	Open Manhole	1200
1.001	o	375	S102	6.500	5.500	0.625	Open Manhole	1200
2.000	o	300	S103	7.200	6.000	0.900	Open Manhole	1200
2.001	o	300	S104	7.200	5.700	1.200	Open Manhole	1200
1.002	o	375	S105	6.500	5.300	0.825	Open Manhole	1200
1.003	o	150	S106	6.500	5.140	1.210	Open Manhole	1200

Downstream Manhole

PN	Length (m)	Slope (1:X)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
1.000	55.000#	244.4	S102	6.500	5.500	0.625	Open Manhole	1200
1.001	37.026	185.1	S105	6.500	5.300	0.825	Open Manhole	1200
2.000	37.213	124.0	S104	7.200	5.700	1.200	Open Manhole	1200
2.001	45.168	139.0	S105	6.500	5.375	0.825	Open Manhole	1200
1.002	121.860	761.6	S106	6.500	5.140	0.985	Open Manhole	1200
1.003	22.445	102.0	FPD	7.000	4.920	1.930	Open Manhole	0

Surcharged Outfall Details for Catchment 2

Outfall Pipe Number	Outfall Name	C. Level (m)	I. Level (m)	Min I. Level (m)	D, L (mm)	W (mm)
1.003	FPD	7.000	4.920	4.500	0	0

Datum (m) 0.000 Offset (mins) 0

Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)
1	5.482	19	5.482	37	5.482	55	5.482	73	5.482	91	5.482	109	5.482
2	5.482	20	5.482	38	5.482	56	5.482	74	5.482	92	5.482	110	5.482
3	5.482	21	5.482	39	5.482	57	5.482	75	5.482	93	5.482	111	5.482
4	5.482	22	5.482	40	5.482	58	5.482	76	5.482	94	5.482	112	5.482
5	5.482	23	5.482	41	5.482	59	5.482	77	5.482	95	5.482	113	5.482
6	5.482	24	5.482	42	5.482	60	5.482	78	5.482	96	5.482	114	5.482
7	5.482	25	5.482	43	5.482	61	5.482	79	5.482	97	5.482	115	5.482
8	5.482	26	5.482	44	5.482	62	5.482	80	5.482	98	5.482	116	5.482
9	5.482	27	5.482	45	5.482	63	5.482	81	5.482	99	5.482	117	5.482
10	5.482	28	5.482	46	5.482	64	5.482	82	5.482	100	5.482	118	5.482
11	5.482	29	5.482	47	5.482	65	5.482	83	5.482	101	5.482	119	5.482
12	5.482	30	5.482	48	5.482	66	5.482	84	5.482	102	5.482	120	5.482
13	5.482	31	5.482	49	5.482	67	5.482	85	5.482	103	5.482	121	5.482
14	5.482	32	5.482	50	5.482	68	5.482	86	5.482	104	5.482	122	5.482
15	5.482	33	5.482	51	5.482	69	5.482	87	5.482	105	5.482	123	5.482
16	5.482	34	5.482	52	5.482	70	5.482	88	5.482	106	5.482	124	5.482
17	5.482	35	5.482	53	5.482	71	5.482	89	5.482	107	5.482	125	5.482
18	5.482	36	5.482	54	5.482	72	5.482	90	5.482	108	5.482	126	5.482

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 Cambridge North
 Catchment 2



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Surcharged Outfall Details for Catchment 2

Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)
145	5.482	157	5.482	169	5.482	181	5.482	193	5.482	205	5.482	217	5.482
146	5.482	158	5.482	170	5.482	182	5.482	194	5.482	206	5.482	218	5.482
147	5.482	159	5.482	171	5.482	183	5.482	195	5.482	207	5.482	219	5.482
148	5.482	160	5.482	172	5.482	184	5.482	196	5.482	208	5.482	220	5.482
149	5.482	161	5.482	173	5.482	185	5.482	197	5.482	209	5.482	221	5.482
150	5.482	162	5.482	174	5.482	186	5.482	198	5.482	210	5.482	222	5.482
151	5.482	163	5.482	175	5.482	187	5.482	199	5.482	211	5.482	223	5.482
152	5.482	164	5.482	176	5.482	188	5.482	200	5.482	212	5.482	224	5.482
153	5.482	165	5.482	177	5.482	189	5.482	201	5.482	213	5.482	225	5.482
154	5.482	166	5.482	178	5.482	190	5.482	202	5.482	214	5.482	226	5.482
155	5.482	167	5.482	179	5.482	191	5.482	203	5.482	215	5.482	227	5.482
156	5.482	168	5.482	180	5.482	192	5.482	204	5.482	216	5.482	228	5.482

Simulation Criteria for Catchment 2

Volumetric Runoff Coeff 0.750 Additional Flow - % of Total Flow 0.000
 Areal Reduction Factor 1.000 MADD Factor * 10m³/ha Storage 2.000
 Hot Start (mins) 0 Inlet Coefficient 0.800
 Hot Start Level (mm) 0 Flow per Person per Day (l/per/day) 0.000
 Manhole Headloss Coeff (Global) 0.500 Run Time (mins) 60
 Foul Sewage per hectare (l/s) 0.000 Output Interval (mins) 1

Number of Input Hydrographs 0 Number of Offline Controls 0 Number of Time/Area Diagrams 0
 Number of Online Controls 1 Number of Storage Structures 2 Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model FEH Summer Storms Yes
 Return Period (years) 30 Winter Storms No
 FEH Rainfall Version 2013 Cv (Summer) 0.750
 Site Location GB 547650 260850 TL 47650 60850 Cv (Winter) 0.840
 Data Type Catchment Storm Duration (mins) 30

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Online Controls for Catchment 2

Hydro-Brake® Optimum Manhole: S106, DS/PN: 1.003, Volume (m³): 14.9

Unit Reference MD-SHE-0080-3200-1360-3200
 Design Head (m) 1.360
 Design Flow (l/s) 3.2
 Flush-Flo™ Calculated
 Objective Minimise upstream storage
 Application Surface
 Sump Available Yes
 Diameter (mm) 80
 Invert Level (m) 5.140
 Minimum Outlet Pipe Diameter (mm) 100
 Suggested Manhole Diameter (mm) 1200

Control Points	Head (m)	Flow (l/s)	Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	1.360	3.2	Kick-Flo®	0.711	2.4
Flush-Flo™	0.350	3.0	Mean Flow over Head Range	-	2.7

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	2.3	0.800	2.5	2.000	3.8	4.000	5.3	7.000	6.9
0.200	2.8	1.000	2.8	2.200	4.0	4.500	5.6	7.500	7.1
0.300	2.9	1.200	3.0	2.400	4.2	5.000	5.9	8.000	7.3
0.400	2.9	1.400	3.2	2.600	4.3	5.500	6.1	8.500	7.5
0.500	2.9	1.600	3.4	3.000	4.6	6.000	6.4	9.000	7.7
0.600	2.7	1.800	3.6	3.500	5.0	6.500	6.6	9.500	7.9

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Storage Structures for Catchment 2

Cellular Storage Manhole: S102, DS/PN: 1.001

Invert Level (m) 5.500 Safety Factor 2.0
Infiltration Coefficient Base (m/hr) 0.00000 Porosity 0.95
Infiltration Coefficient Side (m/hr) 0.00000

Depth (m)	Area (m ²)	Inf. Area (m ²)	Depth (m)	Area (m ²)	Inf. Area (m ²)	Depth (m)	Area (m ²)	Inf. Area (m ²)
0.000	1200.0	0.0	0.600	1200.0	0.0	0.601	0.0	0.0

Cellular Storage Manhole: S106, DS/PN: 1.003

Invert Level (m) 5.200 Safety Factor 2.0
Infiltration Coefficient Base (m/hr) 0.00000 Porosity 0.95
Infiltration Coefficient Side (m/hr) 0.00000

Depth (m)	Area (m ²)	Inf. Area (m ²)	Depth (m)	Area (m ²)	Inf. Area (m ²)	Depth (m)	Area (m ²)	Inf. Area (m ²)
0.000	1140.0	0.0	0.800	1140.0	0.0	0.801	0.0	0.0

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2 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Catchment 2

Simulation Criteria

Areal Reduction Factor 1.000 Additional Flow - % of Total Flow 0.000
 Hot Start (mins) 0 MADD Factor * 10m³/ha Storage 2.000
 Hot Start Level (mm) 0 Inlet Coefficient 0.800
 Manhole Headloss Coeff (Global) 0.500 Flow per Person per Day (l/per/day) 0.000
 Foul Sewage per hectare (l/s) 0.000

Number of Input Hydrographs 0 Number of Offline Controls 0 Number of Time/Area Diagrams 0
 Number of Online Controls 1 Number of Storage Structures 2 Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model FEH Data Type Catchment
 FEH Rainfall Version 2013 Cv (Summer) 0.750
 Site Location GB 547650 260850 TL 47650 60850 Cv (Winter) 0.840

Margin for Flood Risk Warning (mm) 300.0
 Analysis Timestep 2.5 Second Increment (Extended)
 DTS Status OFF
 DVD Status ON
 Inertia Status ON

Profile(s) Summer and Winter
 Duration(s) (mins) 15, 30, 60, 120, 240, 360, 480, 960, 1440, 2880
 Return Period(s) (years) 2, 30, 100
 Climate Change (%) 0, 35, 40

PN	US/MH Name	Duration (mins)	US/CL (m)	Water			Surcharged		Flooded		Pipe	Status
				Level (m)	Depth (m)	Volume (m³)	Flow / Cap.	Overflow (l/s)	Flow (l/s)			
1.000	S101	15	6.500	5.882	-0.218	0.000	0.36			42.8	OK	
1.001	S102	120	6.500	5.608	-0.267	0.000	0.18			24.4	OK	
2.000	S103	15	7.200	6.099	-0.201	0.000	0.23			21.5	OK	
2.001	S104	15	7.200	5.801	-0.199	0.000	0.24			21.3	OK	
1.002	S105	15	6.500	5.582	-0.093	0.000	0.79			54.8	OK	
1.003	S106	480	6.500	5.470	0.180	0.000	0.18			2.9	SURCHARGED	

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30 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Catchment 2

Simulation Criteria

Areal Reduction Factor 1.000 Additional Flow - % of Total Flow 0.000
 Hot Start (mins) 0 MADD Factor * 10m³/ha Storage 2.000
 Hot Start Level (mm) 0 Inlet Coefficient 0.800
 Manhole Headloss Coeff (Global) 0.500 Flow per Person per Day (l/per/day) 0.000
 Foul Sewage per hectare (l/s) 0.000

Number of Input Hydrographs 0 Number of Offline Controls 0 Number of Time/Area Diagrams 0
 Number of Online Controls 1 Number of Storage Structures 2 Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model FEH Data Type Catchment
 FEH Rainfall Version 2013 Cv (Summer) 0.750
 Site Location GB 547650 260850 TL 47650 60850 Cv (Winter) 0.840

Margin for Flood Risk Warning (mm) 300.0
 Analysis Timestep 2.5 Second Increment (Extended)
 DTS Status OFF
 DVD Status ON
 Inertia Status ON

Profile(s) Summer and Winter
 Duration(s) (mins) 15, 30, 60, 120, 240, 360, 480, 960, 1440, 2880
 Return Period(s) (years) 2, 30, 100
 Climate Change (%) 0, 35, 40

PN	US/MH Name	Duration (mins)	US/CL (m)	Water			Surcharged		Flooded		Pipe Flow (l/s)	Status
				Level (m)	Depth (m)	Volume (m³)	Flow / Cap.	Overflow (l/s)				
1.000	S101	15	6.500	6.151	0.051	0.000	1.09	129.4			SURCHARGED	
1.001	S102	120	6.500	5.855	-0.020	0.000	0.47	62.7			OK	
2.000	S103	15	7.200	6.357	0.057	0.000	0.73	67.4			SURCHARGED	
2.001	S104	15	7.200	6.198	0.198	0.000	0.80	70.1			SURCHARGED	
1.002	S105	15	6.500	6.032	0.357	0.000	1.57	108.6			SURCHARGED	
1.003	S106	960	6.500	5.826	0.536	0.000	0.18	2.9			SURCHARGED	

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100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Catchment 2

Simulation Criteria

Areal Reduction Factor 1.000 Additional Flow - % of Total Flow 0.000
 Hot Start (mins) 0 MADD Factor * 10m³/ha Storage 2.000
 Hot Start Level (mm) 0 Inlet Coefficient 0.800
 Manhole Headloss Coeff (Global) 0.500 Flow per Person per Day (l/per/day) 0.000
 Foul Sewage per hectare (l/s) 0.000

Number of Input Hydrographs 0 Number of Offline Controls 0 Number of Time/Area Diagrams 0
 Number of Online Controls 1 Number of Storage Structures 2 Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model FEH Data Type Catchment
 FEH Rainfall Version 2013 Cv (Summer) 0.750
 Site Location GB 547650 260850 TL 47650 60850 Cv (Winter) 0.840

Margin for Flood Risk Warning (mm) 300.0
 Analysis Timestep 2.5 Second Increment (Extended)
 DTS Status OFF
 DVD Status ON
 Inertia Status ON

Profile(s) Summer and Winter
 Duration(s) (mins) 15, 30, 60, 120, 240, 360, 480, 960, 1440, 2880
 Return Period(s) (years) 2, 30, 100
 Climate Change (%) 0, 35, 40

PN	US/MH Name	Duration (mins)	US/CL (m)	Water			Surcharged		Flooded		Pipe Flow (l/s)	Status
				Level (m)	Depth (m)	Volume (m³)	Flow / Cap.	Overflow (l/s)				
1.000	S101	15	6.500	6.398	0.298	0.000	1.48	176.3	FLOOD RISK			
1.001	S102	960	6.500	6.190	0.315	0.000	0.22	28.8	SURCHARGED			
2.000	S103	15	7.200	6.855	0.555	0.000	1.01	92.8	SURCHARGED			
2.001	S104	15	7.200	6.566	0.566	0.000	1.06	93.6	SURCHARGED			
1.002	S105	15	6.500	6.260	0.585	0.000	1.84	127.4	FLOOD RISK			
1.003	S106	960	6.500	6.334	1.044	0.000	0.18	2.9	FLOOD RISK			

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Existing Network Details for C3, C7

- Indicates pipe length does not match coordinates

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	n	HYD SECT	DIA (mm)	Section Type
1.000	11.189	0.050	223.8	0.584	5.00	0.0	0.600		o	450	Pipe/Conduit
1.001	108.847	0.025	4353.9	0.000	0.00	0.0		0.035	\/	-1	Pipe/Conduit
1.002	39.925	0.075	532.3	0.000	0.00	0.0		0.035	\/	-1	Pipe/Conduit
2.000	36.091	0.150	240.6	1.154	5.00	0.0	0.600		o	450	Pipe/Conduit
1.003	61.223	0.025	2448.9	0.000	0.00	0.0		0.035	\/	-1	Pipe/Conduit
1.004	15.766	0.025	630.6	0.000	0.00	0.0	0.600		o	375	Pipe/Conduit
1.005	37.018	0.250	148.1	0.000	0.00	0.0	0.600		o	150	Pipe/Conduit
1.006	3.845	0.025	153.8	0.000	0.00	0.0	0.600		o	150	Pipe/Conduit
1.007	57.619#	0.105	548.8	0.000	0.00	0.0	0.600		o	900	Pipe/Conduit

Network Results Table

PN	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Vel (m/s)	Cap (l/s)
1.000	5.100	0.584	0.0	1.35	215.5
1.001	5.050	0.584	0.0	0.34	1470.1
1.002	5.025	0.584	0.0	0.97	4204.3
2.000	5.100	1.154	0.0	1.31	207.7
1.003	4.950	1.738	0.0	0.45	1960.2
1.004	4.925	1.738	0.0	0.71	78.9
1.005	4.900	1.738	0.0	0.82	14.6
1.006	4.650	1.738	0.0	0.81	14.3
1.007	4.425	1.738	0.0	1.33	846.4

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Manhole Schedules for C3, C7

MH Name	MH CL (m)	MH Depth (m)	MH Connection	MH Diam.,L*W (mm)	Pipe Out			Pipes In			Backdrop (mm)
					PN	Invert Level (m)	Diameter (mm)	PN	Invert Level (m)	Diameter (mm)	
S5	6.500	1.400	Open Manhole	1200	1.000	5.100	450				
SwaleA	6.250	1.200	Open Manhole	1	1.001	5.050	-1	1.000	5.050	450	
SwaleB	6.200	1.175	Open Manhole	1	1.002	5.025	-1	1.001	5.025	-1	
S8S9S10	6.500	1.400	Open Manhole	1200	2.000	5.100	450				
SwaleC	6.150	1.200	Open Manhole	1	1.003	4.950	-1	1.002	4.950	-1	
								2.000	4.950	450	
SwaleEnd	6.125	1.200	Open Manhole	1	1.004	4.925	375	1.003	4.925	-1	
FlowControll	6.500	1.600	Open Manhole	1200	1.005	4.900	150	1.004	4.900	375	
Outfall	6.500	1.850	Open Manhole	1200	1.006	4.650	150	1.005	4.650	150	
FPDDiv1	6.500	2.075	Open Manhole	1800	1.007	4.425	900	1.006	4.625	150	
FPD	7.000	2.680	Open Manhole	0		OUTFALL		1.007	4.320	900	

MH Name	Manhole Easting (m)	Manhole Northing (m)	Intersection Easting (m)	Intersection Northing (m)	Manhole Access	Layout (North)
S5	547488.260	260746.143	547488.260	260746.143	Required	
SwaleA	547478.608	260751.803	547478.608	260751.803	Required	
SwaleB	547519.471	260852.688	547519.471	260852.688	Required	
S8S9S10	547496.771	260894.067	547496.771	260894.067	Required	
SwaleC	547532.672	260890.367	547532.672	260890.367	Required	
SwaleEnd	547555.721	260947.086	547555.721	260947.086	Required	
FlowControll	547571.045	260950.791	547571.045	260950.791	Required	
Outfall	547605.029	260936.114	547605.029	260936.114	Required	
FPDDiv1	547607.800	260938.779	547607.800	260938.779	Required	
FPD	547630.987	260868.930			No Entry	

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PIPELINE SCHEDULES for C3, C7

Upstream Manhole

- Indicates pipe length does not match coordinates

PN	Hyd Sect	Diam (mm)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
1.000	o	450	S5	6.500	5.100	0.950	Open Manhole	1200
1.001	\/	-1	SwaleA	6.250	5.050	0.000	Open Manhole	1
1.002	\/	-1	SwaleB	6.200	5.025	-0.025	Open Manhole	1
2.000	o	450	S8S9S10	6.500	5.100	0.950	Open Manhole	1200
1.003	\/	-1	SwaleC	6.150	4.950	0.000	Open Manhole	1
1.004	o	375	SwaleEnd	6.125	4.925	0.825	Open Manhole	1
1.005	o	150	FlowControl1	6.500	4.900	1.450	Open Manhole	1200
1.006	o	150	Outfall	6.500	4.650	1.700	Open Manhole	1200
1.007	o	900	FPDDiv1	6.500	4.425	1.175	Open Manhole	1800

Downstream Manhole

PN	Length (m)	Slope (1:X)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
1.000	11.189	223.8	SwaleA	6.250	5.050	0.750	Open Manhole	1
1.001	108.847	4353.9	SwaleB	6.200	5.025	-0.025	Open Manhole	1
1.002	39.925	532.3	SwaleC	6.150	4.950	0.000	Open Manhole	1
2.000	36.091	240.6	SwaleC	6.150	4.950	0.750	Open Manhole	1
1.003	61.223	2448.9	SwaleEnd	6.125	4.925	0.000	Open Manhole	1
1.004	15.766	630.6	FlowControl1	6.500	4.900	1.225	Open Manhole	1200
1.005	37.018	148.1	Outfall	6.500	4.650	1.700	Open Manhole	1200
1.006	3.845	153.8	FPDDiv1	6.500	4.625	1.725	Open Manhole	1800
1.007	57.619#	548.8	FPD	7.000	4.320	1.780	Open Manhole	0

Surcharged Outfall Details for C3, C7

Outfall Pipe Number	Outfall Name	C. Level (m)	I. Level (m)	Min I. Level (m)	D, L (mm)	W (mm)
1.007	FPD	7.000	4.320	0.000	0	0

Datum (m) 0.000 Offset (mins) 0

Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)
1	5.240	13	5.240	25	5.240	37	5.240	49	5.240	61	5.240	73	5.240
2	5.240	14	5.240	26	5.240	38	5.240	50	5.240	62	5.240	74	5.240
3	5.240	15	5.240	27	5.240	39	5.240	51	5.240	63	5.240	75	5.240
4	5.240	16	5.240	28	5.240	40	5.240	52	5.240	64	5.240	76	5.240
5	5.240	17	5.240	29	5.240	41	5.240	53	5.240	65	5.240	77	5.240
6	5.240	18	5.240	30	5.240	42	5.240	54	5.240	66	5.240	78	5.240
7	5.240	19	5.240	31	5.240	43	5.240	55	5.240	67	5.240	79	5.240
8	5.240	20	5.240	32	5.240	44	5.240	56	5.240	68	5.240	80	5.240
9	5.240	21	5.240	33	5.240	45	5.240	57	5.240	69	5.240	81	5.240
10	5.240	22	5.240	34	5.240	46	5.240	58	5.240	70	5.240	82	5.240
11	5.240	23	5.240	35	5.240	47	5.240	59	5.240	71	5.240	83	5.240
12	5.240	24	5.240	36	5.240	48	5.240	60	5.240	72	5.240	84	5.240

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Surcharged Outfall Details for C3, C7

Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)
97	5.240	115	5.240	133	5.240	151	5.240	169	5.240	187	5.240	205	5.240
98	5.240	116	5.240	134	5.240	152	5.240	170	5.240	188	5.240	206	5.240
99	5.240	117	5.240	135	5.240	153	5.240	171	5.240	189	5.240	207	5.240
100	5.240	118	5.240	136	5.240	154	5.240	172	5.240	190	5.240	208	5.240
101	5.240	119	5.240	137	5.240	155	5.240	173	5.240	191	5.240	209	5.240
102	5.240	120	5.240	138	5.240	156	5.240	174	5.240	192	5.240	210	5.240
103	5.240	121	5.240	139	5.240	157	5.240	175	5.240	193	5.240	211	5.240
104	5.240	122	5.240	140	5.240	158	5.240	176	5.240	194	5.240	212	5.240
105	5.240	123	5.240	141	5.240	159	5.240	177	5.240	195	5.240	213	5.240
106	5.240	124	5.240	142	5.240	160	5.240	178	5.240	196	5.240	214	5.240
107	5.240	125	5.240	143	5.240	161	5.240	179	5.240	197	5.240	215	5.240
108	5.240	126	5.240	144	5.240	162	5.240	180	5.240	198	5.240	216	5.240
109	5.240	127	5.240	145	5.240	163	5.240	181	5.240	199	5.240	217	5.240
110	5.240	128	5.240	146	5.240	164	5.240	182	5.240	200	5.240	218	5.240
111	5.240	129	5.240	147	5.240	165	5.240	183	5.240	201	5.240	219	5.240
112	5.240	130	5.240	148	5.240	166	5.240	184	5.240	202	5.240	220	5.240
113	5.240	131	5.240	149	5.240	167	5.240	185	5.240	203	5.240	221	5.240
114	5.240	132	5.240	150	5.240	168	5.240	186	5.240	204	5.240	222	5.240

Simulation Criteria for C3, C7

Volumetric Runoff Coeff 0.750 Additional Flow - % of Total Flow 0.000
Areal Reduction Factor 1.000 MADD Factor * 10m³/ha Storage 2.000
Hot Start (mins) 0 Inlet Coefficient 0.800
Hot Start Level (mm) 0 Flow per Person per Day (l/per/day) 0.000
Manhole Headloss Coeff (Global) 0.500 Run Time (mins) 60
Foul Sewage per hectare (l/s) 0.000 Output Interval (mins) 1

Number of Input Hydrographs 0 Number of Offline Controls 0 Number of Time/Area Diagrams 0
Number of Online Controls 1 Number of Storage Structures 2 Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model FEH Summer Storms Yes
Return Period (years) 30 Winter Storms No
FEH Rainfall Version 2013 Cv (Summer) 0.750
Site Location GB 547650 260850 TL 47650 60850 Cv (Winter) 0.840
Data Type Catchment Storm Duration (mins) 30

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05425
 Cambridge North
 Catchments 3 and 7



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Online Controls for C3, C7

Hydro-Brake® Optimum Manhole: FlowControll1, DS/PN: 1.005, Volume (m³): 3.5

Unit Reference MD-SHE-0084-3400-1225-3400
 Design Head (m) 1.225
 Design Flow (l/s) 3.4
 Flush-Flo™ Calculated
 Objective Minimise upstream storage
 Application Surface
 Sump Available Yes
 Diameter (mm) 84
 Invert Level (m) 4.900
 Minimum Outlet Pipe Diameter (mm) 100
 Suggested Manhole Diameter (mm) 1200

Control Points	Head (m)	Flow (l/s)	Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	1.225	3.4	Kick-Flo®	0.753	2.7
Flush-Flo™	0.370	3.4	Mean Flow over Head Range	-	3.0

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	2.5	0.800	2.8	2.000	4.3	4.000	5.9	7.000	7.7
0.200	3.2	1.000	3.1	2.200	4.5	4.500	6.2	7.500	7.9
0.300	3.4	1.200	3.4	2.400	4.6	5.000	6.5	8.000	8.2
0.400	3.4	1.400	3.6	2.600	4.8	5.500	6.8	8.500	8.4
0.500	3.3	1.600	3.8	3.000	5.1	6.000	7.1	9.000	8.7
0.600	3.2	1.800	4.1	3.500	5.5	6.500	7.4	9.500	8.9

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Storage Structures for C3, C7

Cellular Storage Manhole: S8S9S10, DS/PN: 2.000

Invert Level (m) 5.100 Safety Factor 2.0
Infiltration Coefficient Base (m/hr) 0.00000 Porosity 0.95
Infiltration Coefficient Side (m/hr) 0.00000

Depth (m)	Area (m ²)	Inf. Area (m ²)	Depth (m)	Area (m ²)	Inf. Area (m ²)	Depth (m)	Area (m ²)	Inf. Area (m ²)
0.000	330.0	0.0	0.800	330.0	0.0	0.801	0.0	0.0

Cellular Storage Manhole: FlowControll1, DS/PN: 1.005

Invert Level (m) 4.900 Safety Factor 2.0
Infiltration Coefficient Base (m/hr) 0.00000 Porosity 0.95
Infiltration Coefficient Side (m/hr) 0.00000

Depth (m)	Area (m ²)	Inf. Area (m ²)	Depth (m)	Area (m ²)	Inf. Area (m ²)	Depth (m)	Area (m ²)	Inf. Area (m ²)
0.000	597.0	0.0	1.200	597.0	0.0	1.201	0.0	0.0

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2 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for C3, C7

Simulation Criteria

Areal Reduction Factor 1.000 Additional Flow - % of Total Flow 0.000
 Hot Start (mins) 0 MADD Factor * 10m³/ha Storage 2.000
 Hot Start Level (mm) 0 Inlet Coefficient 0.800
 Manhole Headloss Coeff (Global) 0.500 Flow per Person per Day (l/per/day) 0.000
 Foul Sewage per hectare (l/s) 0.000

Number of Input Hydrographs 0 Number of Offline Controls 0 Number of Time/Area Diagrams 0
 Number of Online Controls 1 Number of Storage Structures 2 Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model FEH Data Type Catchment
 FEH Rainfall Version 2013 Cv (Summer) 0.750
 Site Location GB 547650 260850 TL 47650 60850 Cv (Winter) 0.840

Margin for Flood Risk Warning (mm) 300.0
 Analysis Timestep 2.5 Second Increment (Extended)
 DTS Status OFF
 DVD Status ON
 Inertia Status ON

Profile(s) Summer and Winter
 Duration(s) (mins) 15, 30, 60, 120, 240, 360, 480, 960, 1440, 2880
 Return Period(s) (years) 2, 30, 100
 Climate Change (%) 0, 35, 40

PN	US/MH Name	Duration (mins)	US/CL (m)	Water Surcharged Flooded			Pipe		Status
				Level (m)	Depth (m)	Volume (m³)	Flow / Overflow Cap. (l/s)	Flow (l/s)	
1.000	S5	15	6.500	5.364	-0.186	0.000	0.63	97.1	OK
1.001	SwaleA	480	6.250	5.300	-0.950	0.000	0.00	12.4	OK
1.002	SwaleB	480	6.200	5.300	-0.925	0.000	0.00	9.7	OK
2.000	S8S9S10	120	6.500	5.305	-0.245	0.000	0.25	46.2	OK
1.003	SwaleC	480	6.150	5.300	-0.850	0.000	0.01	28.4	OK
1.004	SwaleEnd	480	6.125	5.300	0.000	0.000	0.55	24.9	OK
1.005	FlowControll	480	6.500	5.296	0.246	0.000	0.24	3.4	SURCHARGED
1.006	Outfall	240	6.500	5.242	0.442	0.000	1.62	17.5	SURCHARGED
1.007	FPDDiv1	240	6.500	5.240	-0.085	0.000	0.04	25.7	OK

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30 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for C3, C7

Simulation Criteria

Areal Reduction Factor 1.000 Additional Flow - % of Total Flow 0.000
Hot Start (mins) 0 MADD Factor * 10m³/ha Storage 2.000
Hot Start Level (mm) 0 Inlet Coefficient 0.800
Manhole Headloss Coeff (Global) 0.500 Flow per Person per Day (l/per/day) 0.000
Foul Sewage per hectare (l/s) 0.000

Number of Input Hydrographs 0 Number of Offline Controls 0 Number of Time/Area Diagrams 0
Number of Online Controls 1 Number of Storage Structures 2 Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model FEH Data Type Catchment
FEH Rainfall Version 2013 Cv (Summer) 0.750
Site Location GB 547650 260850 TL 47650 60850 Cv (Winter) 0.840

Margin for Flood Risk Warning (mm) 300.0
Analysis Timestep 2.5 Second Increment (Extended)
DTS Status OFF
DVD Status ON
Inertia Status ON

Profile(s) Summer and Winter
Duration(s) (mins) 15, 30, 60, 120, 240, 360, 480, 960, 1440, 2880
Return Period(s) (years) 2, 30, 100
Climate Change (%) 0, 35, 40

PN	US/MH Name	Duration (mins)	US/CL (m)	Water Surcharged Flooded			Pipe		Status
				Level (m)	Depth (m)	Volume (m ³)	Flow / Cap.	Overflow (l/s)	
1.000	S5	15	6.500	5.801	0.251	0.000	2.02	311.0	SURCHARGED
1.001	SwaleA	960	6.250	5.789	-0.461	0.000	0.01	18.5	OK
1.002	SwaleB	960	6.200	5.789	-0.436	0.000	0.00	14.0	OK
2.000	S8S9S10	960	6.500	5.790	0.240	0.000	0.17	31.3	SURCHARGED
1.003	SwaleC	960	6.150	5.789	-0.361	0.000	0.01	33.1	OK
1.004	SwaleEnd	960	6.125	5.789	0.489	0.000	0.67	30.3	SURCHARGED
1.005	FlowControll	960	6.500	5.787	0.737	0.000	0.24	3.4	SURCHARGED
1.006	Outfall	240	6.500	5.249	0.449	0.000	1.74	18.9	SURCHARGED
1.007	FPDDiv1	240	6.500	5.243	-0.082	0.000	0.04	27.8	OK

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100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for C3, C7

Simulation Criteria

Areal Reduction Factor 1.000 Additional Flow - % of Total Flow 0.000
 Hot Start (mins) 0 MADD Factor * 10m³/ha Storage 2.000
 Hot Start Level (mm) 0 Inlet Coefficient 0.800
 Manhole Headloss Coeff (Global) 0.500 Flow per Person per Day (l/per/day) 0.000
 Foul Sewage per hectare (l/s) 0.000

Number of Input Hydrographs 0 Number of Offline Controls 0 Number of Time/Area Diagrams 0
 Number of Online Controls 1 Number of Storage Structures 2 Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model FEH Data Type Catchment
 FEH Rainfall Version 2013 Cv (Summer) 0.750
 Site Location GB 547650 260850 TL 47650 60850 Cv (Winter) 0.840

Margin for Flood Risk Warning (mm) 300.0
 Analysis Timestep 2.5 Second Increment (Extended)
 DTS Status OFF
 DVD Status ON
 Inertia Status ON

Profile(s) Summer and Winter
 Duration(s) (mins) 15, 30, 60, 120, 240, 360, 480, 960, 1440, 2880
 Return Period(s) (years) 2, 30, 100
 Climate Change (%) 0, 35, 40

PN	US/MH Name	Duration (mins)	US/CL (m)	Water Surcharged Flooded			Pipe		Status
				Level (m)	Depth (m)	Volume (m³)	Flow / Overflow Cap. (l/s)	Flow (l/s)	
1.000	S5	960	6.500	6.132	0.582	0.000	0.17	26.7	SURCHARGED
1.001	SwaleA	960	6.250	6.132	-0.118	0.000	0.01	26.7	FLOOD RISK
1.002	SwaleB	960	6.200	6.131	-0.094	0.000	0.00	14.4	FLOOD RISK
2.000	S8S9S10	960	6.500	6.132	0.582	0.000	0.24	44.7	SURCHARGED
1.003	SwaleC	960	6.150	6.131	-0.019	0.000	0.02	44.2	FLOOD RISK
1.004	SwaleEnd	960	6.125	6.122	0.822	0.000	0.74	33.5	FLOOD RISK
1.005	FlowControll	960	6.500	6.267	1.217	0.000	0.24	3.4	FLOOD RISK
1.006	Outfall	240	6.500	5.249	0.449	0.000	1.74	18.8	SURCHARGED
1.007	FPDDiv1	120	6.500	5.243	-0.082	0.000	0.00	3.4	OK

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Catchment 4



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Existing Network Details for C4

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type
1.000	45.087	0.050	901.7	0.409	5.00	0.0	0.600	o	450	Pipe/Conduit
1.001	5.364	0.041	130.8	0.408	0.00	0.0	0.600	o	150	Pipe/Conduit
1.002	31.680	0.059	536.9	0.000	0.00	0.0	0.600	[]	-2	Pipe/Conduit

Network Results Table

PN	US/IL (m)	I.Area (ha)	E Base Flow (l/s)	Vel (m/s)	Cap (l/s)
1.000	4.650	0.409	0.0	0.67	106.4
1.001	4.350	0.817	0.0	0.88	15.5
1.002	4.309	0.817	0.0	1.63	2516.0

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Manhole Schedules for C4

MH Name	MH CL (m)	MH Depth (m)	MH Connection	MH Diam., L*W (mm)	PN	Pipe Out Invert Level (m)	Pipe Out Diameter (mm)	Pipes In PN	Pipes In Invert Level (m)	Pipes In Diameter (mm)	Backdrop (mm)
S6S7	6.500	1.850	Open Manhole	1200	1.000	4.650	450				
FlowControl	6.500	2.150	Open Manhole	1200	1.001	4.350	150	1.000	4.600	450	550
FPD1	6.500	2.191	Open Manhole	1	1.002	4.309	-2	1.001	4.309	150	
FPD2	7.000	2.750	Open Manhole	0		OUTFALL		1.002	4.250	-2	

MH Name	Manhole Easting (m)	Manhole Northing (m)	Intersection Easting (m)	Intersection Northing (m)	Manhole Access	Layout (North)
S6S7	547586.587	260843.244	547586.587	260843.244	Required	
FlowControl	547603.396	260885.080	547603.396	260885.080	Required	
FPD1	547606.718	260889.292	547606.718	260889.292	Required	
FPD2	547630.987	260868.930			No Entry	

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PIPELINE SCHEDULES for C4

Upstream Manhole

PN	Hyd Sect	Diam (mm)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
1.000	o	450	S6S7	6.500	4.650	1.400	Open Manhole	1200
1.001	o	150	FlowControl	6.500	4.350	2.000	Open Manhole	1200
1.002	[]	-2	FPD1	6.500	4.309	1.091	Open Manhole	1

Downstream Manhole

PN	Length (m)	Slope (1:X)	MH Name	C.Level (m)	I.Level (m)	D.Depth (m)	MH Connection	MH DIAM., L*W (mm)
1.000	45.087	901.7	FlowControl	6.500	4.600	1.450	Open Manhole	1200
1.001	5.364	130.8	FPD1	6.500	4.309	2.041	Open Manhole	1
1.002	31.680	536.9	FPD2	7.000	4.250	1.650	Open Manhole	0

Surcharged Outfall Details for C4

Outfall Pipe Number	Outfall Name	C. Level (m)	I. Level (m)	Min I. Level (m)	D,L (mm)	W (mm)
1.002	FPD2	7.000	4.250	4.500	0	0

Datum (m) 0.000 Offset (mins) 0

Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)	Time (mins)	Depth (m)
1	5.612	31	5.612	61	5.612	91	5.612	121	5.612	151	5.612	181	5.612
2	5.612	32	5.612	62	5.612	92	5.612	122	5.612	152	5.612	182	5.612
3	5.612	33	5.612	63	5.612	93	5.612	123	5.612	153	5.612	183	5.612
4	5.612	34	5.612	64	5.612	94	5.612	124	5.612	154	5.612	184	5.612
5	5.612	35	5.612	65	5.612	95	5.612	125	5.612	155	5.612	185	5.612
6	5.612	36	5.612	66	5.612	96	5.612	126	5.612	156	5.612	186	5.612
7	5.612	37	5.612	67	5.612	97	5.612	127	5.612	157	5.612	187	5.612
8	5.612	38	5.612	68	5.612	98	5.612	128	5.612	158	5.612	188	5.612
9	5.612	39	5.612	69	5.612	99	5.612	129	5.612	159	5.612	189	5.612
10	5.612	40	5.612	70	5.612	100	5.612	130	5.612	160	5.612	190	5.612
11	5.612	41	5.612	71	5.612	101	5.612	131	5.612	161	5.612	191	5.612
12	5.612	42	5.612	72	5.612	102	5.612	132	5.612	162	5.612	192	5.612
13	5.612	43	5.612	73	5.612	103	5.612	133	5.612	163	5.612	193	5.612
14	5.612	44	5.612	74	5.612	104	5.612	134	5.612	164	5.612	194	5.612
15	5.612	45	5.612	75	5.612	105	5.612	135	5.612	165	5.612	195	5.612
16	5.612	46	5.612	76	5.612	106	5.612	136	5.612	166	5.612	196	5.612
17	5.612	47	5.612	77	5.612	107	5.612	137	5.612	167	5.612	197	5.612
18	5.612	48	5.612	78	5.612	108	5.612	138	5.612	168	5.612	198	5.612
19	5.612	49	5.612	79	5.612	109	5.612	139	5.612	169	5.612	199	5.612
20	5.612	50	5.612	80	5.612	110	5.612	140	5.612	170	5.612	200	5.612
21	5.612	51	5.612	81	5.612	111	5.612	141	5.612	171	5.612	201	5.612
22	5.612	52	5.612	82	5.612	112	5.612	142	5.612	172	5.612	202	5.612
23	5.612	53	5.612	83	5.612	113	5.612	143	5.612	173	5.612	203	5.612
24	5.612	54	5.612	84	5.612	114	5.612	144	5.612	174	5.612	204	5.612
25	5.612	55	5.612	85	5.612	115	5.612	145	5.612	175	5.612	205	5.612
26	5.612	56	5.612	86	5.612	116	5.612	146	5.612	176	5.612	206	5.612
27	5.612	57	5.612	87	5.612	117	5.612	147	5.612	177	5.612	207	5.612
28	5.612	58	5.612	88	5.612	118	5.612	148	5.612	178	5.612	208	5.612
29	5.612	59	5.612	89	5.612	119	5.612	149	5.612	179	5.612	209	5.612
30	5.612	60	5.612	90	5.612	120	5.612	150	5.612	180	5.612	210	5.612

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Simulation Criteria for C4

Volumetric Runoff Coeff	0.750	Additional Flow - % of Total Flow	0.000
Areal Reduction Factor	1.000	MADD Factor * 10m ³ /ha Storage	2.000
Hot Start (mins)	0	Inlet Coefficient	0.800
Hot Start Level (mm)	0	Flow per Person per Day (l/per/day)	0.000
Manhole Headloss Coeff (Global)	0.500	Run Time (mins)	60
Foul Sewage per hectare (l/s)	0.000	Output Interval (mins)	1
Number of Input Hydrographs	0	Number of Offline Controls	0
Number of Online Controls	2	Number of Storage Structures	1
		Number of Time/Area Diagrams	0
		Number of Real Time Controls	0

Synthetic Rainfall Details

Rainfall Model	FEH	Summer Storms	Yes
Return Period (years)	30	Winter Storms	No
FEH Rainfall Version	2013	Cv (Summer)	0.750
Site Location	GB 547650 260850 TL 47650 60850	Cv (Winter)	0.840
Data Type		Catchment Storm Duration (mins)	30

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Online Controls for C4

Hydro-Brake® Optimum Manhole: FlowControl, DS/PN: 1.001, Volume (m³): 9.4

Unit Reference MD-SHE-0058-2000-1850-2000
 Design Head (m) 1.850
 Design Flow (l/s) 2.0
 Flush-Flo™ Calculated
 Objective Minimise upstream storage
 Application Surface
 Sump Available Yes
 Diameter (mm) 58
 Invert Level (m) 4.350
 Minimum Outlet Pipe Diameter (mm) 75
 Suggested Manhole Diameter (mm) 1200

Control Points	Head (m)	Flow (l/s)	Control Points	Head (m)	Flow (l/s)
Design Point (Calculated)	1.850	2.0	Kick-Flo®	0.519	1.1
Flush-Flo™	0.255	1.4	Mean Flow over Head Range	-	1.5

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	1.2	0.800	1.4	2.000	2.1	4.000	2.8	7.000	3.7
0.200	1.4	1.000	1.5	2.200	2.2	4.500	3.0	7.500	3.8
0.300	1.4	1.200	1.6	2.400	2.3	5.000	3.2	8.000	3.9
0.400	1.3	1.400	1.8	2.600	2.3	5.500	3.3	8.500	4.1
0.500	1.2	1.600	1.9	3.000	2.5	6.000	3.4	9.000	4.2
0.600	1.2	1.800	2.0	3.500	2.7	6.500	3.6	9.500	4.3

Non Return Valve Manhole: FPD1, DS/PN: 1.002, Volume (m³): 0.1

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Storage Structures for C4

Cellular Storage Manhole: FlowControl, DS/PN: 1.001

Invert Level (m) 4.350 Safety Factor 2.0
 Infiltration Coefficient Base (m/hr) 0.00000 Porosity 0.95
 Infiltration Coefficient Side (m/hr) 0.00000

Depth (m)	Area (m ²)	Inf. Area (m ²)	Depth (m)	Area (m ²)	Inf. Area (m ²)	Depth (m)	Area (m ²)	Inf. Area (m ²)
0.000	679.0	0.0	1.200	679.0	0.0	1.201	0.0	0.0

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2 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for C4

Simulation Criteria

Areal Reduction Factor 1.000 Additional Flow - % of Total Flow 0.000
 Hot Start (mins) 0 MADD Factor * 10m³/ha Storage 2.000
 Hot Start Level (mm) 0 Inlet Coefficient 0.800
 Manhole Headloss Coeff (Global) 0.500 Flow per Person per Day (l/per/day) 0.000
 Foul Sewage per hectare (l/s) 0.000

Number of Input Hydrographs 0 Number of Offline Controls 0 Number of Time/Area Diagrams 0
 Number of Online Controls 2 Number of Storage Structures 1 Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model FEH Data Type Catchment
 FEH Rainfall Version 2013 Cv (Summer) 0.750
 Site Location GB 547650 260850 TL 47650 60850 Cv (Winter) 0.840

Margin for Flood Risk Warning (mm) 300.0
 Analysis Timestep 2.5 Second Increment (Extended)
 DTS Status OFF
 DVD Status ON
 Inertia Status ON

Profile(s) Summer and Winter
 Duration(s) (mins) 15, 30, 60, 120, 240, 360, 480, 960, 1440, 2880
 Return Period(s) (years) 2, 30, 100
 Climate Change (%) 0, 35, 40

PN	US/MH Name	Duration (mins)	US/CL (m)	Water Surcharged Flooded			Pipe		Status
				Level (m)	Depth (m)	Volume (m³)	Flow / Overflow Cap. (l/s)	Flow (l/s)	
1.000	S6S7	15	6.500	4.936	-0.164	0.000	0.72	68.6	OK
1.001	FlowControl	480	6.500	4.629	0.129	0.000	0.11	1.4	SURCHARGED
1.002	FPD1	240	6.500	5.612	0.203	0.000	0.00	1.6	SURCHARGED

Seven House, High Street
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05425
 Cambridge North
 Catchment 4



Date 23/03/2023 10:54
 File 05425 - Catchment 4 Network JG ...

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Network 2019.1

30 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for C4

Simulation Criteria

Areal Reduction Factor 1.000 Additional Flow - % of Total Flow 0.000
 Hot Start (mins) 0 MADD Factor * 10m³/ha Storage 2.000
 Hot Start Level (mm) 0 Inlet Coefficient 0.800
 Manhole Headloss Coeff (Global) 0.500 Flow per Person per Day (l/per/day) 0.000
 Foul Sewage per hectare (l/s) 0.000

Number of Input Hydrographs 0 Number of Offline Controls 0 Number of Time/Area Diagrams 0
 Number of Online Controls 2 Number of Storage Structures 1 Number of Real Time Controls 0

Synthetic Rainfall Details

Rainfall Model FEH Data Type Catchment
 FEH Rainfall Version 2013 Cv (Summer) 0.750
 Site Location GB 547650 260850 TL 47650 60850 Cv (Winter) 0.840

Margin for Flood Risk Warning (mm) 300.0
 Analysis Timestep 2.5 Second Increment (Extended)
 DTS Status OFF
 DVD Status ON
 Inertia Status ON

Profile(s) Summer and Winter
 Duration(s) (mins) 15, 30, 60, 120, 240, 360, 480, 960, 1440, 2880
 Return Period(s) (years) 2, 30, 100
 Climate Change (%) 0, 35, 40

PN	US/MH Name	Duration (mins)	US/CL (m)	Water Surcharged Flooded			Pipe		Status
				Level (m)	Depth (m)	Volume (m³)	Flow / Overflow Cap. (l/s)	Flow (l/s)	
1.000	S6S7	15	6.500	5.299	0.199	0.000	2.30	220.2	SURCHARGED
1.001	FlowControl	960	6.500	5.180	0.680	0.000	0.11	1.4	SURCHARGED
1.002	FPD1	30	6.500	5.612	0.203	0.000	0.00	0.0	SURCHARGED

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 Catchment 4



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Network 2019.1

100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for C4

Simulation Criteria

Areal Reduction Factor 1.000 Additional Flow - % of Total Flow 0.000
 Hot Start (mins) 0 MADD Factor * 10m³/ha Storage 2.000
 Hot Start Level (mm) 0 Inlet Coefficient 0.800
 Manhole Headloss Coeff (Global) 0.500 Flow per Person per Day (l/per/day) 0.000
 Foul Sewage per hectare (l/s) 0.000

Number of Input Hydrographs 0 Number of Offline Controls 0 Number of Time/Area Diagrams 0
 Number of Online Controls 2 Number of Storage Structures 1 Number of Real Time Controls 0


Synthetic Rainfall Details

Rainfall Model FEH Data Type Catchment
 FEH Rainfall Version 2013 Cv (Summer) 0.750
 Site Location GB 547650 260850 TL 47650 60850 Cv (Winter) 0.840

Margin for Flood Risk Warning (mm) 300.0
 Analysis Timestep 2.5 Second Increment (Extended)
 DTS Status OFF
 DVD Status ON
 Inertia Status ON

Profile(s) Summer and Winter
 Duration(s) (mins) 15, 30, 60, 120, 240, 360, 480, 960, 1440, 2880
 Return Period(s) (years) 2, 30, 100
 Climate Change (%) 0, 35, 40


PN	US/MH Name	Duration (mins)	US/CL (m)	Water Surcharged Flooded			Pipe		Status
				Level (m)	Depth (m)	Volume (m³)	Flow / Overflow Cap. (l/s)	Flow (l/s)	
1.000	S6S7	960	6.500	6.293	1.193	0.000	0.19	18.6	FLOOD RISK
1.001	FlowControl	960	6.500	6.293	1.793	0.000	0.16	2.0	FLOOD RISK
1.002	FPD1	15	6.500	5.612	0.203	0.000	0.00	0.0	SURCHARGED

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Seven House, High Street Longbridge Birmingham, B31 2UQ	05425 Balancing Pond Catchment 5 + logistics area	
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Innovyze	Source Control 2019.1	

Cascade Summary of Results for 05425 - Catchment 5 and temp logistics area.SRCX

Upstream Structures		Outflow To		Overflow To		Status
05425 - Catchment 1.SRCX		(None)		(None)		
Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m ³)	Status	
15 min Summer	5.266	0.566	11.6	1085.7	O K	
30 min Summer	5.411	0.711	11.6	1399.5	O K	
60 min Summer	5.544	0.844	11.6	1702.9	O K	
120 min Summer	5.722	1.022	11.6	2131.6	O K	
180 min Summer	5.823	1.123	11.6	2386.5	O K	
240 min Summer	5.888	1.188	11.6	2554.2	O K	
360 min Summer	5.961	1.261	11.6	2748.0	Flood Risk	
480 min Summer	5.997	1.297	11.6	2844.4	Flood Risk	
600 min Summer	6.014	1.314	11.6	2890.7	Flood Risk	
720 min Summer	6.021	1.321	11.6	2908.9	Flood Risk	
960 min Summer	6.016	1.316	11.6	2896.0	Flood Risk	
1440 min Summer	5.978	1.278	11.6	2793.5	Flood Risk	
2160 min Summer	5.901	1.201	11.6	2587.2	Flood Risk	
2880 min Summer	5.833	1.133	11.6	2411.2	O K	
4320 min Summer	5.738	1.038	11.6	2170.8	O K	
5760 min Summer	5.667	0.967	11.6	1997.3	O K	
7200 min Summer	5.609	0.909	11.6	1857.2	O K	
8640 min Summer	5.564	0.864	11.6	1751.6	O K	
10080 min Summer	5.532	0.832	11.6	1675.6	O K	
15 min Winter	5.327	0.627	11.6	1216.9	O K	
30 min Winter	5.486	0.786	11.6	1569.3	O K	
60 min Winter	5.631	0.931	11.6	1911.0	O K	
120 min Winter	5.826	1.126	11.6	2392.8	O K	

Storm Event	Rain (mm/hr)	Flooded Volume (m ³)	Discharge Volume (m ³)	Time-Peak (mins)
15 min Summer	164.640	0.0	947.6	23
30 min Summer	106.400	0.0	982.7	38
60 min Summer	65.100	0.0	1757.5	68
120 min Summer	41.090	0.0	1849.5	128
180 min Summer	30.945	0.0	1795.1	188
240 min Summer	25.060	0.0	1763.4	246
360 min Summer	18.293	0.0	1733.3	366
480 min Summer	14.453	0.0	1719.3	486
600 min Summer	11.960	0.0	1710.6	606
720 min Summer	10.208	0.0	1703.5	724
960 min Summer	7.899	0.0	1689.8	964
1440 min Summer	5.460	0.0	1656.7	1442
2160 min Summer	3.762	0.0	3443.3	2100
2880 min Summer	2.896	0.0	3318.9	2416
4320 min Summer	2.033	0.0	3036.3	3156
5760 min Summer	1.601	0.0	4683.5	3976
7200 min Summer	1.349	0.0	4893.3	4760
8640 min Summer	1.185	0.0	5112.2	5536
10080 min Summer	1.071	0.0	5334.1	6352
15 min Winter	164.640	0.0	977.2	23
30 min Winter	106.400	0.0	975.1	37
60 min Winter	65.100	0.0	1873.6	68
120 min Winter	41.090	0.0	1806.1	126

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Innovyze	Source Control 2019.1	

Cascade Summary of Results for 05425 - Catchment 5 and temp logistics area.SRCX

Storm Event	Max Level (m)	Max Depth (m)	Max Control (l/s)	Max Volume (m ³)	Status
180 min Winter	5.936	1.236	11.6	2680.9	Flood Risk
240 min Winter	6.007	1.307	11.6	2871.5	Flood Risk
360 min Winter	6.089	1.389	11.6	3094.4	Flood Risk
480 min Winter	6.129	1.429	11.6	3208.3	Flood Risk
600 min Winter	6.150	1.450	11.6	3266.3	Flood Risk
720 min Winter	6.159	1.459	11.6	3292.5	Flood Risk
960 min Winter	6.158	1.458	11.6	3289.5	Flood Risk
1440 min Winter	6.125	1.425	11.6	3197.0	Flood Risk
2160 min Winter	6.053	1.353	11.6	2997.4	Flood Risk
2880 min Winter	5.979	1.279	11.6	2795.0	Flood Risk
4320 min Winter	5.865	1.165	11.6	2493.3	O K
5760 min Winter	5.776	1.076	11.6	2267.0	O K
7200 min Winter	5.703	1.003	11.6	2085.1	O K
8640 min Winter	5.635	0.935	11.6	1919.0	O K
10080 min Winter	5.569	0.869	11.6	1762.6	O K

Storm Event	Rain (mm/hr)	Flooded Volume (m ³)	Discharge Volume (m ³)	Time-Peak (mins)
180 min Winter	30.945	0.0	1762.9	184
240 min Winter	25.060	0.0	1747.5	244
360 min Winter	18.293	0.0	1747.8	362
480 min Winter	14.453	0.0	1761.1	480
600 min Winter	11.960	0.0	1773.4	596
720 min Winter	10.208	0.0	1777.9	714
960 min Winter	7.899	0.0	1772.4	946
1440 min Winter	5.460	0.0	1736.5	1402
2160 min Winter	3.762	0.0	3462.2	2076
2880 min Winter	2.896	0.0	3349.1	2684
4320 min Winter	2.033	0.0	3119.7	3336
5760 min Winter	1.601	0.0	5213.7	4272
7200 min Winter	1.349	0.0	5447.7	5256
8640 min Winter	1.185	0.0	5687.4	6144
10080 min Winter	1.071	0.0	5917.5	6960

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05425
 Balancing Pond
 Catchment 5 + logistics area



Date 23/03/2023 12:29

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File 05425 - Catchment 1, 5 + LA

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Cascade Rainfall Details for 05425 - Catchment 5 and temp logistics area.SRCX

Rainfall Model	FEH	Winter Storms	Yes
Return Period (years)	100	Cv (Summer)	0.750
FEH Rainfall Version	2013	Cv (Winter)	0.840
Site Location	GB 547650 260850 TL 47650 60850	Shortest Storm (mins)	15
Data Type		Catchment Longest Storm (mins)	10080
Summer Storms	Yes	Climate Change %	+40

Time Area Diagram


Total Area (ha) 3.548

Time (mins)		Area	Time (mins)		Area
From:	To:	(ha)	From:	To:	(ha)
0	4	1.774	4	8	1.774

Time Area Diagram

Total Area (ha) 0.000

Time (mins)		Area
From:	To:	(ha)
0	4	0.000

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Cascade Model Details for 05425 - Catchment 5 and temp logistics area.SRCX

Storage is Online Cover Level (m) 6.200

Tank or Pond Structure

Invert Level (m) 4.700

Depth (m)	Area (m ²)	Depth (m)	Area (m ²)
0.000	1720.0	1.500	2875.0

Hydro-Brake® Optimum Outflow Control

Unit Reference	MD-SHE-0149-1170-1500-1170
Design Head (m)	1.500
Design Flow (l/s)	11.7
Flush-Flo™	Calculated
Objective	Minimise upstream storage
Application	Surface
Sump Available	Yes
Diameter (mm)	149
Invert Level (m)	4.700
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)	1.500	11.7	Kick-Flo®	0.937	9.4
Flush-Flo™	0.440	11.6	Mean Flow over Head Range	-	10.1

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	5.4	0.800	10.7	2.000	13.4	4.000	18.6	7.000	24.3
0.200	10.5	1.000	9.6	2.200	14.0	4.500	19.7	7.500	25.2
0.300	11.3	1.200	10.5	2.400	14.6	5.000	20.7	8.000	26.0
0.400	11.6	1.400	11.3	2.600	15.2	5.500	21.7	8.500	26.7
0.500	11.6	1.600	12.0	3.000	16.2	6.000	22.6	9.000	27.5
0.600	11.4	1.800	12.7	3.500	17.5	6.500	23.5	9.500	28.2

**APPENDIX 2 : TECHNICAL NOTE BY TEMPLE
GROUP LTD (REF:T6118 DATED 20 APRIL 2023)**

Our ref: T6118
Your ref: 22/02771/OUT



20th April 2023

Matthew Breeze
Principal Planning Officer
Cambridgeshire County Council

Dear Mr Breeze,

LAND NORTH OF CAMBRIDGE NORTH STATION TECHNICAL NOTE ON SAFEGUARDED SITES APPLICATION REFERENCE 22/02771/OUT APPEAL REFERENCE APP/W0530/W/23/3315611

We refer to your letter dated 14 December 2022 in response to the above application and appeal and respond as follows. Temple Group are advising the Appellant on noise and safeguarded sites in respect of the appeal proposal.

Background

1. The appeal site is located to the south of the aggregates railhead, Transport Infrastructure Area (TIA) and the Cowley Road Waste Management Area (WMA) (see plan ref 630.01(MP)024 Rev P2 at **Appendix 1**). These sites, together with the Waste Water Treatment Plant are safeguarded under the Cambridgeshire and Peterborough Minerals and Waste Local Plan 2021.
2. Where noise sensitive development is proposed near to existing or foreseeable future noise generating sources, it is incumbent upon the applicant to demonstrate that the proposals will create an acceptable acoustic environment for the future users. Appropriate acoustic standards should be achieved through the application of good acoustic design.
3. The following information was submitted as part of the application and is of relevance to the Safeguarded Sites:
 - Noise and Vibration Assessment (Appendix 14.1 to the ES);
 - Air Quality chapter of the ES (Section 6);
 - Odour Report;
 - Statement in response to comments of Cambridgeshire County Council in its role as the Minerals and Waste Authority (MWPA), including supplementary assessment work:
 - o Industrial and Commercial Noise Desktop Assessment;
 - o Qualitative Dust Risk Assessment;
 - o Post Submission Odour Response;

- Statement of ES Conformity.
4. One element of the appeal scheme is commercial development to the east of the site on land which is currently unoccupied, in proximity to the main railway line and Cowley Road. The proposed commercial buildings on Plots S7 (1 - 3 Swale Street) and S9 (Triangle Site) of the appeal site are the closest, circa 250m from the main activities of the aggregates site (circa 80m at closest point), and circa 150m from the WMA.
 5. Plots S7 and S9 are to be developed to create Use Class E buildings providing flexible retail, office, and laboratory space.
 6. The facades of the proposed commercial buildings are expected to comprise a combination of masonry constructions, rainscreen cladding system and large areas of glazing. The buildings are expected to be mechanically ventilated and cooled, so users will not be reliant on open windows or trickle vents.
 7. While the Sustainable Design and Construction Supplementary Planning Document (SPD) issued by the Greater Cambridge Shared Planning Service (GCSPS) recognises that office / laboratory buildings and retail units are noise sensitive, it does not provide internal sound criteria for such uses. It is, however, considered acceptable to demonstrate that the internal ambient sound levels specified in British Standard 8233: 2014 – *Guidance on sound insulation noise reduction for buildings* and British Council for Offices Guide to Specification 2019 are likely to be met.
 8. As part of the application an assessment has been carried out for the proposed commercial buildings in line with adopted guidance on internal noise levels specified in BS 8233 and British Council for Office’s Guide to Specification 2019.
 9. The following guideline internal ambient noise levels office / laboratory and retail uses are presented in Table 1. This can also be found within the ES Volume 1, Chapter 14, Table 14.13.

Table 1: Recommended Internal Ambient Noise Level Criteria

Type of Space	Recommended internal ambient sound levels owing to external sources	
	Design range (dB L _{Aeq,T})	Guideline NR level (L _{eq})
Boardroom	35 - 40	30
Meeting room/cellular office	35 - 45	35
Open plan offices / laboratories	45 - 50	40
Corridors / circulation space / toilets / changing rooms	45 - 55	45
Retail units	50 - 55	45

10. A survey of baseline sound and vibration conditions has been undertaken across the appeal site and the data from these measurements have been used to determine baseline environmental sound and vibration levels affecting the site and inform the acoustic assessment of the proposals. The existing and future environmental acoustic sources in the local area have been identified as a mixture of train movements along the railway lines to the east and vehicular movements on the local road network (e.g. Cowey Road). The survey was completed and noise from the safeguarded sites was noted as not noticeable during the survey. Subsequent predictions (presented in the Industrial and Commercial Noise Desktop Assessment report) of the likely worst case noise levels at the proposed development from activities and plant associated with the TIA and WMA sites would not have altered the baseline ambient noise levels from those measured. This would not alter the baseline ambient noise levels because the predicted noise levels from the TIA and WMA operations are more than 10 dB below the measured daytime ambient noise level at the commercial receptors.
11. It should be noted that while the residential use is considered noise-sensitive throughout the day and night, commercial uses are only expected to be sensitive during the day when they are occupied.
12. The minimum recommended sound insulation performances for façade elements have been determined based on the data from the environmental noise survey and the latest architectural drawings.
13. The assessment presented in the ES established that desirable internal sound levels for a flexible office/laboratory development can be achieved with sound insulation provided by standard façade constructions and double-glazing window configurations.
14. The internal noise level criteria outlined in the Table 1 above can be met by implementing a typical masonry construction supplemented internally with a plasterboard lining. Lightweight façade systems may also be appropriate but will most likely require additional boards and resilient fixings. Lightweight rainscreen cladding systems may also be acceptable if appropriate internal linings and sheathing boards are used to provide additional mass.
15. For glazed areas such as windows and any external glazed doors, noise ingress calculations indicate that it is feasible to meet the internal noise level criteria with minimum weighted sound reduction index of $29 \text{ dB } R_w + C_{tr}$; this will be achieved using glazing with a 4/12/6 configuration, for example.
16. The façade system selections are required to be reviewed, as the design progresses, to ensure that the recommended internal sound levels are met.
17. The noise control measures set out herein can be enforced by reasonably worded planning conditions attached to any decision notice for the scheme. Therefore, noise or vibration should not pose an obstacle in the granting of planning permission for the development.

Response from the MWPA 14.12.2022 (and Reason for Refusal No. 8)

18. You responded on 14 December 2022 to confirm that you were “broadly content” with the conclusions of the dust and odour reports, but in your view the noise report does not appear to address the interaction between the proposed Use Class E uses and, the Aggregates Railhead. Furthermore, it is based on current activity at the railhead rather than permitted activity.
19. The following information were, therefore requested to establish whether the objection can be removed or not:
- 1. Are any of the activities that may be undertaken within Use Class E, (i.e., the activities to be undertaken in the buildings proposed to be located closest to the TIA), considered to be sensitive to noise? If yes, what are these activities? In the event any of the Use Class E activities are considered to be sensitive, please can an updated noise assessment be undertaken, or those activities be restricted from the development?*
 - 2. The noise report assumed that the existing level of deliveries at the Aggregates Railhead will be maintained. As there are no restrictions to deliveries at the railhead, beyond those imposed by existing planning controls and physical limits of the site, would the noise assessment reach the same conclusions if the number of deliveries were to increase to, for example, five days a week?*

Temple Group Response to point 1:

20. As set out above, the nearest proposed commercial buildings to the TIA and WMA are on Plots S7 and S9. The activities to be undertaken within these buildings are considered to be sensitive to noise and are expected to comprise of flexible retail, office, and laboratory space (this is detailed in paragraph 14.96 and Table 14.13 of the ES volume 1).
21. The ES included an assessment for the proposed commercial buildings in line with adopted guidance on internal noise levels specified in BS 8233 and British Council for Office’s Guide to Specification 2019 (paragraphs 14.206 to 14.212 of the ES volume 1).
22. The assessment was based on noise levels obtained through a baseline noise survey which included noise from road and rail traffic. This would also have included any noise from the TIA and WMA which would have been prevalent during the survey, however noise from these sites was not noticeable to surveyors when on site.
23. A supplementary assessment of potential noise impact of the TIA and WMA to the proposed development established that the worst case total noise levels from a typical operation would be below the measured ambient noise levels during the day.
24. The proposed commercial buildings are expected to be mechanically ventilated and cooled, so users will not be reliant on open windows or trickle vents.
25. Minimum sound insulation performances for the various façade elements and constructions have been recommended in the ES (Table 14.30 of the ES volume 1) based on



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calculations and it is expected that desirable internal sound levels for these spaces can be achieved with standard façade constructions and double-glazing window configurations.

26. Based on the above-described context, the operations of the TIA and WMA are not likely to adversely impact the nearest proposed commercial buildings.

Temple Group Response to point 2:

27. For the proposed commercial buildings, the noise assessment does not depend on the number of deliveries as the sound insulation provided is considered sufficient for noise levels to be within suitable guidelines during deliveries and worst case operations of the aggregates railhead.

28. For the proposed residential buildings, the BS 4142 assessment (presented in the Industrial and Commercial Noise Desktop Assessment report) discusses the context related to the assessment in paragraphs 5.2.2 to 5.2.8. The number of deliveries per week is one of the aspects of the context discussed along with the other following aspects:

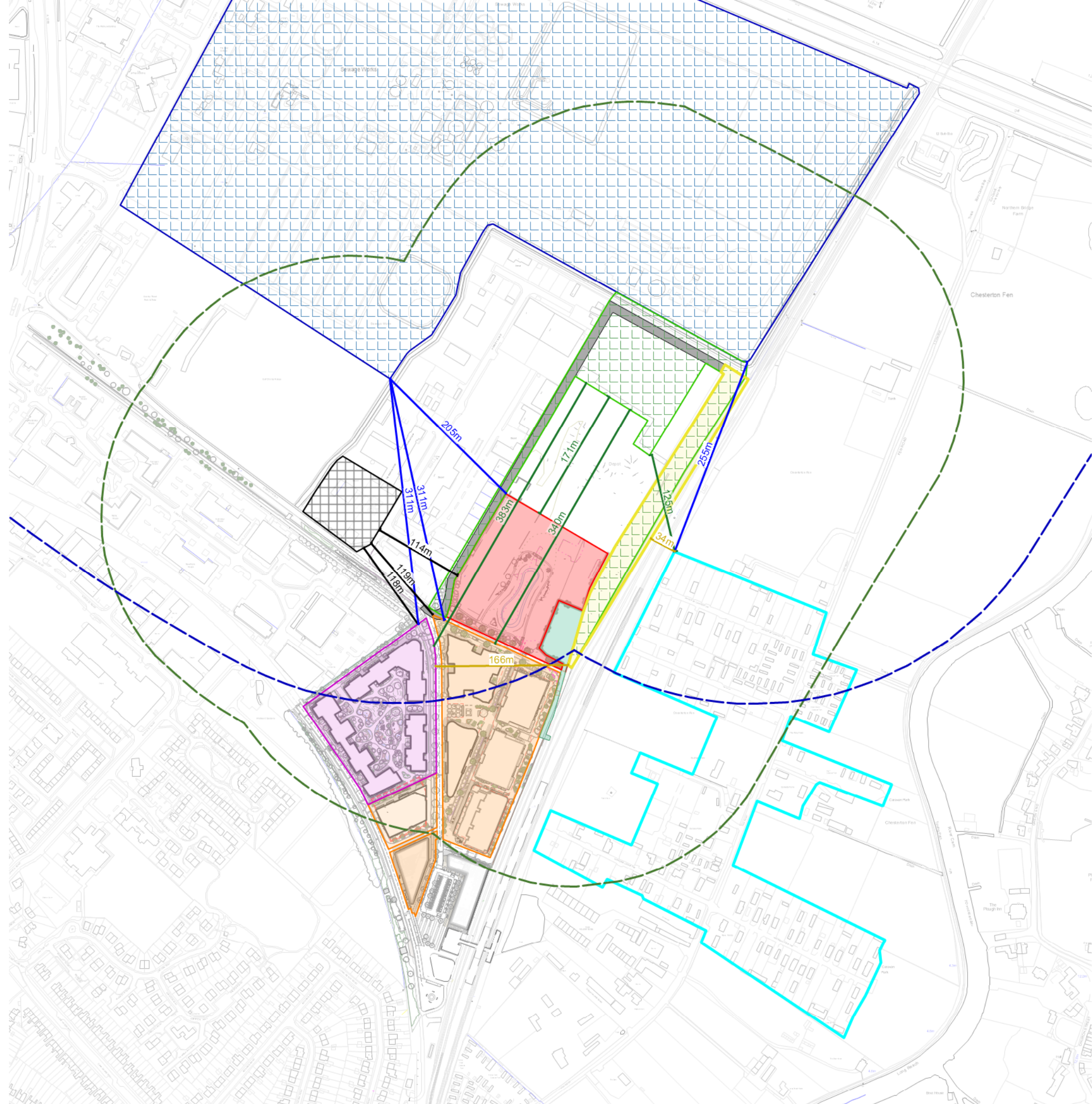
- a. the type of noise the proposed development will be exposed to;
- b. the proximity of other existing residential receptors which are closer to the aggregates railhead;
- c. comparison of the noise levels from operation of the aggregates railhead with the ambient noise levels from road and rail traffic noise;
- d. that windows would need to be closed to achieve the guideline indoor noise levels due to other sources (i.e. road and rail traffic), thereby also minimising internal noise levels from the operation of the aggregates railhead.

29. While an increase to the worst case number of deliveries per week may have the effect of increasing the impact from the operations of the aggregates railhead on residential buildings compared to just one per week, the impact would still be low overall due to other contextual factors (a to d) summarised above.



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Appendix 1





NOTES

TO BE READ IN COLOUR
 DO NOT SCALE FROM THIS DRAWING
 Contractors, sub-contractors and suppliers are to verify any critical dimensions on site prior to commencing work, fabrication or construction of any elements. Any discrepancies or errors must be brought to the attention of Robert Myers Associates.
 All structural elements are shown indicatively. For all elements of structure, refer to structural engineers' and specialist sub-contractor/fabricators' design, detail and specification.
 The drawings are to be read in conjunction with all relevant landscape architect, consultant and specialist drawings.

FOR ILLUSTRATIVE PURPOSES ONLY

LEGEND

-  Cambridge Water Recycling Centre
-  Cambridge Northern Fringe Aggregates Railheads (Transport Infrastructure Area)
-  Cowley Road Waste Management Area
-  Consultation Areas
-  Access Rights
-  Lease Demise
-  Existing Residential Edge
-  Naturalistic Park / Informal recreation
-  Commercial Area
-  Residential Area
-  Rail Infrastructure

PURPOSE OF ISSUE

Rev:	Date:	Drawing Status:
P1	07.10.22	For planning
P2	19.04.23	For planning

REVISIONS

Rev:	Date:	Description:
P1	07.10.22	First issue
P2	19.04.23	Dimension added

CAMBRIDGE NORTH

Client:	Brookgate
Drawing:	Proximity to Mineral Safeguarded areas
Project No:	630.01
Drawing No:	630.01(MP)024
Scale:	1:5000 @ A3
Date:	October 2022
Checked:	JB
Rev:	P2
Drawn:	EL
PM Checked:	RM

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**APPENDIX 3 : TECHNICAL NOTE BY RPS
CONSULTING SERVICES LTD (REF: ECO00253
CN PHASE 2 DATED 5 MA Y 2023)**

Ecology Technical Note: Reasons for Refusal

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Reference:	ECO00253 CN Phase 2
Title:	Ecology Technical Note
date:	5 May 2023

Introduction

RPS Consulting Services Ltd (RPS) was commissioned by Brookgate Land Ltd (Brookgate) to undertake ecology surveys of Cambridge North, the Appeal Site, to help inform the proposed redevelopment of the Site. These surveys have been undertaken over a number of years, across all or parts of the Cambridge North Site (see Appendix 2 - Bat Hibernation Survey Report, Figure 1 for Site boundary and building B1 location). The Ecological Assessment (EclA) submitted in May 2022 was based on a range of surveys, including for birds and bats, the following:

- Breeding Bird Survey 2018
- Breeding Bird Scoping Survey 2019
- Bat Activity Survey 2018
- Preliminary Bat Roost Assessment 2019
- Bat Emergence Survey 2020

Scope

The scope of the ecological surveys was subject to consultation in 2021 and February 2022. Subsequent to this, it was agreed in May 2022 to extend the scope and that an updated breeding bird survey should be undertaken pre-determination, to update the survey baseline and particularly survey for black redstart.

Subsequently, further consultation on scope in July and August 2022 didn't reach agreement on the required scope needed pre-determination, but the discussions focussed on reptiles and bats. Therefore, in August 2022 RPS agreed with Brookgate that further reptile and bat surveys should be undertaken in the 2022 season on a precautionary basis with an update report provided.

The Ecology Survey Report Update was submitted in October 2022 and included:

- Reptiles
- Bat roost assessment
- Bat activity and static monitoring
- Breeding Birds

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The Ecological Assessment

The assessment of ecological value and determination of effect significance has been undertaken with reference to Chartered Institute of Ecology and Ecological Management (CIEEM) Guidelines for Ecological Impact Assessment (2019). The EclA assessed the likely significant effects resulting from the construction and operation of the proposed development on ecology and nature conservation.

This ecological assessment was reviewed and updated within the Ecology Survey Report Update (Oct 2022) in relation to the findings from the surveys.

The Ecology Survey Report Update (Oct 2022) has been slightly updated and re-issued as Appendix 1 to this Technical Note.

Reptiles

For reptiles no additional records were noted in the surveys, so there are no changes to the conclusions of the Environmental Statement (ES) and no further mitigation measures are required for reptiles.

Bats

Building B1 is located north of Cowley Road within the area of the proposed Wild Park. It is within the outline application area, but landscape details have been submitted with the application. It is shown on Figure 1 in the Bat Hibernation Survey Report (RPS March 2023; issued as Appendix 2 to this Technical Note).

The bat roost assessment survey identified Building B1 has moderate bat roost potential due to these features and its location within good bat habitat. The northern rooms have moderate potential to be used as a hibernation roost and required internal inspections and static monitoring between December and February. These have now been undertaken between December 2022 and February 2023 (See Appendix 2) and no bat activity was recorded.

The bat survey in August 2022 also concluded that this building will require 2 emergence surveys to determine presence/absence of bat day roosts on a precautionary basis before demolition of this building. These need to be undertaken between May and August. Whilst only required before demolition to check for the presence of bats on a precautionary basis, these surveys are planned for May 2023 which in line with the latest best practice guidelines and recommendations published by the Bat Conservation Trust in Bat Survey: Good Practice Guidelines (BCT, 2019) is the earliest opportunity to undertake them. These surveys and assessment information will be provided prior to the inquiry, despite this not being necessary in order to determine the application. The interim report with the 2nd of May survey results is attached as Appendix 5. No emergence from B1 was recorded in the first survey on the 2nd of May.

For bats the survey results so far are in line with the baseline assessment within the ES chapter. The results suggest that the site is not used by large numbers of foraging or commuting bats. Overall the site is considered to be of local value for foraging bats. The northern section will include an attenuation pond and grassland which will provide suitable habitat for invertebrates, providing a food source for foraging bats. The lighting within the Wild Park is not yet specified in detail but the principle is to have low-level bollard lighting only along the footpath and log trail and the associated seating. The remainder of the Wild Park will be unlit to allow future foraging of bats. The detail of the lighting design is subject to further approval post-determination. Lighting along the guided busway will be screened by the tree belt and the strengthen underplanting to re-enforce a dark corridor beyond the site boundary. Along the eastern boundary the continuation of the ivy screen and other planting will also reduce light spill beyond the site boundary.

Given the location of the site within Cambridge City, and the low number of bats recorded, it is considered that the loss of the scrub and trees on site will not have a significant adverse impact on the local bat population. Suitable habitat is being enhanced or re-created on site for foraging and commuting bats to

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mitigate for any possible habitat loss impact. This assessment within the Ecology Survey Report Update is in line with the assessment within the ES chapter.

Therefore this additional information has no implications for the predicted effects or proposed mitigation as reported in the ES. The May 2023 bat survey report will update the assessment for bats as necessary.

Birds

For birds, the survey results included a single breeding pair of black redstart were recorded breeding off-site to the east and foraging and singing on site. Black redstart appear to require many vertical features whether they are buildings gantries, flood defence structures, or gasometers. Such structures correlate to the gorges and cliff faces, which are their natural habitat in continental Europe, and also provide high singing posts. Some of these features are found at Cambridge North with high song posts, good feeding opportunities and these features will be retained, or enhanced or re-created through the phased construction of the development.

However, despite the recording of the species, the bird assemblage is still considered to be of no more than local importance. This assessment within the Ecology Survey Report Update is in line with the assessment within the ES chapter. Therefore this additional information has no implications for the predicted effects or proposed mitigation as reported in the ES.

Mitigation

Mitigation measures are set out within the landscape proposals in the ES to enhance the site for bats and birds include the production of a landscape and ecology management plan (LEMP) to be approved by the LPA. The LEMP will include management of vegetated areas in an ecologically sensitive manner and maintenance of bird and bat boxes. This LEMP will incorporate requirements arising from the update surveys for birds and bats, including:

- Use of flower and nectar rich planting in landscaping and habitat creation;
- Restoration of open mosaic habitat (OMH) within a new high value natural greenspace (Wild Park);
- Provision of bird and bat boxes in suitable locations in line with Greater Cambridgeshire Biodiversity SPD (2022) requirements (precise locations and numbers to be determined in the LEMP);
- The design of lighting within the Wild Park to allow future foraging of bats and lighting on the western boundary of the site and along the guided busway will also be sensitively designed;
- Species rich green or open mosaic habitat (OMH) roofs on site; and
- These measures will also support a range of woodland and urban bird species and black redstart recorded (in 2022) which can also benefit from the provision of open fronted nest boxes, particularly in some of the quieter green roof spaces.

BNG and Tree Numbers/Ecological Design Strategy/Tree Strategy

RPS was commissioned by Brookgate to produce an updated Ecological Design Strategy (EDS) to cover the whole of the Cambridge North area. This area brings together the Cambridge North station environs, the developments built out or under construction around the station, the Appeal Scheme and also the remaining land north of the realigned Cowley Road outside of the Appeal Scheme. The EDS and the Tree Strategy for the Appeal Scheme are broadly aligned to support the aim of creating a flower-rich/nectar-rich environment, good for the invertebrate assemblage and other biodiversity.

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The EDS though covers the whole Cambridge North sidings area and also includes what is already present within this wider area. An updated Phasing and resourcing OMH material plan is attached as Appendix 3.

There is a small discrepancy in tree numbers between the BNG Calculator and the Tree Strategy – these are updated below. The number of ‘medium’ sized trees is increased in the BNG Calculator from 109 to 143; the number of ‘small’ trees reduced from 159 to 147 to align with the landscaping. A total of 375 new trees are to be planted. A number of changes to the drainage strategy has also led to a slight increase in permanent open water habitat. This small increase in trees and the increase in open water has led to an increase in the habitat units created overall from a total net unit change (gain) from +32.64 units (66.79%) to +39.22 units (80.27%). The updated BNG Calculator is attached as Appendix 4.

The Tree Strategy also includes native planting of tree/shrub species within a mixed native hedge and woodland understorey planting to strengthen the guided busway verge tree belt in line with the EDS requirements. Within the Wild Park further native tree/shrub planting is planned, selectively interplanting within the existing scrub mosaic, again in line with the EDS.

Urban tree helper						
Tree size	Number of trees and area (ha) for each condition state					
	Poor	Area	Moderate	Area	Good	Area
Small		0.0000	147	0.5982		0.0000
Medium	3	0.1099	143	5.2374		0.0000
Large		0.0000	85	6.4953		0.0000
Total	3	0.1099	375	12.3309	0	0.0000

CN Phase 2 tree numbers & drainage amenity		
Headline Results		Return to results menu
On-site baseline	Habitat units	48.86
	Hedgerow units	0.00
	River units	0.00
On-site post-intervention <small>(including habitat retention, creation & enhancement)</small>	Habitat units	88.08
	Hedgerow units	0.27
	River units	0.00
On-site net % change <small>(including habitat retention, creation & enhancement)</small>	Habitat units	80.27%
	Hedgerow units	100.00%
	River units	0.00%
Off-site baseline	Habitat units	0.00
	Hedgerow units	0.00
	River units	0.00
Off-site post-intervention <small>(including habitat retention, creation & enhancement)</small>	Habitat units	0.00
	Hedgerow units	0.00
	River units	0.00
Total net unit change <small>(including all on-site & off-site habitat retention, creation & enhancement)</small>	Habitat units	39.22
	Hedgerow units	0.27
	River units	0.00
Total on-site net % change plus off-site surplus <small>(including all on-site & off-site habitat retention, creation & enhancement)</small>	Habitat units	80.27%
	Hedgerow units	100.00%
	River units	0.00%
Trading rules Satisfied?	Yes ✓	

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Natural England Consultation Response (28 Oct 2022)

The application includes on-site the Wild Park area of enhanced and retained OMH and other habitats. This area is designed to be a high quality alternative natural green space.

More widely the habitats and green spaces on the Site are designed to align with the wider Green Infrastructure strategy within the AAP and the city.

Additional, direct access through Bramblefields Local Nature Reserve has been avoided in the scheme design to reduce pressure on this adjacent site.

Conclusion

The EclA assessment was reviewed as part of the Survey Update Report (Oct 2022) which concludes:

These survey results from summer 2022 are in line with the baseline assessment within the ES chapter. Therefore this additional information has no implications for the predicted effects or changes to proposed mitigation as reported in the ES.

The table below sets out the detail of the comments raised by the Council in its Committee Report and the RPS response, together with any further action required.

RfR Ref no.	LPA comments	RPS response	Further actions
15.16	For the application information to be sufficient the following would be required: - Confirmation of the location of B1 - Amend report to show locations of surveyed buildings. - Complete recommended surveys prior to determination of application if B1 is located within the full application Site.	The location of B1 has been confirmed and it sits in the landscaping proposals of the outline application. The outstanding 'summer' emergence surveys will be completed in early May (planned for the 2nd and 15th of May) and reported prior to the inquiry.	RPS to undertake and report on emergence surveys in May 2023 and will, where necessary, update the assessment for bats. No emergence was recorded in the first survey on the 2 nd of May.
In Amendment Sheet	This building falls within the Wild Park area which is within the detailed landscape proposals within the outline application, not within the full application as per the report. As landscape is a matter for approval and is not a reserved matter, the additional bat surveys are still required to be submitted and conditions are not appropriate to require such surveys.		
15.17	.. the ES was not updated to take account of the updated surveys. Of particular concern are sections 4.4.13 to 4.4.20 which need to be updated to include the new bat survey information and provide an analysis of any new lighting that might be installed as this may have a measurable impact on bats regardless of the habitats created. This section should also include any roosting and licencing information once required surveys have been completed.	The Ecology Survey Report Update (Oct 2022) reviewed the ecological assessment, and the results did not change the assessment, mitigation requirements or conclusions.	The May 2023 bat survey report will, where necessary, update the assessment for bats. No emergence was recorded in the first survey on the 2 nd of May.

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RfR Ref no.	LPA comments	RPS response	Further actions
15.18	The updated bird surveys show that new bird species have been encountered therefore the analysis within the ES should be updated to take these species into account.	The Ecology Survey Update Report (Oct 2022) reviewed the ecological assessment, and the presence of black redstart breeding outside of the Site to the east was evaluated. Overall, there was no change to the likely significant effects and therefore no change to the conclusions, so there was no need to update the ES Chapter.	The LEMP when produced post-approval will incorporate specific nest box provision for black redstart.
15.19	Natural England has commented that the new housing development is unlikely to deliver sufficient level of access high quality green infrastructure to both 1) meet the needs of new residents and 2) avoid adverse recreational pressure impacts to the existing ecological network including statutorily designated sites and locally important sites such as Milton Country Park and Bramblefields Local Nature Reserve. Further information is required to address this issue and should include provision of alternative strategic accessible natural greenspace to meet the needs of the residents without further adverse impact on sensitive sites.	<p>Additional access through Bramblefields Local Nature Reserve has been avoided in the scheme design measures incorporated into the scheme design to avoid potential impacts.</p> <p>The habitats and green spaces on Site are designed to align with the wider Green Infrastructure strategy within the AAP and the city.</p> <p>The Wild Park area of enhanced and retained OMH and other habitats is designed to be a high quality alternative natural green space.</p>	The actions to mitigate any potential increase in visitor pressure within the LNR will be set out in the LEMP, if required.
15.22	<p>Clarification is required that the Biodiversity Net Gain Calculator (Urban Tree Helper) has been accurately populated based on the submitted Tree Strategy.</p> <p>Given that the urban tree planting represents approximately half of the 66% net gain in biodiversity, and that the intention is to “bank” biodiversity units for future possible development this is a significant part of the plan and clarity is essential. As the landscaping falls within the full application site and is not a reserved matter within the outline application the LPA must be assured that the Biodiversity Net Gain Plan can be delivered.</p>	The BNG Calculator has been updated (Dec 2022) to remove the off-site enhancements and the numbers of trees is corrected in this TN to align with the numbers in the Tree Strategy. Specifically the number of ‘medium-sized’ trees was increased in the calculator from 109 to 145.	A BNG condition will control submission and approach of a final BNG Delivery Plan to clarify final BNG units and the banking of surplus units created above the 20% threshold.
15.23	The EDS includes an Open Mosaic Habitat (OMH) Phasing Plan which is said to show the Site boundary. However, the full extent of the application boundary is not included in the plan, notably the residential element of the outline application is excluded (although it is referred to), this should be clarified.	An updated OMH Phasing Plan covers the whole wider CN Site. The application boundary requires updating and is attached as Appendix 3.	
15.24	Section 2.4.4 of the report outlines the conservation objectives and at bullet point 2 seeks to minimise the effects on existing population of protected and noteworthy species however bats are not included in this list and should be.	The consistent low activity levels of bats on Site means they are not considered noteworthy in the context of the Site. The Site is considered to provide limited suitability for foraging and commuting bats. Nevertheless the mitigation and enhancement proposals incorporate appropriate measures for bats.	The LEMP when produced post-approval will incorporate specific bat mitigation as appropriate, including lighting design in the Wild Park.

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RfR Ref no.	LPA comments	RPS response	Further actions
15.25	Habitat based mitigation is identified in section 3.2 however the tree species within this section do not match those that appear in the Tree Strategy.	The EDS covers the whole of the wider CN Site and includes tree species that are already present within the Site boundary and elsewhere within the wider CN sidings site.	
15.26	The Protected Species Strategy at section 3.3 does not include any mention of bats in particular, how the lighting strategy will be designed to remove any measurable impact to the conservation status of commuting and foraging bats.	The consistent low activity levels of bats on Site means they are not considered noteworthy in the context of the Site. The Site is considered to provide limited suitability for foraging and commuting bats. Nevertheless the mitigation and enhancement proposals incorporate appropriate measures for bats.	
15.27	Enhancement measures are identified at 3.3.8 and 4.9 which include bat and bird boxes however no details are provided in terms of numbers.	The ES sets out that a range of nest box types will be included in the LEMP to support a wide range of species (sparrows, starlings, swifts and other hole-nesting species). Consideration will also be given to providing other more specialist boxes where appropriate. The number and location of bat and bird boxes will be set out in the LEMP and subject to agreement with the LPA.	The LEMP to be submitted and approved pursuant to a planning condition will incorporate specific bird and bat boxes numbers and locations to be agreed with the LPA.
15.28	Appendix 13.2 provides the current baseline measurement, for example at the northeast corner (adjacent to the railway line) there is currently 0.3 Lux of light spill. It does not measure what the future luminescence will be, nor does it mention the BTC guidance, nor does it mention bats or the impacts on ecologically sensitive areas. Therefore, it appears that there has been no ecological input into this document, this is possibly because the bat surveys in the northeast area hadn't been undertaken when it was written.	The consistent low activity levels of bats on Site means they are not considered noteworthy in the context of the Site. The Site is considered to provide limited suitability for foraging and commuting bats. Nevertheless the mitigation and enhancement proposals incorporate appropriate measures for bats.	The LEMP when produced post-approval will incorporate specific bat mitigation as appropriate, including lighting design in the Wild Park.
15.29	The Ecology and Biodiversity Chapter doesn't quote the guidance EDS says it does, nor does it incorporate the surveys or analysis of the ecological data. The main area of concern would be the northeast section along the railway line where there doesn't appear to be any current lighting. Chapter 13.2 shows an access road along this section with new lighting that has the potential to impact commuting bats. The updated bat surveys submitted state that the activity at the east of the site was the highest recorded on site (overall low to moderate bat activity). However, the updated surveys only assess the loss of habitat not the introduction of lighting, resulting in a lack of information to assess the impacts.	The consistent low activity levels of bats on Site means they are not considered noteworthy in the context of the Site. The Site is considered to provide limited suitability for foraging and commuting bats. Nevertheless the mitigation and enhancement proposals incorporate appropriate measures for bats.	The May 2023 bat survey report will update the assessment for bats, as necessary. The LEMP when produced post-approval will incorporate specific bat mitigation as appropriate, including additional bat boxes and lighting design in the Wild Park.
15.31	Section 4.16 Monitor and Remediation – monitoring must include that which is required by biodiversity net gain which will be for a period of 30 years. This section must be amended.	The LEMP will cover the full 30-year period	The LEMP, as controlled by condition, will incorporate specific monitoring requirements.

**APPENDIX 4 : 2023 BAT EMERGENCE SURVEY
REPORT DATED 16 MAY 2023**

CAMBRIDGE NORTH

2023 BAT EMERGENCE SURVEY REPORT

ECO00253
Cambridge North 2023
Bat Emergence Survey
Report
A
16 May 2023

Document status

Version	Purpose of document	Authored by	Reviewed by	Approved by	Review date
1	Draft interim report after 1 st emergence survey	Crystal Acquaviva Heather Matthews	Matt Fasham	Mike Barker	05-05-23
2	Final Emergence survey report	Crystal Acquaviva Heather Matthews	Mike Barker	Mike Barker	16-05-23

Approval for issue

Mike Barker 16 May 2023

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Appendices

Appendix A Bat emergence survey results

Appendix B Impact and Design of Artificial Light for Bats

1 INTRODUCTION

1.1 Purpose and scope of this report

- 1.1.1 In 2022, RPS was commissioned by Brookgate Land Limited to carry out bat emergence surveys at a large derelict shed (Building B1, Figure 2.1) north of Cambridge North Station (RPS, 2022).
- 1.1.2 Two rooms at the north of the building were considered to have moderate potential to be used as a hibernation roost due to the type and location of the structure. At the time of the initial survey, internal access to the two rooms was prevented due to the presence of asbestos. Due to the restricted access, hibernation surveys using only static detectors were undertaken in December 2022, January 2023 and February 2023, reported in Cambridge North Bat Hibernation Survey (RPS, 2023).
- 1.1.3 Building 1 was also considered to have moderate potential to be used as a day or feeding roost due to the type and location of the structure, with potential roost features being gaps in the asbestos sheeting on the buildings south face and the two rooms at the north end of the building. Further emergence surveys were therefore recommended before commencement of development. The first visit was undertaken on 2nd May 2023, and the second survey was carried out on 15th May 2023.
- 1.1.4 The aims of the 2023 emergence survey and report were to:
- Survey Building 1 to establish presence / likely absence of bats;
 - Report on the findings of the survey; and
 - Assess the likely impacts (if any) of the refurbishment of B1 on bats and any mitigation measures required to minimise any impacts.
- 1.1.5 This report pertains to these results only; recommendations included within this report are the professional opinion of an experienced ecologist and therefore the view of RPS.
- 1.1.6 This report supersedes the Interim report issued on 5th May 2023.

1.2 Study area

- 1.2.1 The study area is located on land adjacent to Cowley Road, Cambridge North Station, Cambridge, and comprises dense mainly birch scrub, semi-improved grassland, shrubs, ephemeral/short perennial plant communities and bare ground.
- 1.2.2 Building 1 (B1) is located at the north of the site, within an area of trees and scrub with the rail line running close by, to the east and an industrial area to the north and west. The Cambridge north station car park is located to the south.
- 1.2.3 The location of B1 is shown on Figure 2.1.

1.3 Legislation and policy

- 1.3.1 All British bat species are fully protected under Schedule 5 of the Wildlife and Countryside Act 1981, as updated by the Countryside and Rights of Way Act 2000. All British bats are also included on Schedule 2 of The Conservation of Habitats and Species Regulations 2017 (as amended by the Conservation of Habitats and Species (Amendment) (EU Exit) Regulations 2019) as European Protected Species. It is an offence to:
- intentionally or recklessly kill, injure or capture bats;
 - deliberately or recklessly disturb bats (whether in a roost or not); and

- damage, destroy or obstruct access to bat roosts

1.3.2 A roost is defined as 'any structure or place which [a bat] uses for shelter or protection'. As bats tend to reuse the same roosts, it is commonly accepted that a roost is protected whether or not bats are present at the time of survey.

1.3.3 A licence will therefore be required by those who carry out any operation that would otherwise result in offences being committed.

1.3.4 The following bat species are listed as being of principal importance for the conservation of biodiversity in England, (commonly referred to as UKBAP Priority species): Barbastelle, Bechstein's, Noctule, Soprano Pipistrelle, Brown Long-eared, Greater Horseshoe, and Lesser Horseshoe.

2 METHODS

2.1 Emergence surveys

- 2.1.1 Presence/absence surveys of Building B1, with moderate bat roost potential, have been carried out in May 2023. Figure 2.1 shows the buildings that were surveyed and the location of the ecologists on each survey. Descriptions of the buildings on site can be found in the Preliminary Ecological Appraisal and Preliminary Roost Assessment report (RPS, 2022).
- 2.1.2 Presence / absence surveys involve dusk and / or dawn visits to watch, listen for and record bats exiting or entering bat roosts. The method involves ecologists visiting at dusk or dawn to listen / record with the use of bat detectors and watch for bats emerging or returning to roosts and compile information on species, numbers, access points and roosting locations.
- 2.1.3 Bat detectors were used to record bat echolocation calls of any emerging bats and identify species where possible. Surveyors monitored the building using Batlogger M detectors. Calls were analysed using Kaleidoscope and Anlook software to identify bat species recorded in each survey location.
- 2.1.4 Two infra-red cameras were used on each survey. These were placed in strategic locations around B1, as shown on Figure 2.1. They were used to capture data in areas of B1 considered likely to be the hardest for the surveyors to visually track later in the survey i.e.. areas likely to become most obscured by darkness. Each camera was deployed with two infra-red lamps to illuminate the area of the building in their field of view. A Batlogger M detector was also set up in association with each of the cameras.
- 2.1.1 Surveyors were positioned outside the buildings, facing the features considered to offer potential bat emergence / re-entry points. The locations of the surveyors and cameras are shown on Figure 2.1.
- 2.1.2 The dusk surveys commenced 15 minutes before sunset, and lasted for 1.5 hours after sunset, in order to record any bats that may emerge from the roost feature.
- 2.1.3 All bat passes, including time and species, were recorded. Where possible the behaviour of the bat was also recorded, including foraging, commuting or feeding behaviour.
- 2.1.4 The surveys were carried out following current guidelines (Collins, 2016). The dates and weather conditions during the surveys are shown in Table 2.1.

Table 2.1: Dates and weather conditions during bat surveys

Date	Weather	Sunset time	Start time	End time
02.05.2023	Survey start: 13°C, dry, light cloud cover and light breeze. Survey end: 10°C, dry, light cloud cover and still.	20:26	20:11	21:56
15.05.2023	Survey start: 16°C to 11°C (depending on surveyor location), dry, light cloud cover and light breeze. Survey end: 13°C to 6°C (depending on surveyor location) dry, clear sky, still.	20:47	20:32	22:17

2.2 Static remote monitoring

- 2.2.1 A remote static monitoring detector (Batlogger M) was left out on site during the emergence surveys to record bat activity in the wider site (away from Building 1 but within the site boundary). The location of the static detector is shown on Figure 2.1.

2.3 Bat detectors and data analysis

- 2.3.1 Batlogger M bat detectors were used for the static and emergence survey.
- 2.3.2 The recorded calls were analysed using Kaleidoscope and Analook software to identify the bat species encountered on each survey.

2.4 Limitations

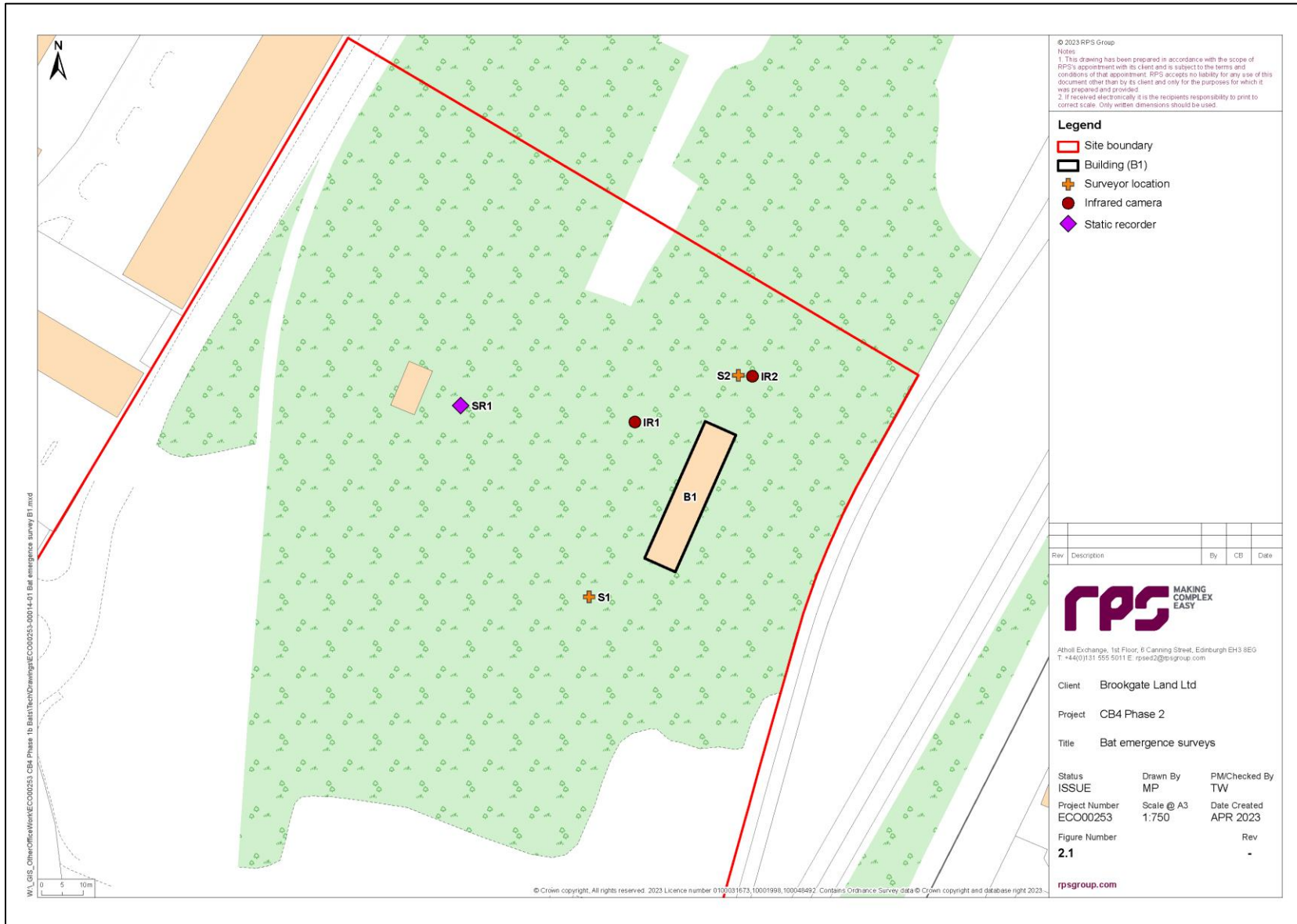
- 2.4.1 The IR camera (IR1) by the windows didn't record between 20:16 and 21:09 on 2 May 2023. However, a static detector was left at this location recorded bats at this location. This is discussed further in the sections below.
- 2.4.2 It should be noted that bats are a group of species with a range of dynamic behaviours and as such, bats can roost in different locations, forage in different areas and preferentially commute along different routes in response to a number of changing physical and environmental factors. Bats exhibit seasonal use of buildings, built structures and trees, and being so mobile may arrive and start using a site after it has been surveyed or be roosting somewhere else during the period it was surveyed.
- 2.4.3 Therefore, this survey provides a snapshot of ecological constraints found to be present at the time and should not be relied upon as evidence of presence / absence for periods longer than one year from the most recent bat survey.
- 2.4.4 The bat data presented in the tables detailing results of the bat surveys shows the number of contacts for different bat species. It is important to note that the number of contacts does not equate to the number of individual bats, as several contacts can be generated by one bat flying past the surveyors several times. Instead, the number of contacts provides an index of bat activity, which can be used to identify areas of habitat of greater or lesser importance for bats.
- 2.4.5 Species identification by sonogram is limited to a certain extent by similarities in call structure parameters for certain species. All bats modulate their calls according to the habitats they are navigating and their behaviour. This imposes limitations on reliable identification of bats to species level for species of the same genus, and specifically for *Plecotus*, *Myotis* and *Nyctalus* bats.

Accurate Lifespan of Ecological Data

- 2.4.6 The majority of ecological data remains valid for only short periods due to the inherently transient nature of the subject. The survey results contained in this report are considered accurate for one year, assuming no significant considerable changes to the site conditions.

CAMBRIDGE NORTH BAT EMERGENCE SURVEY REPORT

Figure 2.1: Location of surveyors, IR cameras and Static Detector



3 RESULTS

3.1 Bat Emergence Surveys

3.1.1 Tables 3.1 and 3.2 below summarise the data from the emergence surveys.

Table 3.1: Summary of Building Emergence Survey Results 2 May 2023

Surveyor / Camera	Emergence Yes/No	Species recorded foraging/commuting
Surveyor 1 (S1) – south of B1	No	Common pipistrelle Soprano pipistrelle
Surveyor 2 (S2) – north of B1	No	Soprano pipistrelle
Infra-red camera 1 (IR1) – B1 northwest windows	Possible Common Pipistrelle emergence 2 nd May 2023 (single bat) but no confirmed evidence	Common pipistrelle Soprano pipistrelle
Infra-red camera 2 (IR2) – north B1	No	Common pipistrelle Soprano pipistrelle

Table 3.2: Summary of Building Emergence Survey Results 15 May 2023

Surveyor / Camera	Emergence Yes/No	Species recorded foraging/commuting
Surveyor 1 (S1) – south of B1	No	Soprano pipistrelle Noctule
Surveyor 2 (S2) – north of B1	No	Common pipistrelle Soprano pipistrelle Noctule
Infra-red camera 1 (IR1) – B1 northwest windows	No	Common pipistrelle Soprano pipistrelle Noctule
Infra-red camera 2 (IR2) – north B1	No	Common pipistrelle Soprano pipistrelle Noctule

3.1.2 No bats were seen emerging from the building on either of the two emergence surveys in May 2023.

3.1.3 Levels of bat activity on both surveys and at all survey locations were low. The highest period of bat activity was recorded by the northern end of B1 on the second survey, by the surveyor positioned here and the detector deployed with the camera at this end of the building. The surveyor noted a Common Pipistrelle *Pipistrellus pipistrellus* bat making repeated foraging flights over the trees adjacent to the building. At one point, two bats may have been present at the same time. Despite frequent contacts recorded by the detector, the surveyor could confirm that this was likely to be one or two bats making repeated flights around the trees. They did not emerge from the building B1. Only one bat was directly observed during the first survey. This was a Soprano Pipistrelle *Pipistrellus pygmaeus* seen by Surveyor 1 at the southern end of B1, at 21:58, flying high and straight over the site from

the south-east. It was not observed using any of the habitat or features on the site at this time.

- 3.1.4 One Noctule *Nyctalus noctula* was recorded on the second survey. This bat was picked up only once, by all detectors at the same time and was not seen. It was likely to have been flying high over the site.
- 3.1.5 No bats were seen flying around the building, or close to it, on either survey.
- 3.1.6 There was some temperature variation around B1 on the second survey, with the more enclosed area to the south notably warmer than the area around the north of the building (see Table 2.1 above). However, bat activity was recorded from the locations to the north of the building, with pipistrelle foraging observed and recorded.

3.2 Static remote monitoring survey

- 3.2.1 Table 3.3 shows the total bat contacts for each species each survey at the static location, away from B1 (see Figure 2.1).
- 3.2.2 Levels of bat activity recorded by the static remote detector were very low on both surveys.
- 3.2.3 On both surveys, the first bat recorded was picked up 30-32 minutes after sunset. These were Common Pipistrelles, and could have been roosting somewhere in the local vicinity of the wider site, based on the time of first contact (pipistrelle bats typically emerge 15-20 minutes after sunset).
- 3.2.4 On the first survey, five Common Pipistrelle contacts were recorded by the static detector for the duration of the survey (fifteen minutes before sunset to 90 minutes after sunset). These were all 30-45 minutes after sunset and three of the contacts were very close together at 21:11 and these are likely to be the same bat. No other bat species were recorded by the static equipment.
- 3.2.5 On the second survey, seven Common Pipistrelle contacts were recorded by the static detector, over a period of 26 minutes. Two Soprano Pipistrelles were recorded during the same timeframe (these were likely to be the same bat, both at 21:24) and a single Noctule pass at 21:27 (corresponding with the time a Noctule was recorded by B1).

Table 3.3: Number of bat contacts recorded during static monitoring (SR1)

Date	COP	SOP	NAP	NOC	LEI	NYS	SER	BLE	MYO	Total
2/05/2023	5	0	0	0	0	0	0	0	0	5
15/05/23	7	2	0	1	0	0	0	0	0	10

4 EVALUATION AND POTENTIAL IMPACTS

- 4.1.1 No bats were observed emerging from or returning to the building during either of the surveys.
- 4.1.2 No bats were seen flying in, around or close to the building during the surveys.
- 4.1.3 Three species of bats were recorded foraging or commuting in the area during the emergence surveys of B1. These were Common Pipistrelle, Soprano Pipistrelle and Noctule. The Noctule is considered unlikely to have been using the habitats on the site and was likely flying high over the site on its way elsewhere.
- 4.1.4 The results of these surveys indicate that bats are not currently using B1 for roosting.
- 4.1.5 As no roost has been found, a Natural England licence will not be required. However, demolition should proceed under a Precautionary Working Method Statement, with inspection of the north rooms immediately before demolition.
- 4.1.6 Levels of bat activity, both around Building B1 and around the remote static detector in the adjacent woodland were very low during the first survey and only a little more frequent during the second survey, when some Pipistrelle foraging (likely one or two bats) was recorded around trees adjacent to the building.
- 4.1.7 Weather conditions were suitable for bats and the area was dark and undisturbed. The findings of this survey are consistent with those of the July 2022 surveys and indicate that the building and the surrounding habitat are not of high importance for bats for roosting or foraging.
- 4.1.8 Building 1 will be demolished as part of proposed works.
- 4.1.9 As Building 1 provides potential roosting opportunities, mitigation for the loss of these potential roost features is recommended (Section 5).

5 MITIGATION

5.1 Mitigation

Building 1

- 5.1.1 Building 1 had moderate potential for roosting bats. The surveys indicate that it is unlikely that bats are roosting in this building.
- 5.1.2 Therefore a Natural England licence will not be required in advance of refurbishment.
- 5.1.3 Demolition should proceed under a Precautionary Working Method Statement, with inspection of the north rooms immediately before demolition.
- 5.1.4 To compensate for the loss of potential roosting locations from the demolition of the building, **seven additional bat boxes** will be provided in and around Wild Park in suitable locations to be set out in the Landscape and Ecological Management Plan (LEMP) and agreed with Greater Cambridge Shared Planning.

Bat activity

- 5.1.5 Three species of bats were recorded during the surveys. These were Common Pipistrelle, Soprano Pipistrelle and Noctule. Levels of bat activity during the surveys were low.
- 5.1.6 Bats are nocturnal and adapted to roost and forage in low light conditions, therefore increases in artificial lighting can cause disturbance or disrupt existing flight paths and roosting, even with more light tolerant bats such as Pipistrelle.
- 5.1.7 A sensitive lighting scheme will be developed to avoid disturbing foraging, commuting and roosting bats on / adjacent to site during construction and post development. Lighting will be designed to minimise light spillage on the new bat boxes and site boundaries.
- 5.1.8 Design recommendations for wildlife friendly lighting are included in the Statement on the impact and design of artificial light on bats produced by BCT (2011). This list can be found in Appendix B.

5.2 Enhancement

- 5.2.1 The wider Cambridge North site will be enhanced for bats by the provision of green roofs (a source of invertebrate prey) and the use of native plant species for soft landscaping wherever practicable.

6 CONCLUSIONS

- 6.1 Two emergence surveys of Building 1 were undertaken on 2nd May 2023 and 15th May 2023. No bats were recorded emerging from the building.
- 6.2 It is considered that bats are currently not using the structure as a roost and therefore no mitigation or a Natural England licence will be required in advance of demolition.
- 6.3 Demolition should proceed under a Precautionary Working Method Statement, with inspection of the north rooms immediately before demolition.
- 6.4 Three species of bats were recorded foraging or commuting on or over the site during the first emergence survey of B1. These were Common Pipistrelle, Soprano Pipistrelle and Noctule. Levels of bat activity during the surveys were low.
- 6.5 A sensitive lighting scheme will be developed to avoid disturbing foraging, commuting and roosting bats on / adjacent to the wider Cambridge North site during and after construction. Lighting will be designed to minimise light spillage on the new bat boxes and site boundaries.
- 6.6 The wider Cambridge North site will be enhanced for bats by the provision of green roofs and the use of native plant species for soft landscaping.

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APPENDICES

Appendix A

Bat emergence survey results

CAMBRIDGE NORTH BAT EMERGENCE SURVEY REPORT

First survey results

02.05.23 dusk - B1

Surveyor / Camera Location	Species	Time of first call (minutes past sunset)	Total contacts	Details
S1	Soprano pipistrelle	20:57 (31)	1	Seen flying high over the site heading north-west
S2 & IR 2	Common pipistrelle	20:55 (30)	6	Not seen
	Soprano pipistrelle	20:58 (32)	1	Not seen
IR1	Common pipistrelle	20:55 (29)	4	Not seen
	Soprano pipistrelle	20:57 (31)	1	Not seen

Possible common pipistrelle emergence at 20:55 from windows of B1 – audio recording only, thus cannot be certain where the bat was and whether it emerged from the building or not

Second survey results

15.05.23 dusk - B1

Surveyor / Camera Location	Species	Time of first call (minutes past sunset)	Total contacts	Details
S1	Noctule	21:26 (39)	1	Not seen
	Soprano pipistrelle	21:34 (47)	3	Not seen
S2 & IR 2	Common pipistrelle	21:18 (31)	54	Feeding recorded. Bat(s) seen flying around trees to west of B1
	Noctule	21:27 (40)	1	Not seen
	Soprano pipistrelle	21:42 (55)	2	Not seen
IR1	Common pipistrelle	21:19 (32)	20	Not seen on camera
	Noctule	21:27 (40)	1	Not seen on camera
	Soprano pipistrelle	21:42 (55)	2	Not seen on camera

Impact and Design of Artificial Light for Bats

Design recommendations for wildlife-friendly lighting include:

- Do not "over" light. This is a major cause of obtrusive light and is a waste of energy. Use only the minimum amount of light needed for safety. There are published standards for most lighting tasks, adherence to which will help minimise upward reflected light.
- Eliminate any bare bulbs and any light pointing upwards. The spread of light should be kept near to or below the horizontal.
- Use narrow spectrum bulbs to lower the range of species affected by lighting.
- Use light sources that emit minimal ultra-violet light. Insects are attracted to light sources that emit ultra-violet radiation.
- Reduce light-spill so that light reaches only areas needing illumination. Shielding or cutting light can be achieved through the design of the luminaire or with accessories, such as hoods, cowls, louvers and shields to direct the light.
- Reduce the height of lighting columns. Light at a low level reduces ecological impact. However, higher mounting heights allow lower main beam angles, which can assist in reducing glare.
- For pedestrian lighting, use low level lighting that is directional as possible and below 3 lux at ground level.
- Use embedded road lights to illuminate the roadway and light only high-risk stretches of roads, such as crossings and merges, allowing headlights to take up the slack at other times.
- Limit the times that lights are on to provide some dark periods for wildlife.
- Use lighting design computer programs and professional lighting designers to predict where light spill will occur.



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