

# Development Control B Committee Agenda



**Date:** Wednesday, 28 September 2016

**Time:** 2.00 pm

**Venue:** The Council Chamber - City Hall, College Green, Bristol, BS1 5TR

## Distribution:

**Councillors:** Harriet Clough, Asher Craig, Mike Davies, Carla Denyer, Richard Eddy, Martin Fodor, Sultan Khan, Olly Mead, Celia Phipps, Kevin Quartley and Afzal Shah

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**Date:** Tuesday, 20 September 2016

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# Agenda

## **1. Apologies for Absence and Substitutions.**

**2.00 pm**

**(Pages 5 - 6)**

## **2. Declarations of Interest**

To note any interests relevant to the consideration of items on the agenda.

Any declarations of interest made at the meeting which are not on the register of interests should be notified to the Monitoring Officer for inclusion.

## **3. Minutes of the previous meeting**

**6.05 pm**

To agree the minutes of the last meeting as a correct record.

**(Pages 7 - 12)**

## **4. Appeals**

To note appeals lodged, imminent public inquiries and appeals awaiting decision.

**(Pages 13 - 19)**

## **5. Enforcement**

To note enforcement notices.

**(Page 20)**

## **6. Public forum**

Any member of the public or councillor may participate in public forum. The detailed arrangements for so doing are set out in the Public Information Sheet





at the back of this agenda. Please note that the following deadlines will apply in relation to this meeting:

**Questions:**

Written questions must be received three clear working days prior to the meeting. For this meeting, this means that your question(s) must be received at the latest by 5pm on **Thursday 22 September 2016**.

**Petitions and statements:**

Petitions and statements must be received by noon on the working day prior to the meeting. For this meeting, this means that your submission must be received at the latest by 12.00 noon on **Tuesday 27 September 2016**.

The statement should be addressed to the Service Director, Legal Services, c/o The Democratic Services Team, City Hall, 3<sup>rd</sup> Floor Deanery Wing, College Green,  
P O Box 3176, Bristol, BS3 9FS or email - [democratic.services@bristol.gov.uk](mailto:democratic.services@bristol.gov.uk)

## 7. Planning and Development

To consider the following applications for Development Control Committee B – **(Pages 21 - 99)**

**1. 16/00719/F - Avonbank, Feeder Road, Bristol**

Proposed installation of low carbon, bio-diesel powered generators and associated infrastructure for the provision of a Flexible Generation Facility to provide energy balancing services via the capacity market for the National Grid.

**2. 16/01888/F - Old Bristol Royal Infirmary Building**

Conversion of the Old BRI Hospital building, including two upper storey additions and partial demolition, to accommodate 6,112 sq.m. office floorspace (Use Class B1) and 3,990 sq.m. Medical School (Use Class D1); and erection of a part 10, part 12 and part 13 storey building to the rear for student accommodation (Sui generis) comprising 738 student bedspaces; communal areas and refurbishment of Fripps Chapel for communal student facility with ground floor commercial use (Use Class A3); associated landscaping, car parking and cycle parking.

**3. 16/02137/F - Land adjacent to 2 Southernhay Avenue**

Proposed four storey, three bedroom single dwelling house.

**4. 16/01193/X - Eastgate Retail Park-** Application for removal of condition No 6 following grant of planning permission 15/00907/X (Insertion of additional mezzanine floorspace into combined Units C/D and alterations to the front and rear of Units C/D - to now allow the sale of food from Unit J)

## 8. Additional information relating to Agenda Item No. 7



**(Pages 100 - 428)**



# Public Information Sheet

Inspection of Papers - Local Government  
(Access to Information) Act 1985

You can find papers for all our meetings on our website at [www.bristol.gov.uk](http://www.bristol.gov.uk).

You can also inspect papers at the City Hall Reception, College Green, Bristol, BS1 5TR.

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Committee rooms are fitted with induction loops to assist people with hearing impairment. If you require any assistance with this please speak to the Democratic Services Officer.

## Public Forum

Members of the public may make a written statement ask a question or present a petition to most meetings. Your statement or question will be sent to the Committee and be available in the meeting room one hour before the meeting. Please submit it to [democratic.services@bristol.gov.uk](mailto:democratic.services@bristol.gov.uk) or Democratic Services Section, City Hall, College Green, Bristol BS1 5UY. The following requirements apply:

- The statement is received no later than **12.00 noon on the working day before the meeting** and is about a matter which is the responsibility of the committee concerned.
- The question is received no later than **three clear working days before the meeting**.

Any statement submitted should be no longer than one side of A4 paper. If the statement is longer than this, then for reasons of cost, only the first sheet will be copied and made available at the meeting. For copyright reasons, we are unable to reproduce or publish newspaper or magazine articles that may be attached to statements.

By participating in public forum business, we will assume that you have consented to your name and the details of your submission being recorded and circulated to the committee. This information will also be made available at the meeting to which it relates and placed in the official minute book as a public record (available from Democratic Services).

We will try to remove personal information such as contact details. However, because of time constraints we cannot guarantee this, and you may therefore wish to consider if your statement



contains information that you would prefer not to be in the public domain. Public Forum statements will not be posted on the council's website. Other committee papers may be placed on the council's website and information in them may be searchable on the internet.

### Process during the meeting:

- Public Forum is normally one of the first items on the agenda, although statements and petitions that relate to specific items on the agenda may be taken just before the item concerned.
- There will be no debate on statements or petitions.
- The Chair will call each submission in turn. When you are invited to speak, please make sure that your presentation focuses on the key issues that you would like Members to consider. This will have the greatest impact.
- Your time allocation may have to be strictly limited if there are a lot of submissions.
- If there are a large number of submissions on one matter a representative may be requested to speak on the groups behalf.
- If you do not attend or speak at the meeting at which your public forum submission is being taken your statement will be noted by Members.

### Webcasting/ Recording of meetings

Members of the public attending meetings or taking part in Public forum are advised that all Full Council and Cabinet meetings and some other committee meetings are now filmed for live or subsequent broadcast via the council's [webcasting pages](#). The whole of the meeting is filmed (except where there are confidential or exempt items) and the footage will be available for two years. If you ask a question or make a representation, then you are likely to be filmed and will be deemed to have given your consent to this. If you do not wish to be filmed you need to make yourself known to the webcasting staff. However, the Openness of Local Government Bodies Regulations 2014 now means that persons attending meetings may take photographs, film and audio record the proceedings and report on the meeting (Oral commentary is not permitted during the meeting as it would be disruptive). Members of the public should therefore be aware that they may be filmed by others attending and that is not within the council's control.

## Bristol City Council Minutes of the Development Control B Committee

23 August 2016 at 6.00 pm



### Members Present:-

**Councillors:** Harriet Clough, Mike Davies, Richard Eddy, Martin Fodor, Sultan Khan, Olly Mead, Celia Phipps, Kevin Quartley, Afzal Shah, Clive Stevens and Steve Pearce

### Officers in Attendance:-

#### 1. Apologies for Absence

Apologies were received from Councillor Carla Denyer (substituted by Councillor Clive Stevens).

The Committee noted that Councillor Asher Craig had resigned from the Committee and was being substituted at this meeting by Councillor Steve Pearce until a permanent replacement member was appointed.

#### 2. Declarations of Interest

Councillor Khan declared a non-pecuniary interest in respect of agenda item 7 (2) Shah Jalal Jame Mosque, being a member of the Mosque and confirmed that he would not take part in the debate or the decision process.

Councillor Shah declared a non-pecuniary interest in respect of agenda item 7 (2) Shah Jalal Jame Mosque, as he sometimes attended the Mosque but confirmed that this would not prejudice his view when considering the Application.

Councillor Fodor declared a non-pecuniary interest in respect of agenda item 7 (2) Shah Jalal Jame Mosque, as he had called in a previous Mayoral decision about digital advertising but confirmed that this would not affect his view when considering this Application.

#### 3. Minutes of the previous meeting



The Minutes of the Development Control Committee B meeting on the 13 July 2016 were approved as a correct record and signed by the Chair subject to the inclusion of the following wording, after numbers 1-5 of the second paragraph, in respect of Minute No. 12 (1) 16/00719/F – Avonbank Feeder Road, Bristol –

‘6. Have receptors at relevant locations and heights to represent the exposure to 3-4 year olds at the nearby nursery, i.e. at lower than 1.5m above ground level.

7. Account for start-up and shut-down effects (as highlighted by one of the public forum statements), not just divide the full-time-running emissions by the number of hours it will run’.

#### **4. Appeals**

The Committee considered a report of the Service Director - Planning, noting appeals lodged, imminent public inquiries and appeals awaiting decision.

#### **5. Enforcement**

The Committee was advised there were no updates for this meeting

#### **6. Public Forum**

Members of the Committee received public forum statements in advance of the meeting.

The Statements were heard before the application they related to and were taken fully into consideration by the Committee prior to reaching a decision. An additional statement in respect of item 7 (3), which had been mislaid, was also included (A copy of the public forum list and statements are held on public record by Democratic Services).

#### **7. Planning and Development**

- (1) (a) 16/02785/F - 821 Bath Road Brislington Bristol BS4 5NL – Brislington East.
- (b) 16/02786/A - 821 Bath Road Brislington Bristol BS4 5NL – Brislington East.

The Planning Case Officer gave a detailed presentation on the application and emphasised that the first application related to buildings and the second related to advertisements. The recommendation was for approval of both applications subject to conditions.

It was considered that the development proposal would bring about significant benefits to the site in terms of visual amenity, contribute toward public transport infrastructure and increase the level of employment floor space in the south of the city. The design, landscaping, sustainability, drainage and land contamination / stability mitigation were considered acceptable but this would be subject to further evaluation. A condition was included to require such evaluation.



The Committee debated the Application and a summary of the main points clarified were –

1. The overriding use of the development would be approximately 65% warehousing in broad accordance with Planning policy;
2. Parking of vehicles on the site was a landowner issue and was not part of the planning application;
3. The proposed food outlets related to café and restaurants and did not include fast food takeaway units;
4. Noise issues eg deliveries, could be controlled by condition;
5. The Application was submitted after consultation had been completed;
6. Unexploded ordnance on the site had been fully taken into account by the Applicant;
7. Concern expressed about potential use of air sourced heat pumps instead of ground sourced heat pumps which were considered a better alternative for environmental reasons.
8. Concern expressed about confliction of pedestrians with vehicles. Highway officer clarified that work on this had mitigated risk with regard to school access and retail access, work still remained in respect of the drive through lane and the delivery area but it was considered that this could be controlled by an appropriate condition;
9. There had been some loss of community facility however it was considered that this did not have a direct impact on the Carmel building so was not relevant with regard to this Application;
10. Car parking rights had only been in actual use for approximately 2/3 years;
11. Tree cover mitigation was covered by condition 9 Landscaping, however there was significant support amongst members for additional trees to be planted above and beyond the minimum amount and members asked that their wish be recorded in the Minutes.

It was moved and seconded to approve the recommendations as set out in the report.

The Committee was reminded that there were two separate applications and that they would need to be voted on separately.

On application 16/02785/F being put to the vote there were ten in favour, one abstention and none against.

On application 16/02786/A being put to the vote there were ten in favour, one abstention and none against.

Resolved –

1. That application 16/02785/F be approved subject to the conditions and advices listed in the report;
2. That application 16/02786/A be approved subject to the conditions listed in the report.

(2) 15/05596/A – Shah Jalal Jame Mosque, Easton – Erection of a double sided Digital Advertising Tower with associated Logo Boxes – Easton



Councillor Khan remained for this item but took no part in the debate or the decision process.

The Planning Case Officer gave a detailed presentation on the application and drew the Committee's attention to the Amendment sheet. The recommendation was for a split decision part approval and part refusal.

The Committee debated the Application and a summary of the main points clarified were –

1. The duration between advertising changes was 30 seconds and this had been conditioned. It was noted that Highways England had been satisfied with a 10 second delay but the Council's highway officer considered that this would be too much of a distraction for motorists with consequent impact on road safety;
2. A condition was in place to mitigate any negative impacts from light pollution both in terms of brightness and light levels and this had not been objected to by Highways England;
3. Members were advised that a previous application near to this site was also a split permission due to highway safety issues so the recommendation for this application was consistent with this approach although the Committee was not bound by this when considering this application;
4. The content of the advertising was not a planning consideration and therefore could not be taken into account;
5. The financial impact on the Mosque was not a planning consideration and therefore could not be taken into account;
6. There were similar examples of this type of proposal and each had been considered on their own merits with safety being a paramount issue;
7. Management of the advertising screen to take into account volume of use of the motorway was not practical as the motorway was in use 24 hours a day. Light pollution of nearby residential properties would be limited as the screens would be directed toward road user, this was in addition to the Condition to manage light pollution;
8. The advertisements were of a static display and for 30 seconds duration;
9. The amount of energy used by the advertising screens was not a planning consideration. There were only two planning considerations namely visual amenity and highway safety;
10. A suggestion to compromise on the Application to use one digital and one plain non-digital advertising board was not possible as the Committee could only consider the Application currently before it.

The Committee was reminded that although the Application must be considered on its own merit there was already in existence a similar permission for advertising with a split permission granted. If the Committee decided to amend this application to a double permission this could have an impact on the current application which was currently the subject of an appeal against the current permission which approved a split decision.

It was moved and seconded to approve the recommendation for a split decision as set out in the report.

On being put to the vote there were five in favour and five against. As the result of the vote was inconclusive the Chair exercised his casting vote and voted in favour.





## Resolved –

1. That the structure and digital display screen facing northeast only be approved subject to the conditions listed in the report;
  2. That permission for the digital advertising screen mounted to the proposed structure facing southwest be refused for the reasons set out in the report.
- (3) 15/05503/F – Land east of Wesley College – Proposed Construction of four new residential dwellings with associated access and landscaping – Westbury-on-Trym and Henleaze.

The Planning Case Officer gave a detailed presentation on the application and drew the Committee's attention to the Amendment sheet which included the withdrawing of refusal reason no.2 from the case officer's recommendation in the report in relation to the loss of the existing playing field. It was also noted that because Sport England was not a statutory consultee, if approved, there would be no need to refer the Application to the Secretary of State for decision in accordance with The Town and Country Planning (Consultation) (England) Direction 2009. The recommendation was for refusal.

During the public forum session an e-mail from Sport England in respect of the application was circulated to members for information by a member of the public, which cited that one objection to the loss of the sport ground remained.

The Committee debated the Application and a summary of the main points clarified were –

1. A member queried the amount of CIL or other financial contribution that would be necessary to mitigate any harm caused by the proposed development, a figure was not given;
  2. The proposed development was for low density housing;
  3. There was no significant precedent for permission for this type of development on this type of land, the only previous application for this site had been refused and the decision upheld at subsequent appeal;
  4. The road safety issues had been fully considered and addressed and the revised highway layout was now supported by the Council's highway officers;
  5. The pathways would be flush with the speed tables to enable inclusive access;
  6. Concerns expressed about damage to 'wildlife corridor', the Committee advised that this had not been a reason for previous refusal on this site and the Nature Conservation officer had not raised any objections or concerns in this respect, however this could be conditioned if necessary. Some Members asked that training about 'wildlife corridor' in relation to planning issues be provided.
- It was moved and seconded to approve the recommendation as set out in the report, having regard to the amendment sheet which removed the second reason for refusal.

On being put to the vote there were seven in favour, three against and one abstention.



Resolved – that permission be refused for the reason set out in the report, as amended by the amendment sheet.

(4) 16/02301/FB – Proposed creation of a permanent overflow car park for 66 cars at Oldbury Court Estate – Frome Vale.

Councillor Khan was absent for part of the proceedings for this item and therefore took no part in the debate or decision process.

Councillors Clough and Eddy left the meeting at this point.

The Planning Case Officer gave a detailed presentation on the application, seeking a solution to the issue of overflow car parking at the estate site. The recommendation was for approval subject to conditions.

It was moved and seconded to approve the recommendations as set out in the report.

On being put to the vote it was unanimously -

Resolved – that permission be granted subject to the conditions listed in the report.

## **8. Additional Information Relating To Agenda Item Number 7**

Additional information was noted as appropriate.

Meeting ended at 9.35pm.

**CHAIR** \_\_\_\_\_



**Agenda item no. 4**

**DEVELOPMENT CONTROL COMMITTEE B**

**28 September 2016**

**REPORT OF THE SERVICE DIRECTOR - PLANNING**

**LIST OF CURRENT APPEALS**

**Informal hearing**

<b>Item</b>	<b>Ward</b>	<b>Address, description and appeal type</b>	<b>Date of hearing</b>
1	Cabot	11 - 13 Queens Road Clifton Bristol BS8 1QE Change of use from a retail unit (Use Class A1) to cafe or restaurant (Use Class A3). Appeal against refusal Delegated decision	29/11/2016
2	Cotham	16 Clyde Road Redland Bristol BS6 6RP Copper Beech - fell. (Tree protected by Tree preservation Order 1283). Appeal against refusal Delegated decision	TBA
3	Westbury-on-Trym	Southmead Police Station Southmead Road Bristol BS10 5DW Demolition of the existing police station buildings and redevelopment of the site to provide a care home (Use Class C2), associated access, car parking and landscaping and the conversion of an existing building fronting Southmead Road to provide a single dwelling (Use Class C3). Appeal against refusal Committee	TBA

**Public inquiry**

<b>Item</b>	<b>Ward</b>	<b>Address, description and appeal type</b>	<b>Date of inquiry</b>
4	Eastville	541-551 Fishponds Road Fishponds Bristol BS16 3AF Demolition of existing warehouse and erection of a freestanding two storey restaurant with associated basement, drive-thru, car parking and landscaping. Installation of 2 no. customer order display and canopy. Appeal against refusal Committee	08/11/2016

5	Clifton	Trinity House Kensington Place Bristol BS8 3AH Appeal against an Enforcement Notice issued by the City Council on 17 March 2016 for an alleged breach of planning: Without planning permission, the re-modelling of existing dwelling to include basement and rear extension without complying with conditions 4 and 5 of the planning permission number13/01376/H. Appeal against an enforcement notice	05/10/2016
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## Written representation

Item	Ward	Address, description and appeal type	Date lodged
6	Clifton	12 The Mall Bristol BS8 4DR Remove three sections of damaged and cracked marble slab located beneath old refrigeration unit and replace with modern butcher's refrigeration unit (retrospective) Appeal against refusal Delegated decision	23/03/2016
7	Frome Vale	46 Field View Drive Bristol BS16 2TT Horse chestnut - Reduce crown by 30%. Removal of deadwood and Ivy. Remove two large branches overhanging the footpath. TPO 379 Appeal against refusal Delegated decision	23/03/2016
8	Southville	1 Lock Lane Bedminster BS3 1BZ Change of use from commercial use to domestic (residential) use. Appeal against refusal Delegated decision	30/03/2016
9	Southville	1 Lock Lane Bedminster Bristol BS3 1BZ Appeal against an Enforcement Notice issued by the City Council on 02.03.2016 for an alleged breach of planning: Without the grant of planning permission the change of use of the property from a commercial unit to a residential dwelling Appeal against an enforcement notice	30/03/2016
10	Easton	420 Stapleton Road Easton Bristol BS5 6NQ Removal of the existing advertising and replace with one free standing digital adverting board (5m x 7.5m)and one wall mounted digital advertising board (14m x 3.5m) with associated logo boxes. Appeal against refusal Committee	08/06/2016

11	Ashley	39A Shaftesbury Avenue Bristol BS6 5LT Retention of the re-roofing of rear (east facing) roof slope with metal sheeting. Appeal against refusal Delegated decision	13/06/2016
12	Easton	18 Belle Vue Road Easton Bristol BS5 6DS An appeal against an Enforcement Noticed issued by the City Council on 25.04.2016 for an alleged breach of planning: Without the grant of planning permission the erection of a cycle storage structure to the front of the property. Appeal against an enforcement notice	28/06/2016
13	Horfield	68 Filton Road Bristol BS7 0PB Enforcement notice appeal for the erection of 2.5 metre high fence to the rear of the site fronting Toronto Road. Appeal against an enforcement notice	05/07/2016
14	Henbury	53 Arnall Drive Bristol BS10 7AR Demolition of existing garage and erection of one detached dwelling on land to the rear of the existing house. Appeal against refusal Delegated decision	13/07/2016
15	Ashley	147 Mina Road Bristol BS2 9YF Replacement of existing brickwork stores building at the rear of no.147 Mina Road with a one bedroom flat located above retained stores on ground floor below. Appeal against refusal Delegated decision	18/07/2016
16	Clifton East	99 Queens Road Clifton Bristol BS8 1LW Application for removal or variation of a condition of permission - app.no. 13/05499/F relating to condition 24 to alter the opening hours of the ground floor cafe. Appeal against refusal Delegated decision	19/07/2016
17	Eastville	Star Inn 539 Fishponds Road Fishponds Bristol BS16 3AF Erection of three houses. Appeal against refusal Delegated decision	19/07/2016

18	St George East	12 Grantham Road Bristol BS15 1JR Demolition of existing bungalow and outbuildings and construction of 4 No. one-bedroom flats in a new 2-storey building. Appeal against refusal Delegated decision	26/07/2016
19	Brislington West	40 Churchill Road Bristol BS4 3RW Proposed one bedroom dwelling accommodated within existing outbuilding. Appeal against refusal Delegated decision	27/07/2016
20	Clifton East	Rear Of 98 Whiteladies Road Bristol BS8 2QY Change of use of existing store to 'sui generis' student studio apartment with associated provision of refuse and cycle storage and roof light. Appeal against refusal Delegated decision	01/08/2016
21	Redland	6 Northumberland Road Bristol BS6 7AU An appeal against an Enforcement Notice issued by the City Council on 9th June 2016 for an alleged breach of planning: Without the benefit of planning permission, the removal of a 1.2 metre wide section of the front boundary wall at 6 Northumberland Road, Bristol BS6 7AU. Appeal against an enforcement notice	02/08/2016
22	Clifton	Haberfield House Hotwell Road Bristol BS8 4NH Conversion of vacant loft accommodation to create 6 two bedroom flats. Associated internal and external alterations including provision of new dormer windows and rooflights. Appeal against refusal Delegated decision	09/08/2016
23	Clifton	Haberfield House Hotwell Road Bristol BS8 4NH Proposed works in relation to conversion of vacant loft accommodation to create 6 two bedroom flats. Conversion of vacant loft accommodation to create 6 two bedroom flats. Associated internal and external alterations including provision of new dormer windows and rooflights. Appeal against refusal Delegated decision	09/08/2016
24	Clifton	1A Ambra Vale Bristol Change of the ground floor car park and storage area to purpose-built student accommodation (Use Class Sui generis) together with associated external alterations. Appeal against refusal	10/08/2016

25	Lawrence Hill	The Old Exchange Clarence Road St Philips Bristol BS2 0NR Erection of two dwelling houses. Appeal against refusal Delegated decision	11/08/2016
26	Windmill Hill	362 St Johns Lane Bristol BS3 5BA Retention and completion of timber raised decking area with opaque perspex/trellis privacy screens and steps to rear of property. Appeal against refusal Delegated decision	11/08/2016
27	Lockleaze	22 Stottbury Road Bristol BS7 9NG Retention of part two storey, part single storey, rear extension. Appeal against refusal Delegated decision	11/08/2016
28	Ashley	39A Shaftesbury Avenue Bristol BS6 5LT An appeal against an Enforcement Notice issued by the City Council on the 26 April 2016 for an alleged breach of planning: Without the benefit of planning permission, the cladding of the eastern roof slope with metal sheet cladding. Appeal against an enforcement notice	15/08/2016
29	Hartcliffe & Withyw	1 Randolph Avenue Bristol BS13 9PG Proposed new dwelling on land to rear of 1 Randolph. Appeal against refusal Delegated decision	15/08/2016
30	Redland	Rear Of 15-17 Zetland Road Bristol BS6 7AH Demolition of existing out buildings and construction of 2no., two bedroom houses (with access from Kingsley Road). Appeal against non-determination Delegated decision	18/08/2016
31	Westbury-on-Trym	4A Russell Grove Bristol BS6 7UE Subdivision of first floor flat to two flats. Appeal against refusal	18/08/2016
32	Hillfields	Land Rear Of 15 Worcester Close Bristol BS16 3PW Proposed 2 no.semi-detached three bedroom houses. Appeal against refusal Delegated decision	18/08/2016

33	Easton	66 Carlyle Road Bristol BS5 6HH Notification of prior approval for the erection of a single storey rear extension that would extend beyond the rear wall of the original house by 5 metres, have a maximum height of 2.5 metres and have eaves that are 2.5 metres high. Appeal against refusal Delegated decision	22/08/2016
34	Westbury-on-Trym	9B Etloe Road Bristol BS6 7PG Proposed roof extension to former additional living accommodation. Appeal against refusal Delegated decision	06/09/2016
35	Kingsweston	Land Adjacent To 3 Westbury Lane Bristol BS9 2PD Erection of dwelling with associated access from Westbury Lane. Appeal against refusal Delegated decision	14/09/2016
36	Clifton	19 Royal York Crescent Bristol BS8 4JY Addition to the existing single storey element; external wall insulation and associated works to existing eaves, sill and windows reveals, and installation of double glazed lights and doors. Appeal against refusal Delegated decision	15/09/2016

### List of appeal decisions

Item	Ward	Address, description and appeal type	Decision and date decided
37	Windmill Hill	1 Cotswold Road North Bristol BS3 4NL Conversion and extension of existing workshop to form 1 x 1 bed flat at upper level and workshop below. Appeal against refusal Delegated decision	Appeal dismissed 07/09/2016
38	Bedminster	209 Luckwell Road Bristol BS3 3HD Proposed 1 no. two storey dwelling. Appeal against refusal Delegated decision	Appeal dismissed 13/09/2016
39	Knowle	36 Wootton Park Bristol BS14 9AQ Application for a Certificate of existing use - two bed independent self-contained dwelling. Appeal against refusal Delegated decision	Appeal dismissed 02/09/2016



40	Cotham	The Wall Woodbury Lane Bristol BS8 2SE Demolition of existing store building and erection of a detached two storey dwelling, (Change of use from D1 to residential). Appeal against refusal Delegated decision	Appeal allowed 17/08/2016  Costs awarded
41	Bishopsworth	28 Bishopsworth Road Bristol BS13 7JJ Demolition of existing garage/storage building and replacement with a two-bedroom dwelling (plus roof terrace) with integral garage. Appeal against refusal Delegated decision	Appeal dismissed 18/08/2016  Costs not awarded
42	Clifton	Avon Gorge Hotel Princes Buildings Sion Hill Bristol BS8 4LD Retention of Pergola. Appeal against refusal Delegated decision	Appeal dismissed 02/09/2016
43	Bedminster	Redpoint Climbing Centre 40 Winterstoke Road Bristol BS3 2NW Extension of climbing centre to form assembly area (Resubmission of 15/04308/F) Appeal against refusal Delegated decision	Appeal allowed  15/08/2016
44	Knowle	72 Somerdale Avenue Bristol BS4 1AE Deletion of condition nos. 4 (Cycle Parking Provision) & 5 (PV Panels) attached to planning permission 13/03335/F, which approved a 2-bedroomed dwelling accommodated within a two storey side extension to 72 Somerdale Avenue. Appeal against refusal Delegated decision	Appeal allowed 09/09/2016
45	Eastville	Grove Lodge Grove Road Fishponds Bristol BS16 2BW Application for a Lawful Development Certificate for a Proposed use or development. It is proposed to install 6 no. sleeping cabins crash pads placed on small concrete pads and connected to the existing water, electricity and sewerage services on the site. Appeal against refusal Delegated decision	Appeal withdrawn 30/08/2016

**Agenda item no. 5**

**DEVELOPMENT CONTROL COMMITTEE B**  
**28 September 2016**

**REPORT OF THE SERVICE DIRECTOR - PLANNING**

**LIST OF ENFORCEMENT NOTICES SERVED**

<b>Item</b>	<b>Ward</b>	<b>Address, description and enforcement type</b>	<b>Date issued</b>
1	Hengrove	1 Cranleigh Road Bristol BS14 9PL Erection of a rear roof dormer extension Enforcement notice	12/08/2016

## **Development Control Committee B**

### **28 September 2016**

#### **Report of the Service Director - Planning**

##### **Index**

##### **Planning Applications**

<b>Item</b>	<b>Ward</b>	<b>Officer Recommendation</b>	<b>Application No/Address/Description</b>
1	Lawrence Hill	Grant	16/00719/F - Avonbank Feeder Road Bristol BS2 0TH Proposed installation of low carbon, bio-diesel powered generators and associated infrastructure for the provision of a Flexible Generation Facility to provide energy balancing services via the capacity market for the National Grid.
2	Central	Grant	16/01888/F - Old Bristol Royal Infirmary Building Marlborough Street (South Side) City Centre Bristol BS1 3NU  Amended proposal Conversion of the Old BRI Hospital building including two upper storey additions and partial demolition to accommodate 6283sqm Office floorspace (Use Class B1) and 4031sqm Medical School (Use Class D1); and part 6, part 7, part 8, part 12, part 14, part 16, and part 20 storey building to the rear for student accommodation (Sui Generis) comprising 738 student bedspaces; communal areas and refurbishment of Fripps Chapel for communal student facility with ground floor commercial use (Use Class A3); associated landscaping, car parking and cycle parking.
3	Clifton	Grant	16/02137/F - Land Adjacent To 2 Southernhay Avenue Bristol Proposed four storey, three bedroom single dwelling house.
4	Lockleaze	Refuse	16/01193/X - Unit 4 Eastgate Centre Eastgate Road Bristol BS5 6XX  Application for removal of condition No 6 following grant of planning permission 15/00907/X (Insertion of additional mezzanine floorspace into combined Units C/D and alterations to the front and rear of Units C/D - to now allow the sale of food from Unit J)

WARD: Lawrence Hill CONTACT OFFICER: Ken Reid

SITE ADDRESS: Avonbank Feeder Road Bristol BS2 0TH

APPLICATION NO: 16/00719/F Full Planning

EXPIRY DATE: 6 April 2016

***Proposed installation of low carbon, bio-diesel powered generators and associated infrastructure for the provision of a Flexible Generation Facility to provide energy balancing services via the capacity market for the National Grid.***

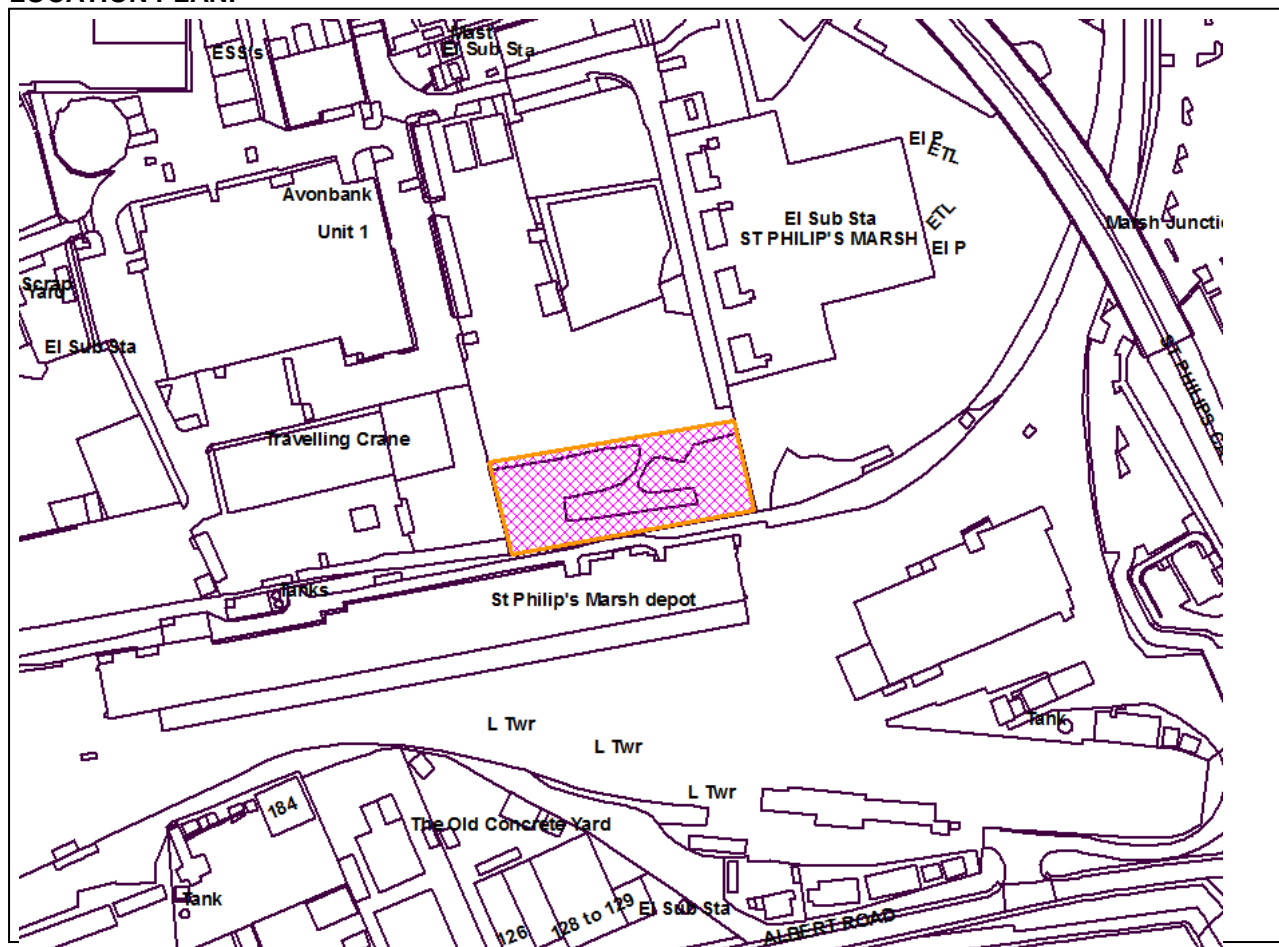
RECOMMENDATION: Grant subject to Condition(s)

AGENT: WYG  
100 St John Street  
London  
EC1M 4EH

APPLICANT: Plutus Energy Limited  
23 Hanover Square  
London  
W1S 1JB  
United Kingdom

***The following plan is for illustrative purposes only, and cannot be guaranteed to be up to date.***

**LOCATION PLAN:**



**Development Control Committee B – 28 September 2016**  
**Application No. 16/00719/F : Avonbank Feeder Road Bristol BS2 0TH**

## BACKGROUND

Members will recall that this application for the installation of 48 bio diesel powered generators, two double bunded storage tanks (for the bio fuel) and associated infrastructure to link into the National Grid, was considered at the meeting of the Development Control Committee B on 13<sup>th</sup> July 2016.

The item was deferred as members considered that the health aspects had not been unequivocally resolved. Officers were asked to provide information in response to the review of the Air Quality Assessment by Air Quality Consultants (AQC) on behalf of the RADE (Residents Against Dirty Energy) group. Officers were asked to provide further information in relation to the start-up and shut down effects of the engines on emission levels, together with a response to whether the relevant receptors have taken account of exposure to 3 to 4 year olds at St Philips Nursery (i.e. lower than the 1.5m readings above ground level), and for this to be included in the Air Quality Assessment. Information was requested over the toxicity of catalysts to be used in the green diesel (Cerium Oxide). Officers were also asked to provide a revised Noise Assessment to take account of tonal issues of the plant especially in relation to the proximity of St Phillips Nursery School.

Committee also requested that a medical opinion on the impact of the proposal on the health of children was sought. However in response to this request, the committee was advised that it would not be possible to obtain such an opinion and that this issue was not relevant to the consideration of the application beyond the normal considerations of the impact on air quality. It was the opinion of the Air Quality Officer that the health impact of emissions has been dealt with by the air quality assessment. If the objectives are not breached, there is not a reasoned argument to suggest that there is a significant impact on health from plant emissions.

A description of the application site, details of the relevant development plan policies, the representations received on the application and all key issues for the consideration are set out in the report that was presented to committee on 13th July 2016 (a copy of this report is attached under Appendix A). There are no additional representations to report.

In response, the applicant has submitted an addendum to the Air Quality Assessment, which provided further justification of the assessment methodology, along with additional modelling in accordance with Environment Agency requirements. The applicant has also provided a revised Noise Impact Assessment in accordance with BS4142 2014 which is more detailed and includes tonal content. The previous Noise Assessment had originally been carried out in accordance with the older BS4142 1997. The findings will be summarised below. These documents are also attached as appendices to this report.

## FURTHER RESPONSES TO AIR QUALITY HEALTH IMPACTS

### **Summary of AQC'S review of the Air Quality Assessment on behalf of RADE**

Full details of AQC's review have been attached under Appendix B of this report. The issues raised included concerns that account had not been taken of the baseline concentrations and therefore higher than predicted exceedances of toxins at many locations including St Philips Nursery and the Paintworks site. There was also concern with the modelling and methodology used in compiling the Air Quality Assessment and the technical data with regard to a number of issues. These included emission rates, exhaust velocity, exhaust gas temperature, metrological data, assumed operating hours and calculations of the number of exceedances in harmful emissions. The review added that it was unclear whether the assumptions made for the Air Quality Assessment were the same for noise in the noise assessment and in particular to the exhaust velocity.

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**Response to AQC's findings from the revised Air Quality Assessment**

In response to this the applicant was instructed by the Local Planning Authority to provide a response to AQC's findings in a further report to the Air Quality Assessment. A copy of this document has been attached (please see Appendix C for details). The applicant has provided further information and assessment in response to the concerns raised by AQC's report. This included a further justification of the assessment methodology used. Additional modelling was carried out in accordance with the Environment Agency's worst case scenario methodology for determining the level of oxidation.

The results from the additional assessment undertaken concluded that the greatest impacts were predicted to occur at industrial receptor locations, with the majority of receptors predicted to experience minor to negligible impacts as a result of the generator emissions. In addition, the severity of the impacts and significance of the effects were based on the results of the modelling of the typical, or representative, operating scenario for low sulphur diesel, rather than the biodiesel which is proposed for the generators. Taking account of all factors in the Air Quality Assessment further report, it concluded that the overall effect of the predicted impacts resulting from the emissions associated with the use of the proposed standby generators remains not significant as previously concluded.

**Response to the impact on emissions during start up and shut down of generation plant**

The efficiency of modern engines means that they are running at maximum capacity in a very short period of time. The applicant has stated that shut-down takes place when a button is pressed and the generators stop operating immediately. As such there is no data available from any of the engine manufacturers covering the short period when the engines start up or when they shut down. These factors were considered under paragraphs 3.2.2 and 5.2.2 of the Air Quality Assessment (See Appendix D).

**Response to the receptors used in readings at St Philips Nursery**

The Air Quality Officer advised that it is standard practice to model a receptor height with that of an average adult (around 1.5m). There was no evidence to show any significant variation between concentrations modelled at 1.5 to 0.6m (the height of a small child of nursery age). However the applicants were advised by the Local Planning Authority to instruct their consultant to run modelling based on receptor heights between 0.6 and 0.8m in the vicinity of St Philips Nursery. Details of the reading can be found under the appendices attached to the addendum to the Air Quality Assessment (see Appendix C). The results showed that there would be no exceedances in oxidants based on the modelling using the lower level receptors based on heights between 0.6 and 0.9m (in addition to the recommended 0.8m).

**The impact of Cerium Oxide on public health**

The applicant was asked by the Local Planning Authority to provide a response to the toxicity of the catalyst to be used in the bio fuel. The applicant confirmed that Cerium Oxide would be in used in the fuel as a pollution reducing additive. The Applicant states that this combination with the HVO offers the lowest possible NOx emissions available on the market in the UK (see Appendix E). In summary the applicant states that Cerium Oxide is a globally used catalyst that reduces NOx, CO and particulates with no ill effects.

In response the Air Quality Officer advised that there is not enough evidence to consider that Cerium Oxide is a risk to health.

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**RESPONSE FROM AIR QUALITY OFFICER**

For full details of the Air Quality officer's comments, please refer to the background paper (Appendix F). However the comments are summarised as follows. The applicant has responded to the critique (from AQC) by thoroughly addressing all the points raised and carrying out further assessment and reporting on the revised predictions on potential air quality impacts.

This type of back-up power generation plant is relatively new and as a result, there is not an accepted tried and tested methodology for realistically and reasonably assessing air quality impacts (as demonstrated by the AQC report).

The relative newness of these types of developments is reflected by the fact that Defra have yet to consult on options for legislation that would set binding emission limit values on relevant air pollutants from diesel engines used for back-up power generation. Defra have stated that legislation is proposed to be in force by no later than January 2019. Until that time, the Local Air Quality Management Regime, which considers the significance and acceptability of air quality impacts through air quality assessments, is the main mechanism for controlling emission of pollutants.

Based on a realistic prediction of likely air quality impacts (for 200 hours of operation), the revised air quality assessment shows that there is a risk of the short term air quality objective for NO<sub>2</sub> being exceeded at Spark Evans Park. However due to the likely operating profile of the plant, (between 5pm and 7pm on winter evenings), it is unlikely that people will be exposed at these times in this location for the relevant hourly period. The largest impacts upon residential receptor locations are predicted to occur at the Paintwork Phase 3 development. Whilst predicted to be close to the objective (based on using the Environment Agency assessment methodology), no exceedance of the objective is predicted in this location or any other residential locations considered in the assessment.

No exceedances of the health based short term NO<sub>2</sub> air quality objective at St Phillips Marsh Nursery are predicted for any of the assessment scenarios considered. This includes the unrealistic worst case scenarios which have reported results with the plant operating for over 3000 hours per year.

The required planning conditions as put before committee on the 13<sup>th</sup> July 2014 should ensure that the development operates within the parameters modelled in the air quality assessment and therefore we do not object to this development on the grounds of air quality effects, based on the predictions contained within the air quality assessment.

**Summary of revised noise assessment**

The details of the full results of the Noise Impact Assessment are attached under Appendix G. As mentioned the revised Noise Assessment has been carried out in accordance with the updated BS 4142: 2014 which also takes account of tonal issues. Based on the worst case scenario of all the generators and transformers running, the impact of the proposed generator facility on St Philips Nursery will not be significant. Notwithstanding this the typical operating period of the proposed generators would be in the evening after 5pm which is generally outside the nursery school's hours albeit for the after school club which operates up to 5:45pm.

**RESPONSE FROM THE POLLUTION CONTROL OFFICER**

Details of the Pollution Control Officer's comments are attached under Appendix H. On considering the revised Noise Impact Assessment the Pollution Control Officer is satisfied with the impact in terms of tonal noise associated with the generators. Whilst no background noise levels have been taken near to the nursery, the predicted noise levels at the nursery have been compared to the recommended noise levels given in Building Bulletin 93, Acoustic Design of Schools: Performance Standards, Department for Education, February 2015. The report predicts that the noise level from the generator units operating will be within the guideline values for both inside and outside spaces.

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Therefore the Pollution Control Officer has re-affirmed that there is no objection to the proposal subject to conditions.

#### OTHER COMMENTS

The question was asked by committee to why the applicant would not be taking the Renewable Obligation Certificates (ROCs) issued under the Renewables Obligation Order 2009 (ROO), even though the fuel is eligible for this subsidy. In response the applicant states that in order to obtain a Capacity Mechanism Contract from the National Grid (to provide emergency power); it cannot receive any form of 'subsidy' from the fuel it uses (see Appendix E).

#### CONCLUSION

This report addresses the concerns of Members at the meeting of Development Control Committee B on 13th July 2016, and the reasons for deferral. The Air Quality Assessment has demonstrated that there would not be a detrimental impact on pre-existing levels of air quality in regards to St Phillips Nursery. The revised calculations suggest some higher short term NO2 levels at the Paintworks site and Spark Evans Park based on the worst case scenario. However given the other factors this is not considered as significant to warrant a refusal on grounds of public health. In wider strategic terms the benefits of the development have been assessed and have to be given due weight, namely the need for infrastructure improvements to the energy network. The conclusions from the revised Noise Assessment have demonstrated that there would not be an unacceptable impact on the closest noise sensitive locations including St Philips Nursery.

#### **RECOMMENDED      GRANTED subject to condition(s)**

##### **Time limit for commencement of development**

1. Full Planning Permission

The development hereby permitted shall begin before the expiration of three years from the date of this permission.

Reason: As required by Section 91 of the Town and Country Planning Act 1990, as amended by Section 51 of the Planning and Compulsory Purchase Act 2004.

##### **Pre commencement condition(s)**

2. Construction management plan

No development shall take place including any works of demolition until a construction management plan or construction method statement has been submitted to and been approved in writing by the Local Planning Authority. The approved plan/statement shall be adhered to throughout the construction period. The statement shall provide for:

Parking of vehicle of site operatives and visitors  
 Routes for construction traffic  
 Hours of operation  
 Method of prevention of mud being carried onto highway  
 Pedestrian and cyclist protection  
 Proposed temporary traffic restrictions  
 Arrangements for turning vehicles  
 Arrangements to receive abnormal loads or unusually large vehicles



**Development Control Committee B – 28 September 2016****Application No. 16/00719/F : Avonbank Feeder Road Bristol BS2 0TH**

Methods of communicating the Construction Management Plan to staff, visitors and neighbouring residents and businesses

Reason: In the interests of safe operation of the highway in the lead into development both during the demolition and construction phase of the development.

3. Acoustic barrier

No development shall take place until full details of the acoustic barrier detailed in the acoustic report submitted with the application have been submitted to and approved in writing by the Council.

Reason: In order to safeguard the amenities of nearby occupiers.

4. Details of a suitable trespass proof fence (of at least 1.8m in height) adjacent to Network Rail's boundary shall be submitted to and approved by the Local planning Authority before development commences.

Reason: To ensure the safe operation of the railway line and the protection of Network Rail's adjoining land.

5. Ecology

No development shall take place until an ecological mitigation strategy prepared by a qualified ecological consultant has been submitted to and approved by the Local Planning Authority. This should include:

- A Precautionary Method of Working method statement with respect to the potential presence of legally protected reptiles;
- Measures to protect nesting birds;
- A method statement for the control and removal of Japanese knotweed which was recorded on site during the extended phase one habitat survey dated July 2015;
- An update badger survey to be undertaken no more than three months prior to construction commencing;
- Measures to protect foraging or commuting badgers becoming trapped in open trenches or pipework;
- The provision of bird and bat boxes;

Reason: - In the interests of maintaining the ecological value of the site.

6. Submission and approval of landscaping scheme

No development shall take place until there has been submitted to and approved in writing by the Local Planning Authority a scheme of hard and soft landscaping, which shall include indications of all existing trees and hedgerows on the land, and details of any to be retained, together with measures for their protection, in the course of development. The approved scheme shall be implemented so that planting can be carried out no later than the first planting season following the occupation of the building(s) or the completion of the development whichever is the sooner. All planted materials shall be maintained for five years and any trees or plants removed, dying, being damaged or becoming diseased within that period shall be replaced in the next planting season with others of similar size and species to those originally required to be planted unless the council gives written consent to any variation.

Reason: To protect and enhance the character of the site and the area and to ensure its appearance is satisfactory.

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**Pre occupation condition(s)**

7. Servicing & Management Plan

No building or use hereby permitted shall be occupied or use commenced until a servicing and management plan addressing vehicle arrivals, departures, parking, stopping and waiting has been prepared and lighting, has been submitted to and approved in writing by the Local Planning Authority. The measures shall thereafter be implemented in accordance with the approved servicing and management plan.

Reason: In the interests of highway safety.

8. Ambient Air Quality Monitoring

An ambient air quality monitoring station will be commissioned in an agreed location by the Local Planning Authority before the development commences operation. Real-time nitrogen oxides monitoring, using monitoring equipment that has been type approved under the UK Environment Agency MCERTS Scheme is required to fulfil this requirement. The air quality monitoring site should be operated and maintained in line with the QA/QC standards applied to Bristol City Councils air quality monitoring network. Bristol City Council should be provided with access to raw data and calibration data for the monitoring equipment. Wind speed and direction data should also be collected at or in close proximity to the air quality monitoring site. The applicant should pay for the equipment installation and running cost for a minimum period of 2 years from the date that the proposed plant is operational:

Reason - To ensure that the air quality impacts at a relevant location are in line with the predictions made in the air quality assessment.

**Post occupation management**

9. Restriction of noise from plant and equipment

The rating level of any noise generated by plant & equipment as part of the development shall be at least 5 dB below the background level as determined by BS4142: 2014 Methods for rating and assessing industrial and commercial sound.

Reason: To safeguard the amenity of nearby premises and the area generally.

10. Inspection and maintenance

The generator plant shall be inspected and maintained in line with manufacturers guidance:

Reason - To ensure optimal engine performance and to minimise emissions to air throughout the life of the plant.

11. Total hours

The plant should not operate outside the hours of 07:30 to 22:30 and for no more than 200 hours in any one year. The applicant must submit records listing the annual hours of operation to Bristol City Council. Any variation to increase operating hours must be accompanied by a revised air quality assessment:

Reason: This is the basis on which the air quality impacts have been assessed and any changes required to the plant operation will need to assess the potential impact on air quality.

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12. Regular and on-going stack emissions monitoring

There shall be regular and on-going stack emissions monitoring, throughout the operational life of the plant, to demonstrate that engine emissions comply with the pollutant emission concentrations as stated in Table D3 of Appendix D contained in the Air Quality Assessment Appendices Document (1750086/R2016/001). This monitoring should also demonstrate that the stack emission parameters are in line with the exhaust flows and temperatures as modelled in the air quality assessment and contained in Table D4 of the Air Quality Assessment Appendices Document (1750086/R2016/001). Data should be reported to Bristol City Council's Sustainable City and Climate Change Service.

Reason: This is the basis on which air quality impacts have been assessed in the planning application and to which the engines will be required to perform.

13. If the measured concentrations of nitrogen oxides are higher than those predicted by the modelling and give rise to concern about breaches of air quality objectives/health impacts, Bristol City Council will review the operation of the site to ensure impacts are reduced to a level that do not give rise to concern. Mechanisms to bring air quality impacts in line with the predicted modelled concentrations could include but would not be limited to examples such as, placing a restriction on the meteorological conditions under which the plant could operate, requiring additional abatement technology to be installed or changing the stack release parameters:

Reason - To ensure mechanisms are in place to ensure that the plant is operating within acceptable parameters to protect health.

14. Bio fuel

The fuel to be used shall comprise of Hydrotreated Vegetable Oil (HVO) only.

Reason: To protect local air quality and as assessed under the Air Quality Assessment.

15. Sustainability criteria

The development hereby permitted shall only operate when the bio fuel satisfies the sustainability criteria.

For the purposes of this condition:

- (a) 'biomass' has the meaning given by Article 2(e) of the Renewables Directive;
- (b) 'sustainability criteria' means such criteria relating to the sustainability of biomass as are set out in the Renewables Directive from time to time;
- (c) 'Renewables Directive' means Directive 2009/28 of the European Parliament and of the Council on the promotion of the use of energy from renewable sources, as amended or replaced from time to time.

Reason: To ensure the use of low-carbon fuel in compliance with policy BCS14 of the Bristol Development Framework Core Strategy.

16. Annual reports

Throughout the operational life of the development, there shall be submitted to the Council annual reports on the sustainability of the biofuel to be used in the electricity generating engines. This information shall provide the same levels of assurance and verification which the operator of the development is required to do (or would be required to do, if they were claiming

**Development Control Committee B – 28 September 2016****Application No. 16/00719/F : Avonbank Feeder Road Bristol BS2 0TH**

financial assistance through Renewable Obligations (RO)).

Reason: To ensure that the fuel used complies with the national criteria of a sustainable fuel.

17. Monitoring

Within 1 month of the granting of this application an assessment of noise generated by the development shall be submitted to and approved by the Local Planning Authority. Should the assessment show that noise generated by the development is above the noise levels predicted in the acoustic report submitted with the application then a further report detailing mitigation measures shall be submitted, approved in writing and works completed in full within 2 months of the commencement of the use.

Reason: In order to safeguard the amenities of nearby occupiers.

**List of approved plans**

18. List of approved plans and drawings

The development shall conform in all aspects with the plans and details shown in the application as listed below, unless variations are agreed by the Local Planning Authority in order to discharge other conditions attached to this decision.

110 Proposed tracking plan, received 31 March 2016  
 104 C Proposed site sections (sheet 1 of 3), received 22 April 2016  
 105 C Proposed site sections (sheet 2 of 3), received 22 April 2016  
 106 C Proposed site sections (sheet 3 of 3), received 22 April 2016  
 Unilateral Undertaking given by Plutus Energy Limited, received 30 June 2016  
 Air Quality Assessment - Further Information, received 6 April 2016  
 Air quality assessment, received 2 June 2016  
 Arboricultural constraints report, received 10 February 2016  
 Extended phase 1 habitat survey, received 10 February 2016  
 Noise impact assessment, received 10 February 2016  
 1525\_SK002 A Site location plan, received 10 February 2016  
 5355-03 Generator plan & elevations, received 10 February 2016  
 5355-04 Switch room elevation & plan, received 10 February 2016  
 5355-05 Double dunded diesel storage tank, received 10 February 2016  
 1525\_SK005 A Existing site with boundary, received 10 February 2016  
 03 C Proposed site layout, received 10 February 2016  
 13442-1-1 A (1) Internal layout, received 10 February 2016  
 13442-1-1 A (2) General arrangement, received 10 February 2016

Reason: For the avoidance of doubt.

**Advices**

1. Network Rail

You are advised to refer to the comments and recommendations from Network Rail dated 21st March 2016 which is to ensure that the safe operation of the adjoining railway is continued.

2. Environment Agency

Oil or chemical storage facilities should be sited in bunded areas. The capacity of the bund should be at least 10% greater than the capacity of the storage tank or, if more than one tank

**Development Control Committee B – 28 September 2016****Application No. 16/00719/F : Avonbank Feeder Road Bristol BS2 0TH**

is involved, the capacity of the largest tank within the bunded area. Hydraulically inter-linked tanks should be regarded as a single tank. There should be no working connections outside the bunded area.

Any waste oils must be collected and contained prior to disposal in an approved manner. On no account should waste oils be discharged to any drainage system.

**BACKGROUND PAPERS**

Covering letter to Bristol City Council	24 August 2016
Noise Impact Assessment	13 September 2016
Air Quality Assessment – Further Information	15 September 2016
Pollution Control	15 September 2016
Email from agent	16 September 2016
Air Quality	16 September 2016

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**WARD:** Central **CONTACT OFFICER:** Charlotte Sangway  
**SITE ADDRESS:** Old Bristol Royal Infirmary Building Marlborough Street (South Side) City Centre  
Bristol BS1 3NU

**APPLICATION NO:** 16/01888/F Full Planning  
**EXPIRY DATE:** 21 July 2016

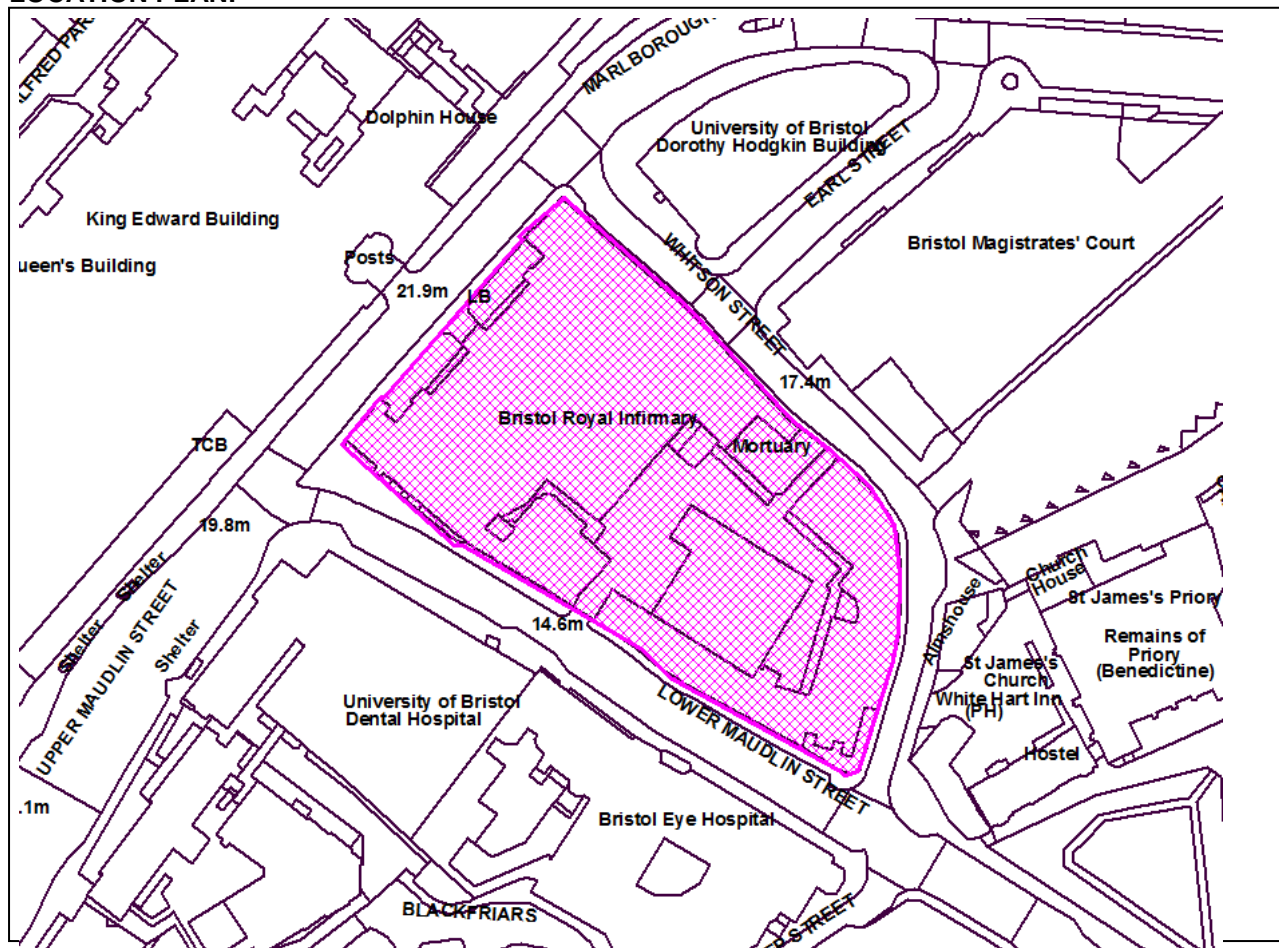
**Amended proposal Conversion of the Old BRI Hospital building including two upper storey additions and partial demolition to accommodate 6283sqm Office floorspace (Use Class B1) and 4031sqm Medical School (Use Class D1); and part 6, part 7, part 8, part 12, part 14, part 16, and part 20 storey building to the rear for student accommodation (Sui Generis) comprising 738 student bedspaces; communal areas and refurbishment of Fripps Chapel for communal student facility with ground floor commercial use (Use Class A3); associated landscaping, car parking and cycle parking.**

**RECOMMENDATION:** Grant subject to Condition(s)

**AGENT:** CgMs Limited  
7th Floor  
140 London Wall  
London  
EC2Y 5DN

**APPLICANT:** UNITE Group Plc  
The Core  
40 St Thomas Street  
Bristol  
BS1 6JZ

**The following plan is for illustrative purposes only, and cannot be guaranteed to be up to date.**  
**LOCATION PLAN:**



**Development Control Committee B – 28 September 2016**

**Application No. 16/01888/F : Old Bristol Royal Infirmary Building Marlborough Street (South Side) City Centre Bristol BS1 3NU**

**SUMMARY**

The application site is in the City Centre within an area designated as Hospital Precinct. The site was formerly owned by the hospital Trust but has been acquired by Unite Group Plc. (student accommodation providers). The buildings on the application site are not listed buildings but the Old BRI Building and chapel are 'locally listed'. The site is not within a conservation area but is adjacent to the St James Parade Conservation Area.

Significant objection has been received to the application (85 objections out of 90 contributors) on grounds including the proposed student uses, loss of hospital uses, impact on the nearby listed buildings and design, management, viability and impact on neighbouring occupiers (St James Priory social housing).

The application proposes 6283sqm of offices at the upper floors of the Old BRI Building, 4031sqm of medical school teaching accommodation (linked to University of Bristol) at the ground and basement level of the Old Building and a new-build development providing 738 student bedspaces to the lower half of the site. A small commercial unit is proposed to front Whitson Street.

The proposed development is arranged around a courtyard providing parking for 11 vehicles (including 2 disabled bays). Demolition is proposed of a number of elements of the existing Old BRI Building, including the Hill Ward Block, South Entrance Block, unsympathetic modern additions to the rear and rooftop level and a portion of the historic structure to the rear, central element. Extensions are proposed to the Old BRI building to facilitate its refurbishment including a rear glazed atrium and rooftop extensions.

**The key consideration for the application is whether the public benefits of retaining the Old BRI building and chapel on the site outweigh other design concerns regarding the height, massing, architecture and heritage assets of the new build elements and the extent of alteration to the Old BRI building itself through demolition and roof additions.**

Objections on these grounds have been received from both Historic England and the Council's City Design Group (as appended in full to this report). However officers, having carefully weighed up this issue, consider that the level of harm resulting from the proposals in visual terms would be less significant than that identified by both these consultees and public objections considering the context and specific public realm impacts. National policy requires any harm to heritage assets to be given considerable importance and weight but to be weighed against the public benefits of this scheme. In this instance, the public benefits are very significant given that they would involve the retention of the historic Old BRI building, that could otherwise be demolished. Despite the complexities of retaining the building, the applicant has agreed to work with officers to seek a solution that retains the building. This application therefore represents a significant opportunity to ensure retention of the building for the city that may otherwise be lost if the proposal is rejected. **Officers strongly consider that weighing all considerations in the balance that the public benefits of the building's retention would outweigh other concerns.** Other public benefits would also result in terms of contributing to housing supply, employment floorspace and educational facilities and wider social, economic and regeneration benefits.

**Development Control Committee B – 28 September 2016****Application No. 16/01888/F : Old Bristol Royal Infirmary Building Marlborough Street (South Side) City Centre Bristol BS1 3NU**

The applicant has undertaken a viability appraisal to support their argument that the amount of development proposed is necessary to enable retention of the Old BRI building and chapel given the significant costs in refurbishing the building. The appraisal has been independently reviewed and concluded that a similar amount of development to that proposed would be required to cross-subsidise the retention of the Old BRI building and to return a reasonable profit by industry standards. Objectors have argued against some of the assumptions made in the viability appraisal or that the applicant has overpaid for the land, however officers are satisfied that this is not the case and this has been addressed in the report.

Officers are clear in their recommendation that the principle and amount of student accommodation would be acceptable on policy grounds (Policy BCAP4), there being no evidence that it would result in a harmful concentration of such accommodation on grounds of reduced housing choice or harm to the residential amenity of the area.

Other key issues include highway matters, and your officers are satisfied that all impacts can be managed and dealt with via condition to include public realm improvements around the entire site.

In conclusions, officers recommend that Members approve the application subject to conditions.

**SITE BACKGROUND**

The application relates to a site situated within Bristol City Centre as defined by the Bristol Central Area Plan (BCAP). The site is designated by the BCAP as being within the Hospital Precinct area of the St Michael's neighbourhood. The site was formerly owned by the hospital Trust but has been acquired by Unite Group Plc. (student accommodation providers). The area surrounding the site is mixed in character including hospital buildings, the courts, the bus station, St James Priory, office buildings and a public house.

The application site contains buildings that are not listed- the Old BRI building and chapel are 'locally listed'. The site is not within a conservation area, but immediately adjacent to the St James Parade Conservation Area. The site is in Flood Zone 1 and a Coal Authority Low Risk Area.

Works of demolition have already commenced at the site under a separate permission (refer to 'Relevant Planning History' below).

**RELEVANT PLANNING HISTORY**

16/03447/N- Prior approval for demolition of the buildings, boundary walls and ancillary structures on the lower half of the site. Approval given 25 July 2016. (See below for an explanation of the scope of control of such applications).

15/06495/PREAPP- Preapplication enquiry for the "Redevelopment of site to provide purpose-built student accommodation (750 bedspaces), a medical school and offices". Responses given 25 Jan 2016 and 19 April 2016.

15/04110/PREAPP- Pre-application enquiry for the "Redevelopment of site to provide purpose-built student accommodation, medical centre and offices". Response issued 6 November 2015. Development proposal comprising:



**Development Control Committee B – 28 September 2016****Application No. 16/01888/F : Old Bristol Royal Infirmary Building Marlborough Street (South Side) City Centre Bristol BS1 3NU**

- A medical school (in partnership with the University of Bristol) circa 2000sqm fronting Whitson Street;
- A 742 bed student residential development (approx. 89 cluster flats providing 673 bed spaces and 69 studios);
- New office accommodation (circa 3000sqm) at the junction of Whitson Street and Lower Maudlin Street;
- Retail uses (circa 440sqm) fronting Marlborough Street;

15/00872/PREAPP- Pre-application enquiry by hospital Trust for the 'Redevelopment of site to provide medical school and student residential accommodation' involving demolition of the existing structures and physical features on the site and the erection of a medical school (approximately 2000 sqm) comprising teaching accommodation and ancillary accommodation; and circa 800-835 bed student residential development and associated support spaces including communal student uses.

**APPLICATION**

The building and its ancillary structures are not listed or within a conservation area and therefore have no statutory protection from demolition and planning permission is not required for their demolition. Prior approval for demolition of the ancillary structures and boundary walls of the lower half of the site was given in July 2016 (see 'Relevant Planning History' above- permission 16/03447/N) and now appear to be largely complete.

Prior approval applications are required in such circumstances but may only consider method of demolition and restoration/ aftercare of the site. Conditions were attached to consent 16/03447/N in relation to these issues and while an application has been made to the Local Planning Authority (LPA) for their discharge, the demolition works have been commenced prior to any decision on these conditions being issued. Officers will be seeking to agree a strategy to deal with the site in the interim period between now and a decision, and should permission be consented, commencement of works.

The application proposal comprises the following uses:

- Medical school at ground floor and basement level of the Old BRI Building (approx. 4031sqm);
- Offices for new Unite Head Office at upper levels of Old BRI Building (approx.. 6283sqm);
- New build student accommodation (738 bedspaces, 151 units);
- Fripp's chapel building- communal spaced related to student accommodation;
- Use Class A3 (café/ restaurant) commercial unit fronting Whitson Street (188sqm);

11 car parking spaces for office use including 2 disabled bays and cycle parking (refer to the Transport Key Issue);

Physical works to the Old BRI Building involve demolition of the Hill Ward Block (rear extension adjacent to Lower Maudlin Street) and South Entrance Block (low level rear extension, former rheumatology department). Extensions are proposed to the rear elevation, top floor and to the chapel.

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**RESPONSE TO PUBLICITY AND CONSULTATION**

A site notice and press notice were issued and neighbours consulted by individual letter.

Following submission of the revised application scheme on 23 August 2016, a further site notice was issued and neighbours were reconsulted by letter (with an expiry date for comments of 15 Sep 2016) advising of the revisions, including any additional contributors to the application.

In total at the time of writing, 90 contributors have commented on the application, 1 in support/ neutral and 89 objecting to the application.

The consultation period (as specified on the site notice) continues until next week however and therefore an update will be given in the committee amendment sheet of any further public representations received.

**Objections to the application:****Proposed uses:**

- Proposed student accommodation is not required and would lead to an overconcentration of such accommodation at the expense of more diverse communities and additional pressure on services;
- Student drop off and collection at start/ end of term times could disrupt the highway network and important functions such as the bus station and hospital access; Disabled parking needs to be addressed and provided for.
- The loss of the hospital land should be questioned and justified- the Trust's Masterplan is short sighted lasting only 10 years;
- The commercial unit would be better sited on Lower Maudlin Street;

**Viability**

- The viability reports made available have been heavily redacted so as to be meaningless. The viability argument put forward should be queried as Unite may have overpaid for the land on the basis of the proposed land value;
- Some of the assumptions made do not hold for instance incentives provided for future tenants and void periods when the offices are pre-let;

**Design**

- The height and scale of the proposed development would be incongruous, would spoil the skyline of Bristol and would not enhance the historic character of the area or respond to Bristol's topography;
- Proposals would harm the historic environment around the site particularly the setting of the listed St James Priory and also other listed buildings including the White Hart. Historic England object to the application;
- The proposals are too intensive for the site;
- The roof extensions proposed to the BRI Old Building are clumsy and the proposed tower blocks are bland, characterless and unexceptional;
- The proposed public art to the stained glass window would not be appreciated by the public;
- The small courtyards within the development would not be publicly accessible to the community and would receive little sunlight;
- The Townscape Visual Impact Assessment is commissioned by the applicant and clearly biased and the objector strongly disagrees with its conclusions, particularly Viewpoint 6 listed

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as 'Minor beneficial' and Viewpoint 7 'Moderate beneficial', which they consider to be highly detrimental.

- The proposal is likely to create wind tunnels on either side;
- Landscaping should include more trees (**Bristol Tree Forum**);

#### Impact on neighbours

- The amenity of occupiers of the Priory would be harmed through overlooking, overbearing, loss of daylight/ sunlight (which has not been adequately assessed), overshadowing of private external space and noise and disturbance issues;

**Ward Member Councillor Paul Smith** has objected to the application, advising that the revised proposals have not addressed his original objections regarding the impact on St James Priory as a listed building as well as a secluded sanctuary for those recovering from addiction. It is recommended that Members visit the Priory to understand the nature of the site for themselves. There is already an overconcentration of student accommodation close to the site and the proposal would be contrary to the Council's policies by adding more.

**St James Priory Project charity** has commented (in summary) as follows:

- The St James Priory Project charity supports vulnerable people and is a secluded location, the proposed student accommodation would harm this without attention to the health of those on the St James Priory site;
- The charity are custodians of the Priory church (Grade I listed), still in use.
- Other buildings on the site provide other services: a Men's Mental Health Crisis Service (which provides support for men for up to 28 days each in Walsingham House), a Supported Housing Service (which provides housing support to those recovering from addiction at St James House) and offices, administration and meeting rooms at Church House. Café Refectoire is the St James Priory café and operates to provide funding for the ongoing maintenance of the Priory and also to support the charitable work of the Project.
- The charity is grateful for the changes made to the scheme at the bottom of Whitson Street, however have considerable concerns remaining about the proposals.
- There is too much student accommodation in the immediate environment already. In the BS1 area there are already around 3,000 units of specialist student accommodation. (Bristol Central Area Plan- Student Accommodation Topic Paper.) This document also states "The provision of specialist student accommodation is supported by policy BCS2 where such development contributes to the diversity of uses within the local area." In our view this development does not contribute to a diversity of uses and actually increases a pattern of specialist student accommodation in this area.
- Major objection still concerns the height of the buildings immediately opposite and overlooking the Priory site. The proposed application reveals a continuing out of character buildings plan which has no true understanding or concern for the immediate historical environment or for the vulnerable people who receive residential support on the St James Priory site. This important heritage site would still be dominated and overlooked by the mainly student accommodation, which is of ultra-modern design and up to 20 floors in one area.
- St James House (the old Almshouses) is a 3 storey construction. The new buildings that are now proposed would be of 7 storeys immediately opposite the Priory and St James House (St James Almshouses) - the Supported Housing provision. Light for the residents would still be seriously and detrimentally reduced. This is supported by the planning document ...."Daylight & Sunlight Summary Report". Appropriate lighting levels are crucial for the well-being of individuals. Walsingham House would also suffer from reduction in light and a sense of being overwhelmed in the same way. Church House would also be overlooked in a way that it has not been over the past 30 years at least.

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- Access to Light is a right under the Prescription Act 1832. This proposal rides roughshod over this right for St James House, Walsingham House, Church House and the Historic Priory Church. There are fundamental inaccuracies in the Daylight / Sunlight Assessments.
- St James House is assessed as the old Almshouses and the layout now is different. The Priory Church has not even been assessed and yet it is open on a daily basis and light is an important factor. Church House has only been assessed for 2 windows when there are 6 windows that will be affected. Walsingham House has the most windows and can be assessed as being most affected by taller buildings than previously on the proposed site.
- The local authority has a responsibility for protecting the character of historically important areas. Policy DM26 of the Site Allocations and Development Management Policies Local Plan states: "Local Character and Distinctiveness Policy BCS21 of the Core Strategy states that development should contribute positively to an area's character and identity, creating or reinforcing local distinctiveness." This development does not contribute positively to the area's character and indeed would alter it substantially.
- A Gated Community for students will not enhance this area.
- The Planning application still includes many cleverly presented Drawings and Photographs which give a false impression of the final outcome. The Visual Impact Verified Views from the St James Priory courtyard are misleading. The tree masks the true impact which will be more clearly viewed during the late autumn and winter months. More importantly there is no visualisation from the Lounge of St James House where the visual impact will be most severe for the residents of this Supported Housing Service. View from the Lounge in St James House before demolition started (included online)
- Our view is that if an application is approved then none of the structures immediately opposite the St James Priory site should be greater in height than the Bristol Eye Hospital."

**The Christmas Steps Arts Quarter (Residents and Traders) (CSAQ)** object as follows (in summary, please refer to full comments available online):

- The pre-application planning history and local involvement to the previous schemes was strong objection to the scheme from many parties;
- Subsequent response included adding an additional bedroom (739) bedspaces making this the largest student complex in Bristol. Massing revised to push mass away from Priory and creates a 20 storey tower.
- Proposal would overwhelm Dental Hospital and Eye Hospital (listed);
- Revision would be architecturally more ordered than the original proposal but fails to address the main thrust of all of the objections regarding scale;
- CSAQ continue to object and propose a scheme with half the number of student bedrooms, which appears more comfortable in the surroundings;
- The viability report concludes that the number of bedrooms could be reduced by 5-10% (to 662 rooms), an improvement but not nearly sufficient. However Unite's report states that all 739 bedrooms are required for the development's viability.
- The dilemma is that CSAQ considers it is vital for the Old BRI and chapel to be preserved however they consider strongly that the proposal is far, far too big;
- Should viability influence the planning decision either way? The Government has rules that viability should not influence planning policy (see appendix);
- It is assumed that the 2 viability assessments are based on the presumable high price paid by Unite to purchase the site- should this influence the scale of the development? Is Unite the right developer for this site?

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- Objections given by CSAQ's scrutiny committee are listed;
- Appendix: Planning Portal article regarding Islington Council's liaison with the Government regarding viability which concludes that "site value should reflect planning policy requirements" to avoid developers paying too much for land and then failing to make provision for affordable housing.

**The Kingsdown Conservation Group (KCG)** has commented as follows:

"While KCG is pleased the client has responded to comment from many quarters and chosen to retain much of The Old Building and Fripp's chapel, the group still has a considerable number of major concerns, some of which have been mentioned at Pre-Application meetings and discussions. Primarily these relate to the scale and height of the entire development, and to the lack of sympathetic development on top of the Old Building, and to the scale and vernacular of the surrounding streets and buildings.

**The Old Building:** The massive, inelegant superstructure proposed as additional accommodation above The Old Building continues to be curiously insensitive to its location despite our conversation with Huw Jones of Rio Architects. Although it is set back from the Marlborough Street facade, it is correspondently too close to the Whitson Street and Maudlin Street facades, which appears irrational. The aerial views are misleading. What is proposed would be a discordant, elongated box, whose aesthetic, materials, height, mass and form clearly have been carried over from the design thinking expressed in the proposed perimeter buildings to the south. This incongruous approach has not been a success. The design of The Old Building's extended-attic storeys should be re-considered and generated by an interplay with the existing fabric and a respect and deference for it.

**New buildings:** The overall height of the new buildings to the southerly part of the site is regrettable. The tower of St James's Priory, the oldest building in Bristol would be diminished in stature.

Existing views would be interrupted and panoramas of Bristol further dominated by an unmemorable, undistinguished, generic jumble of buildings. Much has been made in Pre App discussions by the applicant of the potential for views across the city from the new accommodation on top of the Old Building. It is a shame that these views will be significantly affected by the height of the buildings proposed on the lower portion of the site KCG is also concerned that the requirement for high level student accommodation is predicated on the 'need' for 742 units. We have seen no justification for this, and unless there is a good justification we feel that the height and dominance of the accommodation should be addressed."

**The Bristol Civic Society** has commented as follows (9 Sep 2016- The below revised response abbreviates the earlier responses and responds to the final iteration of the design):

"The Old Building: The Society supports the proposal to convert the Old Building to give it new uses as Unite's headquarters above a medical school on the lower floors. The Society commends the design of the courtyard elevation. The Society's concern about the roof extension is its impact on views of the Old Building along Marlborough Street, Dighton Street and Upper Maudlin Street. The Society would strongly prefer that the redevelopment of the Old Building restore the original window sizes and the plat bands that were damaged in earlier casual and informal alterations.

**The height and mass of the new student accommodation blocks:** The Society supports demolition of the buildings to the rear of the Old Building including the curtilage stone wall and the construction of student accommodation. The Society welcomes the set-back of the buildings facing on to the lower part of Whitson Street to give more width to Whitson Street for accessing the bus station on foot. Subject to consideration of the overall height and mass of the new building the Society supports the architectural design and the transfer of the tallest buildings to Lower Maudlin Street, away from Whitson Street. The Society's primary aim has been to retain and reuse the Old Building. Unite's

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Viability Statement maintains the need to construct 738 student bed-units to create a viable development to enable the retention and conversion of the heritage asset. The redactions in the Viability Statement make it impossible for the Society to form an independent judgment. There is no information about the cost of the site. It is unknown whether the cost of the site is proportional to the amount of permitted development. It must therefore be for the Council to decide whether the public value of the scheme justifies the proposed height of the accommodation block in Lower Maudlin Street; a significant departure from previous planning policy.”

**The Conservation Advisory Panel** has commented (17 May 2016) that:

“The panel is pleased the current proposal has abandoned the idea of completely clearing the site and would now retain much of The Old Building and Fripp's chapel. However, it is regretted that the scale and height of the entire development is still a matter of great concern.

The Old Building: The discordant, elongated "rectangular box" proposed as additional accommodation above the Old Building appears to be remarkably insensitive to its location. Its aesthetic, materials, height, mass and form clearly have been carried over from the design thinking expressed in the proposed perimeter buildings to the south. This incongruous approach has not been a success. Although it would be set back from the Marlborough Street facade, the box would be correspondently much too close to the Whitson Street and Maudlin Street facades. The aerial views are somewhat misleading in this respect. The proposed design of the Old Building's extended-attic storeys should be re-considered and generated by deference and respect for Paty's neoclassical work below. The structure should be altogether more recessive, visually lighter and set further back from the three facades of Marlborough Street, Whitson Street and Upper Maudlin Street. The new south elevation must also be more restrained and respectful to the original Paty building.

The new buildings: The Panel is concerned about the impact of the new buildings on the adjoining listed buildings including St James. The overall height of the new buildings to the southerly part of the site, which would rise to 13 storeys, remains problematic. The architectural context, the neighbouring listed buildings and the broader cityscape would be substantially harmed by the scale of the proposed development. Fashionable architectural detailing should be avoided. Large scale contextual drawings should be provided.”

### **Reasons for support:**

**University Hospitals Bristol NHS Foundation Trust** has commented as follows:

“The Trust fully supports the planning application submitted by Unite for the development of the Old Building site. We believe the plans as submitted reflect the most imaginative development of the site achievable given the restrictions imposed by the requirement to retain the main building. The Trust is particularly supportive of the mixed use approach to the use of the site and is pleased to support the development of a medical education facility which will retain long term links with the hospital and provide long term training of future medical staff.

The Trust confirms that the site is no longer required for health provision as part of its wider site development and rationalisation plans as defined within the Trust 5 year Estate Strategy and are content to have directly facilitated the opportunity to create new units of accommodation, meeting a number of strategic objectives for the City.

The Trust is working closely with Unite to effect the handover of the site to meet their development programme and look forward to a successful outcome to their planning application.”

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**COMMUNITY CONSULTATION**

Refer to Statement of Community Involvement for full detail.

Pre-application engagement with the Local Planning Authority and engagement with local stakeholders; amenity groups and the local community have been undertaken as follows:

- First Pre-application meeting held on 27th August 2015 following submission on 5th August 2015. This sought the full demolition of the site including the old BRI building and redevelopment for a student residential led mixed use development;
- Public Workshop Key Stakeholder event held on 21st October 2015 which included representatives from Bristol Civic Society; Christmas Steps Arts Quarter; Kingsdown Conservation Group as well as other local representatives;
- Second Pre-application meeting held on 18th December 2015. The design evolved such that the Old BRI Building and Fripp's Chapel were retained under the new proposals;
- Public Workshop Key Stakeholder event held on 6th January 2016 which included representatives from Bristol Civic Society; Christmas Steps Arts Quarter; Kingsdown Conservation Group as well as other local representatives;
- Meeting with Historic England held on 3rd February 2016;
- Third Pre-application meeting held on 12th February 2016;
- Public Exhibition held on 24th February 2016;
- Full Planning application for retention of the Old BRI and conversion of the building for mixed use development and redevelopment of the site to the rear submitted on 5th April 2016;
- Post-submission meeting held with Bristol planning officers on 30th June 2016 to discuss the planning application;
- Post-submission meeting held with Bristol planning officers on 20th July 2016 to agree to proposed strategy forward as per the determination of the scheme and submission of amended plans;
- Prior Approval Given, LPA Ref. 16/03447/N, on 25th July 2016 for demolition of ancillary Trust buildings at the southern part of the site. Additional details submitted 2nd August in respect to hoarding details and Demolition Environmental Plan.
- Key Stakeholder update meeting held with local amenity groups on 3rd August 2016; this included the Bristol Civic Society, St James' Priory; Christmas Steps Arts Quarter and Kingsdown Conservation Group.
- Resubmission on 23rd August 2016.

The community involvement process is advised to be appropriate and the Bristol Neighbourhood Planning Networks has advised that 'there has been extensive community involvement.'

**EQUALITIES IMPACT ASSESSMENT**

During the determination of this application due regard has been given to the impact of this scheme in relation to the Equalities Act 2010 in terms of its impact upon key equalities protected characteristics. These characteristics are age, disability, gender reassignment, marriage and civil partnership, pregnancy and maternity, race, religion or belief, sex and sexual orientation. Overall, it is considered that the approval of this application would not have any significant adverse impact upon different groups or implications for the Equalities Act 2010. In this case the design and access to the development have been assessed with particular regard to disability, age and pregnancy and maternity issues.

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**OTHER COMMENTS**

Historic England has objected to the application- comments appended to the report in full.

The Council's City Design Group (Urban design, Conservation, Archaeology, Public Art, Landscape) has objected to the application- comments appended to the report in full. Refer to Key Issue (D) for further details.

The Council's Transport Development Management Team has objected to the application on the grounds of failure to provide a plan showing appropriate public realm improvements. This has been requested of the applicant prior to the Committee meeting- update to be given via amendment sheet/ at Committee. There are no other in principle objections. Refer to Transport Key Issue (E) for full details.

The Council's Sustainability Team has raised a number of queries in relation to the scheme relating to the proposed heating system, solar shading to prevent overheating and provision of renewables. The applicants have not complied with Policy BCS14 regarding provision of renewables. Officers have asked the applicant to respond to these issues prior to Committee- refer to Key Issue (G) for details.

The Council's Pollution Control Team raises no objections subject to conditions.

The Council's Contaminated Land Team raises no objections subject to conditions.

The Council's Flood Risk Management Team raises no objections subject to conditions.

The Council's Air Quality Management Team raises no objections subject to a Construction Management Plan to control dust and details of CHP and Gas plant.

**RELEVANT POLICIES****National Planning Policy Framework – March 2012****Bristol Core Strategy (Adopted June 2011)**

BCS2	Bristol City Centre
BCS5	Housing Provision
BCS7	Centres and Retailing
BCS8	Delivering a Thriving Economy
BCS9	Green Infrastructure
BCS10	Transport and Access Improvements
BCS11	Infrastructure and Developer Contributions
BCS13	Climate Change
BCS14	Sustainable Energy
BCS15	Sustainable Design and Construction
BCS16	Flood Risk and Water Management
BCS18	Housing Type
BCS20	Effective and Efficient Use of Land
BCS21	Quality Urban Design
BCS22	Conservation and the Historic Environment
BCS23	Pollution



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**Bristol Site Allocations and Development Management Policies (Adopted July 2014)**

DM1	Presumption in favour of sustainable development
DM2	Residential sub-divisions, shared and specialist housing
DM4	Wheelchair accessible housing
DM5	Protection of community facilities
DM7	Town centre uses
DM10	Food and drink uses and the evening economy
DM14	The health impacts of development
DM15	Green infrastructure provision
DM19	Development and nature conservation
DM23	Transport development management
DM26	Local character and distinctiveness
DM27	Layout and form
DM28	Public realm
DM29	Design of new buildings
DM31	Heritage assets
DM32	Recycling and refuse provision in new development
DM33	Pollution control, air quality and water quality
DM34	Contaminated land
DM35	Noise mitigation

**Bristol Central Area Plan (Adopted March 2015)**

BCAP1	Mixed-use development in Bristol City Centre
BCAP3	Family sized homes
BCAP4	Specialist student housing in Bristol City Centre
BCAP6	Delivery of employment space
BCAP11	University and hospital development
BCAP15	Small scale retail developments and other related uses in Bristol City Centre
BCAP20	Sustainable design standards
BCAP21	Connection to heat networks
BCAP26	Old City - reducing traffic in the heart of Bristol City Centre
BCAP29	Car and cycle parking
BCAP30	Pedestrian routes
BCAP31	Active ground floor uses and active frontages in Bristol City Centre
BCAP34	Coordinating major development in Bristol City Centre
BCAP36	Bristol shopping quarter
BCAP43	The approach to St Michaels

**Supplementary Planning Documents**

SPD1	Tall Buildings (January 2005)
SPD5	Sustainable Design and Construction (February 2006)
SPD7	Archaeology and Development (March 2006)
Planning Obligations - Supplementary Planning Document - Adopted 27 Sept 2012	

**Supplementary Planning Guidance**

Kingsdown Conservation Area Character Appraisal  
 St James Parade Conservation Area Character Appraisal  
 St Michaels Hill & Christmas Steps Conservation Area Character Appraisal  
 GPA 2- Managing Significance in Decision-Taking in the Historic Environment (Historic England, 2015)  
 GPA 3- The Setting of Heritage Assets (Historic England, 2015)

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**Legislation**

Planning (Listed Buildings and Conservation Areas) Act 1990

The Town and Country Planning Act 1990

**KEY ISSUES****(A) EXISTING AND PROPOSED LAND USES****i) Existing land use**

The site was formerly owned by the University Hospitals Bristol NHS Foundation (Trust) (UHBT) but has now been acquired by Unite Students. The Old BRI site was last used by the Trust for ancillary office facilities with some non-clinical services. All services have been moved off the site into new or existing Trust accommodation as a part of a long term rationalisation of the overall UHBT estate, the site having been deemed surplus to requirements through the UHB Trust's Estate Strategy 2015-2020 and Estate Strategic Plan 2014-2020. This forms part of the wider Bristol Health Services Plan, a major capital programme that seeks to replace old accommodation that is redundant and no longer serves adequately modern day healthcare use. The Estate Strategy focuses on removal of ancillary and non-clinical estate provisions such as the Old BRI building site, which could not support modern operational healthcare service and is no longer economically viable due to high maintenance and running costs.

Paragraph 171 of the National Planning Policy Framework (NPPF) advises that *"Local Planning Authorities (LPAs) should work with public health leads and health organisations to understand and take account of the health status and needs of the local population (such as for sports, recreation and places of worship), including expected future changes, and any information about relevant barriers to improving health and well-being."* The application site is designated as Hospital Precinct by the Bristol Central Area Plan (BCAP). Policy BCAP11 refers to both university and hospital development and states that: *"The Hospital Precinct will be developed for healthcare and ancillary uses associated with the University Hospitals Bristol Trust."* Local Policy BCS2 relating to the City Centre states that there will be a continuing consolidation and expansion on the University of Bristol and Bristol Royal Infirmary sites.

**ii) Proposed land uses**

The application is for a mixed use, though predominantly residential, scheme on the site in accordance with Policy BCAP1 which seeks mixed use schemes in the City Centre, and in St Michael's 'neighbourhood' (as designated in the BCAP) predominantly residential development given the low flood risk.

**Medical School**

A medical school linked with the University of Bristol is proposed at the lower levels of the Old Building (4000sqm), which would fall within the definition of 'healthcare and ancillary uses' permitted by Policy BCAP11, subject to ensuring the provision of the medical school in future via condition. The existing gross internal floor area of the Old BRI building is approximately 8000sqm, so the total loss of healthcare floorspace would be around 4000sqm (and it is stated that the inefficiencies of the old building reduce efficiency of the use and is poor quality). While the policy designates the site as Hospital Precinct, given the retention of a healthcare ancillary facility on the site and the Trust's long-term Estate Strategy to dispose of the site the proposed change of land use is considered to be acceptable.

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**Offices**

Policy BCAP6 seeks the delivery of new employment floorspace in the City Centre on all sites in the BCAP boundary unless designated for other uses. Specifically, Policy BCS2 seeks the provision of 150,000sqm net additional high quality office floorspace by 2026. The application proposal is for 6000sqm of office floor space expected to accommodate 280 employees (and with potential to expand to 450 employees). The proposed office use is considered acceptable.

**Ground floor commercial use (A3)**

A unit of 188sqm floorspace is proposed fronting Whitson Street. Policy BCAP15 states that new small-scale retail uses (Use Classes A2-A5) outside of designated shopping frontages/ areas in the City Centre would be acceptable where they would contribute to the vitality of the area. The unit would contribute to the activity and vitality of this ground floor frontage.

Food and drink uses are acceptable provided they would not harm the character, residential amenity or public safety of the area taking into account concentration of other similar uses, impact of noise, activity, fumes/ smells, litter; transport considerations, refuse storage and flues. The proposals are deemed acceptable in relation to these criteria, subject to appropriate conditions to control matters including opening hours, servicing, extraction equipment, plant noise levels and odour.

**Purpose built student accommodation**

Policy BCS2 states that development up to 2026 will include the provision of 7400 new homes. Student accommodation contributes towards citywide housing delivery targets in accordance with national guidance (the NPPG) on the basis of the number of cluster units and studio flats proposed. There would be a total of 151 new units (96 cluster units and 55 studio flats) comprising 738 student bedspaces proposed.

The applicants have submitted a report by CBRE (commercial property advisors) relating to student housing need, which sets out a very clear picture that there is currently a significant demand for and undersupply of purpose built student accommodation (PBSA) in the city. This supports the LPA's pre-existing understanding of this situation through discussions with higher education establishments.

The report indicates that there are currently a total of 21,823 students in Bristol without access to purpose-built student accommodation – these students are likely to live in Houses in Multiple Occupation (HMOs). In 2017/18 this figure will increase to a total of 24,261 students. The University of Bristol is understood to be seeking 1-1,500 additional beds via 3rd party agreements to house 1st year and international students. The University has been in a sustained period of growth with undergraduate numbers increasing year on year by 6.5% for the last 3 years and currently 10,567 students without access to PBSA. According the CBRE report, Bristol ranks low against comparable cities in terms of private sector PBSA with only 11% students able to access it against a mean of 17% and maximum of 23%. It is understood that the proposed development would have nominated status as a student housing provider for the University of Bristol.

The report advises that further PBSA would reduce pressure on the local housing stock, as for every 1,000 students in HMOs this takes around 200 homes out of the local housing supply. The proposed development would mean the potential for 147 homes to remain free in the future for families and young people. In terms of the future pipeline of development, there is evidence of 800 beds to be provided by UWE and 612 private beds in the pipeline. The supply of PBSA has reduced over the last 12 months as private rented accommodation values have increased. As a consequence there are likely to be upwards of 1,000 units of Private Rental Sector (PRS) housing completing within the next 18 months according to the report. PBSA offers a number of benefits compared to student housing in HMOs including location in the city centre close to facilities and the university, 24 hour management, ability to restrict students bringing vehicles through lease arrangements and high-quality new-build accommodation offering regeneration benefits to sites.

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Finally, Policy BCAP4 of the Bristol Central Area Plan (BCAP) is clear that specialist student housing schemes that contribute to the diversity of uses within the local area will be acceptable in Bristol City Centre unless it would create a harmful concentration of such housing in any given area.

The principle of student accommodation in this location is therefore considered by your officers to be acceptable as contributing to the housing supply and meeting a clear demand for purpose built student accommodation in the city subject to consideration of detailed policy requirements (see below). Furthermore, beyond their contribution to the city's higher education establishments, students bring considerable economic benefits to the city through support of existing services.

*iii) Summary:* Student accommodation is acceptable in principle on the basis of local policy requirements (Policies BCAP4 and DM2) and offers benefits in removing pressure on other housing stock.

**(B) TYPE, MIX AND AMOUNT OF HOUSING*****i) Type of housing***

As referred to earlier, Policy BCAP4 states that specialist student housing schemes that contribute to the diversity of uses within the local area will be acceptable within Bristol City Centre unless it would create or contribute to a harmful concentration of specialist student housing within any given area. Policy DM2 of the SADMP goes on to define what a 'harmful concentration' should be assessed:

DM2 states that specialist student accommodation (and other forms of residential sub-divisions/ conversions/ shared/ specialist housing) "*will not be permitted where:*

*i. The development would harm the residential amenity or character of the locality as a result of any of the following:*

- *Levels of activity that cause excessive noise and disturbance to residents; or*
- *Levels of on-street parking that cannot be reasonably accommodated or regulated through parking control measures; or*
- *Cumulative detrimental impact of physical alterations to buildings and structures; or*
- *Inadequate storage for recycling/refuse and cycles.*

*ii. The development would create or contribute to a harmful concentration of such uses within a locality as a result of any of the following:*

- *Exacerbating existing harmful conditions including those listed at (i) above; or*
- *Reducing the choice of homes in the area by changing the housing mix.*

*Where development is permitted it must provide a good standard of accommodation by meeting relevant requirements and standards set out in other development plan policies.*

***Specialist Student Housing – Location Criteria***

*Specialist student housing schemes will be acceptable within the city centre. Other locations may be suitable subject to the general criteria set out above."*

The application site is situated within a mixed use area and is surrounded by a variety of uses including: the bus station, courts, university buildings, hospital services, offices, public house, residential flats, places of worship and temporary residential uses (both short stay and longer stay uses) at St James Priory.

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The CBRE report is a detailed study of student accommodation in the city and includes listings of the other student accommodation in the city either provided by the institution, leased by the institution or purpose-built and directly let. It is apparent that the application proposal if built would be the largest single student accommodation block in the City Centre by a significant margin. The next largest (Marketgate, Unite), accommodates 490 students. Fusion Tower close by to the site (run by Collegiate) accommodates 438 students. The recently completed Orchard Heights on Trenchard Street (also Unite) accommodates 399 students. The University of Bristol (UoB) Stoke Bishop halls of residence accommodate similar numbers whereas the UWE Student Village (at UWE) accommodates over 1900 students.

The CBRE report (page 29) maps PBSA in central Bristol. This shows that the nearest PBSA to the site is within 100m of the site in a cluster of 4 sites around Marlborough Street where it meets St James Barton roundabout and Dighton Street/ Cherry Lane. This comprises Blenheim Court (231 beds), Cherry Court (176 beds), King Square Studios (243 beds) and iQ Marlborough Street (361) - a total of 1011 student bedspaces. Another local cluster of units exists around Rupert Street/ Nelson Street around 150-200m away from the site- an area where planning policy has encouraged such uses in recognition of the regeneration benefits these schemes offer. The cluster includes Fusion Tower (438 beds), New Bridewell (499 beds- under construction opens Sep 2018), The Courtrooms (224), Fitzhardinge House (47), Nelson & Drake House (301) - a total of 1509 student bedspaces.

There is therefore a clear pattern of student residences located within the City Centre, as would be expected given that this is the main area of demand close to the UoB and public transport links to UWE. This is concluded to be an appropriate location for student accommodation, away from areas with a predominantly residential character, where they are surrounded by and contribute to a diverse mix of uses and in accordance with Policy BCAP4- which is clear that refusal would only be justified on the grounds of evidence of a harmful concentration of uses based on either demonstrable harm to residential amenity or harm to housing choice.

While there is not a high residential population immediately surrounding the site, both St James Priory residential accommodation and the hospital facilities are noise sensitive uses. There would be an increase in footfall around the site due to the development, but that would not be anticipated to be a level that would cause unacceptable disturbance to neighbouring occupiers given the location in the city centre with high existing levels of background noise. It is recognised that the nature of the St James Priory site, which faces towards the application site, currently enjoys a degree of separation from the busy character of other parts of the city centre, however any development on this site beyond the very low level existing hospital accommodation blocks would have an impact on the relationship with this site and would be likely to result in increased footfall and activity around the site. The site would be managed with a staff presence and security on site 24 hours a day (see submitted Housing Management Plan) to avoid any noise issues or conflict with residential uses. Free onstreet parking does not exist in this location, and resident/ controlled parking exists in neighbouring areas thereby restricting students from bringing cars to the city. In terms of the character and visual appearance of the area, this is highly varied and not residential in character and therefore would be less sensitive to the physical change of development.

The proposals are considered to be in accordance with the other criteria of Policy DM2. The choice of homes in this area would not be reduced but increased as there would be no loss of existing housing stock. The proposal would also improve the prospects of housing stock in other parts of the city (particularly family-sized homes) remaining available for family uses.

**ii) Mix of housing**

Policy BCS18 of the Core Strategy expects new development to maintain, provide or contribute to a mix of housing tenures, types and sizes to help support the creation of mixed, balanced and inclusive communities. While the proposal is for only student housing, the evidence above sets out how this

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would contribute to addressing the demand in the city for this type of accommodation and the applicant has advised that it would not be viable to include other housing types within the constraints of this site.

Policy BCAP3 of the BCAP seeks provision of family homes within the City Centre, particularly St Pauls/ Stokes Croft, Old Market & The Dings and Easton/ Lawrence Hill. It notes that development for specialist student housing should be assessed against Policy DM2 of the Site Allocations and Development Management Policies (SADMP). Refer to section (B) i) above for consideration against Policy DM2.

*iii) Amount of housing*

Policy BCS20 states that new development will maximise opportunities to re-use previously developed land. Opportunities will be sought to use land more efficiently throughout the city. Imaginative design solutions will be encouraged at all sites to ensure optimum efficiency in the land use is achieved and higher densities of development will be sought in the City Centre.

The density of housing on the site would be approximately 110 dwellings per hectare (dph) (based on 155 units and a site area of 0.7ha). Given that the size of each cluster unit is between 5-10 bedspaces, which is typically larger than the size of market housing units in the City Centre (though with lower levels of communal space)- care should be taken when comparing this figure with market development. It is likely that this would equate to a higher density of market housing. However even so, higher densities of up to 200dph (Wapping Wharf) and 150dph (The Zone, St Phillips) are typical and expected of new development in the City Centre to ensure efficient use of land- Policy BCAP20 refers.

*iv) Affordable housing/ Key Worker Housing*

Student accommodation is exempt from the local policy seeking affordable housing provision from new residential development as it is recognised that such a requirement may make these schemes unviable and the LPA recognises the strong need for student housing in the City Centre to support Bristol's role as a thriving university city. Purpose built student accommodation provision also alleviates the pressure on the private housing stock elsewhere in the city for conversion to student residences- an issue that the LPA has sought to address through a planning mechanism known as an Article 4 Direction, which requires an application for planning permission for changes of use of homes to houses in multiple occupation (HMOs) in those areas of the city most under pressure.

The question has been raised whether the accommodation should be key worker housing for healthcare workers/ students. While the site is within the Hospital Precinct, this designation applies to healthcare and ancillary uses and does not seek to include healthcare worker housing. There is no policy requirement to require provision of this housing type on the site.

*v) Summary*

Local planning policies BCAP4 and DM2 are clear that specialist student housing schemes will be acceptable in the City Centre provided that they wouldn't result in a harmful concentration through harm to residential character or reduction in housing choice through changing the housing mix.

There is a clear and serious demand for purpose built student accommodation in the city and policy directs such specialist student housing to the City Centre, which helps to relieve the pressure on the private rental housing stock and offers a sustainable location.

While officers acknowledge the public perception that there is an excess of student housing in the city, they are satisfied that this application has demonstrated that it would:

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- Help to address the serious undersupply of student accommodation in the city;
- Make efficient use of previously developed land in the City Centre;
- Be an appropriate location for student accommodation within a mixed use area that is not predominantly residential and is close to the University of Bristol (UoB) campus;
- Be a sustainable location close to local services and facilities and the UoB;
- Would not result in loss of existing housing stock that would reduce the choice of homes in the area and this site would be unlikely to have potential for family-sized housing;
- Not result in harm to residential amenity or the character of the area through noise and disturbance to residents, parking issues, inappropriate structural additions to buildings or inadequate refuse and cycle storage;
- Not result in a harmful concentration of student uses;
- Offer significant economic benefits to the city;

Officers are therefore satisfied that the proposals would meet all of the policy tests in this respect and strongly advise Members to support the principle of the proposed use on this basis.

**(C) VIABILITY CONSIDERATIONS**

The applicant has stated that the costs involved in retaining and converting the Old BRI building are significantly higher than would be the case if the building was to be demolished and a new building constructed in its place. They claim that these high costs have necessitated the provision of the 738 student bed spaces applied for, in order to cross-subsidise the conversion costs of the Old BRI building, whilst still providing a reasonable profit. A viability appraisal has been submitted to support the level of student provision.

It is acknowledged that the Old BRI Building is not a standard construction and does not lend itself to being easily converted. However, in order to be satisfied that the applicants' case was valid, officers commissioned build cost consultants Gardiner & Theobald to assess the build costs, and viability consultants Adams Integra to assess the overall viability of the scheme.

For a non-residential development located on a complex City Centre site such as the proposed scheme, a reasonable benchmark profit margin would be considered to be in the region of 20% profit on cost. In simple terms this means that if a scheme cost £1,000,000 to build, the developer would need to make £200,000 profit.

The Council's consultants identified slightly different costs and values than those identified in the applicants' appraisal. This is to be expected on a complex scheme involving demolition, conversion and new build, with a total value of in the region of £90,000,000. However, what is important is the profit margin, as this is what determines whether the level of student accommodation proposed is required. The following table identifies the results of both the applicants and the Council's appraisals.

Table 1

<b>Appraisal</b>	<b>Resulting Profit on Cost</b>
<b>Applicant</b>	17.84%
<b>Councils consultant</b>	20.87%

Since the Council's appraisal was completed it has come to light that the new Medical School and the Fripp's Chapel will not be income generating, whereas they had been included as income generating by Adams Integra. Removing this income from the Council's appraisal would result in a reduction in the Profit on Cost.

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Responses to the application assume that the viability appraisals are based on the price that the applicant paid for the site, which they assume was “very high”. The appraisals actually assume a land value based on the existing use value of the site (i.e. the value of the site in its current state as a hospital) as valued by the District Valuer, plus a premium of 20% to incentivise the landowner to release the site for development. The actual price paid for the site is unknown and does not form part of the appraisals.

Responses also state the following:

“Bristol City Council’s commissioned independent report concludes that in favourable market conditions the number of bedrooms could be reduced by 5% to 10%, from 739 rooms to 662 rooms”

However this does not accurately reflect what Adams Integra stated; which is as follows:

“However with some cost engineering, favourable market conditions and a reduced expectation of profits, the number of rooms could be reduced by 5%-10%”

Whilst the Council’s appraisal shows a higher profit on cost than the applicants appraisal; officers are of the opinion that overall the proposed level of student accommodation is “in the right ball park” in order for the applicant to secure a reasonable profit. It could be argued that the level of student accommodation could be reduced slightly if a reduced profit were accepted, however the reduction would make only a marginal difference to the scale of building required and it would take the profit well below the accepted benchmark profit margin.

Consequently, officers are satisfied that in the region of 738 student bed spaces are required in order for the scheme to show a reasonable benchmark profit margin.

**(D) HISTORIC ENVIRONMENT: WOULD THE PROPOSED DEVELOPMENT PRESERVE THE SPECIAL INTEREST OF DESIGNATED HERITAGE ASSETS AND SAFEGUARD OR ENHANCE NON-DESIGNATED HERITAGE ASSETS?**

*i) Introduction*

*a) Policy and legislation: historic environment*

In considering the impact of proposals on the historic environment, the National Planning Policy Framework (NPPF) requires Local Planning Authorities (LPAs) to identify and assess the significance of and impact on any heritage asset affected by a proposal.

A ‘heritage asset’ is defined in the NPPF as “*A building, monument, site, place, area or landscape identified as having a degree of significance meriting consideration in planning decisions, because of its heritage interest.*” ‘Significance’ is defined as “*the value of a heritage asset to this and future generations because of its heritage interest. That interest may be archaeological, architectural, artistic or historic. Significance derives not only from a heritage asset’s physical presence, but also from its setting.*”



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The NPPF divides heritage assets into two categories: designated heritage assets and non-designated heritage assets. The heritage assets relevant to this site can be summarised as follows:

Table 2

<u>Designated heritage assets</u>	<u>Non-designated heritage assets</u>
<p><b>Listed buildings</b></p> <ul style="list-style-type: none"> <li>• Church of St James, Whitson Street (Grade I);</li> <li>• Church House, Whitson Street (Grade II*);</li> <li>• Churchyard walls and gates (Grade II);</li> <li>• Listed walls and railings Whitson St (Grade II);</li> <li>• The White Hart Inn, Lower Maudlin Street (Grade II);</li> <li>• Bristol Eye Hospital, Lower Maudlin Street (Grade II listed);</li> <li>• 7 Bridewell Street (Grade II)</li> <li>• Former Fire &amp; Police Stations, Silver Street (Grade II)</li> </ul> <p><b>Conservation Areas</b></p> <ul style="list-style-type: none"> <li>• St James Barton (adjacent)</li> <li>• Kingsdown</li> <li>• St Michaels Hill and Christmas Steps</li> </ul>	<ul style="list-style-type: none"> <li>• Old BRI building and chapel (Local List ref. 225)</li> </ul>

ii) Impact on non-designated heritage assets (including the Old BRI Building and Fripp's Chapel)

## a) Policy: non-designated heritage assets

The term non-designated heritage asset is explained by the National Planning Policy Guidance (NPPG) as: "...buildings, monuments, sites, places, areas or landscapes identified as having a degree of significance meriting consideration in planning decisions but which are not formally designated heritage assets..." The application proposes the retention of the Old BRI building and chapel, which is not listed or within a Conservation Area, but is identified on the city's Local List as being a valued building in heritage terms and is categorised as a non-designated heritage asset.

Paragraphs 135 and 136 of the NPPF state that *"In weighing applications that affect directly or indirectly non designated heritage assets, a balanced judgement will be required having regard to the scale of any harm or loss and the significance of the heritage asset."*

Local Policy BCS22 of the Bristol Core Strategy (BCS) states that *"Development will safeguard or enhance heritage assets and the character and setting of areas of acknowledged importance including historic buildings both nationally and locally listed... and conservation areas."* Policy DM31 of the SADMP requires that *"proposals affecting locally important heritage assets should insure they are conserved having regard to their significance and the degree of harm or loss of significance"*.

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Policy DM31 goes on to state that: *“Conserving heritage assets: Where a proposal would affect the significance of a heritage asset, including a locally listed heritage asset, or its wider historic setting, the applicant will be expected to:*

- i. Demonstrate that all reasonable efforts have been made to sustain the existing use, find new uses, or mitigate the extent of the harm to the significance of the asset; and*
- ii. Demonstrate that the works proposed are the minimum required to secure the long term use of the asset; and*
- iii. Demonstrate how those features of a heritage asset that contribute to its historical, archaeological, social, artistic or architectural interest will be retained; and*
- iv. Demonstrate how the local character of the area will be respected.”*

b) Assessment of impact on the significance of the Old BRI building and Fripp’s chapel

Bristol Royal Infirmary is one of the earliest hospitals founded in the country outside of London (1736) though the Old Building on the site dates from a later period (1784-1814) by architect Thomas Paty. The chapel was added in 1858-60 by local architect S.C.Fripp. An application was made to Historic England (formerly English Heritage) that the buildings be listed but was declined.

The applicant’s Heritage Statement notes that ‘while later additions to the Old Building detract from its heritage significance; the building is not entirely lacking in architectural integrity, particularly on the north, east and west elevations which have undergone lesser alteration. Internally, the Ground Floor retains moderate preservation of architectural details and elsewhere few internal details survive excepting the original ward/ dormitory layouts albeit with later partitions. The 18th-century cantilevered staircase at the east end of the building is a well-preserved feature and was recently cited as a reason to have the building’s earlier refusal for Listing reconsidered.’ The Heritage Statement summarises the heritage significance/ value of the site as being generally of low or moderate value with the Old Building having high historical and communal value and Fripp’s Chapel as having moderate/ high aesthetic value.

The Council’s City Design Group (CDG) (for full comments see Appendix 1) advises that the Old Building has high community and streetscape value, and plays a key role in defining the history and sense of identity to the area. The independent panel considering nominations for local listing has given a good score to the building for its architectural interest and historic importance. It is important to retain the key aspects of the building i.e. original external fabric, the H-form plan, floor slabs and any other notable features that contribute to the significance of the heritage asset. The hospital chapel is a key feature in the streetscape and its retention is welcomed though concerns remain regarding the massing and relationship of the new development to the chapel.

CDG welcomes the opportunity to clean up the front façade and principle street elevations of the Old Building and supports the principle of removal of 20<sup>th</sup> century rear extensions and the introduction of the a glazed atrium to the rear. However it is considered that considerable harm is posed to the significance of the heritage asset in the proposed demolition of the rear section of the building (Demolition Site Plan ‘Rio 0282 A-02-01 B’ refers), which would damage the historic and structural integrity of the building. CDG considers the proposed extension to be over-scaled and incongruous. The proposed massing would compromise the special interest of the locally listed building, its reading in the townscape and settings of the conservation areas (St James’ Parade, St. Michael’s Hill and Christmas Steps and Kingsdown) and listed buildings (Eye Hospital, St James House, and White Hart). Together these alterations represent harm to the significance and special interest of the locally listed buildings.

Historic England (for full comments see Appendix 2) has commented that “Although outside the formal remit of Historic England, the retention of locally listed building is welcomed; as is the intention to remove many of the later interventions to its primary frontage, which may be regarded as an

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enhancement. That said, the scale of the proposed roof-top extensions is of concern (being the equivalent of three storeys in places). The removal of the later interventions to its rear elevation is welcomed, and we do not object to the principle of a glazed circulation zone to the rear of the building. However, the demolition of a significant portion of the back of the locally listed building must be of concern, and we remain to be convinced that the scale of the roof top extension is not overbearing. We welcome the retention of the rear Chapel, but the relationship of the new building with the Chapel's south-eastern gabled elevation is particularly clumsy and overbearing" (10 June 2016- prior to latest revisions to footprint and scale in relation to the chapel).

## c) Summary and conclusion

The Old Building and chapel are locally listed and of architectural/ aesthetic, historical and communal importance, however the building is not statutorily listed or within a conservation area and is therefore not protected from demolition (i.e. planning permission would not be required). The Local Planning Authority therefore welcomes the applicant's approach to work with them to explore a scheme that includes retention of the building.

The existing building has a number of modern additions that are harmful to its significance, particularly to the rear façade- these are currently highly prominent and harm the appearance of the area and the significance of the asset. The proposal also includes removal of unsympathetic additions to the main façade. The removal of these elements represents benefit to the building.

A substantial amount of demolition is proposed to the rear of the building, including fabric of the original building in addition to the harmful modern accretions. The proposals include significant renovation of this façade to create a glazed atrium to the office element of the scheme- which is considered to be a high quality; contemporary design approach in line with Section 7 of the NPPF that states that great weight should be given to innovative designs and bring the building to a standard to create a modern working environment. The proposed atrium would obscure the rear façade of the building that would obscure any appreciation of the rear façade and this element of the building would not be highly visible in public realm views due to the surrounding proposed development.

Roof top additions are proposed to the Old Building, some of which replace existing modern unsympathetic elements but at a larger scale and are proposed to be metal clad or more lightweight and glazed. The Townscape Visual Impact Assessment (TVIA) shows the impact of these proposals in the public realm. While visible, the impact would be mainly on the asset itself from views along Upper Maudlin Street and would not impact on any listed buildings or conservation areas. Although this would have some impact on the heritage asset itself, the proposed additions would be read as highly contemporary extensions amid a highly varied existing townscape context and it must be remembered that they would replace some existing unsympathetic additions and would enable retention of the asset overall.

While the concerns and objections of the City Design Group and Historic England and amenity groups are noted, the building is not listed and its significance lies mainly in its architectural and historic interest, both of which it is considered by your officer could be conserved, and in some areas enhanced by the proposals and updating the building for both modern day and future use. Weighing the scale of the impact on the heritage asset against the significance of this asset, officers are satisfied that works proposed are justified and the policy considerations met.

Appropriate conditions would be recommended to ensure that any alterations to the buildings would be carried out sensitively. Conditions are also required relating to the phasing of the development to ensure that the works to this building would be phased within an appropriate timescale in relation to the remaining development.

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Any decisions relating to listed buildings and their settings and conservation areas must address the statutory considerations of the Planning (Listed Buildings and Conservation Areas) Act 1990 (in particular sections 16, 66 and 72) as well as satisfying the relevant policies within the National Planning Policy Framework and the Local Plan.

Section 66 of the Planning (Listed Buildings and Conservation Areas) Act 1990 states that in considering whether to grant planning permission for development which affects a listed building or its setting, the local planning authority shall have special regard to the desirability of preserving the building or its setting or any features of special architectural or historic interest which it possesses. The Authority is also required (under Section 72 of the Planning (Listed Buildings and Conservation Areas) Act 1990) to pay special attention to the desirability of preserving or enhancing the character or appearance of the conservation area. The case of R (Forge Field Society) v Sevenoaks DC [2014] EWHC 1895 (Admin) ("Forge Field") has made it clear where there is harm to a listed building or a conservation area the decision maker "must give that harm considerable importance and weight." [48].

Section 12 of the national guidance within the National Planning Policy Framework (NPPF) 2012 states that when considering the impact of a proposed development on the significance of a designated heritage asset, great weight should be given to the asset's conservation, with any harm or loss requiring clear and convincing justification. Paragraph 132 of the NPPF states that significance can be harmed or lost through alteration or destruction of the heritage asset or development within its setting. Further, Para.133 states that where a proposed development will lead to substantial harm to or total loss of significance of a designated heritage asset, local planning authorities should refuse consent, unless it can be demonstrated that the substantial harm or loss is necessary to achieve substantial public benefits that outweigh that harm or loss. Finally, Para 134 states that where a development proposal will lead to less than substantial harm to the significance of a designated heritage asset, this harm should be weighed against the public benefits of the proposal, including securing its optimum viable use.

In addition, the adopted Bristol Core Strategy 2011 within Policy BCS22 and the adopted Site Allocations and Development Management Policies within Policy DM31 seek to ensure that development proposals safeguard or enhance heritage assets in the city.

The Setting of a heritage asset is defined within the NPPF as "The surroundings in which a heritage asset is experienced. Its extent is not fixed and may change as the asset and its surroundings evolve. Elements of a setting may make a positive or negative contribution to the significance of an asset, and may affect the ability to appreciate that significance or may be neutral."

## a) Impact on listed buildings (as set out within Table 2 above)

Historic England commented in their summary response that *"We previously commented on proposals for this site at pre-application stage and on this planning application in our letter dated 10 June 2016. Whilst the additional information submitted with amendments to the scheme is helpful, and the reduction in massing to the south-east end of the site will reduce its immediate impact at this point, the proposals will still cause harm to the setting of the Grade I Church of St James. The reduction in height is offset by an increase in height elsewhere on the site, which will cause further harm to the historic environment, and fails to address the concerns set out in our previous consultation response. The elevational treatment of the facades has been simplified, and lacks any architectural sophistication which might serve to break down the massing of the building. We remain of the view*

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*that this application be refused on the grounds of its impact on the historic environment.” See appendix for full comments.*

The Council's City Design Group consider that although the amended proposals seek to draw back from the site boundary at ground level, the vast scale, massing, design, and material quality of the new-build proposals would constitute harm to the setting of The White Hart Inn, Bristol Eye Hospital, Listed walls to St James's Priory, St James's Church and Church House contrary to local policies BCS22 and DM31. They consider that as the highest designation applies to St James's church the impact on the setting of this building is an important factor in determining the degree of harm posed. Due to the proximity and scale of the new structures there remains an unacceptable degree of harm posed to the building and its group interest with adjacent assets. The disparity in this scale is most obviously damaging to the setting when standing within the parvis (the courtyard), in front of the architecturally significant west end of the Romanesque church. The special interest of the church is further harmed by the continued incremental loss of prominence of the medieval church tower within the urban environment. The new buildings will coalesce with the tower from some perspectives, but the general sense of overdevelopment and scale on the Old BRI site will diminish the essential legibility of the church and its skyline in this context. As such there is harm posed to the Grade I Listed asset, and an equal threat to the setting of assets of a lower grade, but in closer proximity.

The above expert advice is noted and the Townscape Visual Impact Assessment and other supporting Visual Representations of the proposed scheme have been reviewed in detail.

The proposed development would clearly have an impact on the setting of nearby listed buildings, particularly the Priory. In middle range views from the Haymarket (Photoviewpoint 2) the height of the proposed tower elements would be of a comparable scale to the Priory tower, however they would be significantly set back and receding into the distance and it is the view of officers that the tower of the Priory would remain dominant. Furthermore, some weight must be given to the fact that for part of the year these views are screened by tree planting, diminishing the visibility of the development. In other similar views from this direction (Photoviewpoints 3, 4 and 8), the elements of the development that would be visible would remain recessive, and while they provide a backdrop to the Priory tower from some angles, the Priory would very much remain in the foreground and prominence of these views. The St James Parade Character Appraisal identifies some of the key views of the Priory from within the Conservation Area, which tend to be very short range (given the size of the conservation area) and local, glimpsed views of the Priory that would remain unaffected by the proposal.

Another key view is Photoviewpoint 7 where the full height and extent of the scheme is visible looking up Lower Maudlin Street at the junction with Deep Street. From this angle, the scale of the development, while reduced, would be in contrast to the scale of the two-storey White Hart Inn opposite. The setting of this listed building is not distinct but is highly varied; on the one side being formed by the Priory and St James Parade Conservation Area and on the other (and across the highway) by larger scale development such as the recently constructed Premier Inn and the Eye Hospital. The building has no surrounding outside space within its curtilage that forms its setting, rather its setting is the surrounding urban form and infrastructure. Such differing scale is not uncommon for heritage assets and listed buildings in urban contexts and it is considered by officers that the proposal would not harm the setting of the listed building substantially. Any harm caused to the setting would be outweighed by the public benefits of bringing the site back into use and the retention of the Old BRI building.

Photoviewpoint 7 also indicates the relationship with the Grade II listed Eye Hospital on Lower Maudlin Street opposite the site. What constitutes the setting of this building is also difficult to describe exactly given its siting within a terrace of modern buildings along a main street of varied character. The proposal would be considered to result in some harm to the setting of this listed building due to the height of the tower elements in this location. However, while such harm is given considerable importance and weight, in this instance there are very significant public benefits of the

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scheme through the retention of the locally listed Old BRI and chapel that would be considered, on balance, to outweigh this harm.

Photoviewpoint 11, the view from the courtyard outside the west entrance to the Priory is another key view in terms of impact on setting of the Priory buildings. The design of the development has been specifically lowered at this end of the site to reduce the impact on this view and setting. While the proposed development immediately fronting Whitson Street is considered to be generally of an appropriate scale in relation to the listed buildings and surrounding context, it is clear that the larger tower blocks of the development would remain visible beyond it. Given the receding nature of the proposed development blocks away from the Priory site, the degree of harm to the setting of the listed buildings has been reduced compared to the previous iteration of the scheme and provides a greater degree of separation and distinction from the Priory complex and Conservation Area. Moreover the St James Park side of the Priory setting would remain largely unaffected. On balance, the resultant level of harm is considered to be justified by the considerable benefits of the scheme through retention of the locally listed building and other benefits of the proposals.

Longer range views towards listed buildings (Old City church spires) across the city have also been assessed and while there would be an impact on views from Dove Street; this view is not identified within SPD1- Tall Buildings or the Kingsdown Character Appraisal and in fact is a very fleeting and glimpsed view from a specific standpoint. As such, there is no objection on that basis.

Considerable importance and weight has been given to the harm caused to the listed buildings, their special interest and their setting however it is concluded that the public benefits of the scheme through retention of the locally listed Old BRI building and chapel would outweigh this level of harm. The development is considered to preserve the buildings, their setting and features of special architectural or historic interest in accordance with Section 66 of the Planning (Listed Buildings and Conservation Areas) Act 1990, Section 12 of the NPPF and Local Plan policies BCS22 and DM31.

b) Impact on conservation areas (see Table 2 above)

The City Design Group considers that the proposals would harm the setting of the St James Conservation Area (refer to full comments, appended) and would compromise the skyline, constituting an incongruous addition to these views of the conservation area, be unacceptably harmful to its setting, unjustifiably dominant, and detract from its special character. They advise that the Old Building of the BRI has a visual presence from the St Michael's Hill and Christmas Steps Conservation Area (CA). Viewed from an elevated position on Park Row, or closer to the building on Upper Maudlin Street, the proposed new rooftop additions and the tall buildings would project incongruously above the existing context. It is considered that this change in emphasis from medium to high-density development would have a harmful visual impact on the CA setting. The additional rooftop storeys, and the new tower, fail to preserve or enhance the local distinctiveness of the Conservation Areas affected. This harm is not adequately addressed by the application so there is not sufficient justification or mitigation to balance the harm against the wider public benefit contrary to national policy and policies BCS22 and DM31).

This advice is noted by officers; however it is their opinion that the proposals, while visible in places above the existing skyline, would not be considered to have any demonstrably harmful impacts on the Conservation Areas or key views identified within the SPD1- Tall Buildings guidance or character appraisals for individual conservation areas. The proposals would generally be compatible with the scale of existing development in the city centre and while a reduction in scale would be more reflective of the existing topography of the area, it is the view of officers that the Townscape Visual Impact Assessment and Visual Representations indicates a degree of impact that would be acceptable within the diverse and varied city centre context.

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Impacts from within the St Michaels Hill and Christmas Steps Conservation Area (views along Perry Road) would not be significant or harmful and the development would be similar to the heights of other visible taller buildings. Impacts from within the Kingsdown Conservation Area are also limited to a limited number of public views, in which the development, while visible would not be highly prominent and would be viewed against the context of other hospital precinct development. The development would be viewed as a distinct element when compared to the heritage assets of the Priory, neighbouring listed buildings and St James Parade and St Michael's Conservation Areas and would not compromise their special interest. Furthermore there are considerable public benefits that should be balanced against any impact, and would be considered to outweigh any harm.

Considerable importance and weight has been given to any harm caused to the conservation areas and their setting, however this is considered to be a limited degree of harm and outweighed by the public benefits of the retention of the Old BRI building. The development is therefore considered to accord with Section 72 of the Planning (Listed Buildings and Conservation Areas) Act 1990, Section 12 of the NPPF and Local Plan Policies BCS22 and DM31.

iii) Proposed new development blocks- design considerations

The NPPF and NPPG identify good design as a key aspect of sustainable development and establish the importance of local distinctiveness. Development should seek to promote character in townscape and landscape by responding to and reinforcing locally distinctive patterns of development, local man-made and natural heritage and culture, while not preventing or discouraging appropriate innovation.

The Bristol Core Strategy contains a number of policies relating to design that require development in the city centre to be of the highest standard in terms of appearance, function, conservation of heritage assets, sustainability and maintaining and enhancing green infrastructure and protecting key views. The criteria are outlined of the key elements of ensuring high quality design (Policies BCS2 and BCS21). The Site Allocations and Development Management Policies (SADMP) document sets out more detailed criteria for assessing design through a suite of policies DM26-DM3), and places particular importance on contributing to local character, layout of form, public realm and design of new buildings.

Finally, the Bristol Central Area Plan (BCAP) contains specific policies relating to this area or 'neighbourhood' within the city centre. Section 8.21-8.24 outlines the importance of considering impacts on views and landmarks in the city centre, particularly in consideration of tall buildings and outlines the relevant policies. The site lies within St Michael's neighbourhood (as identified within the BCAP) where development should *"protect the area's historic assets and respond strongly to the area's topography through its design, preserving or enhancing local and long distance views respecting the dominance within the townscape and skyline of existing historic landmarks. A flexible approach will be taken to the redevelopment of sites within the university and hospital precincts, although higher standards of urban design will continue to be sought. Regard should be had however to the impact of proposed development on the skyline of the city and the historic environment. Opportunities should be taken to improve the public realm and accessibility. The design of new development should take account of the distinctive scale and character of the key historic streets within the neighbourhood."*

## a) SPD1- Tall Building Assessment (adopted 2005)

The Council's Supplementary Planning Document 1 'Tall Buildings' is relevant given the revised proposal on the site for a tower form of development, 20 storeys in height. This sets out an indication of areas within the City Centre considered likely to be appropriate for tall buildings based on topography, consideration of protected views of city landmarks and existing clusters of taller buildings. The site does not lie within an area identified as likely being appropriate. Outside these identified

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areas, the document states that tall buildings would have to be very carefully assessed against the criteria set out and to be of exceptional design quality.

CDG has commented that *“The SPD1 policy position excludes the site from the area identified for a tall building. The site forms the context of secondary City Centre Landmarks in form of St James Church and King Edwards Building. It also forms a part of the rising topography with matching built form as set out in SPD1. The site is not a natural location for a (series of) tall building(s) as currently designed and the proposal fails to meet the SPD1 policy assessment for tall buildings (as set out under SPD1 assessment at the end of the report).”*

SPD1 sets out the assessment criteria as being:

- Relationship to context (topography, built form, skyline): see below
- Effect on the historic environment (citywide and locally): see previous key issues
- Relationship to transport infrastructure: see transport key issue
- Architectural excellence: see below commentary
- Contribution to public spaces/ mix of uses: proposed new areas, though limited of public realm and an improved mix of uses including active frontages.
- Effect on environment including microclimate and amenity;
- Contribution to access through an area: enhancement of key pedestrian routes.
- Sufficient accompanying detail to enable a full assessment: on balance, acceptable.
- Sustainable design and construction: see sustainability key issue
- Consideration of similar density in an alternative urban form: the pre-application process has considered alternative options.

While it is noted that the site is not identified as likely being appropriate for a tall building, it does not rule out a tall building in this location subject to assessment against the criteria. The guidance on siting of tall buildings states that they should not be positioned where they hide or mask the topography of the city e.g. they should not be positioned either on the side or the base of the Clifton-Kingsdown Escarpment (as defined by the 50m contour on the associated SPD1 maps). The application site sits below the escarpment albeit at a slightly raised topography than Broadmead and therefore could be considered the base of the escarpment. The impact of the development needs to be considered in terms of impacts on the protected view framework and identified key views rather than simply height alone.

While there would be a clear impact looking out from identified long range views (Kingsdown Character Appraisal) and some identified views (Dove Street), it is considered that the impact on these views would be acceptable given the glimpsed nature and context of these views. The proposal would not be visible from the wider vistas and viewing points in Kingsdown. It is acknowledged that the proposals would be visible from private residences; however these impacts can be afforded only limited weight as a planning consideration. The analysis of impact on other long range views indicates very minimal or no impact on views within the View Protection Framework. While the proposal would be visible in more local views, these are not considered by officers to be unacceptable harmful.

Daylight/sunlight impact: This has been assessed in terms of impacts on the upper floors of the White Hart Public House and the second floor flat within St James Church House. The assessment indicates only negligible impact on light and sunlight to these units. It is noted that this assessment does not include the temporary stay residential flats within St James Priory Almshouses. The Priory Trust advises that while some of their site is used for very short stay accommodation, that the Almshouses are used for longer term rehabilitation purposes where residents stay for several years. This is noted, and while some weight can be given to the impact on this accommodation, given that this is not permanent accommodation, the weight given is more limited. Officers advise that refusal of the application on this basis would not be reasonable given the temporary nature of this accommodation.



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Wind assessment: The assessment concludes that taking into account the frequency and speeds for all wind directions and all seasons in the year, the results of the assessment indicate that the overall impact of the proposed development on the local wind environment is likely to be minor. All areas remain suitable for their intended use (e.g. walking/ seating).

In conclusion, officers consider that the proposal would be acceptable in terms of the tall buildings assessment.

b) City Design Group (CDG) Comments

- Form, scale and massing

CDG acknowledges the changes made to the massing and design of the scheme following the submission of the original planning application, which have improved the composition and massing of the development but concerns remain about the excessive scale and massing of development considering the context of topography, townscape, listed buildings (including locally listed), conservation areas and public realm. It appears overbearing in the views from south, west and along Lower Maudlin Street.

- Architecture and fenestration

CDG- The revised design approach to create a series of distinct buildings with varying architecture, fenestration, materials and details is supported in principle. However, the proposed development is of significant scale and as per SPD1, the design of the buildings must be of “exemplar quality”. This is further reinforced by policies DM26 and DM29. This places very high emphasis on the design articulation of the buildings to address some of the aspects under consideration as per SPD1. However, the current design falls far short of the criteria for tall building as set out in policies.

- Materials and details

CDG- There is concern about some of the materials and details being proposed. It is inappropriate to use brightly coloured Anodized aluminium for rooftop extension over the Old Building, as this will detract from the existing building and its contribution to the street scene. CDG remains unconvinced about the use of brick slips, GRC (glass reinforced concrete) cladding, and metal cassette framing for windows for achieving an appropriate level of design quality within the city centre.

c) Design Issues Summary

The input and comments of the City Design Group are noted; and while the request to seek further design changes is acknowledged, a decision is due to be taken on the current scheme and a recommendation to Members must be made on that basis. On balance, officers consider the proposals to be an appropriate quality and design in this location, although admittedly some of the blocks are more utilitarian in appearance than others, which is reflective of the proposed uses. The scale of the development is the main consideration, and while the concerns are noted, officers consider that these concerns are outweighed by the viability considerations which mean that such a height is necessary to ensure the retention of the Old BRI building.

Another key consideration will be to make sure that the varied palette of materials will not appear overcomplicated but your officers advise that this could be dealt with through conditions to review sample materials prior to construction. Further review would be needed of the proposed use of brick slips in particular. It is recognised that the architect has also taken efforts to re-use the stone from the existing (recently demolished) boundary walls of the site in both the plinth and the element on Whitson Street and this approach is welcomed.

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The Design and Access Statement includes examples of large scale details of different elements of the scheme, particularly windows, which show that the windows would be set-back from the main facades by a reasonable amount, which will contribute to a sense of depth to each façade, breaking up the massing.

While there is scope for improvement, officers consider the design to be an appropriate response in this location and through the condition agreement process, a high quality finish could be ensured.

d) Crime prevention and security

Officers have liaised with the Police Crime Prevention Advisor and are satisfied that measures have been put in place to reduce opportunities for crime. An advice note is recommended to advise the applicant of this.

iv) Archaeology

There is potential on the site for local to regional and high significance of archaeological remains on the site. An initial stage of evaluation has been commenced but has been temporarily halted due to the presence of asbestos. It is hoped that works will resume imminently however, it is unlikely that the results of this work will have been completed and fully assessed in time for adequate consideration of their significance and thus adequate mitigation agreed (including preservation in situ). Officers are satisfied that these matters can be covered by condition.

iv) Public Art

Policy BCS21 states that major developments should deliver high quality design including the delivery of public art. A public art strategy has not been submitted except brief reference to commissioning a new stained glass window to the chapel building; however this is not publicly accessible. Officers recommend, should Members be minded to grant consent, that public art can be dealt with via an appropriate planning condition requiring a public art plan, with a view to inputting into public realm works, particularly at entrances and access points.

v) Summary

The proposal is considered to be acceptable by your officers on heritage and design grounds subject to appropriate conditions.

**(E) TRANSPORT AND MOVEMENT CONSIDERATIONS**

The site is in a sustainable location that in principle in highway terms is considered to be acceptable for an intensive mixed use development such as this, as it would concentrate development close to public transport hubs, services and facilities in accordance with Policy BCS20 of the Core Strategy.

Access and vehicle movements

Access to the site is currently from Lower Maudlin Street into a courtyard last used for hospital access (ambulances and staff use), currently a construction access. The application also proposes vehicular access from Lower Maudlin Street- this would be slightly relocated northwards of the zebra crossing due to the demolition of the Hill Ward Block. This will remove an existing conflict between emerging traffic and the crossing. No objections are raised on the grounds of any change in vehicle movements to and from the site.

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## Car parking and cycle parking

Below is a summary of the proposed car and cycle parking facilities for each use:

- Offices:
  - 11 staff car parking spaces (9 spaces plus 2 disabled parking spaces) within courtyard;
  - 192 cycle parking spaces shared with medical school with Old Building Level 0 (-2) plus shower facilities. Additional 34 shared spaces beneath canopy at back of Old BRI in rear courtyard (TOTAL= 226);
- Medical school
  - No car parking;
  - 192 cycle parking spaces shared with medical school with Old Building Level 0 (-2) plus shower facilities. Additional 34 shared spaces beneath canopy at back of Old BRI in rear courtyard (TOTAL= 226);
- Student accommodation
  - No car parking. Disabled car parking to be arranged as required (from Unite staff parking);
  - 185 cycle parking spaces at Level 0 (student accommodation), accessed by lift. Two-tier cycle racks;
  - 42 uncovered cycle parking spaces proposed within the courtyard for staff, student, visitors \* This would need to be reviewed to establish if there is space to accommodate this number of additional spaces without comprising the use of the courtyard for amenity purposes/ access/ manoeuvring.
- Commercial unit fronting Whitson Street (Use Class A3)
  - No car parking;
  - No cycle parking proposed; \* Potential for 1 or 2 sheffield stands within newly created additional public realm;

Disabled parking: The Transport Development Management Team advises that an increased number of disabled parking spaces should be provided and that there is space to accommodate this within the parking courtyard area, albeit that a reduced number of disabled spaces could be provided due to the extra space required. This is likely to equate to around 8 disabled bays rather than the 11 spaces proposed at present, which is an appropriate amount to serve the development including offices, medical school and student accommodation based on the parking standards which would require around 8.5 spaces to be provided. Officers will be contacting the applicant prior to the Committee meeting to seek this update, but it can otherwise be conditioned if there is insufficient time to provide this.

A condition would also be required to ensure that the disabled parking is made available for users of the medical school, offices and student accommodation from occupation in perpetuity. A further condition seeking provision of 1 electric vehicle charging point is also recommended.

The Transport Development Management Team has raised no objections to the levels of parking etc. and compliance with parking standards. There is an issue around the width between cycle parking units to manoeuvre cycles and more space would be required to address this issue. Officers recommend a condition to resolve this issue.

The Framework Travel Plan submitted is acceptable and within 6 months of occupations, a Full Travel Plan would be required via condition.

**Development Control Committee B – 28 September 2016****Application No. 16/01888/F : Old Bristol Royal Infirmary Building Marlborough Street (South Side) City Centre Bristol BS1 3NU****Student drop off/ management**

An updated Travel Plan and 'Moving In/ Moving Out Management Strategy' have been provided. In brief, the strategy is to use the car parking spaces on the site at the start and end of term for student loading/ unloading- students will be booked into slots and will have to park elsewhere in public car parks until their slot is available. Please refer to the strategy for further details.

This approach is deemed to be acceptable by the Council's Transport Development Management Team and in line with other student developments in the city centre. As above, a condition would be needed to secure this facility permanently in the future, even were Unite to vacate their office development.

**Pedestrian access and public realm**

The site is in a city centre location situated along two major pedestrian routes and close to key services and facilities including the bus station. Due to the historic background of the site, pavements are typically narrower than would be sought today for a location with such high footfall. The proposals would introduce approximately 450 employees, a significant number of medical students and student residents (738) all using the site at any time. While the site was last used by the hospital trust for offices/ wards which would attract a certain footfall, the proposal would increase footfall to the site dramatically. It is estimated that this would equate to 2500 pedestrian movements daily.

National policy is clear that good design goes beyond architecture and should address connections between places, integrating new development into the existing environment to create safe and accessible places for all people and improve the way that they function (Section 7, NPPF). Local Policy BCAP30 states that "Development on or adjacent to primary and secondary pedestrian routes will be expected to provide an appropriate and proportionate level of public realm improvements to the route." Whitson Street between the bus station and Lower Maudlin St is an existing primary pedestrian route (as designated by the BCAP) whereas all of the other streets bordering the site are existing secondary pedestrian routes.

The applicant has proposed a number of public realm improvements at the request of the Council's Transport Development Management Team; however these do not address all of the requests made and are disproportionately limited in relation to the scale of the development and associated footfall.

The Transport Development Management (TDM) Team has requested a plan to be submitted prior to any decision on an application to show, in principle, the following (these works can then be secured in details through a s278 highway agreement):

1. Refurbishment of footway in Marlborough Street, Lower Maudlin Street and Whitson Street to a condition suitable for a highly used city centre location including appropriate materials;
2. Widening of footway in Whitson Street on site's frontage to an absolute minimum of 2m;
3. Relocation of motorcycle parking;
4. Removal of redundant ambulance bay in Lower Maudlin Street and replacement with short pay and display car parking / motorcycle parking;
5. Pedestrian improvement scheme for the junction of Whitson Street with Marlborough Street to aid crossing movements along Marlborough Street;
6. Alterations to the waiting restrictions to enable the works;
7. Associated ancillary measures including but not limited to lighting, signing, street furniture, street trees, drainage, resurfacing;
8. Dedication of highway extents to be agreed by the Highway Authority.
9. Refurbishment of the zebra crossing on Lower Maudlin Street;
10. Oversailing structures to require an oversailing licence.

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To widen the footway into the carriageway at the northern end of Whitson Street, it is possible to remove the loading bay in Whitson Street at the top end of the site. There is loading available internally for the development site, and the Dorothy Hodgkin Building has a loading bay to the rear in Earl Street. This loading bay is not necessary for the building on the other side of Marlborough Street, and would be unsafe to use this for that purpose.

Without these essential improvements to the highway the Highway Authority would recommend refusal on highway safety grounds on the basis that, through failing to provide appropriate measures to mitigate the impact of the development, it would exacerbate existing road safety concerns, create an unsafe environment, not be accessible for all, to the severe detriment of pedestrian safety.

The Traffic Regulation Orders around the site would need to be amended as required- this can wither be secured through a unilateral undertaking or a highways 278 agreement.

Officers have requested a highway plan showing the above measures sought by the TDM Team from the applicant prior to the Committee meeting. Should this not be provided, a condition is recommended requiring agreement of such a plan prior to commencement of any works however it would be preferable to receive this up front to demonstrate the developer's commitment to addressing these outstanding issues.

**Servicing**

Servicing would need to be undertaken by a private waste contractor as the Councils' operators will not carry large waste containers over a distance of greater than 5m no enter private land to collect waste. The Transport Development Management Team has advised that a Servicing Strategy would be required to ensure that servicing takes place within the site and confirming that a private contractor would be used. This should also include servicing of the commercial unit on Whitson Street. A relevant condition is recommended.

The fire service reviews major development proposals independently and has raised no objections to the proposals. With a development of this type it is likely that the building regulations requirement would be for a sprinkler system, removing the need for fire appliances to enter the internal courtyard of the development, which is not accessible to vehicles.

**Construction Management**

A Construction Environmental Management Plan (CEMP) would be required by condition \* Condition. Ongoing issues with construction management relating to the demolition works that have been undertaken would need to be resolved firstly and then any future construction works to take place would be dealt with under a new CEMP secured by condition. Considerations such as the operation of the bus station taxi rank and cycle lanes around the site are highly important and will need to be addressed immediately to reduce impacts to an absolute minimum.

**(F) IMPACT ON ENVIRONMENTAL AND RESIDENTIAL AMENITY****Neighbouring residential occupiers**

Some of the impacts on neighbouring residential uses have been covered above in terms of noise disturbance and daylight/sunlight impacts. While the proposed development would directly overlook the St James Priory Almshouses, this is considered to be typical of a city centre relationship. Any development of the application site would likely involve overlooking of these properties, which are for long stay temporary accommodation (several years), and given that they have enjoyed a relatively private relationship with the site opposite for many years given the nature of the high boundary wall, it is not unreasonable to state that any redevelopment would likely have an impact. On balance, this would not be considered to be an unacceptable impact taking into account the needs of this group of individuals and the Priory more generally. While it is noted that the use of the building is for rehabilitation purposes where additional privacy and relative quiet are important, the site is within a

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busy city centre location adjacent to the bus station and therefore not totally isolated from the surrounding context.

**Future occupiers**

Student uses are not required to meet the national space standard, given that they are regarded as temporary uses. The Council's Pollution Control Team is satisfied that noise, and food smells impacts (from the proposed A3 use) on future residents can be controlled through appropriate conditions.

Air quality is not considered to be an issue for the residential uses in this location, as advised by the Council's Air Quality Management Team. While the outlook from some of the student bedrooms would be limited given the constrained nature of the site, this is considered appropriate given the urban context and temporary nature of the accommodation.

**(G) SUSTAINABILITY**

The Bristol Core Strategy (21 June 2011) contains specific policies relating to sustainability as follows: Policy BCS13: Climate Change, BCS14: Sustainable Energy, BCS15: Sustainable Design and Construction and BCS16: Flood Risk and Water Management. The Bristol Central Area Plan also includes further policies BCAP20 and BCAP21 relating to sustainability standards and connections to district heat networks.

The proposed student accommodation is seeking to achieve a BREEAM (Building Research Establishment Environmental Assessment Method) 2014 New Construction rating of excellent, in line with local policy. BREEAM 2014 Non-Domestic Refurbishment is proposed for the Old BRI Building (also targeting an Excellent rating). Conditions would be recommended to secure these targets.

An Overheating Analysis has been carried out and all selected spaces in the proposed student accommodation pass under the current weather scenarios and in the 2030 and 2050 scenarios the risk is reduced using solar reflective internal blinds. These are not the preferred solution however as they rely on correct use by occupants and are generally considered to be less effective than external shading. The analysis compares the options- further comparison of external horizontal shading is sought. This could be sought by appropriate condition to ensure the best option is selected. No analysis has been undertaken for the top floor extension of the Old Building, which is considered to be at risk of overheating. Further information is sought by condition in this respect to ensure that any external louvres are considered comprehensively as part of the overall design.

The Energy Statement proposes renewable energy generating technologies in the form of solar photovoltaic panels to the new building elements. This would only reduce the CO2 emissions overall by 5.6% for the student accommodation and 2.2% for the office accommodation from the residual level when the policy requirement (BCS14) is for a 20% reduction. PV panels are not proposed to the new extension of the Old BRI building but insufficient justification has been provided for this- it may be possible to incorporate them with minimal visual impact. Queries have been raised by the Council's Sustainability Team regarding the proposed electric heating system versus a wet heating system. Further information will be sought from the applicant on this point and an update given at Committee.

Connection to a district heat network is unlikely to take place within the timeframe of the construction process, but through conditions, further consideration could be given to this matter or to providing the ability to connect to future networks.

**(H) FLOOD RISK AND SUSTAINABLE URBAN DRAINAGE**

There are no objections on the grounds of the above issues subject to conditions.

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**(I) CONTAMINATION AND COAL MINING RISK ASSESSMENT**

There are no objections on the grounds of the above issues subject to conditions.

**(J) NATURE CONSERVATION**

Officers are satisfied that nature conservation considerations such as potential for roosting bats/ nesting birds can be covered by appropriate planning condition.

**(K) PLANNING OBLIGATIONS/ HEADS OF TERMS**

The key planning obligations relate to the requirement to amend traffic regulation orders (TROs) around the site, which requires a financial payment of £2500 to achieve this. This obligation can be secured by a legal agreement prior to or following the Committee meeting.

**COMMUNITY INFRASTRUCTURE LEVY (CIL)**

How much Community Infrastructure Levy (CIL) will this development be required to pay?

The development will be liable for CIL, however the sum has yet to be finalised as floorspace information is still awaited from the applicant.

**CONCLUSION**

In conclusion, your officers recommend approval of the application subject to the conditions outlined and subject to receipt of a legal agreement for the payment of TRO monies or an agreement to enter into a s278 highways agreement, which could secure this.

The key considerations are the principle and amount of proposed student accommodation, which your officers strongly advise to be acceptable in policy terms.

Another key issue relates to the balance between the visual impact of the proposed scheme on the surrounding townscape and middle/ longer range views and heritage assets and the public benefits in terms of the retention of the Old BRI Building. While Historic England and the Council's City Design Group and other stakeholders have raised objections on these grounds, the role of the planning system is to weigh these concerns regarding harmful impacts (and to give these impacts considerable importance and weight) against the public benefits of the scheme. It is the view of officers that the retention of this historic building for future generations would outweigh those matters.

An independently assessed viability assessment has in the opinion of officers, demonstrated that the amount of development proposed by the applicant is required in order to off-set the costs of the retention of the Old BRI building and chapel.

Transport is another key issue and it is considered that this can be satisfactorily addressed via conditions.

In conclusion, approval of the application is recommended subject to conditions.

**RECOMMENDED GRANTED subject to condition(s)**

Recommended conditions will follow in an Addendum Report to be issued prior to the Committee- this is due to the complexity of the case and the short timescales for consideration of the revised scheme.

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**BACKGROUND PAPERS**

Archaeology Team	25 May 2016
Landscape	18 May 2016
City Centre Projects (Public Art)	20 May 2016
Flood Risk Manager	26 May 2016
Sustainable Cities Team	2 June 2016
Transport Development Management	29 June 2016
Urban Design	To follow
Historic England	10 June 2016
Nature Conservation Officer	25 May 2016
Arboricultural Team	31 May 2016
Pollution Control	7 June 2016
Contaminated Land Environmental Protection	7 June 2016
Crime Reduction Unit	3 June 2016
Wessex Water	13 May 2016
The Coal Authority	20 May 2016
Wessex Water	20 May 2016
Bristol Civic Society	6 June 2016
Bristol Civic Society	9 September 2016



**APPENDIX 1-**  
**THE COUNCIL'S CITY DESIGN GROUP FULL COMMENTS**  
**TO FOLLOW**

**APPENDIX 2-**  
**HISTORIC ENGLAND FULL COMMENTS**

- a) 12 September 2016**
- b) 10 June 2016**



SOUTH WEST OFFICE

Ms Charlotte Sangway  
Bristol City Council  
Brunel House  
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BS1 5UY

Direct Dial: 0117 975 0676

Our ref: P00510566

10 June 2016

Dear Ms Sangway

**Arrangements for Handling Heritage Applications Direction 2015  
& T&CP (Development Management Procedure) (England) Order 2015**

**OLD BRISTOL ROYAL INFIRMARY BUILDING, MARLBOROUGH STREET  
(SOUTH SIDE) , CITY CENTRE, BRISTOL, BS1 3NU  
Application No 16/01888/F**

Thank you for your letter of 10 May 2016 notifying Historic England of the above application.

We provided pre-application advice on proposals for this site in our letter to the applicants, dated 1 March 2016 (our ref. PA00411769, attached). In that letter we set out serious concerns regarding the scale of the proposals and the impact on the setting of the adjacent listed buildings and conservation area. Unfortunately, there has been no response to any of those concerns, and we can only reiterate the significant, if not substantial, harm that these proposals would cause to the setting of those designated heritage assets.

**Historic England Advice**

The proposals have the potential to impact on the settings of the Grade I listed Church of St James' (Priory) and the Grade II\* listed Church House, as well as the settings of other Grade II listed buildings (such as the White Hart Inn and the Eye Hospital) and the St James' Parade Conservation Area. The hospital building on the site is on the Bristol City Council's list of valued buildings, and as such is covered by their Core Strategy Policy BSC22.

Whilst the St James' Parade Conservation Area is small in size, it does not diminish its importance. The Priory itself is one of the oldest and most historically significant buildings in Bristol. Although there are taller buildings to the north of the Priory, its primary aspects are to the west and south. Directly to the north is the low-rise bus/coach station and the buildings beyond are not immediately apparent, as is shown by the views presented in the *Visual Impact Assessment*. In views from the south the Priory is generally seen against a backdrop of clear sky rather than buildings. There



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are taller buildings to the east of the Conservation Area, but these are viewed in the context of the post-War Bearpit Roundabout (when looking towards the Conservation Area from the east) and are surprisingly shielded in views out of the Conservation Area.

The setting of St James' Priory to the south is largely bounded by the raised green space of the churchyard. Due to the topography and the mature trees, along the edge of the churchyard, one has limited awareness of the buildings (and main road) to the south of the Conservation Area.

The primary elevation of the Priory faces west, and on this side of the Conservation Area the buildings are of limited scale. The west end of the church building is the most important architecturally, both in terms of its stone carving and it being the main entrance to the building.

The Eye Hospital is of four storeys with mansard roof, whilst the Grade II element is of three domestic storeys with a mansard roof. There is a newly constructed hotel building on the corner of Lower Maudlin Street and Lewins Mead, and taller buildings further to the west; and although visible in views to and from the Grade I Priory they are not overly dominant. Given the scale of some of the buildings in the vicinity, the view from the west end of the Priory through the listed gates is, again, surprisingly open; looking at buildings of a relatively low scale.

The Grade II White Hart Inn and the Eye Hospital are modest in scale, and in turn are viewed within the context of similar buildings within their immediate townscape.

The former Bristol Royal Infirmary building on the site is a locally listed building, and has townscape value, albeit compromised by later additions and alterations especially to the rear. The Chapel building to the east of the site also has historic townscape value, particularly its gabled elevation to the south-east. Although of limited architectural interest in themselves, the rest of the buildings on the site were historically, and remain, of a relative low scale. They continue to afford a more open aspect to the heritage assets facing the development site, and contribute towards their setting in an otherwise modern urban context.

It should be noted that the setting of historic assets is not limited to inter-visibility with their surroundings but also includes the context in which they experienced. In this context the view down Whitson Street is important as one approaches the Priory from higher ground to the north: one has sight of the complex of buildings over the low bus station, within buildings of a relatively modest scale.

Given the scale of the proposals they come within the tall buildings policy of the Council, and they will also have potential wider townscape impacts: for example, in views along Upper Maudlin Street/Marlborough Street and down Marlborough Hill.



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### *Information*

Whilst the wireframe views presented with the application are useful, it is disappointing that they are not full renderings of the proposals in context. Views from the west end of the Priory have not been provided, nor have views along Upper Maudlin Street and Marlborough Street (from both east and west). Closer views along Lower Maudlin Street should be provided to better illustrate the relationship with the Grade II Eye Hospital buildings. A realistic view up Whitson Street should also be presented, as should closer views (over the Priory) from within the Conservation Area from the south. The more immediate views from outside the White Hart and the bus/coach station (pages 72-75 of the Design and Access Statement) are useful, although they fail to illustrate the full impact of the proposals by limiting themselves to the lower storeys of the building. Confirmation should be provided as to how these views have been generated.

The Heritage Statement by CGMS is cursory in its consideration of the impacts of the proposals on the setting of nearby designated heritage assets, and is of limited value.

### *Impact*

Although outside the formal remit of Historic England, the retention of locally listed building is welcomed; as is the intention to remove many of the later interventions to its primary frontage, which may be regarded as an enhancement. That said, the scale of the proposed roof-top extensions is of concern (being the equivalent of three storeys in places). The removal of the later interventions to its rear elevation is welcomed, and we do not object to the principle of a glazed circulation zone to the rear of the building. However, the demolition of a significant portion of the back of the locally listed building must be of concern, and we remain to be convinced that the scale of the roof top extension is not overbearing. We welcome the retention of the rear Chapel, but the relationship of the new building with the Chapel's south-eastern gabled elevation is particularly clumsy and overbearing.

Whilst we do not object to the principle of the replacement of the existing building to the rear of the site, the proposed development (at 10, 12 and 13 storeys) is clearly out of scale with much, if not all, of the existing townscape around the site. The overwhelming impact of the proposals is exacerbated by the lack of any response to the sloping topography of the site; leading to a particularly overbearing presence to the south and south-east of the site.

The overbearing impact of the proposals is illustrated by the view provided looking up Lower Maudlin Street, and would no doubt be confirmed if views were provided from outside the west end of the Priory. The sections clearly illustrate that the proposals are significantly out of scale with the surrounding listed buildings and would present a sheer cliff face of development of questionable architectural quality.



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In all the views presented from the south the Priory and its tower are viewed against open sky, which despite its urban context maintains a degree of openness which is an important aspect of its setting. The proposals would interrupt the skyline and be visible in views over the nave of the Priory (particularly views 2 and 3 in the Visual Impact Assessment) and possibly in the backdrop to the landmark tower. In views down Whitson Street the proposals are likely to become a dominant and discordant feature, to the right hand side beyond the historic Chapel.

Given the scale of the building it will also impact in longer views, such as those along Silver Street, which currently has an open view northwards across to the Conservation Area and beyond. The proposals will also impact on views down Marlborough Hill as one approaches the city from the north.

Section 66 of the *Planning (Listed Buildings and Conservation Areas) Act 1990* states that the local planning authority shall have special regard to the desirability of preserving a listed building or its setting or any features of special architectural or historic interest which it possesses. The *National Planning Policy Framework* (2012) (NPPF) reinforces the importance of conserving and enhancing the historic environment as an essential component of sustainable development; stating (paragraph 132) "great weight should be given to the asset's conservation. The more important the asset, the greater the weight should be." It goes on to state that Grade I buildings are "heritage assets of the highest significance".

New development should preserve or enhance the settings of designated heritage assets, including conservation areas. Paragraph 137 of the NPPF states that "Local planning authorities should look for opportunities for new development within Conservation Areas and World Heritage Sites and within the setting of heritage assets to enhance or better reveal their significance."

The proposals should also be considered in light of Historic England's *Advice Note 3: the Setting of Heritage Assets*. This echoes the definition of setting given in the NPPF: "the setting of a heritage asset is the surroundings in which a heritage asset is experienced. Its extent is not fixed and may change as the asset and its surroundings evolve. Elements of a setting may make a positive or negative contribution to the significance of an asset, may affect the ability to appreciate that significance or may be neutral (NPPF glossary)."

Bristol City Council's *Supplementary Planning Document 1: Tall Buildings* (2005) identifies St James Church as being a historic asset that is a prominent landmark, and that tall buildings should not be positioned where they "have an adverse impact on the city's historic environment."

### Position



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As is illustrated by the photomontages and long sections, the proposals are considerably out of scale with surrounding development. They fail to respond, not only to the heights of surrounding built form, but also the sloping topography of the site. It presents overbearing and incongruous cliff-like facades to most elevations, and will cause considerable harm to the settings of nearby heritage assets; including the Grade I listed Priory. It will be visible in views over the Priory from the south, causing further harm to its setting. The elevational treatment of the proposals fails to disguise the overwhelming bulk of the buildings.

The proposals will fail to preserve or enhance the settings of the nearby designated heritage assets, and based on the information submitted are likely to cause significant, if not substantial, harm. As such are contrary to the *Planning (Listed Buildings and Conservation Areas) Act 1990* and to guidance in the NPPF, as well as the City's own *Supplementary Planning Document 1: Tall Buildings*.

### Recommendation

We do not object to the principle of development of the rear of the former Bristol Royal Infirmary site. However, given the unacceptable scale of the proposals we would recommend that there is a significant reduction in the height of the proposals across the entire site; particularly to the corner of Lower Maudlin Street and Whitson Street, due to its direct impact on the settings of St James' Priory and the White Hart. Any new scheme should also seek to respond to, not only to the settings of the important heritage assets in the vicinity, but also to the falling topography of the site. Views through, over and into the Conservation Area also need consideration. Further views analysis should indicate the impact of the roof top extensions to the locally listed building, which from the information presented appears to be of concern; as is the extent of demolition of the back of the building.

The relationship of the development with the historic Chapel on the site should also be reconsidered.

We are unable support this scheme, due to the significant harm to the setting of the designated heritage assets in the vicinity. We would recommend that it is refused, on heritage grounds, or preferably withdrawn, to allow for meaningful dialogue over development proposals of a considerably reduced and far more realistic scale.

Please contact me if we can be of further assistance. We would be grateful to receive a copy of the decision notice in due course. This will help us to monitor actions related to changes to historic places.

Yours sincerely



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Ms Charlotte Sangway  
Bristol City Council  
Brunel House  
St George's Road  
Bristol  
BS1 5UY

Direct Dial: 0117 975 0676

Our ref: P00510566

12 September 2016

Dear Ms Sangway

**Arrangements for Handling Heritage Applications Direction 2015 &  
T&CP (Development Management Procedure) (England) Order 2015**

**OLD BRISTOL ROYAL INFIRMARY BUILDING, MARLBOROUGH STREET  
(SOUTH SIDE) , CITY CENTRE, BRISTOL, BS1 3NU  
Application No 16/01888/F**

We have received amended proposals for the above scheme.

**Summary**

We previously commented on proposals for this site at pre-application stage and on this planning application in our letter dated 10 June 2016. Whilst the additional information submitted with amendments to the scheme is helpful, and the reduction in massing to the south-east end of the site will reduce its immediate impact at this point, the proposals will still cause harm to the setting of the Grade I Church of St James. The reduction in height is offset by an increase in height elsewhere on the site, which will cause further harm to the historic environment, and fails to address the concerns set out in our previous consultation response.

The elevational treatment of the facades has been simplified, and lacks any architectural sophistication which might serve to break down the massing of the building. We remain of the view that this application be refused on the grounds of its impact on the historic environment.

**Historic England Advice**

The heritage assets likely to be impacted on by the proposals, and a consideration of their settings as they contribute to their significance, are set out in our previous letter. The legislative and policy context is also set out in that letter.

The amendments appear to propose a similar quantum of development to the previous iteration of the scheme. There is a reduction in scale to the south-east corner of the site and running up Whitson Street, but with a significant increase in height to other sections on Lower Maudlin Street (up to 19 storeys, opposite the Grade II Eye



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Hospital). The elevations have been simplified.

More accurate photomontages have been submitted (previous photomontages were mostly wire frame views) and a view from the forecourt area to the Grade I St James Church has now been provided. Views along Upper Maudlin Street, and wider townscape views, have now been provided, although it is noted that none of the proposed improvements to the elevations of the Locally Listed former BRI building are shown on the photomontages.

We previously raised concerns regarding the overall scale of the proposals, in the context of the surrounding streetscape, as well as the harmful and overbearing nature of the proposal on the setting of adjacent heritage assets, such as the Grade I Church of St James. Of particular concern were the views up Lower Maudlin Street, from the Church of James itself, and over the Priory from the south.

Whilst it is accepted that there has been a slight reduction in scale to the south-east of the site the proposals will still represent a substantial intrusion into views from St James Church (View 11). The inclusion of a 19 storey element will also introduce a vertical element in View 2, which will compete with the primacy of the tower of the Church, particularly in views from the south. Additionally the 19 storey element will now be visible in longer views across the City. The simplified elevational treatment leads to more monotonous, regular facades, which further adds to the overwhelming massing of the proposals.

Historic England's *Advice Note 4: Tall Buildings* is of relevance. It updates previous guidance by English Heritage and CABE, produced in 2007. It sets out the criteria for assessing the impact of tall buildings on the historic environment, which is echoed in Bristol's *Supplementary Planning Document 1: Tall Buildings* (SPD1).

SPD1 identifies St James Church (36m) as an historic asset that is a prominent landmark, and that tall buildings should not be positioned where they "have an adverse impact on the city's historic environment." (p17) It also states that responses to the consultation informing the document "suggests there is a general acceptance that it is entirely appropriate and desirable for these [significant landmarks, such as St James Church] to **dominate** the skyline of the city, an acceptance which is not often conveyed to tall residential or commercial buildings." (p11). It should also be noted that the site falls outside areas identified where tall buildings may be appropriate (Figure G, p26).

As noted in our previous letter, Section 66 of the *Planning (Listed Buildings and Conservation Areas) Act 1990* states that the local planning authority shall have special regard to the desirability of preserving a listed building or its setting or any features of special architectural or historic interest which it possesses. The *National Planning Policy Framework* (2012) (NPPF) reinforces the importance of conserving



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and enhancing the historic environment as an essential component of sustainable development; stating (paragraph 132) "great weight should be given to the asset's conservation. The more important the asset, the greater the weight should be." It goes on to state that Grade I buildings are "heritage assets of the highest significance".

The proposals will fail to preserve or enhance the settings of the nearby designated heritage assets, and based on the information submitted are likely to cause significant harm. As such are contrary to the *Planning (Listed Buildings and Conservation Areas) Act 1990* and to guidance in the NPPF, as well as the City's own *Supplementary Planning Document 1: Tall Buildings*.

We do not object to the principle of re-development of the site, albeit at a scale, and in a form, which does not cause harm to the historic environment. Should a justification be put forward for the level of student accommodation proposed, there would appear to be other sites within the City where it might be sited.

### Recommendation

The revisions have failed to address the concerns set out in our previous letter and the recommendation in that letter still stands: i.e. that it should be refused on the basis of its harmful impact on the historic environment.

Please contact me if we can be of further assistance. We would be grateful to receive a copy of the decision notice in due course. This will help us to monitor actions related to changes to historic places.

Yours sincerely

**Simon Ramsden**

Principal Inspector of Historic Buildings and Areas

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WARD: Clifton CONTACT OFFICER: Susannah Pettit

SITE ADDRESS: Land Adjacent To 2 Southernhay Avenue Bristol

APPLICATION NO: 16/02137/F Full Planning

EXPIRY DATE: 29 June 2016

*Proposed four storey, three bedroom single dwelling house.*

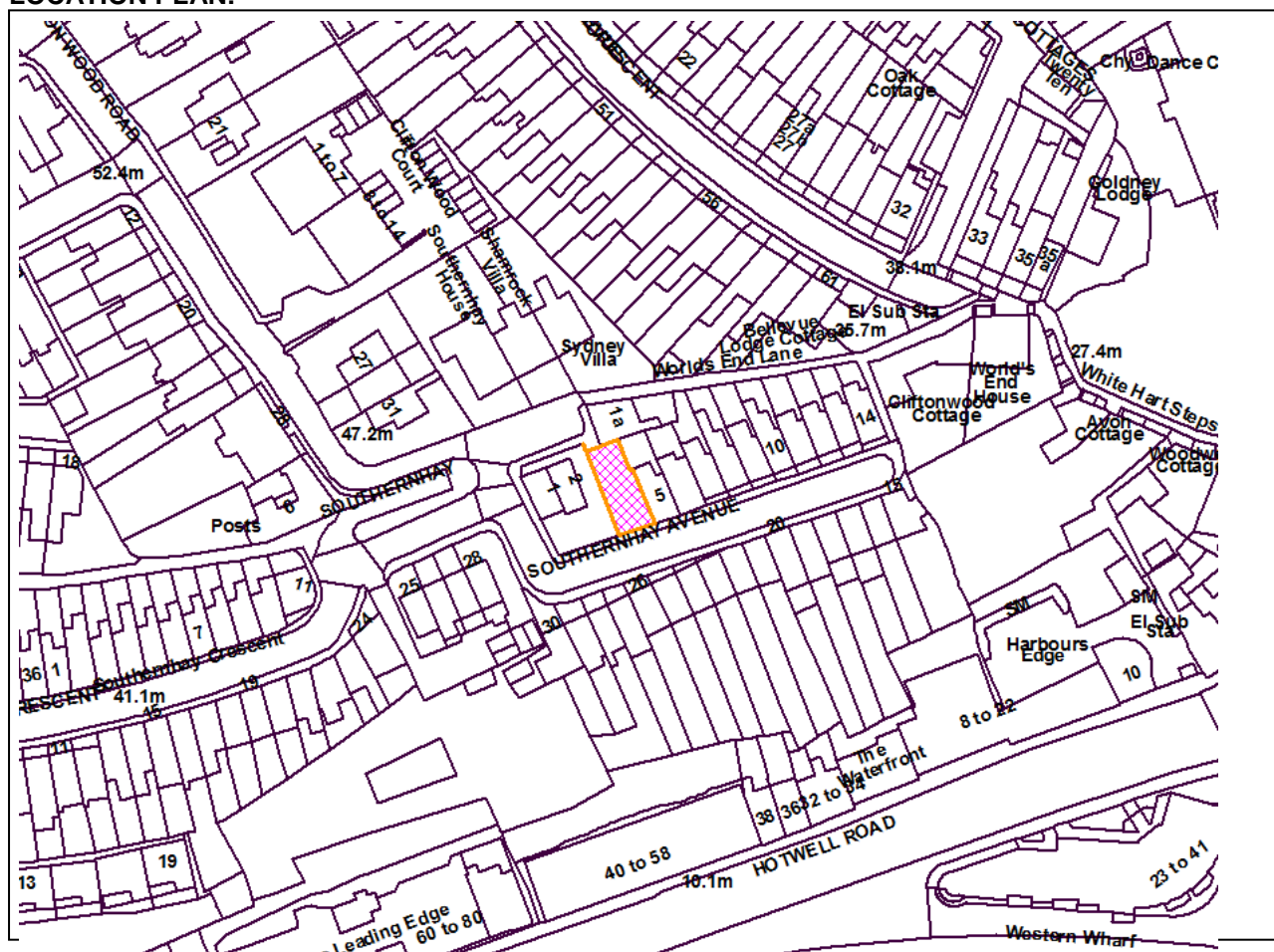
RECOMMENDATION: Grant subject to Condition(s)

AGENT: Greenheart Sustainable Construction  
Studio 2  
St Andrews Road  
Montpelier  
BS6 5EH

APPLICANT: Mr Grimshaw  
6 Windsor Terrace  
Clifton  
Bristol

*The following plan is for illustrative purposes only, and cannot be guaranteed to be up to date.*

LOCATION PLAN:



**Development Control Committee B – 28 September 2016****Application No. 16/02137/F : Land Adjacent To 2 Southernhay Avenue Bristol****SUMMARY**

This case is being referred to committee due to the fact that forty (40) objections have been received. The proposal is for a family sized house to be built on a brownfield site which contains foundations of a pre-war house. The house would be of a modern design and would achieve high standards of sustainability which would be over and above the policy requirement.

The objections that have been raised by neighbours raise issues which are summarised below, but include loss of light, parking, wildlife and land stability.

Officers consider that the scheme is an acceptable response to the site, delivering as it would much needed family sized housing and being of a high quality and sustainable design. A balance has been made between this positive aspect, and the less positive effect that would occur in terms of daylight and sunlight. An assessment on this matter is set out below, but concludes that the loss of light experienced by some of the neighbouring windows and gardens would not be so harmful as to warrant a refusal.

**SITE DESCRIPTION**

The proposal relates to a vacant piece of land adjacent to 2 Southernhay, which has frontages both to the north and south section of the road. The road at this point forms a two pronged shape, with the upper section called Southernhay, and the south section called Southernhay Avenue. Due to a steep change in levels, numbers 1, 1a and 2 Southernhay are on higher ground than their neighbours at 5-30 Southernhay Avenue. The properties are also set further back from the road up the hill, and they front onto and have access to the upper part of Southernhay.

The site falls within the Clifton Conservation Area. There are no listed buildings in the immediate vicinity of the site. The site also falls within an area covered by a Residents Parking Scheme.

**RELEVANT HISTORY**

There are no previous planning decisions for this site, although a pre-application enquiry in respect of the proposed development was submitted (BCC ref 15/05947/PREAPP) and a response was issued 31 December 2015.

**APPLICATION**

The application seeks planning permission to construct a four storey, 3 bedroom family dwelling (lower ground, ground, first floor and second floor). Due to the level changes within the site, the lower ground floor would be built into the hill so the building appears as a three storey building from Southernhay (the upper part of the road). The building would be of a modern style of architecture, using white render, full height glazing and timber framed windows as the main materials, and a bespoke internal layout design. The windows would predominantly face south, and the access would be both from the southern and northern parts of Southernhay Road. The garden would contain a bike and bin storage which would be built into the hill, with a raised garden over, and accessed from new gate inserted in the rubble-stone wall on Southernhay Avenue. A timber framed walkway and steps would lead from the lower ground courtyard level to the ground floor entrance. There would be one parking space located within the site, to the west side of the house and accessed from the northern branch of Southernhay Road.

Historical maps (circa 1900) show a house in the same location as proposed, which was destroyed during the war. Foundations from this building still exist on site.

**Development Control Committee B – 28 September 2016****Application No. 16/02137/F : Land Adjacent To 2 Southernhay Avenue Bristol**

The aim of the proposed building is to attain the highest possible specification in terms of sustainability and energy efficiency, with the proposed measures set out in a sustainability report and discussed in the assessment section of this report. Due to the difference in levels in the area, and following comments received during consultation, the applicant has also provided a Structural Engineers report.

**PRE APPLICATION COMMUNITY INVOLVEMENT**

The application falls below the threshold for which a Statement of Community Involvement is required as a validation requirement, however, in view of the constrained nature of the site has submitted a response in this regard. This statement sets out that the applicant recognises the importance of maintaining a good relationship with the local community and engaging with the prospective neighbours. The document sets out that the applicant intends the proposal to be a family house in which they would live. The document discusses the applicant's desire to create an eco-house that would have a low impact environmentally.

Initial meetings were held with individual neighbours in May 2015 and were ongoing through November 2015 and February 2016. This also included a meeting with a structural engineer. Meetings with individual neighbours were also held in April, May and June 2016.

The outcomes of each meeting have been set out in the report, including how each concern was taken into account. On each matter raised, the applicant has provided a response, and recognises that the proposal is within a very tight and close knit residential area.

Issues addressed have included:

- Alteration of location of bathroom windows facing north to avoid overlooking;
- Retention of party wall between 1a Southernhay and proposed development site;
- Introduction of wooden fencing between proposal's garden and no. 2 Southernhay;
- Submission of a full Daylight and Sunlight Assessment in response to concerns on loss of light from neighbouring gardens and windows.

**RESPONSE TO PUBLICITY AND CONSULTATION**

A site notice and a press advert were both posted on 25.05.16, and letters were sent to 46 neighbouring occupiers on 13.05.2016. A second consultation was also undertaken on 03.08.16 giving a further 14 days to comment on additional material which had been submitted by the applicant. The final date for comment was 17.08.16.

The consultation exercises generated 40 objections during the first consultation, and a further 22 during the second. 5 letters of support were also received.

Issues raised are summarised below:

**Loss of light**

- The building would deprive windows and gardens on Southernhay Avenue of light and sunlight, particularly in the late afternoon;
- The proposals will result in loss of light from the east facing windows of 2 Southernhay;

**Loss of privacy**

- The windows in the proposal would overlook neighbouring windows
- West facing windows should be obscure glazed;
- West facing windows are too close to 2 Southernhay;

**Design and Conservation**

- The proposed building is too high and would affect the skyline;
- The modern design of the proposed building is out of character with the rest of the neighbourhood;

**Development Control Committee B – 28 September 2016**

**Application No. 16/02137/F : Land Adjacent To 2 Southernhay Avenue Bristol**

- The proposed building shows no reference to the pre-war history of the site and is not a sympathetic addition to the conservation area;
- The proposed building is shoe-horned into the corner of the site rather than completing the square of Southernhay;

**Parking and Highways**

- Even though the plans show a parking space, this is misleading as this is understood to be under separate ownership and usage. This would mean the proposed house has no off-street parking and as such, would place pressure on the surrounding streets;
- There is not enough parking for the house;
- The proposal would involve the loss of an on-street parking space;
- The parking space would not achieve adequate entrance / egress and a swept path diagram should have been submitted to show how this can be accessed safely;

**Land and Building Stability**

- Clifton area is built upon rock. The proposed building would require extensive excavation to accommodate a basement and its foundations would result in underpinning of 1a Southernhay. This could pose a serious threat to surrounding buildings in terms of subsidence;
- The area is known for subsidence;
- The drawings show the proposed building is to be built very close to the side wall of no. 1A Southernhay and it is queried how these residents would be able to maintain the external walls of their properties.
- The Structural Engineers' Report submitted with the application states that Structural Solutions Management Ltd accept responsibility for any structural damage cause to nearby properties. What does this mean?

**Construction disturbance**

- There is limited direct access to the plot, therefore disruption to residents during construction would be severe;
- There is no mention in the application of how rock and rubble created from excavation would be removed;

**Other matters**

- The application documents are inadequate and misleading;
- The access point to the site is different to what is shown on the plans;
- The loss of the garden should be resisted;
- The garden provides a feeding space for Leisler bats and other wildlife;
- Social areas within the proposed house are arranged towards the front of the house unlike other properties in Southernhay - this would lead to noise pollution;
- The application states no trees are to be felled, however the tree at no.5 would need to be removed to make way for the scaffolding;
- Residents were not contacted by the author of the Daylight and Sunlight report to arrange access, and the report is inaccurate on several counts;

**Ward Members**

Councillor Jerome Thomas: Supports the application.

- As a City we are seeking to increase the availability of homes at a time when there is a severe housing shortage;
- I am supportive of the green and energy efficiency credentials of the proposed development;
- The design will not be to everyone's taste but it would not dominate the street or skyline.

Bristol Civic Society: Strongly objects to the application. The height and design bear no relation to neighbouring houses and would harm the conservation area. The site is visible from the Floating Harbour. The proposed building would be incongruous.



**Development Control Committee B – 28 September 2016****Application No. 16/02137/F : Land Adjacent To 2 Southernhay Avenue Bristol****OTHER COMMENTS****City Design Group** has commented as follows:-

The proposal would preserve the appearance of the conservation area. It would not result in harm. View Impact Analysis shows the building would sit comfortably within the context. Material samples of render and timber and balcony materials should be made available on site for approval. Details of boundary treatment to include planting should also be conditioned.

**Transport Development Management** has commented as follows:-

The proposal for 3-bedroom house is unlikely to generate a severe negative impact on the surrounding highway in terms of traffic movements and parking once built. The site is located sustainably and as such its location will deter excessive car reliance. An off-street parking space is provided whilst the site is located within an existing controlled parking zone to deter detrimental overspill of parking and highway safety issues.

However, this will be a difficult site to access for construction traffic in view of the need to keep the highway clear. Therefore, development should not commence until a Construction Management Plan (CMP) is submitted and agreed in writing. The CMP will be required in the interests of avoiding unnecessary blockage or obstruction to surrounding occupiers.

Adequate cycle parking is provided to encourage movement to / from the site by sustainable means in line with the requirements of the transport team's standing advice. Sufficient bin storage is shown and this will need to be conditioned to avoid overspill of refuse containers / bins onto the footway.

**RELEVANT POLICIES****National Planning Policy Framework – March 2012****Bristol Core Strategy (Adopted June 2011)**

BCS20	Effective and Efficient Use of Land
BCS5	Housing Provision
BCS2	Bristol City Centre
BCS9	Green Infrastructure
BCS14	Sustainable Energy
BCS15	Sustainable Design and Construction
BCS16	Flood Risk and Water Management
BCS13	Climate Change
BCS18	Housing Type
BCS20	Effective and Efficient Use of Land
BCS21	Quality Urban Design
BCS22	Conservation and the Historic Environment

**Bristol Site Allocations and Development Management Policies (Adopted July 2014)**

DM23	Transport development management
DM26	Local character and distinctiveness
DM27	Layout and form
DM29	Design of new buildings
DM31	Heritage assets
DM32	Recycling and refuse provision in new development

**Supplementary Planning Guidance**

Clifton &amp; Hotwells Conservation Area Character Appraisal



**Development Control Committee B – 28 September 2016****Application No. 16/02137/F : Land Adjacent To 2 Southernhay Avenue Bristol****KEY ISSUES****(A) LAND USE PRINCIPLE**

Policy BCS5 sets out the need in Bristol for 30,600 new homes, and the requirement to build the new homes on previously developed land. This site is not identified for housing development within the Local Plan, but would be classed as a 'windfall site', to be developed by a private developer. The Policy Delivery section of policy BCS 5 states that where proposals are in accordance with other policies in the Core Strategy and other Development Plan Documents (DPD), the potential contribution of small unidentified housing sites towards the delivery of 30,600 homes will be a relevant consideration.

This site would constitute 'previously developed land' as identified in the Core Strategy. Furthermore it is in an area of the City where higher densities are appropriate, as described in policy BCS20 being located close to the City Centre and with good access to public transport. As such, the continued residential use of the site is acceptable and can be further developed for housing to add to the city's housing stock.

Some of the objections have raised the issue of the existing site contributing to the City's green areas as a garden. However the site is a vacant plot and does not fall into the category of a private garden (as referred to in DM21, 'Development of Private Gardens'). The more recent keeper of the site had taken it upon themselves to plant and maintain the site as a garden, but this was fortuitous site maintenance and may not be taken into account as a reason to protect the site as a green space.

Wildlife and tree aspects are discussed further at Key Issue (F) of this report.

**(B) WOULD THE PROPOSAL OFFER A SATISFACTORY RESPONSE IN TERMS OF DESIGN AND CONSERVATION?**

Section 72 of the Planning (Listed Buildings and Conservation Areas) Act 1990 states that in considering whether to grant planning permission, the Local Authority is required to pay special attention to the desirability of preserving or enhancing the character or appearance of the conservation area.

Section 12 of the national guidance within the National Planning Policy Framework (NPPF) 2012 states that when considering the impact of a proposed development on the significance of a designated heritage asset, great weight should be given to the asset's conservation, with any harm or loss requiring clear and convincing justification. Paragraph 134 states that where a development proposal will lead to less than substantial harm to the significance of a designated heritage asset, this harm should be weighed against the public benefits of the proposal, including securing its optimum viable use.

In addition, the adopted Bristol Core Strategy 2011 within Policy BCS22 and the adopted Site Allocations and Development Management Policies (SADMP) within Policy DM31 seeks to ensure that development proposals safeguard or enhance heritage assets in the city.

The Council's adopted Clifton and Hotwells Conservation Area Character Appraisal states that "The variety and quality of views in Clifton are a critical component of the area's special interest. Clifton's elevated position on the escarpment that rises high above sea level afford it exceptional views across the City and beyond, while local and glimpsed views lead towards key landmarks or townscape features." The site falls within Character Area 7 (Clifton Wood Slopes) identified within this document, which is described thus; "a little backwater full of cranky corners and wide vistas. Close packed, rubble and stuccoed terraces hug the contours of the steep slopes above the Harbour."

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Characteristics in this area include domestically scaled buildings being typically of 2 to 3 storeys in height, sometimes with basements; terraces which directly address street or set behind low boundary wall or railings; vertical emphasis; diminishing window heights and concealed roofs. Exemplary materials are pennant sandstone; Stucco (painted) render; low rubble boundary walls; timber framed sash windows and doors and natural slate roof coverings.

Officers have considered whether a three storey with basement level building would be appropriate within this context, in view of the typically lower 2 and 3 buildings nearby. It is considered however, that in view of the elevated position of this site, and the slightly taller buildings in the immediate context of the site, on the hill, this height can be supported here. The proposal is shown as being no higher than its neighbour at no.1 Southernhay, and detail design and materials show a successful modern intervention. This view has also been reached due to the apparent careful design and positioning of the proposed building, which responds well to its site and its slope.

The modern design is acceptable, and there are several local examples of such modern buildings in the wider vicinity. The proposed materials would be sympathetic to those elsewhere in the conservation area, and as such, this justifies the modern design. The proposal is considered to preserve the appearance of the conservation area, and in terms of the tests in the NPPF, would not result in harm thereto. The View Impact Analysis submitted with the application shows that the building would sit comfortably within the context. Conditions shall be imposed requiring samples made available on site for inspection and for details of front boundary treatment (to include planting) to be submitted.

**(C) WOULD THE PROPOSAL PROTECT THE AMENITY OF EXISTING AND FUTURE RESIDENTS?**

Good design and protection and enhancement of the environment are critical components of central government guidance, as identified in the NPPF. Adopted Bristol Core Strategy Policy BCS18 makes specific reference to residential developments providing sufficient space for everyday activities and to enable flexibility and adaptability by meeting the appropriate space standards. In addition, Policy BCS21 expects development to safeguard the amenity of existing developments and create a high-quality environment for future occupiers. Furthermore, Core Strategy Policy BCS15 requires development to address issues of flexibility and adaptability, allowing future modification of use or layout, facilitating future refurbishment and retrofitting.

**Daylight and Sunlight**

Due to the difference in levels on and around the site, properties to the east of the site are at a lower level and somewhat overshadowed by the current retaining wall on site. The proposed building would to some extent intensify this relationship, and following the first round of consultation, a number of objections raised the issue of loss of daylight and sunlight to neighbouring windows and gardens. In the light of the comments and in order to present a more detailed analysis of the relationship, the applicant supplied a more in depth Daylight and Sunlight BRE (Building Research Establishment) Assessment to supplement the originally submitted Shading Report. The Daylight and Sunlight Assessment is a desk-based survey, and has been informed using a measured survey, architects drawings photographs, Ordnance Survey information, topographical survey data and a 3D model of the proposed development.

The BRE assessment consists of a set of tests which can be applied according to the type of development. In this case, the Vertical Sky Component (VSC); Average Daylight Factor (ADF) and the Annual Probable Sunlight Hours (APSH) tests have been used.

**Vertical Sky Component (VSC)**

The VSC is a measure of light falling on a window, and the target for a good level of light is 27% -

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meaning a ratio of direct sky luminance falling on the surface of the window. 40% is the maximum possible VSC score, and would mean that if one had a view from a window which was totally unobstructed by buildings, 40% of the total hemisphere would be visible. If a development would reduce the VSC from a given window to less than 27%, AND to less than 0.8 times its former value, then according to the BRE guidelines it is likely that the loss of light would be harmful. It should, nevertheless, be noted that the 27% VSC target value is derived from a low density suburban housing model. The independent daylight and sunlight review states that in an inner city urban environment, VSC values in excess of 20% should be considered as reasonably good, and that VSC in the mid-teens should be acceptable. However, where the VSC value falls below 10% (so as to be in single figures), the availability of direct light from the sky will be poor.

**VSC results**

The results in the submitted analysis document show that 3 of the 19 windows tested would experience a reduction of less than 0.8 times their former value. These are the ground floor east facing windows at no. 2 Southernhay, and the ground floor side (west facing) kitchen window at no. 5 Southernhay Avenue. Of these, the side window at no.5 is the only one to ALSO fall below 20% - the others all maintain a VSC of 20% or above. This therefore complies with the BRE guidelines: whilst there would be some loss of light from these windows, it would not be harmful.

**No Skyline Contour (NSC)**

This test is also known as the "Daylight Distribution" method as it looks at how daylight is distributed within a room. If a development reduces the amount of daylight to less than 0.8 times its former value, the loss of light is likely to be noticeable. There is no absolute minimum identified by the BRE guidelines however. None of the windows assessed yielded a score of less than 0.8 times its former value.

**Sunlight to Gardens and Outdoor Spaces**

This test looks at the proportion of an amenity area that receives at least 2 hours of sun on 21st March in the existing condition, and compares this with the proportion of the area that receives at least 2 hours of sun on 21st March with the proposal in place. The document tested the gardens of no.5 and no.6. No. 5 was found not to see two or more hours of sun across any of its garden area on March 21st. No. 6 had two or more hours of sun across 3% of its garden. The concluding assessment is that these north-facing gardens are currently very poorly sunlit on March 21st and that the proposed building would not unacceptably reduce this.

**Conclusion on Daylight and Sunlight**

It must be borne in mind that the BRE tests are guidelines only, and not planning policy. They are intended to be applied flexibly, and the background sets out that in some areas (for example city centres and high density areas,) developments may not always fully comply with the guidelines or achieve optimum levels of daylight or sunlight.

The site is within a relatively dense central residential location and residents currently enjoy a relatively open aspect due to the vacant and underdeveloped site. The development itself does not breach established building heights in the area, as it matches the height of no 1. Southernhay. Whilst three of the windows tested would experience some loss of daylight or sunlight, it is not considered that these impacts would be significantly harmful. Similarly, it is not considered that the proposal would result in a significantly harmful loss of light from neighbouring gardens.

**Overlooking**

Potential overlooking could occur from the corner windows proposed on the west elevation, facing no. 2 Southernhay, however the applicant has agreed that these windows would be fitted with obscure

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glass to prevent harmful views between the properties. The two windows in the east elevation are high-level. One relates to a stairwell and the other is a second window of a bedroom. Due to them being high level, no harmful views would be afforded over the rear of properties on Southernhay Avenue. The external deck leading from basement to ground floor level is not envisaged to result in an amenity issue as its intended use is to gain access between lower and upper ground levels. Residents of the property would be able to use their external courtyard at basement level for sitting out purposes, and this is commensurate in size and location with other neighbouring gardens in the area.

#### Quality of Accommodation

The proposed house would comply with the National Space standards for a three bedroom property.

#### (D) WOULD THERE BE ANY HARMFUL HIGHWAYS OR TRANSPORT ISSUES?

DM23 expects development to provide a safe secure, accessible and usable level of parking provision having regard to parking standards, as well as secure and well-located cycle parking and facilities for cyclists. In reference to a three or more bedroom house or flat, the residential parking standards (appendix 2 of Site Allocations and Development Management Policies) require an average of 1.5 spaces per dwelling, however the same standards also state that in respect of individual or small-scale developments these standards will be applied flexibly to allow for the best layout of the site.

#### Car Parking

One car parking space is identified on the proposed plans and this is sufficient for a family-sized house in this location. It is also acceptable in terms of access and egress. Some of the objections have alleged that this space is proposed to be used by another party, however the application is assessed at face-value as submitted and the application proposes one car parking space within the site. A condition is proposed on the recommendation to ensure the car parking space is maintained and made available for vehicles associated with the development.

#### Cycle Parking and Refuse Storage

The scheme proposes adequate storage space for bicycles and refuse containers beneath the raised garden area, and these would be accessed from a gate on Southernhay Avenue.

#### Construction Management

As acknowledged in the transport officer's comments, the site is constrained and would be difficult for construction traffic to access. The development should not therefore commence until officers have assessed and approved a Construction Management Plan which should demonstrate a satisfactory response on the following points:

- parking of vehicle of site operatives;
- routes for construction traffic;
- hours of operation;
- method of prevention of mud being carried onto highway;
- pedestrian and cyclist protection
- arrangements for turning vehicles

Advice notes are also attached to the recommendation notifying the developer of the requirement to enter into the relevant Highways agreements for the works proposed thereto.

#### (E) SUSTAINABILITY

Sustainability should be integral to all new development in Bristol. BCS13 encourages developments

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to respond pro-actively to climate change, by incorporating measures to mitigate and adapt to it. BCS14 expects development to provide sufficient renewable energy generation to reduce carbon dioxide emissions from residual energy use in the buildings by at least 20%. BCS15 requires developments to demonstrate through a Sustainability Statement how they have addressed energy efficiency; waste and recycling; conserving water; materials; facilitating future refurbishment and enhancement of biodiversity.

The design of the building is aimed at achieving a Passivhaus standard, which is a rigorous, voluntary standard for energy efficiency in a building, reducing its ecological footprint, and is awarded post-construction. The building would have a super-insulated thermal frame; an airtight envelope with Heat Recovery System, which minimises ventilation heat loss. It would have triple glazed windows and doors, renewable energy through PV panels and would use recyclable materials such as timber, fibre insulation and would reuse stonework from remaining walls.

An Energy Strategy has also been submitted showing that the PV array would achieve a policy compliant 20% saving on residual carbon emissions.

This response is welcomed, and the Passivhaus certification is encouraged. A condition is proposed to require the development to be undertaken in accordance with the submitted Energy Statement in terms of the PV panels. It would go outside the remit of this application to attempt to impose a condition on the Passivhaus certification however, as this is not a policy requirement and therefore not necessary to make the development acceptable.

**(F) WILDLIFE AND TREES**

Policy BCS9 states that individual green assets should be retained wherever possible, and that development should incorporate new or enhanced green infrastructure of an appropriate type, standard and size.

Policy DM19 seeks to protect habitat, features and species which contribute to nature conservation, and developments are expected to be informed by appropriate surveys.

The site contains features which have the potential to support legally protected slow-worms. The vegetation on site also has the potential to be used by nesting birds (typically between March and September inclusive).

It is quite possible that Leisler's bats forage over this site, but as it is relatively small the development of the site is not considered to have a significant impact on this species.

In view of the above, a condition is recommended to require a pre-commencement of vegetation clearance and development method statement for a precautionary method of working (PMW) with respect to the potential presence of nesting birds and legally protected slow-worms (reptiles) and other legally protected and priority species. The PMW shall be produced by a qualified ecological consultant. The reason for this is to ensure the protection of legally protected and priority species (both protected and priority species are a material planning consideration).

The application proposes to include a pond and wildlife garden, to provide a habitat for insects birds and invertebrates and would include planting of fruit trees. The roof of the bike shed would be covered in long grasses and wildflowers, and there would be a vertical kitchen garden with climbing plants.

In order to formalise the above proposals, a condition requiring a landscaping plan to be submitted prior to occupation is included in the recommendation. This would also ensure that the habitat lost during construction has the best opportunity to replenish.

Permission from the owner as well as a separate application for conservation area consent would be required to remove or carry out works to the tree in the garden of no.5 Southernhay Avenue.

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Land and structural stability are not normally considered in planning applications of this size. However the NPPF does require planning applications to be assessed so as to ensure that permitted operations do not have unacceptable adverse impacts arising from subsidence albeit this is in a mining and quarrying context. In view of the nature of some of the objections however, it is considered a response was necessary in this regard and the applicant has duly provided a letter from a Structural Engineer which covers the issues raised.

The submitted Structural Engineers' letter outlines that the proposed building could be constructed using a combination of existing foundations, a basement raft and concrete floor at ground level, and provides assurance that the construction works would be undertaken so as not to undermine surrounding properties. A detailed methodology would form part of a Building Regulations submission, however for the purpose of this planning application, the submission provides adequate assurance at this stage that the building works could be safely undertaken and would not result in damage to neighbouring properties.

A Party Wall Agreement would need to be entered into and this also falls outside of the planning remit. This would need to be entered into in the event that construction would impact on neighbouring walls and basements, and is a civil matter between the parties involved.

**CONCLUSION**

The proposed development would provide a family house on a vacant brownfield plot which is close to the City Centre. It would also provide off-street parking and would be of a highly sustainable design which would cause no harm to the character or appearance of the conservation area. The less desirable consequence of the development would be the effect it would have on neighbouring windows and gardens, which are predominantly north facing, and would experience a certain loss of light. Whilst this loss would be noticeable, it is recommended that this would not result in such harm to amenity as to warrant a refusal of this scheme. It is therefore recommended that subject to the attached conditions, planning permission should be granted.

**COMMUNITY INFRASTRUCTURE LEVY**

The CIL liability for this development is £13,100.63

**RECOMMENDED      GRANTED subject to condition(s)****Time limit for commencement of development**

1. Full Planning Permission

The development hereby permitted shall begin before the expiration of three years from the date of this permission.

Reason: As required by Section 91 of the Town and Country Planning Act 1990, as amended by Section 51 of the Planning and Compulsory Purchase Act 2004.

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## 2. Construction management plan

No development shall take place including any works of demolition until a construction management plan or construction method statement has been submitted to and been approved in writing by the Local Planning Authority. The approved plan/statement shall be adhered to throughout the construction period. The statement shall provide for:

Parking of vehicle of site operatives and visitors  
 routes for construction traffic  
 hours of operation  
 method of prevention of mud being carried onto highway  
 pedestrian and cyclist protection  
 arrangements for turning vehicles

Reason: In the interests of safe operation of the highway in the lead into development both during the demolition and construction phase of the development.

## 3. Prior to commencement of development or clearance of vegetation or structures, a method statement for a Precautionary Method of Working (PMW) with respect to vegetation and site clearance and the potential presence of nesting birds and legally protected slow-worms (reptiles) and any other legally protected and priority species shall be prepared by a suitably qualified ecological consultant and submitted to and approved in writing by the Local Planning Authority.

Reason: To ensure the protection of legally protected and priority species.

## 4. Submission of samples before relevant element starts

No development shall take place until the developer has applied to the LPA giving notice when timber and render samples are available for viewing on site, and the samples shall subsequently be approved in writing by the Local Planning Authority. The development shall be carried out in accordance with the approved samples.

Reason: To ensure that the external appearance of the building is satisfactory.

**Pre occupation condition(s)**

## 5. Implementation/Installation of Refuse Storage and Recycling Facilities - Shown on approved plans

No building or use hereby permitted shall be occupied or the use commenced until the refuse store, and area/facilities allocated for storing of recyclable materials, as shown on the approved plans have been completed in accordance with the approved plans. Thereafter, all refuse and recyclable materials associated with the development shall either be stored within this dedicated store/area, as shown on the approved plans, or internally within the building(s) that form part of the application site. No refuse or recycling material shall be stored or placed for collection on the public highway or pavement, except on the day of collection.

Reason: To safeguard the amenity of the occupiers of adjoining premises, protect the general environment, and prevent obstruction to pedestrian movement, and to ensure that there are adequate facilities for the storage and recycling of recoverable materials.

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6. Completion and Maintenance of Car/Vehicle Parking - Shown on approved plans

No building or use hereby permitted shall be occupied or the use commenced until the car/vehicle parking area shown on the approved plans has been completed, and thereafter, the area shall be kept free of obstruction and available for the parking of vehicles associated with the development

Reason: To ensure that there are adequate parking facilities to serve the development.

7. Completion and Maintenance of Cycle Provision - Shown on approved plans

No building or use hereby permitted shall be occupied or the use commenced until the cycle parking provision shown on the approved plans has been completed, and thereafter, be kept free of obstruction and available for the parking of cycles only.

Reason: To ensure the provision and availability of adequate cycle parking.

**Post occupation management**

8. The Energy Strategy (prepared by Piers Sadler Consulting) shall be adhered to and the measures outlined therein installed within the development and maintained throughout its lifetime, unless prior written consent is first obtained from the LPA.

Reason: In order to secure a sustainable development in accordance with the Council's policies.

9. Non opening and obscured glazed window

Notwithstanding the provisions of the Town and Country Planning (General Permitted Development) (England) Order 2015 (or any Order revoking and/or re-enacting that Order) the proposed west facing windows; shall be glazed with obscure glass and shall be permanently maintained thereafter as obscure glazed.

Reason: To safeguard the amenities of the adjoining premises from overlooking and loss of privacy.

10. No further extensions

Notwithstanding the provisions of the Town and Country Planning (General Permitted Development) (England) Order 2015 (or any Order revoking and/or re-enacting that Order) no extension or enlargement (including additions to roofs) shall be made to the dwellinghouse(s) hereby permitted, or any detached building erected, without the express permission in writing of the council.

Reason: The further extension of this dwelling or erection of detached building requires detailed consideration to safeguard the amenities of the surrounding area.



**Development Control Committee B – 28 September 2016****Application No. 16/02137/F : Land Adjacent To 2 Southernhay Avenue Bristol****List of approved plans**

## 11. List of approved plans and drawings

The development shall conform in all aspects with the plans and details shown in the application as listed below, unless variations are agreed by the Local Planning Authority in order to discharge other conditions attached to this decision.

SH23 , received 28 July 2016

PL01 Existing Plot, received 4 May 2016

PL02 View from South of the river, received 4 May 2016

PL03 Proposed Building from North, received 4 May 2016

PL04 Proposed Site Roof and 3dView Plan, received 4 May 2016

PL05 West Elevations, received 4 May 2016

PL06 South Elevation, received 4 May 2016

PL07 East Elevation, received 4 May 2016

PL08 North Elevation, received 4 May 2016

PL09 Sections, received 4 May 2016

PL10 Floor Plans, received 4 May 2016

PL11 East Facing Windows- Sightlines, received 4 May 2016

Reason: For the avoidance of doubt.

**Advices**

- 1 Note that in deciding to grant permission, the Committee/Planning Service Director also decided to recommend to the Council's Executive in its capacity as Traffic Authority in the administration of the existing Controlled Parking Zone of which the development forms part, that the development should be treated as car free / low-car and the occupiers ineligible for resident parking permits.
- 2 The development hereby approved is likely to impact on the highway network during its construction. The applicant is required to contact Highway Network Management to discuss any temporary traffic management measures required, such as footway, Public Right of Way or carriageway closures, or temporary parking restrictions. Please call 0117 9036852 or email [traffic@bristol.gov.uk](mailto:traffic@bristol.gov.uk) a minimum of eight weeks prior to any activity on site to enable Temporary Traffic Regulation Orders to be prepared and a programme of Temporary Traffic Management measures to be agreed.

**BACKGROUND PAPERS**

City Design Group

17 May 2016

commdelgranted  
V1.0211

**WARD:** Lockleaze **CONTACT OFFICER:** Angelo Calabrese

**SITE ADDRESS:** Unit 4 Eastgate Centre Eastgate Road Bristol BS5 6XX

**APPLICATION NO:** 16/01193/X Variation/Deletion of a Condition

**EXPIRY DATE:** 3 June 2016

*Application for removal of condition No 6 following grant of planning permission 15/00907/X (Insertion of additional mezzanine floorspace into combined Units C/D and alterations to the front and rear of Units C/D - to now allow the sale of food from Unit J)*

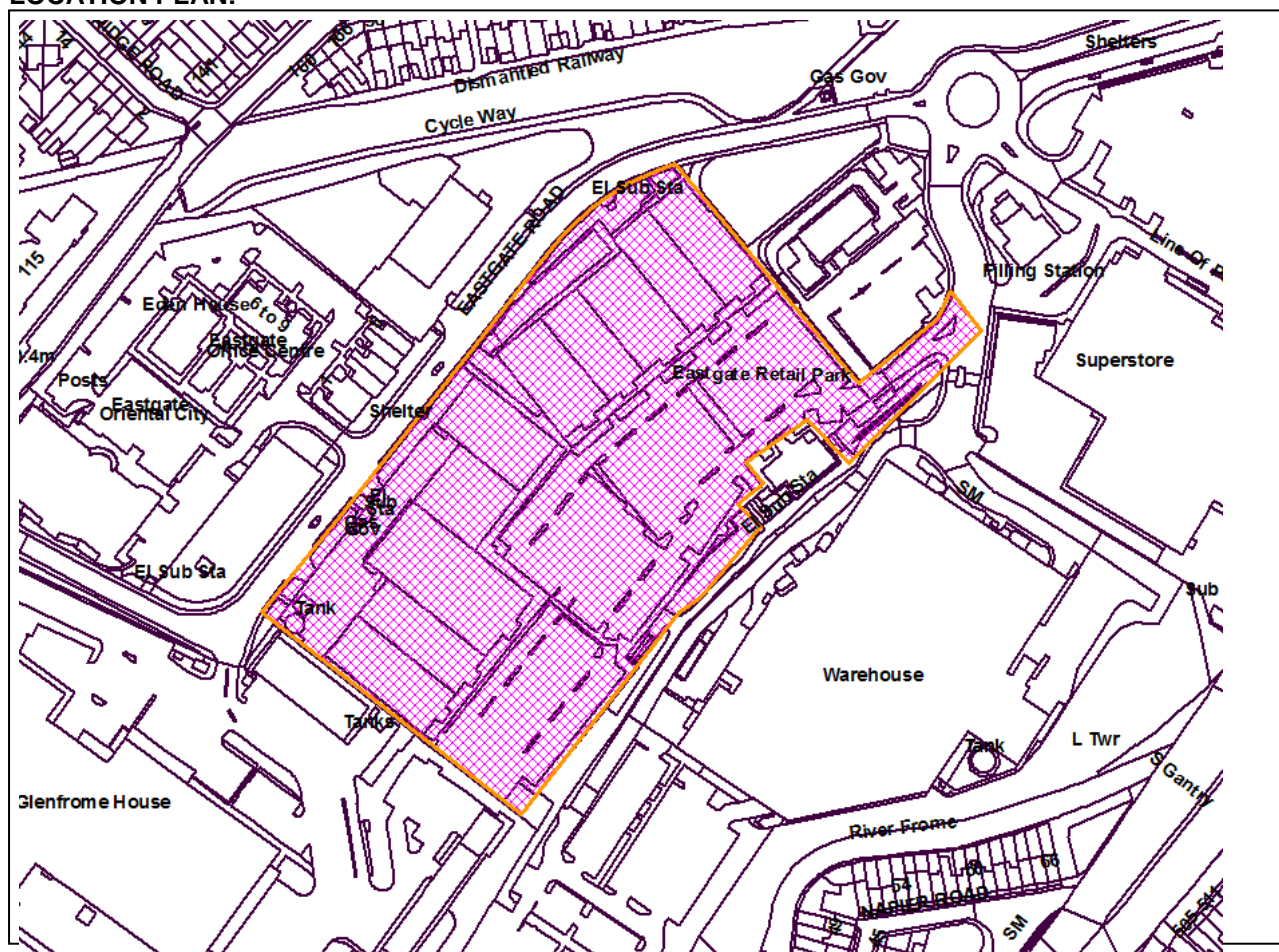
**RECOMMENDATION:** Refuse

**AGENT:** Savills (UK) Limited  
Belvedere  
12 Booth Street  
Manchester  
M2 4AW

**APPLICANT:** CPG South East Limited  
C/O Agent

*The following plan is for illustrative purposes only, and cannot be guaranteed to be up to date.*

**LOCATION PLAN:**



**Development Control Committee B – 28 September 2016****Application No. 16/01193/X : Unit 4 Eastgate Centre Eastgate Road Bristol BS5 6XX****COUNCILLOR REFERRAL**

The application has been referred to the next available Development Control Committee by local ward councillor Gillian Kirk who has been approached by the applicant.

The councillor considers Eastgate retail park as an important retail amenity for the local residents in Lockleaze and we need it to adapt and be viable for the future, able to attract good companies and provide good local employment. It should not be regarded as an 'out of town' shopping centre as it is in a residential area and improving the offer here would not impact detrimentally on Cabot circus or other designated shopping areas. Cllr Kirk considers that the issues need to be raised and discussed at committee.

**SITE DESCRIPTION, BACKGROUND AND RELEVANT HISTORY**

The site concerned is the Eastgate retail park. The park has 10 retail units fronting a parking area.

There is a detailed planning history for this site dating back to 1987 when the Eastgate Centre was granted full planning permission in March 1987 under planning permission reference 00207F/87N for non-food retail warehousing and associated car parking. Condition 7 reads as follows:

"No retail warehouse hereby permitted shall be used for the retail sale predominantly of clothing, fashion accessories, sporting goods, books or stationery or any of them and for the avoidance of doubt it is confirmed that the occupation of Unit 2 by Children's World Limited, a subsidiary of the Boots Company Plc or their successors trading in a similar manner is deemed to comply with the provisions of this Condition".

The Council's case for justifying a restriction on the range and type of goods sold from the application site and across the Eastgate retail warehouse park is driven by a need to seek to protect the vitality and viability of the hierarchy of protected retail centres across the city. Whilst not in force at the time of the 1987 decision, the objective as set out above is established by the former policy framework PPS 6 and specifically by former Bristol Local Plan 1997 policies S1 and S2.

Further applications to increase the overall quantum and to vary the nature of the use of the floor space were considered in 1999 and 2000 either by the Council and/or at appeal and were duly dismissed. It is relevant to note that during the consideration of one of the appeals that were heard in 2000 with regards to condition 7 of the 1987 permission as set out above, an Inspector concluded that the use of the word predominant within the condition establishes a bench mark for enforcement purposes.

In September 2002 planning permission (ref:02/01127/F/C) was granted for the extension of units D and H to form 3 new retail units referred to as H, J and K and an extension to existing unit D to form a new unit E. The permission effectively allowed an increase in the amount of retail floor space by just 18 sqm (as reported) metres and 124 car parking spaces. To reflect a change in the retail trade since 1987 and to continue to ensure there was no impact on existing retail centres, the following condition (condition 3) was attached to the consent:

'None of the floor space hereby permitted shall be used for the retail sale predominantly of clothing, fashion accessories, sporting goods, books or stationery, or any of them'.

The key change arising from the wording of the condition compared to the 1987 condition is that the restriction applies to the approved floor space and not to each individual unit.

**Development Control Committee B – 28 September 2016****Application No. 16/01193/X : Unit 4 Eastgate Centre Eastgate Road Bristol BS5 6XX**

Subsequent to the 2002 approval application 03/04902/X/C was submitted and sought to vary condition 3 as set out above to allow the sale of clothing, fashion accessories and footwear in as far as it relates to unit H. The application was refused on the grounds that no robust assessment had been undertaken including an assessment of need and available sites and that the proposed liberalisation of retail trade from the site would be detrimental to the vitality and viability of surrounding centres. Whilst the application was refused Unit H is now occupied by Next selling a full product range. Because the unit still sells predominantly non restricted goods in terms of the amount of floor space allocated to each product range the LPA have not pursued enforcement action. When interpreting condition 3 the LPA has agreed that providing one of the restricted ranges of goods did not take up a greater proportion of retail space than the non-restricted goods, then that change of goods could not be argued to be predominant. This approach would allow up to 49% of the floor space within the 4 units covered by the 2002 permission to be used to retail restricted goods.

Planning permission 05/04078/X then varied the terms of trade to provide greater clarity for any future occupier of unit K. (Unit K was then the only unit of the four covered by the 2002 permission which had never been occupied). Planning permission 05/04078/X established an overall limit of floor space (5331 sqm) across all the floor space in the 4 units covered by the 2002 application. Thresholds for each unit are based on the proposition that all of the floor space in unit K is used to retail goods from the restricted range. Further variations to the pattern of trade were then approved 06/01237/X (Units A, B, C, D F and G) and 06/04148/X (units E to K) to seek to clarify the terms of trade across the park as a whole. No increase in floor space was involved in either of these later proposals.

Planning permission for an insertion of additional mezzanine floorspace into combined units J/K and alterations to the pattern of trade across the park was approved on 9th August 2007 (07/02550/F). The approval included a condition which applied a single figure of 5,331sq to the permitted floor area for the sale of restricted goods across the park.

Application 08/01342/F granted permission for the insertion of additional mezzanine floorspace into combined Units C/D and alterations to the front and rear of Units C/D. Permission was granted subject to a condition restricting the area of floorspace which can sale restrictive goods. This condition is the subject of the planning application.

In the last 4 years the applicants have sought to remove the restrictive goods condition on two seperate occasions (12/00254/X and 12/05316/X) with both applications being refused on the grounds that the application failed to satisfy the sequential test and that the development would have a negative impact on designated centres. The applicant appealed these two decisions and both were dismissed by the Planning Inspectorate. The inspector concluded that there are currently suitable, viable and available premises within the City centre to accommodate retail development. Allowing the appeals could prolong their vacancy longer than would otherwise be necessary and to this extent there would be an adverse impact on the city centre's vitality and viability in the short term. The appeal decision is attached to this report.

In 2013 an application (13/03623/CE) was submitted by the applicant arguing that the sale of all retail goods was lawful as the condition as worded does not explicitly refer to the use class order or remove its operation. The application was refused and an appeal was lodged by the applicant but was subsequently withdrawn.

In 2015 permission was granted to sell food for unit J(15/00907/X).

A further planning application (15/04749/X) was submitted in 2015 to again remove the condition. This was refused permission under delegated powers for the same reasons as the previous appeals, that the proposal still fails the sequential test and would have an impact on retail

**Development Control Committee B – 28 September 2016****Application No. 16/01193/X : Unit 4 Eastgate Centre Eastgate Road Bristol BS5 6XX**

investment and undermine the growth of the city centre.

Since 2012 there have been a total of 5 applications (including this one) seeking to remove the condition.

**APPLICATION**

This application is the latest in a line of identical proposals by CPG South East Ltd at Eastgate Retail Park, which have included two appeal dismissals (in 2013) and refusal of permission in 2015.

The wording of the condition 6 is as follows:

Unless otherwise agreed in writing by the Local Planning Authority the amount of floor space to be used for the retail sale of clothing, fashion accessories, sporting goods, books or stationery or any of them, shall not exceed 1,858 sqm in Units C/D and 3,473 sqm in the total combined floorspace of Units A, B, E, F, G, H, J and K.

Reason: To minimise any adverse impact upon designated centres.

The applicants have submitted a detailed retail assessment which addresses the tests required by the NPPF and the Bristol Local Plan (sequential test and impact). The applicants consider that the circumstances have changed since the last decision taken in 2015 by officers and the appeal decision and consider the application is acceptable for the following reasons:

- o There is a change in circumstances following an appeal decision by the Secretary of State (Rushden Lakes 2014) and the Government has rescinded the practice guidance on need, impact and sequential approach that previously required applications to consider the scope for disaggregation. Therefore the sequential test for this application should consider sequentially preferable sites for the entire retail park, and there is no suitable sites available in the city centre.
- o Regarding sequential preferable sites- The two allocated sites in the Bristol Central Area Plan (KS02 and KS03) identified in the Bristol Central Area Action Plan (AAP) that was referred to as the emerging development plan in the previous appeal decision are unlikely to be available within the medium to long term, therefore they cannot be considered to be an available site.
- o The proposal would not have a significant adverse impact on Bristol City Centre as concluded by the previous appeal inspector.
- o The condition is unenforceable. In order to enforce the condition, the use of the retail floorspace as a whole has to be constantly monitored.

Following discussions between officers and the applicant, the applicant has presented a revised condition which would reduce the amount of floorspace that can be utilised for the sale of bulky goods to the two units currently occupied by Halfords and Pets at Home. This request will be discussed in the key issue section of the report.

In order for the Local Planning Authority to robustly review this submission and consistency of decision making, officers have sought the view of planning consultants GVA Grimley who have provided expert retail advice and represented the council on both previous appeals. Their comments are set out in the key issue section of the report and included as a background paper.

Also included as a background paper are letters from the application submitted with the application and in response to the assessment by the Councils retail expert GVA Grimley.

**Development Control Committee B – 28 September 2016****Application No. 16/01193/X : Unit 4 Eastgate Centre Eastgate Road Bristol BS5 6XX****RESPONSE TO PUBLICITY AND CONSULTATION**

A site notice was issued, no representations received.

Ward Members-

As well as the councillor referral, Local Ward Councillor Estella Tincknell has comment that councillors are keen to sustain Eastgate as a retail centre given the lack of such provision in the area, and recognise that small scale retail parks of this kind may be under particular pressures. She comments that her understating is that this proposal was intended to make the offer to potential retailers more attractive.

**RELEVANT POLICIES****National Planning Policy Framework – March 2012****Bristol Core Strategy (Adopted June 2011)**

BCS7 Centres and Retailing

**Bristol Site Allocations and Development Management Policies (Adopted July 2014)**

DM7 Town centre uses

**Bristol Central Area Plan (Adopted March 2015)**

BCAP36 Bristol shopping quarter

**KEY ISSUES.**

**WOULD THE REMOVAL OF THE CONDITION COMPROMISE THE DELIVERY OF SEQUENTIALLY PREFERABLE SITES FOR DEVELOPMENT AND WOULD THE PROPOSAL UNDERMINE THE VITALITY OF DESIGNATED CENTRES?**

The adopted local plan policies reiterate the retail policy tests set out by Central Government within the National Planning Policy Framework (NPPF).

Policy DM7 requires applications for town centre uses to address the sequential test which aims to direct retail development to designated centres first. Where there are no suitable sites to meet the needs for such uses in centres, edge of centre locations may be appropriate provided that the proposal would support the role of the centre and would be of a scale and intensity proportionate to the centre's position in the identified hierarchy. Out of centre sites will only be acceptable when no centre or edge of centre sites are available, the proposal is of a small scale, and is aimed at providing for local needs.

DM7 also requires an impact assessment on retail developments of more than 500 sqm. The key tests is whether the development would be liable to have a significant adverse impact on the vitality, viability and diversity of existing centres; or it would impact on existing, committed and planned investment.

In terms of how Eastgate Retail Park fits into this policy context, Eastgate it is one of 4 retail parks found in the city which are not identified within the hierarchy of retail centres set out under policy BCS7 of the Core Strategy. Therefore it is considered to be in an 'out of centre' location and there is no specific policy which protects and promotes retail in the retail park.

**Development Control Committee B – 28 September 2016****Application No. 16/01193/X : Unit 4 Eastgate Centre Eastgate Road Bristol BS5 6XX****Sequential test**

The applicant places particular emphasis on condition No.6 relating to all of the units at the retail park, allowing for the sale of any non-food goods and, if granted, the permission applying the day it is granted and not at some point in time in the future. The effect of this definition is to suggest that the proposal, in the context of the sequential test, can only be considered as relating to the whole of the proposal floorspace in one single block. In addition, their covering letter also suggests that to consider the proposal in any other way would be to suggest disaggregation which is not part of the National Planning Practice Guidance. A copy of their covering letter is included in the background papers.

This is a repeat of the applicant's arguments used at the appeals in 2013 and also within the 2015 application. GVA Grimley have advised that the correct approach with applying the sequential test on this proposal as has previously been outlined by the Planning Inspector at appeal, is to recognise that the proposal will allow different retail units to become available to retailers selling the wider range of goods sought over a period of time when leases expire at the retail park. In other words in reality, retail units would become available one by one and not all at once.

In relation to the sequentially preferable alternative sites within Bristol city centre, the applicant considers that the Council did not clearly set out which sites were available when the previous 2015 application was refused. Nevertheless, the applicant has examined vacant units in the city centre and also the two allocations in the Central Area Plan. (CAP) Again, it should be noted that the applicants assessment proceeds on the basis that the alternative sites must be able to accommodate the whole of the retail park. Apart from the assumption that they must be able to accommodate the whole of the retail park, the applicant has suggested that they can (A) only be delivered in the medium to longer term and (B) they are not available now so cannot be considered to be genuinely 'available' and (C) there must be planning permission(s) in place in order to classify them as being 'available'.

The suggestion that these sites, particularly the Horsefair/Callowhill Court allocation (KS02- Central Area Plan), are medium to long term opportunities only appears to be based on the conclusions of the Inspector in 2013. Since that time, the CAP has been adopted (March 2015) and it is clear that matters regarding the redevelopment of the Horsefair/Callowhill Court area are advancing with pre-application meetings taking place between the Council and landowners. This supersedes part of the information that was available to the Inspector at the second appeal in 2013/14 and reinforces the Horsefair/Callowhill Court area as a suitable and available sequentially preferable site for comparison goods retailers who could be attracted to Eastgate Retail Park should this application succeed.

Therefore the approach supported by the applicant is contrary to the view taken by the planning inspector at appeal and it is considered that there are available sites in the city centre now and in the future that can accommodate the proposal.

**Impact assessment**

Whilst the applicant's covering letter is correct to note that the Inspector at the second appeal in 2013 did not conclude that the previous (identical) proposal would have a significant adverse impact upon the vitality and viability of Bristol city centre, he nevertheless indicated that there would be "adverse effects". GVA Grimley have advised that whilst such a conclusion does not suggest that the provisions of paragraph 27 of the NPPF<sup>1</sup> apply, this is still a negative impact of the proposal to be weighed in the overall planning balance when the Council reaches its final view on this application.

<sup>1</sup> Section 27 of the NPPF 27- Where an application fails to satisfy the sequential test or is likely to have significant adverse impact on one or more of the above factors, it should be refused.

**Development Control Committee B – 28 September 2016****Application No. 16/01193/X : Unit 4 Eastgate Centre Eastgate Road Bristol BS5 6XX**

Our expert retail advice considers that as the Horsefair/Callowhill Court proposals (allocated site KS02 in the Central Area Plan) are now progressing, and given that the effect of the proposed variation of condition would allow high street style retailers to occupy Eastgate Retail Park rather than the city centre site, officers consider that there is now more of a concern over the scale of impact on future city centre investment. It should be noted that the current proposal to extend The Mall at Cribbs Causeway has the potential to have a further cumulative impact on the health of the city centre. The Retail expert also considers that whilst this remains an undetermined application at this stage, an approval for The Mall extension, when combined with the Eastgate Retail Park proposal, would increase the cumulative impact on the health of, and investment within, Bristol city centre.

**Enforceability of the condition and management problems**

The applicant considers that the condition require the use of the retail floorspace (as a whole) to be constantly monitored and they consider that it is not reasonable for the LPA to monitor the retail park, the tenants to monitor each other and the landlord to arbitrate between tenants.

This was considered by the Inspector at the previous public inquiry. The Inspector concluded that the condition specifically refers to the maximum amounts of floorspace that can be used for the sale of the restricted goods and that it does not create uncertainty for the Appellant. The Inspector also considered that if the condition has proved to be unduly onerous to administer, the restricted floorspace could be divided between the units through a revised condition, but this was never suggested at the previous appeal and has not been suggested under this application. The applicant has suggested revised condition but this does not fully address the entire floorspace covered by the condition and is discussed below.

**Proposed revised condition**

The appellant has suggested that permission could be granted that removes the non-food retail use restriction for Units A/B, C/D, E, H, J and K and keeps in tact the restriction for Units F and G.

While this would retain units F and G, the level of change proposed would be significant and would not address the issues identified in this report. Currently the condition permits approximately 4000 sqm of floorspace for bulky goods sales, and if only units F and G sold bulky goods that level of sales area for bulky goods would reduce to approximately 1800 sqm of sales area (this is based on the floor areas provided at the previous appeal). This would represent the introduction of approximately 2,000 sqm of unrestricted retail floorspace which would not have been subject to a sequential assessment. This would set a precedent as the required sequential test would not have been applied.

**Conclusion**

Officers consider that the proposal fails to satisfy the sequential test and therefore as stated at paragraph 27 of the National Planning Policy Framework, such applications should be refused. In addition, there remains a likelihood of a clear adverse impact upon the health of, and investment within the city centre which could now be larger due to the progress being made on the Horsefair/Callowhill Court redevelopment area.



**Development Control Committee B – 28 September 2016****Application No. 16/01193/X : Unit 4 Eastgate Centre Eastgate Road Bristol BS5 6XX****RECOMMENDED    REFUSED**

The following reason(s) for refusal are associated with this decision:

**Reason(s)**

1. The submitted retail assessment fails to satisfy the requirements of the sequential test as set out in the National Planning Policy Framework (NPPF) and DM7 of the Bristol Local Plan, as there are sequentially preferable, suitable and available alternatives within Bristol City Centre. These existing sites could accommodate retail development that might otherwise locate within Eastgate retail park. In so doing, this proposal would lead to the loss of existing and potential retail investment, undermining the growth of the city centre contrary to the objectives of the National Planning Policy Framework, Bristol Core Strategy 2011 (Spatial visions and objectives) and the Bristol Central Area Plan 2015.

**Advice(s)**

1. Refused Applications Deposited Plans/Documents

The plans that were formally considered as part of the above application are as follows:-

14-114 SK\_07 Location Plan, received 4 March 2016

commrepref  
V1.0211



**Development Control Committee B  
Wednesday 28 September, 2016**

**Supporting Documents**

- 1. Avonbank, Feeder Road**
- 2. Old Bristol Royal Infirmary Building, Marlborough Street**
- 3. Land adjacent to 2 Southernhay Avenue**
- 4. Unit 4 Eastgate Centre, Eastgate Road**

## **Supporting Documents**

### **1. Avonbank, Feeder Road**

1. Appendix A - Report to Committee (13<sup>th</sup> July 2016)
2. Appendix B – Review of Air Quality Assessment by Air Quality Consultants (July 2016)
3. Appendix C – Air Quality Assessment – Further Information (15<sup>th</sup> September 2016)
4. Appendix D - Air Quality Assessment by PJD Consultants Ltd (June 2016)
5. Appendix E – Applicant's covering letter (24<sup>th</sup> August 2016)
6. Appendix F – Comments from Air Quality Officer (16<sup>th</sup> September 2016)
7. Appendix G – Revised Noise Impact Assessment
8. Appendix H – Comments from Pollution Control (15<sup>th</sup> September 2016)

**Development Control Committee B – 13 July 2016**  
**Application No. 16/00719/F : Avonbank Feeder Road Bristol BS2 0TH**

## SITE DESCRIPTION & BACKGROUND

The application site concerns a parcel of land that is bound by a Network Rail Maintenance Depot to the south, Western Power Distribution Offices and generation units to the east and north and other industrial units to the west. The site which forms part of the St Phillips Marsh industrial area is designated as a Primary Industrial and Warehousing Area under the provisions of the Site Allocations and Development Management Policies. The site comprises of a mix of trees, shrubs and hardstanding is also designated as a wildlife corridor.

## RELEVANT PLANNING HISTORY

15/02310/F - Proposed installation of diesel powered generators and associated infrastructure for the provision of a Flexible Generation Facility to provide energy balancing services via the capacity market for the National Grid. The application was withdrawn following advice from the Local Planning Authority. It was concluded that the proposal was unacceptable due to the significant impacts on air quality, exceeding the national and European objectives. This consequently would introduce a risk of harm to human health for those residents and members of the public within the vicinity of the site, contrary to policies.

## APPLICATION

Planning consent is sought for the installation of 48 bio diesel powered generators, 12 transformers, two double banded storage tanks (for the bio fuel) and associated infrastructure to link into the National Grid. These would be called on by the National Grid at times of high demand, participating in the National Grid's Short Term Operating Reserve (STOR) programme. STOR provides balance to the National Grid during unexpected period of high demand for electricity or where there are constraints on electricity available in England and Wales.

It is anticipated that the generators would operate up to 2 hours when called upon and a maximum of 200 hours per year, with an energy output of up to 20MW. The nature of their use means that their operation will be intermittent, however the generators will not be operated outside the hours of 07:00 and 22:30.

Each generator would comprise of galvanised steel modular acoustic enclosures measuring approximately 4.93m by 1.65m with a height of 2.15m. The proposed design combines exhaust and cooling air emissions from 4 engines into one stack measuring 4m in height (6m in total when measured from the ground) and there would be a total of 12 stacks. The generators would be contained within a 3m high acoustic fence. The two fuel storage tanks would measure 10.5m by 2.5m and 2.2m in height each and a switch room of similar dimensions.

Since the submission of the current proposal, the applicant was asked to provide additional information on the advice of the Local Planning Authority. This included:

- Information to supplement the Air Quality Assessment in terms of methodology,
- Readings taken from additional receptor locations not previously included in the assessment at sites including St Phillips Marsh Nursery School and,
- How the predicted concentrations of pollutants were presented in the assessment.

Clarification was also sought and confirmed over how the fuel is resourced and imported.

**Development Control Committee B – 13 July 2016****Application No. 16/00719/F : Avonbank Feeder Road Bristol BS2 0TH****RESPONSE TO PUBLICITY AND CONSULTATION**

The application was advertised by neighbour notification letters and a site notice. To date a total of 297 objections have been received including from the Head of St Phillips Marsh Nursery, parents of children that attend St Phillips Marsh Nursery, the Wellspring Healthy Living Centre, the Barton Hill Settlement, and RADE (Residents Against Dirty Energy) Bristol, an organisation set up following concerns about recent proposals for standby generators in the city. Comments have come from across the city and given the high number of representations only a summary of these are set out in this report. These are as follows.

- The emissions from the generators would worsen air quality in the area to the detriment of public health, with particular concern for St Phillip's Nursery and residential areas such as Barton Hill and the Paintworks
- This is within the Air Quality Management Area where pollutant limits are already exceeded
- It would result in noise pollution to the detriment of amenity and in particular St Phillip's Nursery which the application has not taken into account
- The proposal is not a sustainable energy solution and undermines the city's Green Capital status
- That the use of bio fuel has a large environmental impact with concerns over how its resourced, placing the environmental credentials of the applicants in doubt.
- It would set a precedent for similar development in future if approved

**OTHER COMMENTS**

**Thangam Debbonaire MP** objects to the planning application on the grounds that the surrounding area already suffers from poor air quality, which would be exacerbated by proposed generators. Areas such as Lawrence Hill and Barton Hill already suffer from health inequalities and reduced lifespan. As the site is near to St Phillip's Marsh Nursery school there is a risk to young children in terms of breathing in harmful particulates. Bristol should be leading in genuinely clean and renewable energy.

**The Bristol Education Centre (Bristol City Council)** has commented as follows

I believe this proposal will have a detrimental effect on the health and well-being of a significant number of very young children who attend the nursery school. The levels of noise and air pollution should be taken into account. The proposed installation is located within the Bristol Air Quality Management Area, which will result in increased levels of harmful emissions within an area of known poor air quality that already exceeds government limits.

**The Energy Service (Bristol City Council)** has commented as follows

Having reviewed the fuel proposed Hydrated Vegetable Oil (HVO) they agree that it should result in reduced emissions of NOx and particulates, when compared to either mineral diesel, or conventional biodiesel. The lower viscosity of HVO than conventional is also likely to give cold-starting benefits, which is particularly relevant to this application, given the intermittency of its operation. In addition, net greenhouse gas emissions are lower than mineral diesel.

**Network Rail** has commented as follows:-

There is no objection in principle subject to requirements ensuring the safe operation of the railway and the protection of Network Rail's adjoining land.

**Pollution Control** has commented as follows:-

As with the previous planning application (15/02310/F), the submitted noise report is acceptable and there is no objection. Approve subject to condition for noise from plant and equipment and that the

**Development Control Committee B – 13 July 2016****Application No. 16/00719/F : Avonbank Feeder Road Bristol BS2 0TH**

details of the acoustic barrier are submitted for consideration prior to development commencing.

**Contaminated Land Environmental Protection** has commented as follows:-

The land to the north of the site was recently remediated by Western Power Distribution under a voluntary arrangement. Therefore we recommend the reporting of unexpected contamination only condition is applied to any future planning consent.

We support the use of the advisory note prepared by the Environment Agency with respect to the Control of Pollution (Oil Storage) Regulations 2001.

**Transport Development Management** has commented as follows:-

In principal there is no objection to the proposals which are not considered to pose any highway safety concerns providing:

- Swept path analysis is provided to demonstrate that the tankers required to deliver the bio-diesel will be able to access the non-adopted road off of Feeder Road and be able to turn within the site. [details now submitted and accepted]
- Information is provided to show how the road within the site will be lit to provide safe access during evening and winter.
- Information setting out where staff servicing/maintaining the site will park is clarified.
- Information setting out how any refuse/recycling produced by the site will be stored/collected.

**Environment Agency (Sustainable Places)** has commented as follows:-

The Environment Agency has no objections in principle, to the proposed development. However planning permission should be subject of informatives that ensure that the ground diesel tanks will have to comply with the control of pollution (oil storage) regulations 2001.

**Nature Conservation Officer** has commented as follows:-

This site is designated as a Wildlife Corridor towards the southern boundary. Accordingly local plan policy DM19 applies and therefore it is recommended that any consent is subject to an ecological mitigation strategy. This should be conditioned as a pre-commencement of development along with vegetation clearance and landscaping planning conditions.

**Arboricultural Team** has commented as follows:-

I have reviewed the arboricultural report and have no objection to the proposal and the proposed financial contribution for tree planting within the local area.

**Air Quality** has commented as follows:-

The appendices of the Air Quality Assessment describe the impact of the changes to air quality caused by the development in accordance with the guidance.

Other factors that have been taken into account, in order to determine the potential 'effect' of the development proposal, include the limited hours of operation of no more than 200 hours per annum,

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and limited number of hours predicted to exceed the average hourly concentration (of 200µg/m<sup>3</sup>) at any relevant receptor locations.

No exceedance of the short term air quality objective will result from the proposed development. At relevant receptor locations in the vicinity of the development site it has been demonstrated that maximum predicted hourly concentrations for NO<sub>2</sub> will meet the short term health based objectives for this pollutant.

In order to ensure that the development proposal is operating in line with the modelled engine emission limits, regular inspection and maintenance of the engines, in line with the manufacturers recommendations, will be required and should be conditioned. Reporting of engine stack emissions, an ambient air quality monitoring programme and restricting the hours of operation to 200 hours per annum should also be conditioned. The applicant should report to the Council on the hours of operation to ensure compliance with this condition.

The required planning conditions will ensure that the development operates within the parameters modelled in the air quality assessment and therefore I do not object to this development on the grounds of air quality effects, based on the predictions contained within the air quality assessment.

**RELEVANT POLICIES****National Planning Policy Framework – March 2012****Bristol Core Strategy (Adopted June 2011)**

BCS8	Delivering a Thriving Economy
BCS9	Green Infrastructure
BCS10	Transport and Access Improvements
BCS13	Climate Change
BCS14	Sustainable Energy
BCS15	Sustainable Design and Construction
BCS21	Quality Urban Design
BCS23	Pollution

**Bristol Site Allocations and Development Management Policies (Adopted July 2014)**

DM13	Development proposals on principal industrial and warehousing areas
DM14	The health impacts of development
DM15	Green infrastructure provision
DM17	Development involving existing green infrastructure
DM23	Transport development management
DM27	Layout and form
DM29	Design of new buildings
DM33	Pollution control, air quality and water quality
DM19	Development and nature conservation
DM25	Greenways
DM34	Contaminated land

**POLICY CONTEXT**

While the principle of the proposed development is assessed in more detail in the key issues below, the purpose of this section is to clarify the policy position in which the proposed development sits. This application has been made as it is recognised that the energy demands in the city are outweighing the supply, and back up generation is needed to meet energy requirements. The Council's Energy Service has confirmed that such proposals do provide security of supply for National Grid, operating either as STOR (Short Term Operating Reserve) or as Flexible Balancing Generation. This is of

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national strategic importance to the National Grid as infrastructure such as this allows the National Grid to operate a smaller supply margin as they can call-upon such generation capacity, in association with other measures, such as large scale energy saving. At this time there is not a renewable energy alternative that could satisfy this demand in an urban area.

Classifying this type of development in terms of the planning use class can be problematic as proposals for a back-up energy supply are not clearly addressed in local or national planning policy. For this assessment, the proposed use is defined as B2 - General Industrial and has been evaluated as such, although there is clearly a need to assess the specific and unique impacts of this particular proposal, which are covered under the key issues.

As stated above, there is no specific policy that covers the control of small scale power generations units. The policies contained within the Bristol Development Framework Core Strategy relating to climate change and renewable energy are intended as promotional policies to encourage the submission of planning applications in which developments incorporate sustainable design and renewable energy sources.

National policies such as the National Planning Policy Framework (NPPF) and the associated National Planning Policy Guidance (NPPG), also encourage the promotion of renewable energy technology, but again does not account for other forms of energy production. Wider national policy relating to energy generation is set out in the National Policy Statement for Energy (EN-1). Whilst this policy document is primarily used by the Planning Inspectorate to assess major infrastructure projects of over 50MW, the information nonetheless provides useful guidance for smaller scale development.

Paragraph 2.2.4 of EN-1 states that the role of the planning system is to provide a framework which allows for the construction of the types of essential infrastructure in areas of need and that are acceptable in planning terms, including the principles of sustainable development. Paragraph 3.4.4 of EN-1 adds that as more intermittent renewable electricity comes onto the UK grid, the ability of biomass and electricity from waste to deliver predictable, controllable electricity is increasingly important in ensuring the security of UK supplies. Paragraph 3.4.1 of EN-1 sets out the UK's commitment to sourcing 15% of its total energy (across the sectors of transport, electricity and heat) from renewable sources by 2020 and new projects need to continue to come forward urgently to ensure that this target is met.

The National Policy Statement for renewable energy Infrastructure (EN-3) must be read alongside EN-1 as it provides specific policies in regard to electricity generation from renewable sources of energy including the use of bio fuels (biomass). Paragraph 2.5.1 of EN-3 states fuels of biological origin for electricity generation is likely to play an increasingly important role in meeting the UK's renewable energy targets.

**ENVIRONMENTAL IMPACT ASSESSMENT (EIA) SCREENING**

The proposed development is classed as Schedule 2 development (3 (a) - Industrial installations for the production of electricity). However, as the application site does not exceed 0.5 hectares it falls below the size threshold set by the Town and Country Planning (Environmental Impact Assessment) Regulations 2011 (As amended). The site does not comprise a "sensitive area" as defined in the Regulations. An Environmental Impact Assessment is therefore not required.



**Development Control Committee B – 13 July 2016****Application No. 16/00719/F : Avonbank Feeder Road Bristol BS2 0TH****KEY ISSUES****(A) ARE THE PROPOSALS ACCEPTABLE IN LAND USE TERMS?**

Notwithstanding the policy context of the development as set out in key issue B, the suitability of the site must be assessed against the potential use. The site is located within a Principle Industry and Warehousing Area (PIWA) and Policy DM13 cites that general industrial uses are acceptable. DM13 also specifically states that essential public utilities are also acceptable in principle within PIWA's.

As such, as the proposal is considered to be appropriate to the site and wider industrial context, subject to detailed assessment as to the specific impacts of environmental amenity, movement and design. The site is also designated as a Wildlife Corridor and the ecological impacts are assessed under Key issue D.

**(B) IS THE INSTALLATION OF A BIO FUEL POWERED FLEXIBLE GENERATION FACILITY ACCEPTABLE IN TERMS OF SUSTAINABILITY AND CLIMATE CHANGE?**

Policy BCS13 of the Core Strategy requires development to contribute to both mitigating and adapting to climate change, and to meeting targets to reduce carbon dioxide emissions. The various measures by which development can do this include the use of decentralised, renewable and low-carbon energy supply systems. New development should demonstrate through Sustainability Statements how it would contribute to mitigating and adapting to climate change and to meeting targets to reduce carbon dioxide emissions through the use of such measures. Policy BCS14 of the Core Strategy further promotes the use, distribution and development of renewable and low-carbon energy, including by encouraging freestanding renewable energy installations.

Policies BCS13 and BCS14 do not seek to restrict any form of development in principle. Their purpose is to ensure that, if the principle of any given development is acceptable in other respects, its impact on climate change and vulnerability to climate change is minimised. Officers therefore consider that, while the policies promote renewable and low-carbon energy, they do not themselves provide an in-principle reason to refuse proposals for conventional energy generating development. Nor does the National Planning Policy Framework which, at paragraphs 97-98, promotes renewable and low carbon energy development, seek to restrict the development of the alternatives. Notwithstanding the above it is recognised that the proposed use of a bio-fuelled standby generator is derived from a renewable energy source.

The proposal would still be subject to the requirement in policy BCS13 (in terms of its operation) to demonstrate, through a Sustainability Statement, what steps have been taken to mitigate and adapt to climate change. However, in practice, there are limits to how a development of this type could reasonably mitigate its impact. Principally this would be likely to involve making efficient use of its waste heat. Officers have considered the potential for the proposed development to capture its waste heat to contribute to a future district heating network. However, due to the intermittent nature of the proposed energy generation on the site, it is considered that the proposed development would not provide a consistent or reliable source of heat and heat capture would be unlikely to be cost-effective.

**The sustainability of the fuel**

The applicant has confirmed that the source of the bio fuel would be a hydrotreated vegetable oil (HVO) which is derived from the removal of oxygen from vegetable oil molecules using hydrogen therefore creating hydrocarbons similar to diesel fuel components. The main component of HVO is rapeseed oil in the European market, however it can also be made from other sources including soybean and carmelina oil. The fuel would be supplied by a Finnish based national oil company (who manufacture the product in Finland, the Netherlands and Singapore) and each shipment of fuel would come with a Proof of Sustainability Certificate (POS). In addition the applicant has provided detailed documentation of the oil company's sustainability strategy and sustainability credentials. The applicant

**Development Control Committee B – 13 July 2016****Application No. 16/00719/F : Avonbank Feeder Road Bristol BS2 0TH**

has stated that the choice of the Finnish based product was because this HVO is the leading biofuel available on the market and is not currently available in the UK. The fuel results in lower emissions and is the most viable product as recommended by engine manufacturers and the terms of their engine warrantee.

There has been a debate regarding the sustainability of resourcing bio-fuel and it has been raised as a concern in the comments received. The social, environmental and economic case for widespread deployment of biomass-fuelled plant depends on the sustainability of fuel used in it. The Renewables Obligation, administered by the Office of Gas and Electricity Markets (Ofgem) is the main support mechanism for renewable electricity in the UK. In order to receive incentives (ROCs) under the Renewables Obligation (RO), and for their output to count towards the UK's renewable energy targets, generation plants fuelled by bio liquids must use fuel which meets sustainability criteria laid down in the Renewable Energy Directive.

The applicant has confirmed that the source of the HVO allows them to receive Renewable Obligation Certificates (ROCs) however they will not be claiming them. It is for these reasons that officers in the Council's Energy Team do not raise any objections to the proposal on sustainability grounds.

Officers recommend that the acceptability of the proposed development should therefore be determined on the basis of its wider environmental impact in the proposed location, in accordance with other policies of the Local Plan and national planning policy.

**(C) DO THE PROPOSALS HARM THE ENVIRONMENTAL AMENITY OF THE AREA?**

Policy BCS23 of the Core Strategy deals with any form of pollution that would result from development, stating that development must "avoid adversely impacting upon environmental amenity" of the area, taking account of surrounding uses. Policy DM14 of the Site Allocations and Development Management Policies cover the health impacts of development and seeks to ensure that development contributes to reducing the causes of ill health, improving health and reducing health inequalities throughout the city. DM33 and DM35 are specifically concerned with Air Quality and Noise Mitigation respectively. Air Quality Management Areas are designated where concentrations of key pollutants exceed national targets. Major development within Air Quality Management Areas will require mitigation.

**Air Quality**

The full comments from the Air Quality Team are attached as a background paper and relate to the technical output that could potentially result from the proposed development.

Concerns were raised by the Council with regards to the predicted maximum hourly concentrations of Nitrogen Dioxide (NO<sub>2</sub>) associated with the proposed engine configuration under the previous withdrawn application (15/02310/F). The current proposal includes a number of alterations aimed at reducing the predicted impacts upon air quality. The revised proposal includes changes to the fuel type, number of stacks, stack height, exhaust emission temperature and velocity.

The impacts from the operation of the proposed generators have been assessed using an air quality dispersion modelling package. Consideration was also given to construction dust impacts, impacts from the vehicles making deliveries to the site and consideration of the potential for odour.

In the air quality assessment, the impacts were predicted assuming the engines would operate continuously during all the hours that it could be called into operation (3607 hours per annum). This ensured that the meteorological conditions that may give rise to an exceedance could be identified and the frequency of these conditions quantified. The probable number of exceedances is then derived based on the maximum of 200 hours that the generators would be in operation in any one year. Assessment of impacts has been made on the basis of the flexible generation facility operating

**Development Control Committee B – 13 July 2016****Application No. 16/00719/F : Avonbank Feeder Road Bristol BS2 0TH**

for no more than 200 hours per year and for a maximum of 2 hours at any one time. The full results of this have been set out in the Executive Summary of the air quality assessment.

The assessment focuses on the impact on short-term NO<sub>2</sub> concentrations as it is this pollutant and its potential impact upon hourly concentrations which are of greatest relevance for a development of this nature. Where the average hourly concentration of 200µg/m<sup>3</sup> of nitrogen dioxide is exceeded more than 18 times per year, in a location where members of the general public can be expected to be present for an hour or more, then this objective is considered to have been breached.

The findings of the Air Quality Assessment showed that the highest number of exceedance predicted to occur is at an industrial site on Albert Road. As advised by the Air Quality Officer the hourly objective for NO<sub>2</sub> is only relevant at outdoor locations where members of the public might reasonably be expected to spend one hour or longer. An industrial site does not meet these criteria.

The focus of this application is on those areas where the largest air quality impacts are predicted where they coincide with relevant exposure locations, in this case, Sparke Evans Park, Paintworks Phase 3 and the Wholesale Fruit Centre.

The findings showed that no exceedances are predicted to be breached at any of the relevant receptor locations when considering the probable impacts from operation of the plant for 200 hours per year. The maximum number of probable hourly exceedances is reported as 1 at Sparke Evans Park and the Wholesale Fruit Centre. At all other receptor locations it is predicted that there would be no exceedances.

The applicant was presented with a request for clarification of a number of points related to the air quality assessment and they responded to the Council addressing all the points raised. One of the requests was for data to be supplied showing the predicted impacts at the St Phillip's Marsh Nursery due to its sensitive nature and proximity to the site (approximately 200m). This showed that with the development proposal running for 3607 hours of the year that there would not be a single hour that pollutant levels are predicted to exceed the 200µg/m<sup>3</sup> average hourly value, consequently, given the limited 200 operational hours that the generators would be running, no exceedance is predicted at this location.

The air quality assessment submitted for the proposal has shown that these peak hourly impacts have been effectively mitigated by the newly proposed configuration of the generation plant. Therefore the impacts would not be harmful.

#### Noise

The applicant has included a noise assessment as part of the submission. The generator site would also be enclosed with an acoustic fence. No objection has been raised by the Pollution Control Team who were satisfied with the conclusions reached in the noise assessment and stated that the development is unlikely to cause excessive noise nuisance. Subject to standard controls of plant machinery and details of the acoustic fence attached as condition to any approval, this aspect is considered satisfactory.

#### (D) HAVE ECOLOGICAL ISSUES BEEN ADDRESSED?

This site is designated as a Wildlife Corridor and includes vegetation and trees as well as hard standing. Accordingly Local Plan Policy DM19 applies and it is necessary to submit a Phase 1 habitat survey. This, along with a bat survey, was submitted and investigated the site for habitats and any mitigation measures necessary. Recommendations from the survey included retaining an element of woodland and scrub habitat to maintain a contiguous and connective corridor, along with a precautionary approach to any site clearance.

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The city's Nature Conservation Officer has been consulted and is satisfied that the proposals meet the requirements of DM19, subject to conditions being attached to any approval that secure the recommendations in both surveys.

In relation to trees, an arboricultural report was submitted and evaluated by the Council's Arboricultural Officer. Given the location of the site, away from the public realm, it is concluded that the trees on site have little public amenity and, as such, it is not reasonable to protect them through a Tree Protection Order. The loss of the trees are therefore acceptable, subject to compliance with policy DM17 and a suitable tree replacement contribution, which the applicant has agreed with and can be secured by a planning obligation.

The applicant has submitted a Unilateral Undertaking as part of the proposal and in the event of an approval, a contribution of £56,625 is required to cover the loss of the 19 trees identified in the arboricultural report and the cost of the 74 replacement trees that are required but cannot be provided within the site. This is in accordance with the Bristol Replacement Tree Standard.

**(E) IS THE PROPOSAL ACCEPTABLE IN DESIGN TERMS?**

The site is away from the public realm and the visual impact will be minimal. Furthermore, the proposed design will not appear out of place in what is an industrial context.

**(F) ARE ANY TRANSPORT AND MOVEMENT ISSUES RAISED?**

The generation unit is proposed to store fuel on site with expected deliveries to number once a week. Transport Development Management has been consulted upon the scheme and following minor revisions have offered no objection. The industrial natural of the area meaning the proposals are not expected to significantly alter the pattern of traffic in the area.

**UNILATERAL UNDERTAKING**

Prior to commencement of the development, hereby approve, a contribution of £56,625 shall be provided for any trees not replaced on site in accordance with the Bristol Tree Replacement Standard (DM17).

**CONCLUSION**

The application has been assessed upon its own merits. All impacts and benefits of the development have been assessed, including the need for infrastructure improvements to the energy network and environmental and residential amenity, movement issues and design.

The conclusions of the Air Quality Assessment have demonstrated that there would not be a detrimental impact on pre-existing levels of air quality and in particularly at St Phillips Nursery School, the Paintworks site and Sparke Evans Park, which is a regularly used public space. The health, wellbeing, residential and environmental amenity of these close-by locations would not be detrimentally harmed.

Other impacts, including loss of trees and part of the Wildlife Corridor are considered to be satisfactorily mitigated and can be controlled through appropriate conditions should the Committee be minded to approve the application.

**Development Control Committee B – 13 July 2016****Application No. 16/00719/F : Avonbank Feeder Road Bristol BS2 0TH****COMMUNITY INFRASTRUCTURE LEVY**

How much Community Infrastructure Levy (CIL) will this development be required to pay?

Development of less than 100 square metres of new build that does not result in the creation of a new dwelling; development of buildings that people do not normally go into, and conversions of buildings in lawful use, are exempt from CIL. This application falls into one of these categories and therefore no CIL is payable.

**RECOMMENDED GRANTED subject to condition(s)****Time limit for commencement of development**

1. Full Planning Permission

The development hereby permitted shall begin before the expiration of three years from the date of this permission.

Reason: As required by Section 91 of the Town and Country Planning Act 1990, as amended by Section 51 of the Planning and Compulsory Purchase Act 2004.

**Pre commencement condition(s)**

2. Construction management plan

No development shall take place including any works of demolition until a construction management plan or construction method statement has been submitted to and been approved in writing by the Local Planning Authority. The approved plan/statement shall be adhered to throughout the construction period. The statement shall provide for:

Parking of vehicle of site operatives and visitors  
 Routes for construction traffic  
 Hours of operation  
 Method of prevention of mud being carried onto highway  
 Pedestrian and cyclist protection  
 Proposed temporary traffic restrictions  
 Arrangements for turning vehicles  
 Arrangements to receive abnormal loads or unusually large vehicles  
 Methods of communicating the Construction Management Plan to staff, visitors and neighbouring residents and businesses

Reason: In the interests of safe operation of the highway in the lead into development both during the demolition and construction phase of the development.

3. Acoustic barrier

No development shall take place until full details of the acoustic barrier detailed in the acoustic report submitted with the application have been submitted to and approved in writing by the Council.

Reason: In order to safeguard the amenities of nearby occupiers.

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4. Details of a suitable trespass proof fence (of at least 1.8m in height) adjacent to Network Rail's boundary shall be submitted to and approved by the Local planning Authority before development commences.

Reason: To ensure the safe operation of the railway line and the protection of Network Rail's adjoining land.

5. Ecology

No development shall take place until an ecological mitigation strategy prepared by a qualified ecological consultant has been submitted to and approved by the Local Planning Authority. This should include:

- A Precautionary Method of Working method statement with respect to the potential presence of legally protected reptiles;
- Measures to protect nesting birds;
- A method statement for the control and removal of Japanese knotweed which was recorded on site during the extended phase one habitat survey dated July 2015;
- An update badger survey to be undertaken no more than three months prior to construction commencing;
- Measures to protect foraging or commuting badgers becoming trapped in open trenches or pipework;
- The provision of bird and bat boxes;

Reason: - In the interests of maintaining the ecological value of the site.

6. Submission and approval of landscaping scheme

No development shall take place until there has been submitted to and approved in writing by the Local Planning Authority a scheme of hard and soft landscaping, which shall include indications of all existing trees and hedgerows on the land, and details of any to be retained, together with measures for their protection, in the course of development. The approved scheme shall be implemented so that planting can be carried out no later than the first planting season following the occupation of the building(s) or the completion of the development whichever is the sooner. All planted materials shall be maintained for five years and any trees or plants removed, dying, being damaged or becoming diseased within that period shall be replaced in the next planting season with others of similar size and species to those originally required to be planted unless the council gives written consent to any variation.

Reason: To protect and enhance the character of the site and the area and to ensure its appearance is satisfactory.

**Pre occupation condition(s)**

7. Servicing & Management Plan

No building or use hereby permitted shall be occupied or use commenced until a servicing and management plan addressing vehicle arrivals, departures, parking, stopping and waiting has been prepared and lighting, has been submitted to and approved in writing by the Local Planning Authority. The measures shall thereafter be implemented in accordance with the approved servicing and management plan.

Reason: In the interests of highway safety.

**Development Control Committee B – 13 July 2016****Application No. 16/00719/F : Avonbank Feeder Road Bristol BS2 0TH****8. Ambient Air Quality Monitoring**

An ambient air quality monitoring station will be commissioned in an agreed location by the Local Planning Authority before the development commences operation. Real-time nitrogen oxides monitoring, using monitoring equipment that has been type approved under the UK Environment Agency MCERTS Scheme is required to fulfil this requirement. The air quality monitoring site should be operated and maintained in line with the QA/QC standards applied to Bristol City Councils air quality monitoring network. Bristol City Council should be provided with access to raw data and calibration data for the monitoring equipment. Wind speed and direction data should also be collected at or in close proximity to the air quality monitoring site. The applicant should pay for the equipment installation and running cost for a minimum period of 2 years from the date that the proposed plant is operational:

Reason - To ensure that the air quality impacts at a relevant location are in line with the predictions made in the air quality assessment.

**Post occupation management****9. Restriction of noise from plant and equipment**

The rating level of any noise generated by plant & equipment as part of the development shall be at least 5 dB below the background level as determined by BS4142: 1997- "Method of rating industrial noise affecting mixed residential and industrial areas".

Reason: To safeguard the amenity of nearby premises and the area generally.

**10. Inspection and maintenance**

The generator plant shall be inspected and maintained in line with manufacturers guidance:

Reason - To ensure optimal engine performance and to minimise emissions to air throughout the life of the plant.

**11. Total hours**

The plant should not operate outside the hours of 07:30 to 22:30 or for more than 200 hours in any one year. The applicant must submit records listing the annual hours of operation to Bristol City Council. Any variation to increase operating hours must be accompanied by a revised air quality assessment:

Reason: This is the basis on which the air quality impacts have been assessed and any changes required to the plant operation will need to assess the potential impact on air quality.

**12. Regular and on-going stack emissions monitoring**

There shall be regular and on-going stack emissions monitoring, throughout the operational life of the plant, to demonstrate that engine emissions comply with the pollutant emission concentrations as stated in Table D3 of Appendix D contained in the Air Quality Assessment Appendices Document (1750086/R2016/001). This monitoring should also demonstrate that the stack emission parameters are in line with the exhaust flows and temperatures as modelled in the air quality assessment and contained in Table D4 of the Air Quality Assessment Appendices Document (1750086/R2016/001). Data should be reported to Bristol City Council's Sustainable City and Climate Change Service.

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Reason: This is the basis on which air quality impacts have been assessed in the planning application and to which the engines will be required to perform.

13. If the measured concentrations of nitrogen oxides are higher than those predicted by the modelling and give rise to concern about breaches of air quality objectives/health impacts, Bristol City Council will review the operation of the site to ensure impacts are reduced to a level that do not give rise to concern. Mechanisms to bring air quality impacts in line with the predicted modelled concentrations could include but would not be limited to examples such as, placing a restriction on the meteorological conditions under which the plant could operate, requiring additional abatement technology to be installed or changing the stack release parameters:

Reason - To ensure mechanisms are in place to ensure that the plant is operating within acceptable parameters to protect health.

15. Bio fuel

The fuel to be used shall comprise of Hydrotreated Vegetable Oil (HVO) only.

Reason: To protect local air quality and as assessed under the Air Quality Assessment.

16. Sustainability criteria

The development hereby permitted shall only operate when the bio fuel satisfies the sustainability criteria.

For the purposes of this condition:

- (a) 'biomass' has the meaning given by Article 2(e) of the Renewables Directive;
- (b) 'sustainability criteria' means such criteria relating to the sustainability of biomass as are set out in the Renewables Directive from time to time;
- (c) 'Renewables Directive' means Directive 2009/28 of the European Parliament and of the Council on the promotion of the use of energy from renewable sources, as amended or replaced from time to time.

Reason: To ensure the use of low-carbon fuel in compliance with policy BCS14 of the Bristol Development Framework Core Strategy.

17. Annual reports

Throughout the operational life of the development, there shall be submitted to the Council annual reports on the sustainability of the biofuel to be used in the electricity generating engines. This information shall provide the same levels of assurance and verification which the operator of the development is required to do (or would be required to do, if they were claiming financial assistance through Renewable Obligations (RO)).

Reason: To ensure that the fuel used complies with the national criteria of a sustainable fuel.

**List of approved plans**

18. List of approved plans and drawings

The development shall conform in all aspects with the plans and details shown in the application as listed below, unless variations are agreed by the Local Planning Authority in order to discharge other conditions attached to this decision.



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110 Proposed tracking plan, received 31 March 2016  
 104 C Proposed site sections (sheet 1 of 3), received 22 April 2016  
 105 C Proposed site sections (sheet 2 of 3), received 22 April 2016  
 106 C Proposed site sections (sheet 3 of 3), received 22 April 2016  
 Unilateral Undertaking given by Plutus Energy Limited, received 30 June 2016  
 Air Quality Assessment - Further Information, received 6 April 2016  
 Air quality assessment, received 2 June 2016  
 Arboricultural constraints report, received 10 February 2016  
 Extended phase 1 habitat survey, received 10 February 2016  
 Noise impact assessment, received 10 February 2016  
 1525\_SK002 A Site location plan, received 10 February 2016  
 5355-03 Generator plan & elevations, received 10 February 2016  
 5355-04 Switch room elevation & plan, received 10 February 2016  
 5355-05 Double bunded diesel storage tank, received 10 February 2016  
 1525\_SK005 A Existing site with boundary, received 10 February 2016  
 03 C Proposed site layout, received 10 February 2016  
 13442-1-1 A (1) Internal layout, received 10 February 2016  
 13442-1-1 A (2) General arrangement, received 10 February 2016

Reason: For the avoidance of doubt.

**Advices**

## 1. Network Rail

You are advised to refer to the comments and recommendations from Network Rail dated 21st March 2016 which are to ensure that the safe operation of the adjoining railway is continued.

## 2. Environment Agency

Oil or chemical storage facilities should be sited in bunded areas. The capacity of the bund should be at least 10% greater than the capacity of the storage tank or, if more than one tank is involved, the capacity of the largest tank within the bunded area. Hydraulically inter-linked tanks should be regarded as a single tank. There should be no working connections outside the bunded area.

Any waste oils must be collected and contained prior to disposal in an approved manner. On no account should waste oils be discharged to any drainage system.

**BACKGROUND PAPERS**

Air Quality	18 March 2016
Bristol Neighbourhood Planning Network	29 February 2016
Network Rail	21 March 2016
Pollution Control	12 April 2016
Contaminated Land Environmental Protection	17 March 2016
Transport Development Management	1 April 2016
Environment Agency (Sustainable Places)	9 March 2016
Nature Conservation Officer	17 March 2016
Arboricultural Team	29 April 2016
Air Quality	11 April 2016
City Design Group	1 March 2016

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**Review of Air Quality  
Assessment:**  
Flexible Generation  
Facility, Feeder Road,  
Bristol

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July 2016



Experts in air quality  
management & assessment

## Document Control

<b>Client</b>	Residents Against Dirty Energy	<b>Principal Contact</b>	Bruce Yates
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<b>Job Number</b>	J2636
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<b>Report Prepared By:</b>	Dr Ben Marner and Kieran Laxen
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### Document Status and Review Schedule

Report No.	Date	Status	Reviewed by
J2636/1/F1	12 July 2016	Note	Prof. Duncan Laxen (Managing Director)

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## 1 Introduction

- 1.1 This note has been prepared by Air Quality Consultants Ltd. on behalf of Residents Against Dirty Energy (RADE). It reviews the updated air quality assessment ('the Assessment') for the proposed Flexible Generation Facility, Feeder Road, St Phillip's March, Bristol, submitted on 02/06/16<sup>1</sup>.
- 1.2 Owing to the timescale for conducting this review, it has not been possible to go through all the other information on the planning portal website or to deal with every aspect of the Assessment in detail. This note thus focuses on what are considered to be the key issues with the Assessment. It focuses on the operational impacts of the proposals on nitrogen dioxide (NO<sub>2</sub>) concentrations, since professional experience suggests that these are likely to be the most significant impacts associated with a scheme such as this.

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<sup>1</sup> [http://planningonline.bristol.gov.uk/online-applications/files/117FBAD057D946F40E64E27A894E1D4E/pdf/16\\_00719\\_F-AIR\\_QUALITY\\_ASSESSMENT\\_-\\_MAIN\\_REPORT-1490166.pdf](http://planningonline.bristol.gov.uk/online-applications/files/117FBAD057D946F40E64E27A894E1D4E/pdf/16_00719_F-AIR_QUALITY_ASSESSMENT_-_MAIN_REPORT-1490166.pdf)

## 2 Model Input Parameters

### Emission Rate

- 2.1 The nitrogen oxides (NO<sub>x</sub>) emission rate from each generator has been assumed to be 0.51 g/s. The Assessment states that this emission rate was supplied by Progress Group but gives no further details. Diesel generators are usually regulated according to the United States Environmental Protection Agency (USEPA) emissions standards. The latest - and cleanest - standard is termed 'Tier 4'. Tier 4 engines would emit significantly less than 0.51 g/s of NO<sub>x</sub>, and so it is assumed that the generators conform to the older - and dirtier - 'Tier 3' standard. If that is the case, then it would be usual to model emissions at the emissions limits for these plant, which is 3,500 mg/KWh, or effectively 1.2 g/s (i.e. more than twice the emissions that have been assumed).
- 2.2 Ideally, the generators should be specified to conform to the latest Tier 4 standard, which would minimise the impacts. If this is not to be the case then continuous monitoring of the emissions should be undertaken to ensure that the generators will emit no more than 0.51 g/s. If NO<sub>x</sub> emissions exceed 0.51 g/s per generator then the plant should be shut down until this emission rate can be confidently achieved.

### Exhaust Velocity

- 2.3 The modelling has assumed an exit velocity of 59.8 m/s<sup>2</sup>. Even considering the addition of cooling air, this is an extremely high velocity for this type of plant. The authors of this review are not qualified to comment on the technical feasibility of this design, but are nevertheless quite surprised that neither the noise<sup>3</sup>, nor the back pressures involved are prohibitive to this design.
- 2.4 The model results will be very sensitive to this parameter. For example, a basic model run carried out by AQC using the ADMS-5 dispersion model, the Bristol (2010) meteorological dataset, and the same model input parameters presented in the Assessment<sup>4</sup> showed that the contribution of the plant to 99.8<sup>th</sup> percentile of 1-hour mean NO<sub>2</sub> concentrations at St Philips Marsh Nursery would be predicted to increase by 160% (i.e. it would be 2.6 times the presented value) if the cooling air was removed from the exhaust stream (thus reducing the exit volumes to those achievable by the generators on their own).

<sup>2</sup> Which is 134 mph. Across all stacks, this is almost 600 m<sup>3</sup>/s (or the volume of an Olympic sized swimming pool being blown out of the stacks every 4 seconds).

<sup>3</sup> The noise assessment ([http://planningonline.bristol.gov.uk/online-applications/files/7DCD20A1C22234384FB745ED599DB392/pdf/16\\_00719\\_F-NOISE\\_IMPACT\\_ASSESSMENT-1392680.pdf](http://planningonline.bristol.gov.uk/online-applications/files/7DCD20A1C22234384FB745ED599DB392/pdf/16_00719_F-NOISE_IMPACT_ASSESSMENT-1392680.pdf)) does not make specific reference to the 134 mph exhaust jets and appears to consider only noise from the generator engines themselves. It is thus unclear whether the noise from these jets was considered.

<sup>4</sup> With the exception of building wake effects or terrain.

- 2.5 Given that the model results are dependent upon this exit velocity being achieved consistently, it is suggested that continuous monitoring is put in place to ensure the velocity does not drop below 59.8 m/s. If the velocity drops below this rate, it is suggested that the plant should shut down until this rate can be confidently maintained.

### Exhaust Temperature

- 2.6 The temperature of the exhaust gas has been calculated to take account of the combined temperatures of the generator exhaust and the cooling air. It appears that this calculation has been done incorrectly. When calculating a combined temperature of two mixed gas streams, it is necessary to first express both volumes normalised to the same temperature. It appears that this was not done. Based on the information provided in the assessment, AQC has calculated the combined temperature to be 107°C, which is significantly less than the 148°C that has been modelled. The effect of this error will be to over-state the plume buoyancy and thus under-predict the impacts. The Assessment is thus likely to have under-predicted the impacts of the proposed development.

### Meteorological Data

- 2.7 The Assessment began by looking at five years of meteorological data from the Bristol meteorological site. It determined that some of the individual years of data gave higher predictions at some receptors, while others gave higher predictions at other receptors. Rather than taking the more usual, and worst-case, approach of presenting the maximum prediction at any receptor across any year of data, all of the results presented are for a single year of data (2010), since this gave the highest predictions at certain receptors<sup>5</sup>. It is inevitable that using one of the alternative years would give higher predictions at some receptors than those that have been presented. Given that meteorological conditions vary year-on-year, the results for some receptors will not be robust; even if the results for the worst-case receptors are<sup>5</sup>.

### Assumed Operating Hours

- 2.8 The model has been run assuming that the plant will not be permitted to operate outside of the hours set out in Table D2 of the Assessment. For example, this means no operation between the hours of 8.30 PM and 7:00 AM between October and February. The potential impacts of operation outside of these periods have not been assessed and so the development should be prohibited from operating outside of these periods. The assumption is also made that the plant would only run for a maximum of 200 hours per year, but as explained in Paragraph 4.5 below, the way in which this was assessed was inappropriate and so this part of the Assessment should be ignored in any event.

<sup>5</sup> Ironically, the Assessment discounts any impacts at these particular receptors in any event, since they do not represent relevant exposure to the objective.

### 3 Modelling Approach

- 3.1 The Assessment has used the AERMOD dispersion model, which is considered to be suitable. To calculate NO to NO<sub>2</sub> conversion in the plume, the assessment has used the Plume Volume Molar Ratio Method (PVMRM). This method is not often used in the UK since it is usually considered that there are simpler, and more robust, methods. The authors of the Assessment submitted with the application have, separately, carried out a sensitivity test based on using the PVMRM as well as an approach recommended by the UK Environment Agency, and have shown that the PVMRM is worst-case. However, this sensitivity test has been carried out using the estimated biodiesel emissions only. It is unclear why this sensitivity test was not carried out using the same diesel-based emissions as used in the Assessment. The PVMRM will give lower conversion rates at higher predicted concentrations, and so it is possible that, had the sensitivity test been based on the same emissions data as the assessment, it may have shown higher predictions using the UK Environment Agency approach. It is therefore possible that the assessment is not worst case.

#### Isopleths

- 3.2 The shapes of the contour isopleths are quite unusual for Bristol meteorological data. The predominant impacts are to the southwest. It would be more usual to see the biggest impacts, even short-term impacts, toward the northeast. Without access to more details on the model setup, it is not possible to see whether this is a genuine affect, or whether it represents an error.

#### Baseline Concentrations

- 3.3 It is not clear from the Assessment whether existing baseline levels have been included in the predicted concentrations. Given that there is no mention that baseline concentrations are included, it has been assumed that they have not, and that the numbers presented all relate to the Process Contributions (PCs) alone. A common approach used in the UK when adding baseline values to short-term predictions is to add twice the expected annual mean concentration.
- 3.4 The Assessment comments that measurements made at the urban background monitoring site at Higham Street will be representative of background concentrations at the site. While this may be true, the impacts of the proposed development cover a large number of roadside locations (and locations which will be influenced by other local emissions) and so existing concentrations at these receptors will be well above background levels.
- 3.5 Table 6 of the Assessment shows that annual mean nitrogen dioxide concentrations at roadside locations in this area were as high as 55.8 µg/m<sup>3</sup> in 2014. If twice this value (111.6 µg/m<sup>3</sup>) were

added to the short-term PCs that are shown in the report, exceedences of the short-term objective would be predicted over a much larger area<sup>6</sup>.

- 3.6 The tabulated results and contour plots which show the number of hourly mean concentrations in exceedence of  $200 \mu\text{g}/\text{m}^3$  are thus all extremely misleading, since they take no account that a PC of less than  $200 \mu\text{g}/\text{m}^3$  may, when added to the existing concentrations, lead to an exceedence of the  $200 \mu\text{g}/\text{m}^3$  standard<sup>7</sup>.

### Averaging Periods

- 3.7 The assessment has focused on short-term impacts, stating that 200 hours of operation per year cannot have significant impacts in relation to annual mean concentrations. This is frequently not true. For example, if a plant were to add  $100 \mu\text{g}/\text{m}^3$  to a receptor for 200 hours, this would result in an increment to annual mean concentrations of  $2.3 \mu\text{g}/\text{m}^3$  (i.e.  $100 * 200 / 8760$ ). Given that the predicted 99.8<sup>th</sup> percentiles of 1-hour mean concentrations are well above  $100 \mu\text{g}/\text{m}^3$  at many receptors, the predicted increments to annual mean concentrations should also have been presented.

## 4 Interpretation

### 99.8<sup>th</sup> Percentiles of 1-hour Mean NO<sub>2</sub> Concentrations

- 4.1 Figure 6 shows the predicted 99.8<sup>th</sup> percentile of 1-hour mean NO<sub>2</sub> concentrations, based on the assumption that 18 of the hours of operation would coincide with the 18 hours of worst-case meteorology for each point on the grid (i.e. the impacts at any given point shown in Figure 6 could be experienced even if the plant were only to operate for 18 hours in a year, albeit that the chance of these hours coinciding with the 18 worst-case hours for meteorology is slim). Thus, discounting the comments made above regarding limitations in the model parameters, the predictions in Figure 6 provide a reasonable worst-case set of predicted PCs (i.e. the impacts of the plant on their own). Even without considering existing baseline levels, the area shown in red in Figure 6 (which represents the  $200 \mu\text{g}/\text{m}^3$  contour) is predicted to exceed the 1-hour objective.
- 4.2 As explained in Paragraph 3.5, in order to predict whether or not the 1-hour mean NO<sub>2</sub> objective would be exceeded, it would be appropriate to add between  $45 \mu\text{g}/\text{m}^3$  and  $112 \mu\text{g}/\text{m}^3$  to these predictions. On this basis, the area exceeding the objective would either (approximately) follow the  $140 \mu\text{g}/\text{m}^3$  contour, or the  $80 \mu\text{g}/\text{m}^3$  contour, depending on the proximity to an existing emission source such as a road. This means that the 1-hour NO<sub>2</sub> objective could be exceeded at St Philips

<sup>6</sup> Even if twice the assumed annual mean background concentration ( $22.6 \mu\text{g}/\text{m}^3 \times 2 = 45.2 \mu\text{g}/\text{m}^3$ ) were added, it would add significantly to the area over which the 1-hour mean objective is predicted to be exceeded.

<sup>7</sup> There are also other issues with these results, as explained in Paragraph 4.5.



Marsh Nursery, at the Paintworks development, and across a large part of the area shown in Figure 6 of the Assessment.

- 4.3 In terms of Table A, total 99.8<sup>th</sup> percentiles of 1-hour mean concentrations may be estimated by adding either 45  $\mu\text{g}/\text{m}^3$  or 112  $\mu\text{g}/\text{m}^3$  (depending upon whether or not the receptor is near to an existing emission source) to all of the receptor-specific predicted 99.8<sup>th</sup> percentile concentrations. This results in considerably more receptors where exceedences are predicted. St Philips Marsh Nursery is not, however, included as a receptor<sup>8</sup>. Given the sensitivity of this receptor, this is an important omission.

### Calculating the Number of Hourly Exceedences of 200 $\mu\text{g}/\text{m}^3$

- 4.4 As well as presenting the 99.8<sup>th</sup> percentiles of 1-hour mean  $\text{NO}_2$  concentrations, the Assessment has presented the number of exceedences of 200  $\mu\text{g}/\text{m}^3$  as a 1-hour mean concentration. This is not usually done for assessments against the UK objectives. The reason for this is that meteorological data usually contain gaps, and 'calm' conditions which cannot be modelled. For example, the 2010 meteorological dataset for Bristol contains 23 hours with no wind data at all, and a further 108 hours of calm conditions which cannot usually be modelled<sup>9</sup>. This makes the predicted number of hours with an exceedence a meaningless statistic, since there may be an additional 131 hours with exceedences which were probably not considered. Thus, the focus should be – as is usually the case with assessments done in the UK – on the 99.8<sup>th</sup> percentiles of 1-hour mean concentrations.

### Scaling to 200 hours

- 4.5 Even though just 18 hours of operation could, on their own, give rise to the receptor-specific impacts shown in Figure 6, this is quite unlikely. Rather than calculating the probability of exceedences (i.e. how likely it is that meteorological conditions with the potential to give rise to impacts would coincide with the plant operating) the Assessment has taken the approach of simply reducing all of the predicted numbers of hourly exceedences by 94%. This reduction was derived on the basis that the plant will only run for 6% of the assumed model duration (i.e. 200 hours out of 3,607 hours). Given the limitations in calculating the number of hourly exceedences, this is not appropriate. In any event, it would not provide a reasonable worst-case assessment. This approach is considered to be an over-simplification which will present an optimistic picture of the impacts of the facility. A more robust, probability-based, assessment has not been carried out.
- 4.6 For the reasons given above, it is suggested that Figures 8 and 12 of the Assessment, along with all other aspects which scale the results down to take account of 200 hours of operation, are disregarded. This includes the assessment using the Institute of Air Quality Management impact

<sup>8</sup> This particular error in the assessment has already been raised by the Council.

<sup>9</sup> This is based on the dataset from the same observation station that is held by AQC. AQC does not have access to the precise data used in the Assessment.

descriptors. Without a robust assessment of the probability of the proposed plant having significant impacts, the only robust assessment is that shown in Figure 6, as described above, which shows potentially significant impacts.

## 5 Conclusions

- 5.1 If the Assessment had taken account of baseline concentrations, and focused on the robust set of predictions, then it would have predicted exceedences of the objective at many locations, including St Philips Marsh Nursery, and the Paintworks development. There are also issues with the way in which the model itself has been run and these may have caused the impacts to have been under-predicted.
- 5.2 It is unclear whether the assumptions made in the Assessment are the same as those in the noise assessment. A key concern in this respect is whether the noise assessment has accounted for a 134 mph exhaust velocity from the proposed stacks.
- 5.3 If, despite the potential for significant impacts, the development does proceed, monitoring of the emissions and release conditions should be carried out. This will be necessary in order to ensure that the impacts will not be significantly greater than those which have been predicted.
- 5.4 As explained in Section 1, this review has been carried out over a very short timeframe and thus the list of issues raised reflects what was identified in this time and may not be exhaustive.

# 6 Appendices

A1 Professional Experience.....10

## A1 Professional Experience

### **Prof. Duncan Laxen, BSc (Hons) MSc PhD MEnvSc FIAQM**

Prof Laxen is the Managing Director of Air Quality Consultants, a company which he founded in 1993. He has over forty years' experience in environmental sciences and has been a member of Defra's Air Quality Expert Group and the Department of Health's Committee on the Medical Effects of Air Pollution. He has been involved in major studies of air quality, including nitrogen dioxide, lead, dust, acid rain, PM<sub>10</sub>, PM<sub>2.5</sub> and ozone and was responsible for setting up the UK's urban air quality monitoring network. Prof Laxen has been responsible for appraisals of all local authorities' air quality Review & Assessment reports and for providing guidance and support to local authorities carrying out their local air quality management duties. He has carried out air quality assessments for power stations; road schemes; ports; airports; railways; mineral and landfill sites; and residential/commercial developments. He has also been involved in numerous investigations into industrial emissions; ambient air quality; indoor air quality; nuisance dust and transport emissions. Prof Laxen has prepared specialist reviews on air quality topics and contributed to the development of air quality management in the UK. He has been an expert witness at numerous Public Inquiries, published over 70 scientific papers and given numerous presentations at conferences. He is a Fellow of the Institute of Air Quality Management.

### **Dr Ben Marner, BSc (Hons) PhD CSci MEnvSc MIAQM**

Dr Marner is a Technical Director with AQC and has seventeen years' experience in the field of air quality. He has been responsible for air quality and greenhouse gas assessments of road schemes, rail schemes, airports, power stations, waste incinerators, commercial developments and residential developments in the UK and abroad. He has been an expert witness at several public inquiries, where he has presented evidence on health-related air quality impacts, the impacts of air quality on sensitive ecosystems, and greenhouse gas impacts. He has extensive experience of using detailed dispersion models, as well as contributing to the development of modelling best practices. Dr Marner has arranged and overseen air quality monitoring surveys, as well as contributing to Defra guidance on harmonising monitoring methods. He has been responsible for air quality review and assessments on behalf of numerous local authorities. He has also developed methods to predict nitrogen deposition fluxes on behalf of the Environment Agency, provided support and advice to the UK Government's air quality review and assessment helpdesk, Transport Scotland, Transport for London, and numerous local authorities. He is a Member of the Institute of Air Quality Management and a Chartered Scientist.

**Kieran Laxen, MEng (Hons) AMIEnvSc MIAQM**

Mr Laxen is a Senior Consultant with AQC with over seven years' experience in the field of air quality management and assessment. Previously having two years' experience in scientific research on internal combustion engines, he now works in the field of air quality. He is involved in a wide range of development projects, most of which have involved use of ADMS modelling methodologies for biomass boilers, CHP plant and roads, and is also competent in the assessment of construction dust. He has pioneered the use of OpenAir software within the Company, which is used to analyse air quality monitoring data, and is responsible for routine calibration of air quality monitoring stations, together with data ratification. He is a Member of the Institute of Air Quality Management.

**Ricky Gellatly, BSc (Hons) AMIEnvSc MIAQM**

Mr Gellatly is a Senior Consultant with AQC with over four years' relevant experience. Prior to joining AQC he worked as an air quality consultant at Odournet UK Ltd. He has also worked as an oceanographer, and holds a first class degree in meteorology and oceanography from the University of East Anglia. He has undertaken air quality assessments for a wide range of projects, assessing many different pollution sources using both qualitative and quantitative methodologies, with most assessments having included dispersion modelling (using a variety of models). He has assessed road schemes, airports, energy from waste facilities, anaerobic digesters, poultry farms, urban extensions, rail freight interchanges, energy centres, waste handling sites, sewage works and shopping and sports centres, amongst others. He also has experience in ambient air quality monitoring, the analysis and interpretation of air quality monitoring data, monitoring and assessment of nuisance odours and the monitoring and assessment of construction dust.

Full CVs are available at [www.aqconsultants.co.uk](http://www.aqconsultants.co.uk).

15th September 2016

Mr Ken Reid  
Development Management  
Brunel House  
Second Floor  
Bazaar Wing  
Bristol City Council  
PO Box 3176  
Bristol  
BS3 9FS

***Sent via email***

Dear Ken

**Proposed Flexible Generation Facility, Feeder Road, St Philip's Marsh, Bristol:  
Air Quality Assessment – Further Information**

This correspondence follows our receipt of a report prepared by Air Quality Consultants (AQC) on behalf of Residents Against Dirty Energy (RADE) reviewing the air quality assessment for the above project. Please find below further information in response to the issues raised in the AQC report.

***Air Quality Consultant's Comments on the Air Quality Assessment***

AQC made a number of comments in its report relating to the input data for the dispersion modelling undertaken for the air quality assessment and the assessment approach. Further dispersion modelling has been undertaken in response to the comments made by AQC and these results are presented and discussed below. Responses to a number of AQC's comments are provided below before presentation of the revised modelling results as they relate to what further modelling has been completed. The responses are presented under the same headings as used in the AQC report.

## **Model Input Parameters**

### ***Emission Rate***

The emission data for the Engines was provided by MTU. The mass emission rate used in the modelling was based on the data in the engine emissions data sheet and product data sheet for the engine model operating at 420kW and is conservative for the power output.

### ***Exhaust Velocity***

It is understood that the proposed exhaust velocity is technically achievable. The exhaust flow comprises both the exhaust from each engine and the cooling air from each engine and would be emitted from the engine enclosures regardless of exactly how. The chosen exhaust configuration provides a good outcome with regards dispersion of emissions. There is no intention to remove the cooling air from the exhaust flow and this is what has been modelled. Therefore the potential increase in air quality impacts resulting from such a course of action (referred to by AQC) is not relevant.

### ***Exhaust Temperature***

The calculation of the combined engine exhaust and cooling air flow had been incorrectly calculated as referred to by AQC. The discharge temperature has been re-calculated as 105°C (rather than the 131.7°C, which was the combined exhaust temperature that was modelled<sup>1</sup>). The dispersion modelling has been revised using the amended temperature and any results presented in this report reflect the use of the amended temperature. The results of the revised modelling showed that maximum ground level concentrations were not affected significantly as a result of the revised temperature. The greatest increase in hourly mean concentration at a residential receptor is equivalent to 5% of the objective and is still well below the objective as a process contribution. Reductions in 1-hour mean concentrations of up to 4% of the objective were also predicted at a number of receptors.

To further assess the potential impact of different combined exhaust flow temperature, additional modelling has undertaken using higher and lower temperature cooling air flows for the calculation of the combined flow<sup>2</sup>. This showed that the 99.8<sup>th</sup> percentile of 1-hour concentrations at residential receptors only varied (increased or decreased) by a maximum of 3.8% (or 7.6µg/m<sup>3</sup>) assuming 10°C (increase or decrease) in cooling air temperature compared to the temperature used in the modelling (79°C). These results indicate that the impact on ambient concentrations is not significantly affected by such changes in temperature and suggest that the efflux velocity is the dominant parameter with regards the dispersion of the emissions released from the proposed stacks.

### ***Meteorological Data***

The selection of the year of meteorological data for use in the modelling (2010) was in fact undertaken on the basis of the closest residential receptor locations rather than at receptors where relevant exposure was ultimately dismissed (as AQC suggest). Although this was not explicitly stated in the air quality assessment, this was the approach used. Industrial and commercial receptors were also included in the initial screening of the meteorological data; however, the single year was selected on the basis of a greater impact at residential locations.

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<sup>1</sup> Table D4 in Appendix D of the Air Quality Assessment incorrectly showed the engine discharge temperature as 550°C and the combined flow temperature of 148°C (this was from an earlier model engine). The temperatures actually modelled were 500°C and 131.7°C, respectively.

<sup>2</sup> The efflux velocity was also amended accordingly for the different temperature of the combined flows. The stack diameter was assumed to remain as previously modelled (1.03m).

This method was used in the air quality assessment submitted for the original planning application for the plant and the approach was accepted by the Council. For ease of comparison of subsequent modelling results with the original results, the approach using a single year of meteorological data had been retained for assessing subsequent plant designs and the relative benefits gained (in terms of reduced impacts) for different configurations.

To address the suggestion by AQC that the results may not be robust at some receptor locations, the dispersion modelling has been undertaken for the four other four years of meteorological data (and using the amended discharge temperature) used initially to ensure that any variation in predicted concentration at receptor locations due to varying weather conditions year on year has been accommodated in the results included in this response. The wind roses for the 2010 to 2014 are presented in *Figures A1-1 to A1-5* in **Appendix A1**. The results for the modelling for all five years are presented and discussed in detail below; however, the results suggest that the worse year of meteorology overall, in terms of impacts from the plant, is 2010.

### ***Assumed Operating Hours***

The dispersion modelling of the worse-case scenario has taken into account the allowable operating hours of the proposed facility and would not operate outside of these times. Further modelling has been completed for the most likely operating hours for the proposed plant.

### ***Modelling Approach***

The Plume Volume Molar Ratio Method (PVMRM) was selected for use due to the unusual operating characteristics of the proposed facility; it is considered that employing a 'Tier 3' level of assessment as a case-specific scenario (which follows the EA Methodology) would provide a more representative picture of the potential impact of the plant, particularly because the appropriate input data was available that would allow the more detailed assessment methodology to be used. The method was considered appropriate and robust because of the use of conservative assumptions regarding annual operational hours of the plant in the previous modelling. Further information on the reasons for utilising the PVMRM was provided previously in response to a request by the Council.

As mentioned above, the dispersion modelling for the project has been revised using the re-calculated discharge temperature. This was undertaken using the PVMRM and has also been undertaken using the EA Methodology<sup>3</sup> for emissions from the engines operating on diesel and biodiesel to allow for a comparison of the results. The results of the revised modelling are presented and discussed below.

The revised modelling has also included prediction of 1-hour mean NO<sub>2</sub> concentrations at different heights above the ground (0.6m, 0.8m and 0.9m) at the St Phillip's Marsh Nursery so that concentrations at a range of heights for the children present at the premises have been assessed. The additional receptors that were included in the modelling undertaken in response to the Council's previous comments<sup>4</sup> have also been included in the latest modelling. This includes receptors located at different heights corresponding to multi-storey buildings at the proposed Paintworks 3 development.

### ***Isopleths***

It is believed that the shape of the contour plots is a genuine effect in the modelling and does not represent an error. Contour plots for the additional modelling referred to above show that for the worse case scenario a similar pattern to the isopleths is seen for all of the years of

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<sup>3</sup> EA worse-case scenario approach of assuming 35% oxidation for 1-hour mean NO<sub>x</sub> concentrations to determine 1-hour mean NO<sub>2</sub> concentrations; and 70% oxidation for annual mean NO<sub>x</sub> concentrations to determine annual mean NO<sub>2</sub> concentrations.

<sup>4</sup> Letter from PJD Consultants Ltd to Ken Reid dated 6<sup>th</sup> April 2016 (Ref: 1750086/L02PD).



meteorological data; however, the contour plots for the typical operating scenario show that the short and long-term impacts are highest to the immediate northeast of the site (as AQC suggested would commonly be observed for Bristol) for all meteorological data years except 2010 (which was the year used in the original modelling). For the typical operating scenario using 2010 data, impacts remain greatest to the south and southwest of the plant. Review of the wind roses shown in **Appendix A1** for 2010 to 2014 shows that the wind rose for 2010 has a considerably larger proportion of north north-easterly winds when compared with the other four years. This is likely to be the primary difference seen for the contour plot of the typical operating scenario using the 2010 modelling compared to the contour plots for the other years, where the modelling is considering two hours operation at the same time each week day in the winter months.

It is considered that the terrain data and buildings included in the modelling are likely to be the primary reason for the impact predicted with the worse-case scenario (i.e. the distribution of the isopleths), where the emissions are occurring under a much wider range of meteorological conditions (particularly direction). The off-site buildings included in the model are both taller than the proposed FGF stacks and are likely to influence the dispersion of the emissions around the site for many wind directions. This is particularly so for the railway workshop building located to the immediate south of the FGF site, where it appears downwash impacts occur to the south and southeast side of the building.

### ***Background Concentrations***

The AQC report suggests that it is unclear whether the results reported are solely from the process contribution (PC) or the predicted environmental concentration (PEC), but assumes that background concentrations have not been included.

It is explained within the air quality assessment that the Process Contribution (PC) has been presented in the assessment (Section 3.3.2) rather than the Predicted Environmental Concentration (PEC). Whilst it is acknowledged that background concentrations are commonly added to model predictions to obtain the PEC, as is clearly set out in Section 3.3.2 of the air quality assessment report, the approach of presenting the PC rather than the PEC is in accordance with the latest Institute of Air Quality Management (IAQM) and Environment Protection UK (EPUK) Guidance on Development Planning and Air Quality<sup>5</sup> for assessing the significance of the effect of short-term concentrations at receptor locations.

The IAQM/EPUK Guidance clearly states that when considering the impact of emissions from a point source on 1-hour mean pollutant concentrations, the severity of the impact should be determined as slight, moderate or substantial without the need to reference background or baseline conditions (paragraph 6.38; p.25 of the guidance). The guidance goes on to state that this approach is intended to be a streamlined and pragmatic assessment procedure that avoids undue complexity. This is even more relevant to the operation of the proposed FGF because the guidance is likely to be more commonly applied to continuous sources of emissions rather than one which operates so irregularly and for so few hours annually (such as the proposed FGF). Therefore, it is considered the presentation of the PC and determination of the severity of the impact on this basis is in accordance with the guidance, the use of which was agreed through consultation with the Council.

Nevertheless, background concentrations have been added to the revised modelling results to provide the PECs. Background NO<sub>2</sub> concentrations from monitoring undertaken in the surrounding area were selected for addition to the predicted concentrations. To reflect the variation in background concentration that is likely to be experienced by a receptor due to the proximity of other emission sources (primarily roads), annual background concentrations ranging from 22.6 to 50.1µg/m<sup>3</sup> were used. The results of the modelling are presented and discussed below.

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<sup>5</sup> Environmental Protection UK & Institute of Air Quality Management; Land Use Planning and Development Control: Planning for Air Quality (May 2015)

## **Averaging Periods**

AQC have suggested that the plant's contribution to annual mean concentrations may be significant, despite only operating for 200 hours. An example is provided assuming the plant gives rise to a 1-hour mean NO<sub>2</sub> concentration of 100µg/m<sup>3</sup> at a receptor location for 200 hours operations, resulting in an annual process contribution of 2.3µg/m<sup>3</sup> at the receptor.

While such an impact is perhaps conceivable, the likelihood is very slim, particularly at a residential receptor or the nursery receptors. While the 99.8<sup>th</sup> percentile of 1-hour means at some receptors is over 100µg/m<sup>3</sup>, this is due to the extreme worse-case assumption that the proposed FGF operates for all the allowable hours (3,830<sup>6</sup> hours per year) and therefore, the 200 highest concentrations that can occur during this period are included in the predictions, which is extremely unlikely to happen at any one receptor location and therefore the annual contribution estimated by AQC has very little chance of occurring in practice at any given receptor location. This is because essentially all of the 200 hours of the plant operation would have to coincide with a significant proportion of the least favourable meteorological conditions for an individual location.

Further modelling has been completed for the most likely annual operating hours for the plant based on national power demand data. This power demand data and modelling scenario are discussed in more detail in the following section; however, national power demand data shows that the operation of the plant is most likely to be confined to operation between 5pm and 7pm on winter (November to February) weekdays. Because this scenario is more representative of the impact the plant would likely have if operational, both long-term as well as short-term mean NO<sub>2</sub> concentrations have been predicted for this scenario to provide an assessment of the likely impact and significance of impacts over both the annual and 1-hour averaging periods.

## **Interpretation**

AQC agreed that the contour plot of the 99.8<sup>th</sup> percentile of 1-hour mean NO<sub>2</sub> concentrations for the plant assumed to be operating for all allowable operating hours represents a reasonable worse-case because it assumed the operation of the plant would coincide with the worse-case meteorology. AQC did not, however, consider that presenting the number of exceedences of the air quality objective was common practice due to potential limitations of the meteorological datasets. AQC also indicated that the scaling of the number of exceedences was too simplistic an approach and that this component of the assessment should be disregarded. AQC suggested a more probability-based approach should be taken to determine how likely it is that meteorological conditions with the potential to give rise to the greatest impacts would coincide with the plant operating and give rise to the impacts predicted by the worse-case scenario.

It is accepted that there are potential limitations to also considering the impact of the proposed FGF based the number of exceedences. It is however, worth noting that local authorities present the number of exceedences of the 1-hour objective in their Air Quality Progress Reports (rather than the 99.8<sup>th</sup> percentile concentrations) to identify compliance with the objective. The Council's monitoring data is also likely to be affected by missing data in the same way AQC suggest the modelling predictions would. In addition, the 99.8<sup>th</sup> percentile concentration would also be affected by exceedences that may have occurred during the gaps in the meteorological dataset.

It was considered that the number of exceedences was a reasonable relative measure of the likelihood that the worse-case impact would occur as it provides an indication of the

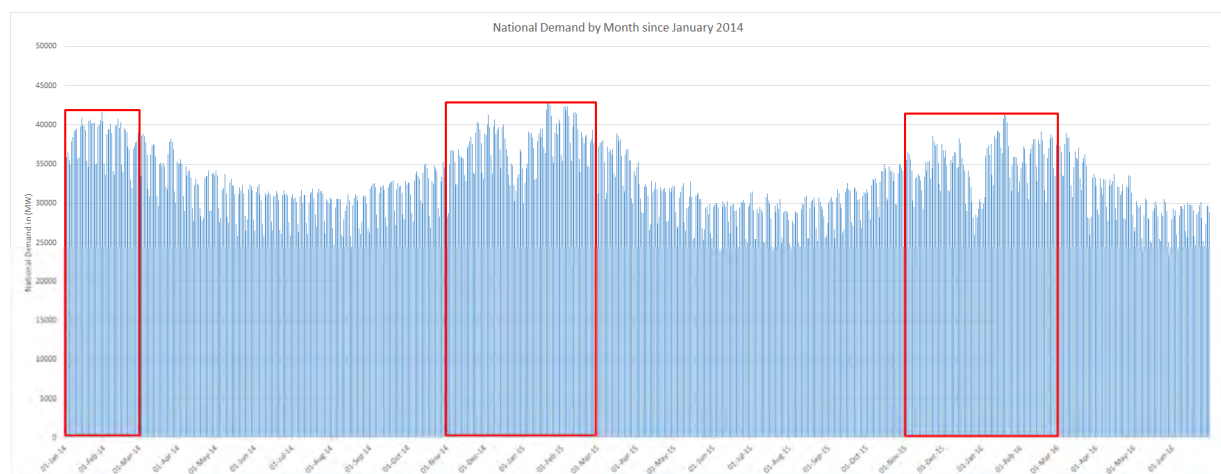
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<sup>6</sup> This is the number of hours modelled for 2010, 2011, 2013 and 2014. For 2012 the number was 3,837hrs. 3,607 hours were quoted in the Air Quality Assessment; however, some operating intervals presented in Appendix D had been extended by 30min to allow them to be accommodated in the modelling over the course of several modelling reports. This also adds some further conservatism to the assessment.

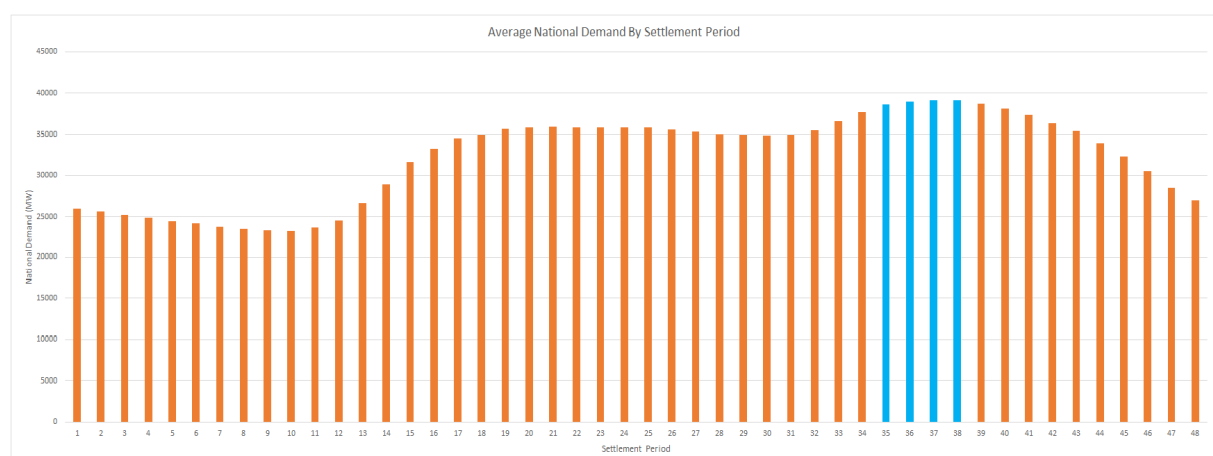
percentage time that exceedances could occur during the allowable operating times for the plant (which was not predicted to exceed 5% of the time the plant is allowed operate at any receptor). It is acknowledged that the scaling of the exceedances is a basic approach; however, this was aimed at providing an estimate only of the number of exceedances when the annual operating hours were taken into account.

To address the issue raised by AQC, data on the power demand on the national grid has been reviewed to identify the most likely operating times for the plant based on peak power demand. **Figures 1 and 2** below show the national power demand by month since January 2014 and the average national daily demand (in half hour increments, referred to as settlement periods in the graph), respectively. This data shows the period of highest demand is over the period 1<sup>st</sup> November to the end of February and that during a 24-hour period (weekday) the power demand peaks between 5pm and 7pm. This data indicates that despite the relatively large number of allowable operating hours throughout the year, the plant is most likely to operate for around an hour between 5pm and 7pm on winter weekdays, as this is when power demand peaks consistently and regularly during the year and when the plant will be required to operate. This equates to approximately 170 hours operation per year. Further modelling of the plant assuming operation of the engines for a 2 hour period on weekdays over the period specified above has been undertaken to determine the potential long and short-term impact of this annual operating profile and these results are presented below together with the other results of the revised modelling.

**Figure 1: National Power Demand since January 2014**



**Figure 2: Average National Power Demand by Hour (over 24-hours)**



## Results of the Revised Modelling

### Background Concentrations

Background concentrations to be added to the model predictions have been selected from results of air quality monitoring carried out in the area modelled. Consultation with BCC indicated that monitoring from the urban background diffusion tube location at Higham Street (located 40m from the nearest road) would be representative of the background NO<sub>2</sub> concentration at the site. Some sensitive receptor locations included in the model are likely to have higher background concentrations than the project site as a result of being closer to roads. The Council's continuous monitoring station at Brislington station is also classified as urban background but is located closer to the A4, being 18m from the kerb of the nearest road. This monitoring location is likely to be representative of receptors located closer to the larger roads in the study area. Monitoring from a roadside diffusion tube location on Bath Road would represent a very worst-case background location for receptor locations adjacent to the roadside as it is located 2m from the kerbside on a busy narrow section of the A4.

For determining the PECs, different background concentrations were selected for different receptor locations based on the 2014 results from the above monitoring sites. The background concentrations are presented in **Table 1**.

**Table 1: Background NO<sub>2</sub> Concentrations used in the Revised Modelling**

Monitoring Location	Annual Mean NO <sub>2</sub> Background Concentration (µg/m <sup>3</sup> )	Short-term Background Concentration (µg/m <sup>3</sup> )
Higham Street (DT)	22.6	45.2
Brislington Depot (AQMS)	31.4	65.8
Bath Road (DT)	50.1	100.2

### Worse-Case Modelling Scenario

This scenario is the same as the scenario presented in the Air Quality assessment, only using the re-calculated temperature and including additional receptors at different heights at the nursery. This scenario represents a worse-case because it assumes the plant operating for all allowable operational hours (approximately 3830hrs), meaning that the operation of the plant will coincide with the worse-case meteorology that occurs during the allowed operating hours. The emission data used for the engines in the revised modelling is provided in *Table A1-1* in **Appendix A1**. The results for the PVMRM and EA Method for conversion of NO<sub>x</sub> to NO<sub>2</sub> for this scenario (assuming the use of both diesel, as a worse-case, and biodiesel) are compared in **Table 2** overleaf. The process contribution, background concentration and PEC are presented for each receptor location in the Table. The results presented are the highest concentrations predicted at each receptor locations for the 5-years of meteorological data 2010 – 2014. A full set of results are provided in **Appendix A2** (Tables A2-1 to A2-8).

The results of the modelling show that as a worse-case (diesel emissions) the highest predicted 99.8<sup>th</sup> hourly concentration as a process contribution exceeds the objective at only a small number of receptors for both the PVMRM and EA Methodology, despite the highly conservative nature of the scenario. For the EA Methodology, concentrations higher than the objective were predicted at three additional industrial receptor locations for the process contribution alone. Exceedences are not predicted at any of the receptor locations that were identified as of concern by the Council (e.g. St Phillips Marsh Nursery or the Paintworks development site) or any other residential locations considered.

It is also worth noting that at a number of receptor locations, the PVMRM model predictions are more conservative than the EA Methodology. This is because the results of the latter

method are reduced by the same factor as the NO<sub>x</sub> emissions, whereas the PVMRM takes account of the oxidation within the model, based on available ozone and, as a result, predicts higher NO<sub>2</sub> concentrations in some locations.

When the background concentrations are added to the process contributions, exceedences of the objective concentration are predicted at an additional seven receptor locations for the PVMRM modelling, including two residential locations (Receptors R40 and R63).

The exceedence at R40 (226 Bath Road) is a result of the conservative background concentration used for this receptor (100.2µg/m<sup>3</sup>). This background concentration is measured 2m from a heavily trafficked section of Bath Road, whereas the receptor modelled is located 5m from a different section of Bath Road that carries a lower traffic flow; as such, the PEC is unlikely to be as high as predicted. The other exceedence at a residential location is predicted to occur at the (future) receptor location at the Paintworks development site. The PECs for all the other locations and heights modelled at the site are predicted to be close to the objective concentration.

The results also suggest there is a very small increase in maximum predicted concentration with increasing height at the Paintworks site; however, the change in concentration only ranges between 3 and 5µg/m<sup>3</sup> for the various locations on the site. No concentrations are predicted to exceed the short-term objective at the Nursery receptors (Receptors R51 – R53 and R74 – R79), with the results showing that there is essentially no difference in the concentration at the different receptor heights considered at this receptor location (0.6m, 0.8m and 0.9m).

For the EA methodology, the addition of the background concentrations to the process contribution results in combined concentrations exceeding the objective at an additional 23 receptors compared to the PVMRM. The large majority of these exceedences are located at the Paintworks development site, where concentrations are predicted to exceed the objective by up to 10% for the worse-case scenario (diesel) and modelling approach.

**Table 2: Highest Predicted 99.8<sup>th</sup> Percentile of 1-Hour Means NO<sub>2</sub> Concentrations at Receptor Locations (Worse-Case Scenario)**

Receptors		Elevation (m, agl)	Short-term Background Concentration (µg/m <sup>3</sup> )	CURRENT MODELLING - 12 x 1.03m Dia, 6m stacks, 59.8 m/s, 105°C (exhaust gases and cooling air)							
				PVMRM Method (used in modelling to date)				EA Methodology (assumes 35% oxidation of NO <sub>x</sub> the NO <sub>2</sub> )			
				Low Sulphur Diesel		Green B+ Bio-diesel		Low Sulphur Diesel		Green B+ Bio-diesel	
				99.8th %ile of Hourly Means (Process Contribution)	99.8th %ile of Hourly Means (PEC)	99.8th %ile of Hourly Means (Process Contribution)	99.8th %ile of Hourly Means (PEC)	99.8th %ile of Hourly Means (Process Contribution)	99.8th %ile of Hourly Means (PEC)	99.8th %ile of Hourly Means (Process Contribution)	99.8th %ile of Hourly Means (PEC)
R1	St Philip's Marsh Depot (south)	1.5	45.20	130.50	175.7	119.26	164.5	<b>272.74</b>	<b>317.9</b>	192.3	<b>237.5</b>
R2	St Philip's Marsh Depot (southwest)	1.5	45.20	156.93	<b>202.1</b>	143.31	188.5	<b>309.02</b>	<b>354.2</b>	<b>218.1</b>	<b>263.3</b>
R3	St Philip's Marsh Depot (southeast)	1.5	45.20	168.22	<b>213.4</b>	144.23	189.4	<b>226.57</b>	<b>271.8</b>	159.6	<b>204.8</b>
R4	KFC	1.5	62.80	142.14	<b>204.9</b>	115.50	178.3	172.07	<b>234.9</b>	121.5	184.3
R5	Carpark (McDonalds)	1.5	62.80	106.52	169.3	85.59	148.4	127.77	190.6	90.2	153.0
R6	Carpark (Avonmean Retail Park)	1.5	45.20	59.61	104.8	52.84	98.0	99.59	144.8	70.3	115.5
R7	Carpark (Costa)	1.5	62.80	106.22	169.0	100.49	163.3	145.12	<b>207.9</b>	102.4	165.2
R8	Showcase Cinema	1.5	62.80	111.92	157.1	101.44	146.6	115.93	161.1	81.6	144.4
R9	St Martins Court (Cole Rd)	1.5	62.80	85.97	148.8	68.62	131.4	74.08	136.9	52.3	115.1
R10	Merchant Trade Park	1.5	62.80	66.24	111.4	56.47	101.7	61.61	106.8	43.5	106.3
R11	Bristol Television	1.5	45.20	115.72	160.9	110.71	155.9	127.08	172.3	89.2	134.4
R12	Avonbank (industrial)	1.5	45.20	<b>217.65</b>	<b>262.9</b>	<b>202.81</b>	<b>248.0</b>	<b>350.88</b>	<b>396.1</b>	<b>247.7</b>	<b>292.9</b>
R13	Industrial site (Meriton Street)	1.5	45.20	115.99	161.2	110.53	155.7	174.33	<b>219.5</b>	123.1	168.3
R14	Industrial site (Albert Road)	1.5	45.20	<b>320.63</b>	<b>365.8</b>	<b>304.17</b>	<b>349.4</b>	<b>417.77</b>	<b>463.0</b>	<b>294.7</b>	<b>339.9</b>
R15	Spark Evans Park	1.5	45.20	<b>220.95</b>	<b>266.2</b>	<b>204.61</b>	<b>249.8</b>	<b>260.53</b>	<b>305.7</b>	183.9	229.1
R16	44 Edward Road	1.5	45.20	104.38	149.6	85.60	130.8	109.37	154.6	77.1	122.3
R17	Black Castle PH	1.5	62.80	76.37	139.2	63.36	126.2	86.60	149.4	61.1	123.9
R18	Sainbury's Carpark	1.5	62.80	60.41	123.2	49.96	112.8	69.77	132.6	49.1	111.9
R19	19 Whitby Road	1.5	45.20	63.29	108.5	60.22	105.4	88.51	133.7	61.0	106.2
R20	Whitby Road Industrial area (S)	1.5	45.20	38.09	83.3	35.68	80.9	54.10	99.3	38.2	83.4
R21	15 Hardenhuish Road	1.5	45.20	36.69	81.9	33.44	78.6	49.34	94.5	34.8	80.0

Receptors		Elevation (m, agl)	Short-term Background Concentration (µg/m <sup>3</sup> )	CURRENT MODELLING - 12 x 1.03m Dia, 6m stacks, 59.8 m/s, 105°C (exhaust gases and cooling air)							
				PVMRM Method (used in modelling to date)				EA Methodology (assumes 35% oxidation of NOx the NO <sub>2</sub> )			
				Low Sulphur Diesel		Green B+ Bio-diesel		Low Sulphur Diesel		Green B+ Bio-diesel	
				99.8th %ile of Hourly Means (Process Contribution)	99.8th %ile of Hourly Means (PEC)	99.8th %ile of Hourly Means (Process Contribution)	99.8th %ile of Hourly Means (PEC)	99.8th %ile of Hourly Means (Process Contribution)	99.8th %ile of Hourly Means (PEC)	99.8th %ile of Hourly Means (Process Contribution)	99.8th %ile of Hourly Means (PEC)
R22	5/7 Kilvert Close	1.5	45.20	16.45	61.6	14.94	60.1	36.86	82.1	26.0	71.2
R23	Whitby Road Industrial area (N)	1.5	45.20	39.35	84.5	36.46	81.7	39.85	85.0	28.1	73.3
R24	St Anne's Junior & Infant Schools	1.0	45.20	14.87	60.1	13.77	59.0	28.32	73.5	20.0	65.2
R25	3 Mardon Road	1.5	45.20	36.13	81.3	31.20	76.4	30.68	75.9	21.7	66.9
R26	Industrial Park (Avonsdie Rd)	1.5	45.20	54.62	99.8	50.76	96.0	47.56	92.8	33.4	78.6
R27	Netham Park	1.5	45.20	41.71	86.9	37.68	82.9	32.71	77.9	23.1	68.3
R28	14 Ford Street	1.5	45.20	46.32	91.5	43.32	88.5	43.08	88.3	30.4	75.6
R29	12 Beaconsfield Close	1.5	62.80	57.49	120.3	48.70	111.5	56.05	118.9	39.6	102.4
R30	Victoria Terrace Comm/Ind	1.5	45.20	127.96	173.2	107.48	152.7	155.50	<b>200.7</b>	109.8	155.0
R31	Playground (Kingsland Road)	1.0	45.20	27.14	72.3	26.03	71.2	27.32	72.5	19.3	64.5
R32	Industrial Area (Silverthorn Lane)	1.5	45.20	51.73	96.9	44.45	89.6	61.50	106.7	43.4	88.6
R33	Industrial area (Gamwal Road)	1.5	45.20	47.94	93.1	38.66	83.9	54.37	99.6	38.4	83.6
R34	Wholesale Fruit Centre (1)	1.5	45.20	125.09	170.3	114.48	159.7	177.38	<b>222.6</b>	123.7	168.9
R35	Wholesale Fruit Centre (2)	1.5	45.20	52.09	97.3	48.44	93.6	74.17	119.4	51.9	97.1
R36	Bristol Temple Meads Station	1.5	62.80	23.19	86.0	20.95	83.7	20.37	83.2	14.4	77.2
R37	Chatterton Square	1.5	45.20	15.56	60.8	13.12	58.3	14.62	59.8	10.3	55.5
R38	1 Higham Street	1.5	45.20	25.47	70.7	23.42	68.6	26.85	72.1	19.0	64.2
R39	The Thunderbolt PH	1.5	100.20	45.74	145.9	41.82	142.0	69.46	169.7	48.7	148.9
R40	226 Bath Road	1.5	100.20	112.65	<b>212.9</b>	106.13	<b>206.3</b>	150.82	<b>251.0</b>	105.8	<b>206.0</b>
R41	Paintworks Phase 3	1.5	45.20	141.89	187.1	127.84	173.0	142.87	188.1	100.6	145.8
R42	Commercial Retail Area (Castle Court)	1.5	62.80	138.44	<b>201.2</b>	111.04	173.8	128.49	191.3	90.4	153.2
R43	Spark Evans Park 2	1.5	45.20	<b>217.78</b>	<b>263.0</b>	197.86	<b>243.1</b>	<b>276.14</b>	<b>321.3</b>	194.9	<b>240.1</b>

Receptors		Elevation (m, agl)	Short-term Background Concentration (µg/m <sup>3</sup> )	CURRENT MODELLING - 12 x 1.03m Dia, 6m stacks, 59.8 m/s, 105°C (exhaust gases and cooling air)							
				PVMRM Method (used in modelling to date)				EA Methodology (assumes 35% oxidation of NOx the NO <sub>2</sub> )			
				Low Sulphur Diesel		Green B+ Bio-diesel		Low Sulphur Diesel		Green B+ Bio-diesel	
				99.8th %ile of Hourly Means (Process Contribution)	99.8th %ile of Hourly Means (PEC)	99.8th %ile of Hourly Means (Process Contribution)	99.8th %ile of Hourly Means (PEC)	99.8th %ile of Hourly Means (Process Contribution)	99.8th %ile of Hourly Means (PEC)	99.8th %ile of Hourly Means (Process Contribution)	99.8th %ile of Hourly Means (PEC)
R44	Spark Evans Park 3	1.5	45.20	205.84	251.0	196.73	241.9	273.74	318.9	192.8	238.0
R45	Spark Evans Park 4	1.5	45.20	208.53	253.7	197.93	243.1	234.00	279.2	164.9	210.1
R46	Spark Evans Park 5	1.5	45.20	199.87	245.1	189.69	234.9	237.85	283.1	167.8	213.0
R47	Spark Evans Park 6	1.5	45.20	202.65	247.8	187.26	232.5	253.45	298.7	178.8	224.0
R48	Paintworks Phase 3 (2)	1.5	45.20	152.31	197.5	137.23	182.4	155.72	200.9	109.8	155.0
R49	Paintworks Phase 3 (3)	1.5	45.20	147.69	192.9	142.25	187.5	171.82	217.0	121.2	166.4
R50	Paintworks Phase 3 (4)	1.5	45.20	147.39	192.6	139.98	185.2	165.36	210.6	116.7	161.9
R51	St Philip's Marsh Nursery School (1)	0.9	45.20	105.12	150.3	98.36	143.6	129.67	174.9	91.5	136.7
R52	St Philip's Marsh Nursery School (2)	0.9	45.20	115.25	160.4	106.51	151.7	131.53	176.7	92.8	138.0
R53	St Philip's Marsh Nursery School (3)	0.9	45.20	123.05	168.2	112.61	157.8	138.53	183.7	97.8	143.0
R54	Paintworks Phase 3 (1)	4.5	45.20	142.05	187.3	131.33	176.5	142.81	188.0	100.5	145.7
R55	Paintworks Phase 3 (1)	7	45.20	143.23	188.4	133.16	178.4	143.07	188.3	100.7	145.9
R56	Paintworks Phase 3 (1)	9.5	45.20	144.42	189.6	132.87	178.1	149.79	195.0	105.6	150.8
R57	Paintworks Phase 3 (1)	11	45.20	145.22	190.4	132.37	177.6	149.61	194.8	105.5	150.7
R58	Paintworks Phase 3 (1)	13.5	45.20	145.78	191.0	135.11	180.3	149.20	194.4	105.2	150.4
R59	Paintworks Phase 3 (2)	4.5	45.20	152.44	197.6	137.05	182.3	156.21	201.4	110.1	155.3
R60	Paintworks Phase 3 (2)	7	45.20	153.21	198.4	136.78	182.0	156.24	201.4	110.1	155.3
R61	Paintworks Phase 3 (2)	9.5	45.20	153.64	198.8	136.39	181.6	159.21	204.4	112.3	157.5
R62	Paintworks Phase 3 (2)	11	45.20	153.95	199.2	136.11	181.3	158.49	203.7	111.8	157.0
R63	Paintworks Phase 3 (2)	13.5	45.20	155.63	200.8	139.08	184.3	164.92	210.1	116.3	161.5
R64	Paintworks Phase 3 (3)	4.5	45.20	148.52	193.7	141.88	187.1	171.43	216.6	120.9	166.1
R65	Paintworks Phase 3 (3)	7	45.20	148.12	193.3	141.21	186.4	172.08	217.3	120.5	165.7



Receptors		Elevation (m, agl)	Short-term Background Concentration (µg/m <sup>3</sup> )	CURRENT MODELLING - 12 x 1.03m Dia, 6m stacks, 59.8 m/s, 105°C (exhaust gases and cooling air)							
				PVMRM Method (used in modelling to date)				EA Methodology (assumes 35% oxidation of NO <sub>x</sub> the NO <sub>2</sub> )			
				Low Sulphur Diesel		Green B+ Bio-diesel		Low Sulphur Diesel		Green B+ Bio-diesel	
				99.8th %ile of Hourly Means (Process Contribution)	99.8th %ile of Hourly Means (PEC)	99.8th %ile of Hourly Means (Process Contribution)	99.8th %ile of Hourly Means (PEC)	99.8th %ile of Hourly Means (Process Contribution)	99.8th %ile of Hourly Means (PEC)	99.8th %ile of Hourly Means (Process Contribution)	99.8th %ile of Hourly Means (PEC)
R66	Paintworks Phase 3 (3)	9.5	45.20	149.29	194.5	142.09	187.3	172.07	<b>217.3</b>	121.1	166.3
R67	Paintworks Phase 3 (3)	11	45.20	152.61	197.8	142.42	187.6	172.10	<b>217.3</b>	121.2	166.4
R68	Paintworks Phase 3 (3)	13.5	45.20	152.95	198.2	144.00	189.2	175.51	<b>220.7</b>	123.1	168.3
R69	Paintworks Phase 3 (4)	4.5	45.20	147.27	192.5	140.64	185.8	167.72	<b>212.9</b>	118.3	163.5
R70	Paintworks Phase 3 (4)	7	45.20	147.54	192.7	141.91	187.1	167.22	<b>212.4</b>	117.9	163.1
R71	Paintworks Phase 3 (4)	9.5	45.20	149.50	194.7	143.20	188.4	169.49	<b>214.7</b>	119.5	164.7
R72	Paintworks Phase 3 (4)	11	45.20	149.87	195.1	142.70	187.9	168.78	<b>214.0</b>	119.0	164.2
R73	Paintworks Phase 3 (4)	13.5	45.20	150.08	195.3	142.79	188.0	167.30	<b>212.5</b>	118.0	163.2
R74	St Philip's Marsh Nursery School (1A)	0.8	45.20	105.03	150.2	98.30	143.5	129.52	174.7	91.4	136.6
R75	St Philip's Marsh Nursery School (2A)	0.8	45.20	115.17	160.4	106.39	151.6	131.40	176.6	92.8	138.0
R76	St Philip's Marsh Nursery School (3A)	0.8	45.20	122.94	168.1	112.51	157.7	138.36	183.6	97.7	142.9
R77	St Philip's Marsh Nursery School (B1)	0.6	45.20	104.85	150.0	98.16	143.4	129.21	174.4	91.2	136.4
R78	St Philip's Marsh Nursery School (2B)	0.6	45.20	115.01	160.2	106.14	151.3	131.15	176.3	92.6	137.8
R79	St Philip's Marsh Nursery School (3B)	0.6	45.20	122.73	167.9	112.32	157.5	138.01	183.2	97.4	142.6

The prediction described above relate to diesel emissions where as the plant will be operated on biodiesel. With the use of bio-diesel, the impacts of the emissions are reduced due to the lower NO<sub>x</sub> emission rate. The PEC is predicted to exceed the objective at only one residential receptor location for both the PVMRM modelling and EA Methodology; this is again R40 and is the result of the conservative background value used. As with the diesel modelling, at a number of receptor locations the PVMRM model predictions are more conservative than the EA Methodology.

**Figures 3 to 7 in Appendix A3** show the process contribution for the proposed FGF for each year of meteorological data. Comparison of these figures shows how the spatial distribution of the worse-case impacts for the proposed FGF varies across the five years of meteorological data. The contour plots follow a similar general pattern with the greatest area of impact to the south of the plant and varying degrees of impact to the north and northeast of the plant.

**Figures 8 to 12 in Appendix A3** show the PEC for each of the years of meteorological data. The contour plots have been prepared using a single background concentration of 62.8µg/m<sup>3</sup>, which has been applied across all receptors to the process contributions shown in **Figures 3 to 7** to provide an indication of the changes on the spatial extent of the impacts when the background concentrations are considered. This background concentration is considered to be conservative for the large majority of the sensitive receptor locations (particularly for the Paintworks site) given the concentration is taken from the Brislington Depot AQMS, where the concentrations are higher than the Higham Street monitoring location. Only locations in close proximity of larger roads in the area are likely to experience a background higher than this. This variation in background has been allowed for in the calculation of the individual receptors considered in the assessment.

The PEC contour plots show that concentrations exceeding the objective are predicted to occur up to around 350m to 400m to the south and southwest of the plant and up to 300m to the north. The majority of this area is occupied by industrial and commercial properties, but includes Spark Evans Park and part of the Paintworks development site to varying degrees depending on the year. Contour plots of the PEC calculated using the EA Methodology have also been included for comparison (**Figures 13 to 17**). The extent of the area where concentrations are predicted to exceed the objective concentrations is greater for the EA Method than the PVMRM, mainly affecting receptor locations to the south and southwest of the plant, which may include some additional residential receptors on Bath Road (for 2010 meteorological data); however, the increased areas where PECs higher than the objective concentration are predicted generally cover industrial and commercial sites and do not include the nursery or any large additional areas of residential development. The greater area over which the objective concentration is predicted to be exceeded can be seen by comparing the corresponding process contribution and PEC contour plots.

While the impacts might be considered significant for this scenario on the basis of these results, it is important to remember that this is a worse-case scenario that requires (at least) 18 hours of the plant operation to coincide with the 18 hours of the worse-case meteorology (occurring during the allowable operating hours). The likelihood of this scenario occurring is very low (as AQC acknowledged in its review). In order to provide a more representative assessment of the potential impact of the emissions from the proposed plant, the likelihood of the plant operating during the worse-case meteorological conditions has been further assessed using a more realistic operating scenario based when national power demand is greatest and the engines are most likely to be called on to operate.

### ***Typical Operating Modelling Scenario***

As referred to above, review of data on national power demand shows that the plant is only likely to operate for an hour on weekdays during the period 5pm to 7pm over the winter months (November to February). As such, this annual operating profile is more representative of the likely actual annual operation of the proposed FGF compared to the worse-case scenario. For the typical operating scenario, the FGF has been assumed to be operating on both diesel and biodiesel over the specified winter months for the two hour period specified to above. The results for each methodology for the diesel scenarios are presented in **Table 3** and **Table 4** overleaf for the same sensitive receptor locations as the worse-case scenario. A full set of results is included in **Appendix A2** (Tables A2-9 to A2-12).

The results for the PVMRM modelling show that for this operational scenario the maximum 1-hour process contribution (i.e. the first highest predicted concentration) is predicted to exceed the objective concentration at only four receptor locations, none of which are residential locations. For the EA Methodology, maximum concentrations greater than the objective are predicted to occur at a number of receptor locations, the majority of which are commercial or industrial locations, but which do include a small number of residential locations and public areas.

The 99.8<sup>th</sup> percentile of 1-hour mean concentrations (i.e. 18<sup>th</sup> highest concentration) as process contributions are predicted to be well below the objective concentration at all the sensitive receptor locations considered in the assessment using the PVMRM. The addition of the background concentrations to the 99.8<sup>th</sup> percentile process contributions does not give rise to PECs greater than the objective concentration in any location. The highest predicted PEC is equivalent to 57% of the objective concentration and occurs at Receptor R40; however, 87% of the PEC at this location is made up of the assumed background concentration which is highly conservative. The background concentrations used to calculate the PEC at the assessment receptors ranges between 27 and 50% of the short-term objective concentration.

For the EA methodology, the 99.8<sup>th</sup> percentile of 1-hour mean process contributions is predicted to exceed the objective at one industrial receptor location to the south of the site (and for only one of the years of meteorological data); however, this location is unlikely to be occupied during the FGF operating period.

**Table 3: Highest Predicted 99.8<sup>th</sup> Percentile of 1-Hour Means NO<sub>2</sub> and Annual Mean Concentrations at Receptor Locations Typical Operating Scenario (PVMRM)**

Receptors		Elevation (m, agl)	WINTER OPERATING HOURS - 12 x 1.03m Dia, 6m stacks, 59.8 m/s, 105°C (exhaust gases and cooling air)						
			Typical Annual Operating Hours - 5 to 7pm, weekdays, November to February; Low Sulphur Diesel						
			PVMRM Method						
			Annual Mean Background Concentration	Annual Mean (PC)	Annual Mean (PEC)	Maximum Predicted 1-hr Mean (Process Contribution)	99.8th %ile of Hourly Means (Process Contribution)	Short-term Background Concentration	99.8th %ile of Hourly Means (PEC)
R1	St Philip's Marsh Depot (south)	1.5	22.6	0.37	22.97	145.99	45.92	45.20	91.1
R2	St Philip's Marsh Depot (southwest)	1.5	22.6	0.14	22.74	130.67	22.40	45.20	67.6
R3	St Philip's Marsh Depot (southeast)	1.5	22.6	0.18	22.78	168.83	18.16	45.20	63.4
R4	KFC	1.5	31.4	0.15	31.55	180.60	21.38	62.80	84.2
R5	Carpark (McDonalds)	1.5	31.4	0.11	31.51	166.28	15.38	62.80	78.2
R6	Carpark (Avonmean Retail Park)	1.5	22.6	0.10	22.70	66.96	14.79	45.20	60.0
R7	Carpark (Costa)	1.5	31.4	0.18	31.58	156.60	27.43	62.80	90.2
R8	Showcase Cinema	1.5	31.4	0.18	22.78	197.63	30.92	62.80	76.1
R9	St Martins Court (Cole Rd)	1.5	31.4	0.17	31.57	88.89	24.03	62.80	86.8
R10	Merchant Trade Park	1.5	31.4	0.17	22.77	128.22	27.88	62.80	73.1
R11	Bristol Television	1.5	22.6	0.12	22.72	82.34	37.31	45.20	82.5
R12	Avonbank (industrial)	1.5	22.6	0.26	22.86	<b>200.36</b>	38.32	45.20	83.5
R13	Industrial site (Meriton Street)	1.5	22.6	0.10	22.70	89.69	11.81	45.20	57.0
R14	Industrial site (Albert Road)	1.5	22.6	0.39	22.99	178.65	7.21	45.20	52.4
R15	Spark Evans Park	1.5	22.6	0.13	22.73	<b>207.17</b>	3.51	45.20	48.7
R16	44 Edward Road	1.5	22.6	0.09	22.69	113.22	8.09	45.20	53.3
R17	Black Castle PH	1.5	31.4	0.05	31.45	168.88	1.51	62.80	64.3
R18	Sainbury's Carpark	1.5	31.4	0.03	31.43	132.37	1.46	62.80	64.3

Receptors		Elevation (m, agl)	WINTER OPERATING HOURS - 12 x 1.03m Dia, 6m stacks, 59.8 m/s, 105°C (exhaust gases and cooling air)						
			Typical Annual Operating Hours - 5 to 7pm, weekdays, November to February; Low Sulphur Diesel						
			PVMRM Method						
			Annual Mean Background Concentration	Annual Mean (PC)	Annual Mean (PEC)	Maximum Predicted 1-hr Mean (Process Contribution)	99.8th %ile of Hourly Means (Process Contribution)	Short-term Background Concentration	99.8th %ile of Hourly Means (PEC)
R19	19 Whitby Road	1.5	22.6	0.06	22.66	188.96	1.44	45.20	46.6
R20	Whitby Road Industrial area (S)	1.5	22.6	0.07	22.67	132.98	7.40	45.20	52.6
R21	15 Hardenhuish Road	1.5	22.6	0.06	22.66	106.74	6.08	45.20	51.3
R22	5/7 Kilvert Close	1.5	22.6	0.05	22.65	28.22	7.96	45.20	53.2
R23	Whitby Road Industrial area (N)	1.5	22.6	0.11	22.71	107.65	16.54	45.20	61.7
R24	St Anne's Junior & Infant Schools	1.0	22.6	0.03	22.63	17.22	6.15	45.20	51.3
R25	3 Mardon Road	1.5	22.6	0.10	22.70	47.98	15.12	45.20	60.3
R26	Industrial Park (Avonsdie Rd)	1.5	22.6	0.14	22.74	98.71	20.75	45.20	65.9
R27	Netham Park	1.5	22.6	0.08	22.68	51.11	16.28	45.20	61.5
R28	14 Ford Street	1.5	22.6	0.12	22.72	65.32	21.77	45.20	67.0
R29	12 Beaconsfield Close	1.5	31.4	0.14	31.54	57.84	23.69	62.80	86.5
R30	Victoria Terrace Commercial/Industrial	1.5	22.6	0.11	22.71	<b>249.67</b>	13.57	45.20	58.8
R31	Playground (Kingsland Road)	1.0	22.6	0.05	22.65	103.50	3.66	45.20	48.9
R32	Industrial Area (Silverthorn Lane)	1.5	22.6	0.08	22.68	147.62	5.54	45.20	50.7
R33	Industrial area (Gamwal Road)	1.5	22.6	0.02	22.62	37.67	2.03	45.20	47.2
R34	Wholesale Fruit Centre (1)	1.5	22.6	0.08	22.68	<b>213.27</b>	5.52	45.20	50.7
R35	Wholesale Fruit Centre (2)	1.5	22.6	0.05	22.65	142.34	2.43	45.20	47.6
R36	Bristol Temple Meads Station	1.5	31.4	0.02	31.42	32.92	2.26	62.80	65.1
R37	Chatterton Square	1.5	22.6	0.02	22.62	24.21	0.94	45.20	46.1
R38	1 Higham Street	1.5	22.6	0.01	22.61	19.56	0.30	45.20	45.5

Receptors		Elevation (m, agl)	WINTER OPERATING HOURS - 12 x 1.03m Dia, 6m stacks, 59.8 m/s, 105°C (exhaust gases and cooling air)						
			Typical Annual Operating Hours - 5 to 7pm, weekdays, November to February; Low Sulphur Diesel						
			PVMRM Method						
			Annual Mean Background Concentration	Annual Mean (PC)	Annual Mean (PEC)	Maximum Predicted 1-hr Mean (Process Contribution)	99.8th %ile of Hourly Means (Process Contribution)	Short-term Background Concentration	99.8th %ile of Hourly Means (PEC)
R39	The Thunderbolt PH	1.5	50.1	0.03	<b>50.13</b>	110.73	2.66	100.20	102.9
R40	226 Bath Road	1.5	50.1	0.13	<b>50.23</b>	162.22	14.34	100.20	114.5
R41	Paintworks Phase 3	1.5	22.6	0.11	22.71	141.89	12.01	45.20	57.2
R42	Commercial Retail Area (Castle Court)	1.5	31.4	0.07	31.47	<b>208.84</b>	2.79	62.80	65.6
R43	Spark Evans Park 2	1.5	22.6	0.13	22.73	184.98	4.49	45.20	49.7
R44	Spark Evans Park 3	1.5	22.6	0.13	22.73	160.10	8.08	45.20	53.3
R45	Spark Evans Park 4	1.5	22.6	0.14	22.74	193.88	13.75	45.20	58.9
R46	Spark Evans Park 5	1.5	22.6	0.14	22.74	169.18	20.77	45.20	66.0
R47	Spark Evans Park 6	1.5	22.6	0.17	22.77	121.96	28.86	45.20	74.1
R48	Paintworks Phase 3 (2)	1.5	22.6	0.11	22.71	104.81	16.33	45.20	61.5
R49	Paintworks Phase 3 (3)	1.5	22.6	0.12	22.72	89.47	22.09	45.20	67.3
R50	Paintworks Phase 3 (4)	1.5	22.6	0.14	22.74	84.64	30.02	45.20	75.2
R51	St Philip's Marsh Nursery School (1)	0.9	22.6	0.06	22.66	91.40	3.99	45.20	49.2
R52	St Philip's Marsh Nursery School (2)	0.9	22.6	0.07	22.67	117.08	4.02	45.20	49.2
R53	St Philip's Marsh Nursery School (3)	0.9	22.6	0.07	22.67	134.72	3.53	45.20	48.7
R54	Paintworks Phase 3 (1)	4.5	22.6	0.11	22.71	142.40	11.53	45.20	56.7
R55	Paintworks Phase 3 (1)	7	22.6	0.11	22.71	143.23	11.52	45.20	56.7
R56	Paintworks Phase 3 (1)	9.5	22.6	0.11	22.71	144.42	11.49	45.20	56.7
R57	Paintworks Phase 3 (1)	11	22.6	0.11	22.71	145.31	11.48	45.20	56.7
R58	Paintworks Phase 3 (1)	13.5	22.6	0.12	22.72	142.91	12.75	45.20	58.0

Receptors		Elevation (m, agl)	WINTER OPERATING HOURS - 12 x 1.03m Dia, 6m stacks, 59.8 m/s, 105°C (exhaust gases and cooling air)						
			Typical Annual Operating Hours - 5 to 7pm, weekdays, November to February; Low Sulphur Diesel						
			PVMRM Method						
			Annual Mean Background Concentration	Annual Mean (PC)	Annual Mean (PEC)	Maximum Predicted 1-hr Mean (Process Contribution)	99.8th %ile of Hourly Means (Process Contribution)	Short-term Background Concentration	99.8th %ile of Hourly Means (PEC)
R59	Paintworks Phase 3 (2)	4.5	22.6	0.10	22.70	105.30	14.91	45.20	60.1
R60	Paintworks Phase 3 (2)	7	22.6	0.10	22.70	106.14	15.71	45.20	60.9
R61	Paintworks Phase 3 (2)	9.5	22.6	0.11	22.71	107.34	15.31	45.20	60.5
R62	Paintworks Phase 3 (2)	11	22.6	0.11	22.71	98.30	14.88	45.20	60.1
R63	Paintworks Phase 3 (2)	13.5	22.6	0.12	22.72	99.87	14.20	45.20	59.4
R64	Paintworks Phase 3 (3)	4.5	22.6	0.11	22.71	75.37	20.09	45.20	65.3
R65	Paintworks Phase 3 (3)	7	22.6	0.11	22.71	77.29	20.67	45.20	65.9
R66	Paintworks Phase 3 (3)	9.5	22.6	0.11	22.71	89.34	20.40	45.20	65.6
R67	Paintworks Phase 3 (3)	11	22.6	0.11	22.71	98.48	20.03	45.20	65.2
R68	Paintworks Phase 3 (3)	13.5	22.6	0.12	22.72	116.88	20.62	45.20	65.8
R69	Paintworks Phase 3 (4)	4.5	22.6	0.13	22.73	84.29	28.24	45.20	73.4
R70	Paintworks Phase 3 (4)	7	22.6	0.13	22.73	91.34	26.93	45.20	72.1
R71	Paintworks Phase 3 (4)	9.5	22.6	0.13	22.73	103.28	26.04	45.20	71.2
R72	Paintworks Phase 3 (4)	11	22.6	0.13	22.73	112.35	25.64	45.20	70.8
R73	Paintworks Phase 3 (4)	13.5	22.6	0.13	22.73	130.58	25.00	45.20	70.2
R74	St Philip's Marsh Nursery School (1A)	0.8	22.6	0.06	22.66	91.30	3.98	45.20	49.2
R75	St Philip's Marsh Nursery School (2A)	0.8	22.6	0.07	22.67	116.94	4.01	45.20	49.2
R76	St Philip's Marsh Nursery School (3A)	0.8	22.6	0.07	22.67	134.56	3.52	45.20	48.7
R77	St Philip's Marsh Nursery School (1B)	0.6	22.6	0.06	22.66	91.09	3.97	45.20	49.2
R78	St Philip's Marsh Nursery School (2B)	0.6	22.6	0.06	22.66	116.66	4.00	45.20	49.2

Receptors		Elevation (m, agl)	WINTER OPERATING HOURS - 12 x 1.03m Dia, 6m stacks, 59.8 m/s, 105°C (exhaust gases and cooling air)						
			Typical Annual Operating Hours - 5 to 7pm, weekdays, November to February; Low Sulphur Diesel						
			PVMRM Method						
			Annual Mean Background Concentration	Annual Mean (PC)	Annual Mean (PEC)	Maximum Predicted 1-hr Mean (Process Contribution)	99.8th %ile of Hourly Means (Process Contribution)	Short-term Background Concentration	99.8th %ile of Hourly Means (PEC)
R79	St Philip's Marsh Nursery School (3B)	0.6	22.6	0.07	22.67	134.23	3.51	45.20	48.7



**Table 4: Highest Predicted 99.8<sup>th</sup> Percentile of 1-Hour Means NO<sub>2</sub> and Annual Mean Concentrations at Receptor Locations - Typical Operating Scenario (EA Methodology)**

Receptors		Elevation (m, agl)	WINTER OPERATING HOURS - 12 x 1.03m Dia, 6m stacks, 59.8 m/s, 105°C (exhaust gases and cooling air)						
			Typical Annual Operating Hours - 5 to 7pm, weekdays, Nov to February; Low Sulphur Diesel						
			EA Methodology (assumes 35% oxidation of NO <sub>x</sub> the NO <sub>2</sub> for short-term concentrations; and 70% for long-term concentrations)						
			Annual Mean Background Concentration	Annual Mean (PC)	Annual Mean (PEC)	Maximum Predicted 1-hr Mean (Process Contribution)	99.8th %ile of Hourly Means (Process Contribution)	Short-term Background Concentration	99.8th %ile of Hourly Means (PEC)
R1	St Philip's Marsh Depot (south)	1.5	22.6	2.31	24.91	292.28	112.11	45.20	157.3
R2	St Philip's Marsh Depot (southwest)	1.5	22.6	0.87	23.47	<b>404.89</b>	92.48	45.20	137.7
R3	St Philip's Marsh Depot (southeast)	1.5	22.6	0.84	23.44	<b>286.99</b>	84.61	45.20	129.8
R4	KFC	1.5	31.4	0.75	32.15	<b>293.51</b>	84.12	62.80	146.9
R5	Car park (McDonalds)	1.5	31.4	0.57	31.97	<b>282.88</b>	55.20	62.80	118.0
R6	Car park (Avonmean Retail Park)	1.5	22.6	0.65	23.25	131.63	69.35	45.20	114.6
R7	Car park (Costa)	1.5	31.4	1.17	32.57	<b>279.92</b>	97.72	62.80	160.5
R8	Showcase Cinema	1.5	31.4	0.93	23.53	198.46	69.99	62.80	115.2
R9	St Martin's Court (Cole Rd)	1.5	31.4	0.58	31.98	81.86	51.62	62.80	114.4
R10	Merchant Trade Park	1.5	31.4	0.39	22.99	115.58	35.86	62.80	81.1
R11	Bristol Television	1.5	22.6	0.96	23.56	155.74	104.26	45.20	149.5
R12	Avonbank (industrial)	1.5	22.6	1.53	24.13	<b>362.86</b>	180.89	45.20	<b>226.1</b>
R13	Industrial site (Meriton Street)	1.5	22.6	0.61	23.21	183.18	109.77	45.20	155.0
R14	Industrial site (Albert Road)	1.5	22.6	2.76	25.36	<b>475.95</b>	<b>299.60</b>	45.20	<b>344.8</b>
R15	Spark Evans Park	1.5	22.6	0.54	23.14	<b>427.13</b>	9.85	45.20	55.0
R16	44 Edward Road	1.5	22.6	0.38	22.98	<b>248.90</b>	20.03	45.20	65.2
R17	Black Castle PH	1.5	31.4	0.19	31.59	<b>366.68</b>	1.82	62.80	64.6
R18	Sainsbury's Car park	1.5	31.4	1.19	32.59	<b>249.75</b>	1.19	62.80	64.0
R19	19 Whitby Road	1.5	22.6	0.17	22.77	<b>331.86</b>	2.87	45.20	48.1

Receptors		Elevation (m, agl)	WINTER OPERATING HOURS - 12 x 1.03m Dia, 6m stacks, 59.8 m/s, 105°C (exhaust gases and cooling air)						
			Typical Annual Operating Hours - 5 to 7pm, weekdays, Nov to February; Low Sulphur Diesel						
			EA Methodology (assumes 35% oxidation of NO <sub>x</sub> the NO <sub>2</sub> for short-term concentrations; and 70% for long-term concentrations)						
			Annual Mean Background Concentration	Annual Mean (PC)	Annual Mean (PEC)	Maximum Predicted 1-hr Mean (Process Contribution)	99.8th %ile of Hourly Means (Process Contribution)	Short-term Background Concentration	99.8th %ile of Hourly Means (PEC)
R20	Whitby Road Industrial area (S)	1.5	22.6	0.23	22.83	<b>209.74</b>	17.45	45.20	62.7
R21	15 Hardenhuish Road	1.5	22.6	0.19	22.79	167.07	13.91	45.20	59.1
R22	5/7 Kilvert Close	1.5	22.6	0.17	22.77	52.45	25.05	45.20	70.2
R23	Whitby Road Industrial area (N)	1.5	22.6	0.25	22.85	178.95	27.11	45.20	72.3
R24	St Anne's Junior & Infant Schools	1.0	22.6	0.19	22.79	31.34	17.80	45.20	63.0
R25	3 Mardon Road	1.5	22.6	0.17	22.77	105.37	15.81	45.20	61.0
R26	Industrial Park (Avonsdie Rd)	1.5	22.6	0.25	22.85	88.02	20.97	45.20	66.2
R27	Netham Park	1.5	22.6	0.19	22.79	40.42	16.45	45.20	61.6
R28	14 Ford Street	1.5	22.6	0.24	22.84	70.24	22.64	45.20	67.8
R29	12 Beaconsfield Close	1.5	31.4	0.33	31.73	61.49	36.40	62.80	99.2
R30	Victoria Terrace Comm/Ind	1.5	22.6	0.45	23.05	359.41	63.56	45.20	108.8
R31	Playground (Kingsland Road)	1.0	22.6	0.12	22.72	122.20	7.85	45.20	53.1
R32	Industrial Area (Silverthorn Lane)	1.5	22.6	0.25	22.85	177.91	15.18	45.20	60.4
R33	Industrial area (Gamwal Road)	1.5	22.6	0.12	22.72	61.57	6.57	45.20	51.8
R34	Wholesale Fruit Centre (1)	1.5	22.6	0.51	23.11	<b>509.52</b>	26.94	45.20	72.1
R35	Wholesale Fruit Centre (2)	1.5	22.6	0.25	22.85	<b>400.29</b>	16.84	45.20	62.0
R36	Bristol Temple Meads Station	1.5	31.4	0.05	31.45	38.13	2.26	62.80	65.1
R37	Chatterton Square	1.5	22.6	0.03	22.63	20.84	2.65	45.20	47.8
R38	1 Higham Street	1.5	22.6	0.06	22.66	51.17	2.63	45.20	47.8
R39	The Thunderbolt PH	1.5	50.1	0.11	50.21	<b>218.86</b>	5.47	100.20	105.7
R40	226 Bath Road	1.5	50.1	0.53	50.63	<b>330.98</b>	40.98	100.20	141.2

Receptors		Elevation (m, agl)	WINTER OPERATING HOURS - 12 x 1.03m Dia, 6m stacks, 59.8 m/s, 105°C (exhaust gases and cooling air)						
			Typical Annual Operating Hours - 5 to 7pm, weekdays, Nov to February; Low Sulphur Diesel						
			EA Methodology (assumes 35% oxidation of NOx the NO <sub>2</sub> for short-term concentrations; and 70% for long-term concentrations)						
			Annual Mean Background Concentration	Annual Mean (PC)	Annual Mean (PEC)	Maximum Predicted 1-hr Mean (Process Contribution)	99.8th %ile of Hourly Means (Process Contribution)	Short-term Background Concentration	99.8th %ile of Hourly Means (PEC)
R41	Paintworks Phase 3	1.5	22.6	0.49	23.09	189.74	28.36	45.20	73.6
R42	Commercial Retail Area (Castle Court)	1.5	31.4	0.27	31.67	<b>459.50</b>	3.01	62.80	65.8
R43	Spark Evans Park 2	1.5	22.6	0.57	23.17	<b>349.32</b>	13.13	45.20	58.3
R44	Spark Evans Park 3	1.5	22.6	0.62	23.22	<b>297.28</b>	21.52	45.20	66.7
R45	Spark Evans Park 4	1.5	22.6	0.70	23.30	<b>322.70</b>	38.60	45.20	83.8
R46	Spark Evans Park 5	1.5	22.6	0.81	23.41	<b>277.46</b>	62.98	45.20	108.2
R47	Spark Evans Park 6	1.5	22.6	1.06	23.66	<b>285.64</b>	118.13	45.20	163.3
R48	Paintworks Phase 3 (2)	1.5	22.6	0.53	23.13	189.71	41.16	45.20	86.4
R49	Paintworks Phase 3 (3)	1.5	22.6	0.62	23.22	186.38	59.42	45.20	104.6
R50	Paintworks Phase 3 (4)	1.5	22.6	0.75	23.35	183.71	83.70	45.20	128.9
R51	St Philip's Marsh Nursery School (1)	0.9	22.6	0.35	22.95	180.22	44.37	45.20	89.6
R52	St Philip's Marsh Nursery School (2)	0.9	22.6	0.36	22.96	<b>228.77</b>	29.93	45.20	75.1
R53	St Philip's Marsh Nursery School (3)	0.9	22.6	0.37	22.97	<b>260.18</b>	24.62	45.20	69.8
R54	Paintworks Phase 3 (1)	4.5	22.6	0.48	23.08	190.36	28.18	45.20	73.4
R55	Paintworks Phase 3 (1)	7	22.6	0.49	23.09	191.38	28.64	45.20	73.8
R56	Paintworks Phase 3 (1)	9.5	22.6	0.51	23.11	192.84	30.00	45.20	75.2
R57	Paintworks Phase 3 (1)	11	22.6	0.53	23.13	<b>207.66</b>	31.29	45.20	76.5
R58	Paintworks Phase 3 (1)	13.5	22.6	0.56	23.16	<b>237.78</b>	32.50	45.20	77.7
R59	Paintworks Phase 3 (2)	4.5	22.6	0.53	23.13	189.75	41.21	45.20	86.4
R60	Paintworks Phase 3 (2)	7	22.6	0.53	23.13	189.39	41.24	45.20	86.4

Receptors		Elevation (m, agl)	WINTER OPERATING HOURS - 12 x 1.03m Dia, 6m stacks, 59.8 m/s, 105°C (exhaust gases and cooling air)						
			Typical Annual Operating Hours - 5 to 7pm, weekdays, Nov to February; Low Sulphur Diesel						
			EA Methodology (assumes 35% oxidation of NOx the NO <sub>2</sub> for short-term concentrations; and 70% for long-term concentrations)						
			Annual Mean Background Concentration	Annual Mean (PC)	Annual Mean (PEC)	Maximum Predicted 1-hr Mean (Process Contribution)	99.8th %ile of Hourly Means (Process Contribution)	Short-term Background Concentration	99.8th %ile of Hourly Means (PEC)
R61	Paintworks Phase 3 (2)	9.5	22.6	0.55	23.15	188.71	41.31	45.20	86.5
R62	Paintworks Phase 3 (2)	11	22.6	0.56	23.16	188.17	41.38	45.20	86.6
R63	Paintworks Phase 3 (2)	13.5	22.6	0.59	23.19	187.07	41.50	45.20	86.7
R64	Paintworks Phase 3 (3)	4.5	22.6	0.61	23.21	186.20	59.28	45.20	104.5
R65	Paintworks Phase 3 (3)	7	22.6	0.61	23.21	185.67	59.10	45.20	104.3
R66	Paintworks Phase 3 (3)	9.5	22.6	0.62	23.22	185.29	59.07	45.20	104.3
R67	Paintworks Phase 3 (3)	11	22.6	0.63	23.23	185.62	58.91	45.20	104.1
R68	Paintworks Phase 3 (3)	13.5	22.6	0.65	23.25	196.98	61.65	45.20	106.9
R69	Paintworks Phase 3 (4)	4.5	22.6	0.75	23.35	183.95	83.77	45.20	129.0
R70	Paintworks Phase 3 (4)	7	22.6	0.75	23.35	198.40	83.61	45.20	128.8
R71	Paintworks Phase 3 (4)	9.5	22.6	0.76	23.36	<b>224.34</b>	83.69	45.20	128.9
R72	Paintworks Phase 3 (4)	11	22.6	0.76	23.36	<b>244.04</b>	85.31	45.20	130.5
R73	Paintworks Phase 3 (4)	13.5	22.6	0.78	23.38	<b>283.64</b>	84.34	45.20	129.5
R74	St Philip's Marsh Nursery School (1A)	0.8	22.6	0.35	22.95	180.01	44.32	45.20	89.5
R75	St Philip's Marsh Nursery School (2A)	0.8	22.6	0.36	22.96	<b>228.49</b>	29.90	45.20	75.1
R76	St Philip's Marsh Nursery School (3A)	0.8	22.6	0.37	22.97	<b>259.86</b>	24.59	45.20	69.8
R77	St Philip's Marsh Nursery School (B1)	0.6	22.6	0.35	22.95	179.58	44.21	45.20	89.4
R78	St Philip's Marsh Nursery School (2B)	0.6	22.6	0.36	22.96	<b>227.92</b>	29.83	45.20	75.0
R79	St Philip's Marsh Nursery School (3B)	0.6	22.6	0.37	22.97	<b>259.20</b>	24.52	45.20	69.7

The addition of background concentrations results in a PEC exceeding the objective at one further industrial receptor to the northwest of the site. The results show that with the exception of one of the locations in Spark Evans Park, the predicted short-term PEC at all residential, care, educational and public receptor locations is well below the objective (<65%). The highest PEC predicted at the park receptors equates to 82% of the objective concentration.

With respect to long-term impacts, for the PVMRM, the highest annual mean process contribution at sensitive receptor locations (where exposure is relevant to the annual averaging period) is less than 1% of the objective. For the EA Methodology, the annual mean process contribution is less than 2% at all receptor locations where relevant exposure exists. The annual PECs are also well below the objective for annual mean NO<sub>2</sub> concentrations at all receptors for both methodologies, with the exception of the concentration predicted at Receptor R40, where a conservative background concentration of 50.1µg/m<sup>3</sup> has been applied.

The background concentration at this location is likely to be lower than the concentration applied in this assessment; however, given the receptor is only 5m from the roadside, annual mean concentrations approaching the objective may be experienced in this location. For the PVMRM, the process contribution at this location is less than 0.5% of the objective for annual mean NO<sub>2</sub> concentrations; and for the EA methodology, the process contribution is 1% of the objective; therefore, it is unlikely that the emission from the plant would be the significant contributor to any exceedence of the annual objective in this location.

**Figures 18 to 22 in Appendix A3** show the short-term mean PECs for each of the years of meteorological data for the typical operating scenario using the PVMRM and **Figures 23 to 27** show the short-term mean PECs for the EA Methodology. A single background concentration (62.8µg/m<sup>3</sup>) has again been applied to the process contribution to provide an indication of the changes on the spatial distribution of the impacts when the background concentrations are considered compared with the worse-case operating scenario. Comparison of **Figures 18 to 27** with the corresponding figures for the worse-case operating scenario (PVMRM and EA Methodology) clearly shows the reduced impact associated with the typical operating scenario relative to the worse-case scenario.

Concentrations are not predicted to exceed the objective concentration for any of the years for the PVMRM modelling. For the EA Methodology, the contours plots show that there is some potential for concentrations to be above the objective in the area immediately surrounding the site; however, the area where the exceedences are predicted is industrial in nature and where the impact it not obviously likely to be the cause of harm, particularly because many of the sites may not be operating at the time the plant is operating and, added to which, members of the public would not have access to the locations. The IAQM/EPUK guidance also indicates that where people are working in a location where an objective may not be met the impact is not likely to be classified as significant because occupational standards are different to the ambient air quality objectives.

**Figures 28 to 32 in Appendix A3** show contour plots of the annual mean PECs for each of the five years of meteorological data for the PVMRM modelling. The contour plots and the data in **Table 3** show that the emissions from the plant operating according to a typical annual profile have only a very small impact on annual mean concentrations at receptor locations in the area surrounding the plant. **Figures 33 to 37** show the corresponding contour plots for the EA Methodology, which show a slightly higher impact compared with the PVMRM; however, no exceedences of the objective for annual mean NO<sub>2</sub> concentrations are predicted to occur with the conservative background concentrations of 31.4µg/m<sup>3</sup>.

The results from the modelling of the typical operating scenario show that the impact of emissions from the plant when operating according to a more representative annual operating profile is likely to be considerably less than those predicted for the worse-case scenario and provide more realistic assessment of the potential impact of the proposed plant.

In addition to this, the results presented above are for the worse-case emissions from the proposed FGF as it has been assumed that the plant is operating on diesel. It is proposed that the engines at the facility would be powered by biodiesel which will have a lesser impact on ambient NO<sub>2</sub> concentration due to the lower NO<sub>x</sub> emissions. **Tables 5 and 6** show the results of the modelling of biodiesel emissions for the typical operating hours for the PVMRM and the EA Methodology, respectively. A full set of results is provided in **Appendix A2** (Tables A1-13 to A1-16).

The results of the PVMRM modelling show that the reduction in NO<sub>x</sub> emissions associated with the use of biodiesel could lead to reductions in maximum 1-hour mean NO<sub>2</sub> concentrations of between approximately 5% and 11% for residential receptors, 5.5% for the Nursery, between 3.4% and 9% for the recreational locations and up to 16% for industrial/commercial receptor locations. For the 99.8<sup>th</sup> percentile concentrations, the reductions in concentration vary from 3% to 29%. For the EA Methodology, the highest predicted NO<sub>2</sub> concentrations are reduced at all receptor locations by the same as the assumed relative reduction in NO<sub>x</sub> emissions (29%) because the NO<sub>2</sub> concentrations are calculated by applying a factor to the NO<sub>x</sub> concentration predicted at the receptor.

A similar pattern is seen with the annual mean concentrations where reductions range between 8.5% and 15% across all receptor locations for the PVMRM. For the EA Methodology, the annual mean NO<sub>2</sub> concentrations are again all reduced by the same factor as the NO<sub>x</sub> emissions.

**Figures 33 to 37** in **Appendix A3** show the contour plots for the 99.8<sup>th</sup> percentile of 1-hour means for each year of meteorology for the PVMRM modelling and **Figures 38 to 42** are the corresponding contour plots for the EA Methodology. Comparison of these figures with the corresponding figures for diesel emissions (Figures 18 to 27) shows the reduction in the extent of impact of the emissions with the use of biodiesel.

**Table 5: Highest Predicted 99.8<sup>th</sup> Percentile of 1-Hour Means NO<sub>2</sub> and Annual Mean Concentrations at Receptor Locations Typical Operating Scenario (PVMRM) – Biodiesel**

Receptors		Elevation (m, agl)	WINTER OPERATING HOURS - 12 x 1.03m Dia, 6m stacks, 59.8 m/s, 105°C (exhaust gases and cooling air)						
			PVMRM Method (used in modelling to date) - 5 to 7pm, weekdays, Nov to February						
			Green D+ Bio-diesel						
			Annual Mean Background Concentration	Annual Mean (PC)	Annual Mean (PEC)	Maximum Predicted 1- hr Mean (Process Contribution)	99.8th %ile of Hourly Means (Process Contribution)	Short-term Background Concentration	99.8th %ile of Hourly Means (PEC)
R1	St Philip's Marsh Depot (south)	1.5	22.6	0.32	22.9	136.8	41.2	45.2	86.4
R2	St Philip's Marsh Depot (southwest)	1.5	22.6	0.12	22.7	92.2	18.7	45.2	63.9
R3	St Philip's Marsh Depot (southeast)	1.5	22.6	0.16	22.8	159.1	16.4	45.2	61.6
R4	KFC	1.5	31.4	0.13	31.5	172.1	16.6	62.8	79.4
R5	Carpark (McDonalds)	1.5	31.4	0.10	31.5	158.8	11.9	62.8	74.7
R6	Carpark (Avonmean Retail Park)	1.5	22.6	0.09	22.7	63.1	13.1	45.2	58.3
R7	Carpark (Costa)	1.5	31.4	0.15	31.6	144.8	24.2	62.8	87.0
R8	Showcase Cinema	1.5	31.4	0.16	22.8	189.3	28.7	62.8	73.9
R9	St Martins Court (Cole Rd)	1.5	31.4	0.16	31.6	74.4	21.1	62.8	83.9
R10	Merchant Trade Park	1.5	31.4	0.15	22.7	123.4	25.3	62.8	70.5
R11	Bristol Television	1.5	22.6	0.17	22.8	78.6	33.7	45.2	78.9
R12	Avonbank (industrial)	1.5	22.6	0.23	22.8	185.1	32.7	45.2	77.9
R13	Industrial site (Meriton Street)	1.5	22.6	0.09	22.7	84.5	9.8	45.2	55.0
R14	Industrial site (Albert Road)	1.5	22.6	0.33	22.9	162.2	61.7	45.2	106.9
R15	Spark Evans Park	1.5	22.6	0.11	22.7	189.2	3.1	45.2	48.3
R16	44 Edward Road	1.5	22.6	0.08	22.7	102.8	6.2	45.2	51.4
R17	Black Castle PH	1.5	31.4	0.05	31.4	153.5	1.4	62.8	64.2
R18	Sainbury's Carpark	1.5	31.4	0.04	31.4	121.9	1.6	62.8	64.4

Receptors		Elevation (m, agl)	WINTER OPERATING HOURS - 12 x 1.03m Dia, 6m stacks, 59.8 m/s, 105°C (exhaust gases and cooling air)						
			PVMRM Method (used in modelling to date) - 5 to 7pm, weekdays, Nov to February						
			Green D+ Bio-diesel						
			Annual Mean Background Concentration	Annual Mean (PC)	Annual Mean (PEC)	Maximum Predicted 1- hr Mean (Process Contribution)	99.8th %ile of Hourly Means (Process Contribution)	Short-term Background Concentration	99.8th %ile of Hourly Means (PEC)
R19	19 Whitby Road	1.5	22.6	0.05	22.7	175.0	1.3	45.2	46.5
R20	Whitby Road Industrial area (S)	1.5	22.6	0.06	22.7	124.2	6.5	45.2	51.7
R21	15 Hardenhuish Road	1.5	22.6	0.05	22.7	99.7	5.3	45.2	50.5
R22	5/7 Kilvert Close	1.5	22.6	0.04	22.6	26.0	7.1	45.2	52.3
R23	Whitby Road Industrial area (N)	1.5	22.6	0.10	22.7	100.1	14.0	45.2	59.2
R24	St Anne's Junior & Infant Schools	1.0	22.6	0.03	22.6	16.4	5.6	45.2	50.8
R25	3 Mardon Road	1.5	22.6	0.09	22.7	44.8	12.8	45.2	58.0
R26	Industrial Park (Avonsdie Rd)	1.5	22.6	0.12	22.7	95.0	18.0	45.2	63.2
R27	Netham Park	1.5	22.6	0.10	22.7	49.4	13.8	45.2	59.0
R28	14 Ford Street	1.5	22.6	0.11	22.7	62.4	17.7	45.2	62.9
R29	12 Beaconsfield Close	1.5	31.4	0.12	31.5	55.0	22.2	62.8	85.0
R30	Victoria Terrace Comm/Ind	1.5	22.6	0.10	22.7	<b>234.6</b>	11.3	45.2	56.5
R31	Playground (Kingsland Road)	1.0	22.6	0.04	22.6	98.4	3.5	45.2	48.7
R32	Industrial Area (Silverthorn Lane)	1.5	22.6	0.08	22.7	141.4	5.3	45.2	50.5
R33	Industrial area (Gamwal Road)	1.5	22.6	0.02	22.6	35.8	1.9	45.2	47.1
R34	Wholesale Fruit Centre (1)	1.5	22.6	0.07	22.7	193.3	5.1	45.2	50.3
R35	Wholesale Fruit Centre (2)	1.5	22.6	0.04	22.6	125.5	2.0	45.2	47.2
R36	Bristol Temple Meads Station	1.5	31.4	0.02	31.4	30.4	1.6	62.8	64.4
R37	Chatterton Square	1.5	22.6	0.01	22.6	17.1	0.7	45.2	45.9
R38	1 Higham Street	1.5	22.6	0.01	22.6	17.4	0.3	45.2	45.5



Receptors		Elevation (m, agl)	WINTER OPERATING HOURS - 12 x 1.03m Dia, 6m stacks, 59.8 m/s, 105°C (exhaust gases and cooling air)						
			PVMRM Method (used in modelling to date) - 5 to 7pm, weekdays, Nov to February						
			Green D+ Bio-diesel						
			Annual Mean Background Concentration	Annual Mean (PC)	Annual Mean (PEC)	Maximum Predicted 1- hr Mean (Process Contribution)	99.8th %ile of Hourly Means (Process Contribution)	Short-term Background Concentration	99.8th %ile of Hourly Means (PEC)
R39	The Thunderbolt PH	1.5	50.1	0.03	50.1	104.8	2.4	100.2	102.6
R40	226 Bath Road	1.5	50.1	0.12	50.2	157.7	12.8	100.2	113.0
R41	Paintworks Phase 3	1.5	22.6	0.10	22.7	134.5	10.6	45.2	55.8
R42	Commercial Retail Area (Castle Court)	1.5	31.4	0.07	31.5	189.5	2.7	62.8	65.5
R43	Spark Evans Park 2	1.5	22.6	0.12	22.7	170.3	4.0	45.2	49.2
R44	Spark Evans Park 3	1.5	22.6	0.12	22.7	147.6	7.1	45.2	52.3
R45	Spark Evans Park 4	1.5	22.6	0.12	22.7	180.7	12.2	45.2	57.4
R46	Spark Evans Park 5	1.5	22.6	0.13	22.7	158.6	18.5	45.2	63.7
R47	Spark Evans Park 6	1.5	22.6	0.15	22.7	115.0	25.3	45.2	70.5
R48	Paintworks Phase 3 (2)	1.5	22.6	0.10	22.7	99.9	14.7	45.2	59.9
R49	Paintworks Phase 3 (3)	1.5	22.6	0.11	22.7	83.4	20.4	45.2	65.6
R50	Paintworks Phase 3 (4)	1.5	22.6	0.12	22.7	77.2	25.6	45.2	70.8
R51	St Philip's Marsh Nursery School (1)	0.9	22.6	0.05	22.7	86.3	2.8	45.2	48.0
R52	St Philip's Marsh Nursery School (2)	0.9	22.6	0.06	22.7	110.6	3.0	45.2	48.2
R53	St Philip's Marsh Nursery School (3)	0.9	22.6	0.06	22.7	127.3	3.1	45.2	48.3
R54	Paintworks Phase 3 (1)	4.5	22.6	0.10	22.7	135.0	10.4	45.2	55.6
R55	Paintworks Phase 3 (1)	7	22.6	0.10	22.7	135.8	10.3	45.2	55.5
R56	Paintworks Phase 3 (1)	9.5	22.6	0.10	22.7	136.9	10.3	45.2	55.5
R57	Paintworks Phase 3 (1)	11	22.6	0.10	22.7	137.8	10.5	45.2	55.7
R58	Paintworks Phase 3 (1)	13.5	22.6	0.11	22.7	135.3	10.3	45.2	55.5

Receptors		Elevation (m, agl)	WINTER OPERATING HOURS - 12 x 1.03m Dia, 6m stacks, 59.8 m/s, 105°C (exhaust gases and cooling air)						
			PVMRM Method (used in modelling to date) - 5 to 7pm, weekdays, Nov to February						
			Green D+ Bio-diesel						
			Annual Mean Background Concentration	Annual Mean (PC)	Annual Mean (PEC)	Maximum Predicted 1- hr Mean (Process Contribution)	99.8th %ile of Hourly Means (Process Contribution)	Short-term Background Concentration	99.8th %ile of Hourly Means (PEC)
R59	Paintworks Phase 3 (2)	4.5	22.6	0.09	22.7	100.3	13.4	45.2	58.6
R60	Paintworks Phase 3 (2)	7	22.6	0.09	22.7	101.1	14.5	45.2	59.7
R61	Paintworks Phase 3 (2)	9.5	22.6	0.10	22.7	102.3	13.7	45.2	58.9
R62	Paintworks Phase 3 (2)	11	22.6	0.10	22.7	93.2	13.3	45.2	58.5
R63	Paintworks Phase 3 (2)	13.5	22.6	0.10	22.7	94.7	12.6	45.2	57.8
R64	Paintworks Phase 3 (3)	4.5	22.6	0.10	22.7	69.2	19.3	45.2	64.5
R65	Paintworks Phase 3 (3)	7	22.6	0.10	22.7	71.9	18.2	45.2	63.4
R66	Paintworks Phase 3 (3)	9.5	22.6	0.10	22.7	83.2	18.4	45.2	63.6
R67	Paintworks Phase 3 (3)	11	22.6	0.10	22.7	91.7	18.6	45.2	63.8
R68	Paintworks Phase 3 (3)	13.5	22.6	0.11	22.7	108.8	18.4	45.2	63.6
R69	Paintworks Phase 3 (4)	4.5	22.6	0.11	22.7	76.8	25.7	45.2	70.9
R70	Paintworks Phase 3 (4)	7	22.6	0.11	22.7	83.0	22.6	45.2	67.8
R71	Paintworks Phase 3 (4)	9.5	22.6	0.11	22.7	93.9	21.7	45.2	66.9
R72	Paintworks Phase 3 (4)	11	22.6	0.11	22.7	102.1	21.3	45.2	66.5
R73	Paintworks Phase 3 (4)	13.5	22.6	0.11	22.7	118.7	21.4	45.2	66.6
R74	St Philip's Marsh Nursery School (1A)	0.8	22.6	0.05	22.7	86.2	2.8	45.2	48.0
R75	St Philip's Marsh Nursery School (2A)	0.8	22.6	0.06	22.7	110.5	3.0	45.2	48.2
R76	St Philip's Marsh Nursery School (3A)	0.8	22.6	0.06	22.7	127.2	3.1	45.2	48.3
R77	St Philip's Marsh Nursery School (B1)	0.6	22.6	0.05	22.7	86.0	2.8	45.2	48.0
R78	St Philip's Marsh Nursery School (2B)	0.6	22.6	0.06	22.7	110.2	3.0	45.2	48.2

Receptors		Elevation (m, agl)	WINTER OPERATING HOURS - 12 x 1.03m Dia, 6m stacks, 59.8 m/s, 105°C (exhaust gases and cooling air)						
			PVMRM Method (used in modelling to date) - 5 to 7pm, weekdays, Nov to February						
			Green D+ Bio-diesel						
			Annual Mean Background Concentration	Annual Mean (PC)	Annual Mean (PEC)	Maximum Predicted 1- hr Mean (Process Contribution)	99.8th %ile of Hourly Means (Process Contribution)	Short-term Background Concentration	99.8th %ile of Hourly Means (PEC)
R79	St Philip's Marsh Nursery School (3B)	0.6	22.6	0.06	22.7	126.9	3.1	45.2	48.3

**Table 6: Highest Predicted 99.8<sup>th</sup> Percentile of 1-Hour Means NO<sub>2</sub> and Annual Mean Concentrations at Receptor Locations - Typical Operating Scenario (EA Methodology) – Biodiesel**

Receptors		Elevation (m, agl)	WINTER OPERATING HOURS - 12 x 1.03m Dia, 6m stacks, 59.8 m/s, 105°C (exhaust gases and cooling air)						
			Typical Operating Hours - 5 to 7pm, weekdays, Nov to February; Green D+ Bio-diesel						
			EA Methodology (assumes 35% oxidation of NO <sub>x</sub> the NO <sub>2</sub> for short-term concentrations; and 70% for long-term concentrations)						
			Annual Mean Background Concentration	Annual Mean (PC)	Annual Mean (PEC)	Maximum Predicted 1-hr Mean (Process Contribution)	99.8th %ile of Hourly Means (Process Contribution)	Short-term Background Concentration	99.8th %ile of Hourly Means (PEC)
R1	St Philip's Marsh Depot (south)	1.5	22.6	1.63	24.2	<b>206.3</b>	78.7	45.2	123.9
R2	St Philip's Marsh Depot (southwest)	1.5	22.6	0.61	23.2	<b>285.8</b>	52.3	45.2	84.3
R3	St Philip's Marsh Depot (southeast)	1.5	22.6	0.59	23.2	<b>202.6</b>	59.7	45.2	104.9
R4	KFC	1.5	31.4	0.53	31.9	<b>207.2</b>	57.3	62.8	120.1
R5	Carpark (McDonalds)	1.5	31.4	0.41	31.8	199.7	39.0	62.8	101.8
R6	Carpark (Avonmean Retail Park)	1.5	22.6	0.46	23.1	92.9	37.9	45.2	83.1
R7	Carpark (Costa)	1.5	31.4	0.83	32.2	197.6	67.7	62.8	130.5
R8	Showcase Cinema	1.5	31.4	0.66	23.3	140.1	49.4	62.8	94.6
R9	St Martins Court (Cole Rd)	1.5	31.4	0.41	31.8	57.8	35.9	62.8	98.7
R10	Merchant Trade Park	1.5	31.4	0.28	22.9	81.6	22.3	62.8	67.5
R11	Bristol Television	1.5	22.6	0.68	23.3	109.9	73.6	45.2	118.8
R12	Avonbank (industrial)	1.5	22.6	1.08	23.7	256.4	96.3	45.2	141.5
R13	Industrial site (Meriton Street)	1.5	22.6	0.43	23.0	129.3	31.6	45.2	60.5
R14	Industrial site (Albert Road)	1.5	22.6	1.95	24.5	<b>336.0</b>	211.5	45.2	256.7
R15	Spark Evans Park	1.5	22.6	0.38	23.0	<b>301.5</b>	7.0	45.2	52.2
R16	44 Edward Road	1.5	22.6	0.27	22.9	175.7	14.1	45.2	59.3
R17	Black Castle PH	1.5	31.4	0.13	31.5	<b>258.8</b>	1.3	62.8	64.1
R18	Sainbury's Carpark	1.5	31.4	0.09	31.5	176.3	0.8	62.8	63.6

Receptors		Elevation (m, agl)	WINTER OPERATING HOURS - 12 x 1.03m Dia, 6m stacks, 59.8 m/s, 105°C (exhaust gases and cooling air)						
			Typical Operating Hours - 5 to 7pm, weekdays, Nov to February; Green D+ Bio-diesel						
			EA Methodology (assumes 35% oxidation of NO <sub>x</sub> the NO <sub>2</sub> for short-term concentrations; and 70% for long-term concentrations)						
			Annual Mean Background Concentration	Annual Mean (PC)	Annual Mean (PEC)	Maximum Predicted 1-hr Mean (Process Contribution)	99.8th %ile of Hourly Means (Process Contribution)	Short-term Background Concentration	99.8th %ile of Hourly Means (PEC)
R19	19 Whitby Road	1.5	22.6	0.12	22.7	<b>234.3</b>	1.1	45.2	46.3
R20	Whitby Road Industrial area (S)	1.5	22.6	0.16	22.8	148.1	11.5	45.2	56.7
R21	15 Hardenhuish Road	1.5	22.6	0.13	22.7	117.9	9.8	45.2	55.0
R22	5/7 Kilvert Close	1.5	22.6	0.12	22.7	37.0	10.6	45.2	55.1
R23	Whitby Road Industrial area (N)	1.5	22.6	0.18	22.8	126.3	12.3	45.2	57.5
R24	St Anne's Junior & Infant Schools	1.0	22.6	0.08	22.7	22.1	7.5	45.2	52.0
R25	3 Mardon Road	1.5	22.6	0.13	22.7	74.4	9.0	45.2	54.2
R26	Industrial Park (Avonsdie Rd)	1.5	22.6	0.21	22.8	62.1	14.8	45.2	60.0
R27	Netham Park	1.5	22.6	0.13	22.7	32.7	9.7	45.2	54.9
R28	14 Ford Street	1.5	22.6	0.17	22.8	49.6	11.9	45.2	57.1
R29	12 Beaconsfield Close	1.5	31.4	0.24	31.6	43.4	22.4	62.8	85.2
R30	Victoria Terrace Comm/Ind	1.5	22.6	0.32	22.9	<b>253.7</b>	22.9	45.2	68.1
R31	Playground (Kingsland Road)	1.0	22.6	0.08	22.7	86.3	2.7	45.2	47.9
R32	Industrial Area (Silverthorn Lane)	1.5	22.6	0.18	22.8	125.6	6.8	45.2	52.0
R33	Industrial area (Gamwal Road)	1.5	22.6	0.08	22.7	43.5	2.2	45.2	47.4
R34	Wholesale Fruit Centre (1)	1.5	22.6	0.36	23.0	<b>359.7</b>	9.5	45.2	54.7
R35	Wholesale Fruit Centre (2)	1.5	22.6	0.18	22.8	282.6	2.0	45.2	47.2
R36	Bristol Temple Meads Station	1.5	31.4	0.03	31.4	26.9	1.6	62.8	64.4
R37	Chatterton Square	1.5	22.6	0.02	22.6	14.7	0.4	45.2	45.6
R38	1 Higham Street	1.5	22.6	0.04	22.6	36.1	0.3	45.2	45.4

Receptors		Elevation (m, agl)	WINTER OPERATING HOURS - 12 x 1.03m Dia, 6m stacks, 59.8 m/s, 105°C (exhaust gases and cooling air)						
			Typical Operating Hours - 5 to 7pm, weekdays, Nov to February; Green D+ Bio-diesel						
			EA Methodology (assumes 35% oxidation of NO <sub>x</sub> the NO <sub>2</sub> for short-term concentrations; and 70% for long-term concentrations)						
			Annual Mean Background Concentration	Annual Mean (PC)	Annual Mean (PEC)	Maximum Predicted 1-hr Mean (Process Contribution)	99.8th %ile of Hourly Means (Process Contribution)	Short-term Background Concentration	99.8th %ile of Hourly Means (PEC)
R39	The Thunderbolt PH	1.5	50.1	0.13	50.2	154.5	3.6	100.2	103.8
R40	226 Bath Road	1.5	50.1	0.37	50.5	<b>233.6</b>	28.9	100.2	129.1
R41	Paintworks Phase 3	1.5	22.6	0.34	22.9	133.9	20.0	45.2	65.2
R42	Commercial Retail Area (Castle Court)	1.5	31.4	0.19	31.6	<b>324.4</b>	2.1	62.8	64.9
R43	Spark Evans Park 2	1.5	22.6	0.41	23.0	<b>246.6</b>	9.3	45.2	54.5
R44	Spark Evans Park 3	1.5	22.6	0.44	23.0	<b>209.8</b>	15.2	45.2	60.4
R45	Spark Evans Park 4	1.5	22.6	0.49	23.1	<b>227.8</b>	27.2	45.2	72.4
R46	Spark Evans Park 5	1.5	22.6	0.57	23.2	195.9	44.5	45.2	89.7
R47	Spark Evans Park 6	1.5	22.6	0.75	23.3	<b>201.6</b>	83.4	45.2	128.6
R48	Paintworks Phase 3 (2)	1.5	22.6	0.38	23.0	133.9	29.1	45.2	74.3
R49	Paintworks Phase 3 (3)	1.5	22.6	0.43	23.0	131.6	41.9	45.2	87.1
R50	Paintworks Phase 3 (4)	1.5	22.6	0.53	23.1	129.7	59.1	45.2	104.3
R51	St Philip's Marsh Nursery School (1)	0.9	22.6	0.25	22.8	127.2	5.5	45.2	50.1
R52	St Philip's Marsh Nursery School (2)	0.9	22.6	0.25	22.9	161.5	7.7	45.2	50.0
R53	St Philip's Marsh Nursery School (3)	0.9	22.6	0.26	22.9	183.7	4.6	45.2	49.8
R54	Paintworks Phase 3 (1)	4.5	22.6	0.34	22.9	134.4	19.9	45.2	65.1
R55	Paintworks Phase 3 (1)	7	22.6	0.35	22.9	135.1	20.2	45.2	65.4
R56	Paintworks Phase 3 (1)	9.5	22.6	0.36	23.0	136.1	21.2	45.2	66.4
R57	Paintworks Phase 3 (1)	11	22.6	0.37	23.0	146.6	22.1	45.2	67.3
R58	Paintworks Phase 3 (1)	13.5	22.6	0.39	23.0	167.8	22.9	45.2	68.1

Receptors		Elevation (m, agl)	WINTER OPERATING HOURS - 12 x 1.03m Dia, 6m stacks, 59.8 m/s, 105°C (exhaust gases and cooling air)						
			Typical Operating Hours - 5 to 7pm, weekdays, Nov to February; Green D+ Bio-diesel						
			EA Methodology (assumes 35% oxidation of NO <sub>x</sub> the NO <sub>2</sub> for short-term concentrations; and 70% for long-term concentrations)						
			Annual Mean Background Concentration	Annual Mean (PC)	Annual Mean (PEC)	Maximum Predicted 1-hr Mean (Process Contribution)	99.8th %ile of Hourly Means (Process Contribution)	Short-term Background Concentration	99.8th %ile of Hourly Means (PEC)
R59	Paintworks Phase 3 (2)	4.5	22.6	0.37	23.0	133.9	29.1	45.2	74.3
R60	Paintworks Phase 3 (2)	7	22.6	0.38	23.0	133.7	29.1	45.2	74.3
R61	Paintworks Phase 3 (2)	9.5	22.6	0.39	23.0	133.2	29.2	45.2	74.4
R62	Paintworks Phase 3 (2)	11	22.6	0.40	23.0	140.6	29.2	45.2	74.4
R63	Paintworks Phase 3 (2)	13.5	22.6	0.41	23.0	170.5	29.3	45.2	74.5
R64	Paintworks Phase 3 (3)	4.5	22.6	0.43	23.0	131.4	41.8	45.2	87.0
R65	Paintworks Phase 3 (3)	7	22.6	0.43	23.0	131.1	41.7	45.2	86.9
R66	Paintworks Phase 3 (3)	9.5	22.6	0.44	23.0	130.8	41.7	45.2	86.9
R67	Paintworks Phase 3 (3)	11	22.6	0.45	23.0	131.0	41.6	45.2	86.8
R68	Paintworks Phase 3 (3)	13.5	22.6	0.46	23.1	139.0	43.5	45.2	88.7
R69	Paintworks Phase 3 (4)	4.5	22.6	0.53	23.1	129.8	59.1	45.2	104.3
R70	Paintworks Phase 3 (4)	7	22.6	0.53	23.1	140.0	59.0	45.2	104.2
R71	Paintworks Phase 3 (4)	9.5	22.6	0.53	23.1	158.4	59.1	45.2	104.3
R72	Paintworks Phase 3 (4)	11	22.6	0.54	23.1	172.3	60.2	45.2	105.4
R73	Paintworks Phase 3 (4)	13.5	22.6	0.55	23.2	<b>200.2</b>	59.5	45.2	104.7
R74	St Philip's Marsh Nursery School (1A)	0.8	22.6	0.25	22.8	127.1	5.5	45.2	50.1
R75	St Philip's Marsh Nursery School (2A)	0.8	22.6	0.25	22.9	161.3	7.7	45.2	49.9
R76	St Philip's Marsh Nursery School (3A)	0.8	22.6	0.26	22.9	183.4	4.6	45.2	49.8
R77	St Philip's Marsh Nursery School (B1)	0.6	22.6	0.24	22.8	126.8	5.5	45.2	50.1
R78	St Philip's Marsh Nursery School (2B)	0.6	22.6	0.25	22.9	160.9	7.7	45.2	49.9

Receptors		Elevation (m, agl)	WINTER OPERATING HOURS - 12 x 1.03m Dia, 6m stacks, 59.8 m/s, 105°C (exhaust gases and cooling air)						
			Typical Operating Hours - 5 to 7pm, weekdays, Nov to February; Green D+ Bio-diesel						
			EA Methodology (assumes 35% oxidation of NOx the NO <sub>2</sub> for short-term concentrations; and 70% for long-term concentrations)						
			Annual Mean Background Concentration	Annual Mean (PC)	Annual Mean (PEC)	Maximum Predicted 1-hr Mean (Process Contribution)	99.8th %ile of Hourly Means (Process Contribution)	Short-term Background Concentration	99.8th %ile of Hourly Means (PEC)
R79	St Philip's Marsh Nursery School (3B)	0.6	22.6	0.26	22.9	183.0	4.6	45.2	49.8



### ***Additional Annual Operating Hours***

The typical operating scenario allows for approximately 170 hours of operation per year. The plant may operate up to 200 hours a year; however, any additional operating events would occur irregularly (as a result of power demand) outside the most likely operational hours modelled (5pm to 7pm) for the scenario and as such cannot be specifically accommodated in the modelling. To assess the potential impact on the 99.8<sup>th</sup> percentile 1-hour concentrations of an additional 30 hours of operation, the national power demand data and the frequency of the highest predicted concentrations can be compared.

The national power demand data presented in **Figures 1 and 2** shows that demand is highest in the colder months modelled (November – February) and lowest in the warmer months (May – August), with demand gradually increasing or decreasing in the months in between. On a daily basis, the demand peaks for the two hour period modelled, with demand tapering away either side of the peak (4pm to 5pm and 7pm to 9pm). Slightly higher average demand is also seen during the day between 10am and 2pm. This data can be used with the modelling results from the worse-case scenario to conservatively estimate the increase in the 99.8<sup>th</sup> percentile of 1-hour mean concentrations (as a process contribution) that may arise from the 30 hours of operation across the year beyond the most likely hours modelled.

For different receptors types (e.g. residential, recreational, educational etc.) with the highest predicted impact for the typical and worse-case scenarios (in this case R19, R40, R57, R73, R53, R15, R47, R12 and R14), the highest predicted 1-hour mean concentrations were reviewed to determine the time and date of each occurrence (approximately the highest 70 concentrations). The concentrations then placed in five general categories on the following basis:

1. The predicted concentration occurred during the colder months (Nov to Feb) and within wider operating hours (10am to 2pm and 4pm to 9pm, including weekends);
2. The predicted concentration occurred during the interim months (Mar, Apr, Sep or Oct) and within wider operating hours (10am to 2pm and 4pm to 9pm, including weekends) **or** occurred during the colder months (Nov to Feb), but outside wider operating hours (10am to 2pm and 4pm to 9pm);
3. The predicted concentration occurred during the warmer months (May to Aug) and within wider operating hours (10am to 2pm and 4pm to 9pm, including weekends);
4. The predicted concentration occurred during the interim months (Mar, Apr, Sep or Oct), but outside wider operating hours (10am to 2pm and 4pm to 9pm);
5. The predicted concentration occurred during the warmer months (May to Aug), but outside the wider operating hours (10am to 2pm and 4pm to 9pm);

These categories can then be assigned a conservative probability of occurring. The probability for each category can be applied to the highest predicted concentrations (e.g. top 100 concentrations predicted for the worse-case scenario) to select the highest 18 concentrations which may occur. This process is aimed at providing a conservative estimate of the potential impact on the 99.8<sup>th</sup> percentile concentration at a specified receptor location, should the plant operate for an additional 30 hours across the year, while still providing a more representative assessment than the worse-case scenario.

For the purpose of this assessment, it has been assumed that the chance of highest concentrations in category 1 above occurring is 50% of the time; that is, one in every two of the concentrations in this category was selected, starting with the highest concentration and moving down. For category 2 it is assumed to be 33%; category 3 is 25%; category 4 is 10% and category 5 is 5%. While the assumed probability is somewhat arbitrary, the assumptions are very conservative because the concentrations have been selected starting with the highest concentration predicted at a receptor location and working down. This would not occur in reality as the frequency of occurrence of the highest concentrations would not be this high for the additional operating hours assumed beyond the most likely hours modelled. Using this approach, the 18<sup>th</sup> highest concentration (99.8<sup>th</sup> percentile of 1-hour means) was estimated from within the highest 65 concentrations for each of the receptors considered. Approximately 2,800 hours fall within the wider operating hours referred to above; however, the 18 highest concentrations were assumed to all fall within the 100 hours of highest concentrations with the frequency described above, starting from the highest concentration and working down. It can be clearly seen from this comparison that the estimated 99.8<sup>th</sup> percentile concentrations presented in the Tables below are highly conservative and over-estimate the likely impact of the additional hours operation.

**Table 7** and **Table 8** show the predicted concentrations for the range of different receptor locations where impacts were predicted to be greatest for both the Worse-Case scenario and the Typical Operating scenario for the PVMRM and EA Methodology, respectively. Also presented is the highest estimated 99.8<sup>th</sup> percentile of 1-hour mean concentrations assuming an additional 30 hours operation across the year and based on the conservative assumptions above.

**Table 7: Highest Predicted Concentrations and Estimated 99.8<sup>th</sup> Percentile of 1-hour Mean Concentrations for Selected Receptors for 30 Hours Additional Operation per Annum (PVMRM)**

Receptor		Receptor Type	Typical Operating Scenario			Worse Case Scenario		
			Maximum Predicted Concentration ( $\mu\text{g}/\text{m}^3$ )	Predicted 99.8th%ile of Hourly Means ( $\mu\text{g}/\text{m}^3$ )	Estimated 99.8th %ile of Hourly Means	Year Maximum Impact Predicted	Maximum Predicted Concentration ( $\mu\text{g}/\text{m}^3$ )	Predicted 99.8th%ile of Hourly Means ( $\mu\text{g}/\text{m}^3$ )
R19	19 Whitby Road	Residential	189.0	1.5	34.1	2010	231.5	63.3
R40	226 Bath Road	Residential	162.2	14.3	56.0	2010	249.7	112.7
R57	Paintworks Phase 3 (1)	Residential	145.3	11.5	110.9	2010	216.1	145.2
R73	Paintworks Phase 3 (4)		130.6	25.0	126.1	2010	205.6	150.1
R53	St Philip's Marsh Nursery School (3)	Day Care	134.7	3.5	69.6	2014	214.9	123.0
R15	Spark Evans Park	Recreational	207.2	3.5	172.5	2013	422.8	221.0
R47	Spark Evans Park (6)		122.0	28.9	148.6	2010	274.0	202.6
R12	Avonbank (industrial)	Industrial	200.4	38.3	142.2	2011	336.3	217.7
R14	Industrial site (Albert Road)	Industrial	178.7	76.5	261.3	2010	407.3	320.6

**Table 8: Highest Predicted Concentrations and Estimated 99.8<sup>th</sup> Percentile of 1-hour Mean Concentrations for Selected Receptors for 30 Hours Additional Operation per Annum (EA Methodology)**

Receptor		Receptor Type	Typical Operating Scenario			Worse Case Scenario		
			Maximum Predicted Concentration ( $\mu\text{g}/\text{m}^3$ )	Predicted 99.8th%ile of Hourly Means ( $\mu\text{g}/\text{m}^3$ )	Estimated 99.8th %ile of Hourly Means	Year Maximum Impact Predicted	Maximum Predicted Concentration ( $\mu\text{g}/\text{m}^3$ )	Predicted 99.8th%ile of Hourly Means ( $\mu\text{g}/\text{m}^3$ )
R19	19 Whitby Road	Residential	331.9	2.9	19.4	2010	352.2	88.5
R40	226 Bath Road	Residential	331.0	41.0	81.3	2010	443.8	150.8
R57	Paintworks Phase 3 (1)	Residential	207.7	31.3	119.0	2010	207.7	149.6
R73	Paintworks Phase 3 (4)		283.6	84.3	144.9	2010	283.2	167.3
R53	St Philip's Marsh Nursery School (3)	Day Care	260.2	24.6	114.2	2013	285.9	138.5
R15	Spark Evans Park	Recreational	427.1	9.8	179.1	2013	430.2	260.5
R47	Spark Evans Park (6)		285.6	118.1	213.8	2010	288.9	253.5
R12	Avonbank (industrial)	Industrial	363.3	180.9	306.4	2011	420.2	350.9
R14	Industrial site (Albert Road)	Industrial	476.0	299.6	390.1	2010	476.0	417.8

The results in **Table 7** and **Table 8** show that even assuming a very conservative likelihood of the highest concentrations occurring due to the additional hours of operation of the plant coinciding with the worst meteorology, the estimated 99.8<sup>th</sup> percentile concentrations are all below the objective concentrations for the residential and day care receptors as a process contribution. The estimated concentrations at these locations would also remain below the objective with the background concentration (of  $45.2\mu\text{g}/\text{m}^3$ ) added to the process contribution for both methodologies. For Spark Evans Park, estimated concentrations would exceed the objective concentration with the background concentration included. For the industrial receptors, the short-term concentration is estimated to be above the objective as a process contribution. It is, however, important to remember that the selection of the 18 highest concentrations which could potentially occur during an additional 30 hours operation was undertaken very conservatively; as such, the actual 99.8<sup>th</sup> percentile concentration is likely to lie between the concentrations predicted for the Typical Operating scenario and the concentration estimated based on when the highest concentrations were predicted to occur for the Worse-Case scenario and the power demand profile.

With respect to impacts on annual concentrations, the contribution of the additional (outside the typical hours modelled) 30 highest 1-hour mean concentrations (determined in the same manner as described above for the highest 18 concentrations) to the annual mean was determined by totalling the 1-hour concentrations and dividing the total by the number of hours in the year. This showed that if the additional highest concentrations occurred, the additional contribution to the annual mean would range between  $0.2$  and  $0.4\mu\text{g}/\text{m}^3$  at the residential receptors for the PVMRM and between  $0.3$  and  $0.5\mu\text{g}/\text{m}^3$  for the EA Methodology. The annual mean process contribution predicted for the above receptors for the typical operating scenario was around  $0.1\mu\text{g}/\text{m}^3$  for the PVMRM and ranged between  $0.2$  and  $0.8\mu\text{g}/\text{m}^3$  for the EA Methodology, which is derived from 170 hours operation. The contribution from the estimated highest 30 concentrations was an average of almost three times the contribution of the 170 hours of typical operation for the PVMRM and almost 1.4

times the contribution of the 170 hours for the EA Methodology for the selected receptors. This comparison also illustrates how conservative the additional contribution is based on the estimated highest 30 concentrations.

### ***Significance of the Predicted Concentrations for the Typical Operating Scenario***

The results of the typical operating scenario are most representative of the air quality impact the plant is likely to have compared to the worse-case scenario. It is therefore considered more appropriate to determine the severity of the impacts and associated significance of the effects based on the results for the representative operating scenario, rather than the worse-case scenario because the results of this scenario better characterise the likelihood of the plant operation coinciding with worse-case meteorology and better reflect the likely impact the plant may have on local air quality.

With respect to assessing the significance of the effects, the EPUK/IAQM guidance advises that impacts on air quality, whether adverse or beneficial, will have an effect on human health that can be judged as 'significant' or 'not significant'. The guidance goes on to say it is important to distinguish between the meaning of 'impact' and 'effect' in this context. An impact is the change in the concentration of an air pollutant, as experienced by a receptor. This may have an effect on the health of a human receptor, depending on the severity of the impact and other factors that may need to be taken into account. The guidance states that when assessing the significance of the effect of air quality impacts, the following must be taken into account:

- Existing and future air quality in the absence of the proposed development;
- The extent of the current and future population exposure to impacts; and
- The influence and validity of the assumptions adopted when undertaking the prediction of impacts.

The severity of the predicted impact has been determined on the basis of both the predicted annual and 1-hour mean concentrations. The severity of the impacts on annual mean concentrations has been determined using the impact descriptors presented in *Table 6.3* of the latest IAQM/EPUK guidance on air quality and planning<sup>5</sup>. The severity of the impacts for the 1-hour mean concentrations has been determined using the impact descriptors and approach described in *paragraphs 6.35, 6.38 and 6.39* of the IAQM/EPUK guidance.

The results of the PVMRM modelling of the typical operating scenario (presented in **Appendix A3**) show that the severity of the impact of emissions from the plant on annual mean concentrations is negligible at all receptor locations because the process contribution is <1% of the annual objective and/or the annual background concentration is less than 94% of the annual objective (and the process contribution is no greater than 5% of the objective). Therefore, it is considered that the effect of the impact on annual mean concentrations is not significant for the plant operating according to a typical annual operating profile.

For the EA Methodology, impacts on annual mean NO<sub>2</sub> concentrations were predicted to also be negligible at all but five of the receptors. A slight impact was predicted at five receptors; however, four of these receptors are industrial locations where relevant exposure would not exist. A slight impact was predicted at the residential receptor location on Bath Road (Receptor R40). This is primarily due to the background concentration of 50.1 µg/m<sup>3</sup> assumed

for calculating the PEC at this receptor. The assumed background is likely to be higher than actually experienced at this location and given the process contribution at the location is predicted to be only 1% of the objective; it is likely that the impact at this location would also be negligible. If the conservatively estimated contribution of an additional 30 hours operation is considered, the severity of impact would not change based on the results of the receptors shown in **Table 7**.

The severity of the short-term impacts has been determined in the absence of background concentrations in accordance with paragraph 6.38 of the IAQM/EPUK Guidance, that is the severity is '*described as slight, moderate and substantial, without the need to reference background or baseline concentrations*'. In addition, paragraph 6.39 also states that in most cases, the assessment of severity for a proposed development will be governed by the long-term exposure experienced by receptors and it will not be a necessity to define the significance of effects by reference to short-term impacts; however, the guidance suggests that the severity of the impact will be substantial when there is a risk that the relevant AQAL for short-term concentrations is approached through the presence of the new source, taking into account the contribution of other prominent local sources.

For the PVMRM modelling the severity of the process contribution impact is moderate at two industrial receptor locations, slight at 16 receptors and negligible the remaining 35<sup>7</sup> specific receptors considered in the assessment. A slight impact is predicted at several residential locations; however, the predicted concentrations are at the lower end of the category concentration range for these receptors. All other receptors where slight impacts were predicted are industrial locations. The severity of the impact at the majority of residential receptors is negligible.

Based on the results in Table 7 showing the impact of the potential additional 30 hours of operation, the estimated 99.8<sup>th</sup> percentile of 1-hour mean concentrations does not exceed the objective as a process contribution or PEC at the existing or proposed residential or nursery receptors. It is also important to remember that the estimated impact of the additional hours of operation has been conservatively assessed and therefore, the impact would not be as great as estimate suggests. As such, the impact likely to be slight at worst at the vast majority of residential receptors and the Nursery and moderate at the Paintworks Phase 3.

For the EA Methodology, the severity of the short-term impact was classified as substantial at five industrial receptor locations on sites adjacent the proposed FGF site and one of the park receptor locations. Impacts of moderate severity are predicted at nine industrial/commercial receptor locations and six residential, educational or recreational receptors locations. The impacts are classified as slight to negligible for all remaining industrial and residential/educational receptors. The severity of the impact at the majority of existing residential receptors is negligible.

As with the PVMRM results above, if the results from **Table 8** are taken into account, the impact severity increases at receptor locations such that moderate to substantial impacts are predicted at some receptors where minor to moderate impacts are predicted for the typical operating scenario. However, even with the conservatively estimated hourly mean concentrations, breaches of the objective are not predicted at the residential or nursery

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<sup>7</sup> This assumes 53 separate receptor locations (79 separate discrete receptors were included in the model). Where receptor locations have been set for several heights, the locations have been considered as a single receptor because the severity tends to be the same for all receptor heights.

receptors. Again, the conservative nature of the estimated 99.8<sup>th</sup> percentile concentrations means the impact is unlikely to be as great as that based on the estimated concentrations. With respect to the application of the impact descriptors, the guidance states that they are not, of themselves, a clear and unambiguous guide to reaching a conclusion on significance. The impact descriptors are intended for application at a series of individual receptors and the guidance states that whilst it may be that there are 'slight', 'moderate' or 'substantial' impacts at one or more receptors, the overall effect may not necessarily be judged as being significant in some circumstances. To illustrate this, the guidance provides the example where a 'moderate' or 'substantial' impact may not have a significant effect if it is confined to a very small area and where it is not obviously the cause of harm to human health (bearing in mind that the examples assume exceedences of the annual mean rather than the short-term mean, which is more of a concern due to the chronic nature of the exposure versus the acute nature of the short-term exposure, which is by nature likely to be transient in an outdoor setting).

In the case of the proposed FGF, the substantial to moderate impacts predicted for the EA Methodology is confined to areas which are industrial or commercial in nature and where the impact is not obviously likely to be the cause of harm, particularly because members of the public would not have access to the industrial locations or would not remain in the location (e.g., a car park) for the duration of the averaging period (particularly given the time of day and season when operation would occur). In addition, the guidance indicates that where people are working in a location where an objective may not met the impact is not likely to be classified as significant because occupational standards are different to the ambient air quality objectives. Operation for an additional 30 hours outside the typical operating hours would increase the impact by a certain level. The results of the conservative estimate of the impact indicated that moderate to substantial impacts may occur at a greater number of receptors (mainly at the Paintworks Phase 3 development site), but that no breaches of the objective would occur at these locations as a process concentration or PEC. The estimated concentrations are conservative and impacts are unlikely to be substantial at any residential locations or the nursery.

The existing and future air quality in the area of the proposed FGF is likely to be reasonably typical of an urban area. Urban background monitoring is undertaken by the Council in a number of locations and Council advised that the diffusion tube monitoring location in Higham Street would be representative of the proposed development site. The annual NO<sub>2</sub> concentration at this location in 2014 was 22.6µg/m<sup>3</sup>, which is well below the objective of 40µg/m<sup>3</sup>. The Council also operate a continuous analyser at Brislington Depot and data for this station showed no exceedences of the hourly objective for NO<sub>2</sub> concentrations in 2014 (3 exceedences in 2013); therefore, it is unlikely that exceedences of the hourly objective would currently occur at the existing or proposed (future) sensitive receptors considered in the assessment. While the results of the PVMRM modelling do not indicate that exceedences of the objective for 1-hour mean NO<sub>2</sub> concentrations are likely at any receptor location for the typical operating scenario, the modelling results of the EA Methodology indicate that there is some potential for exceedences at a small number of receptors in the surrounding area. However, these receptor locations are industrial in nature and, due to a lack of public access to these areas and the likely FGF operating times (generally outside work hours), exposure is unlikely to occur over the relevant averaging period in these locations. In addition to which, the impact of emissions from the plant on annual mean pollutant concentrations is unlikely to be significant or lead to a significant worsening of the local long-term air quality.

The extent of the current and future exposure of the population is closely related to the existing and future air quality. The results of the EA Methodology indicate that there is some limited potential for exceedences of the objective concentration to occur at industrial sites located in the area immediately surrounding the proposed FGF site; however, no residential

or educational receptors are located, or will be located, within the areas where exceedences are predicted. In addition to this, the results of case-specific PVMRM modelling do not indicate that exceedences will occur in these locations for the typical operating hours of the proposed FGF; therefore the extent of exposure of more sensitive areas of development is very unlikely to increase significantly.

The revised NO<sub>x</sub> emission modelling was completed using both the conservative EA Methodology and the more detailed case specific PVMRM. The worse case modelling scenario assumed an operating profile that would not occur in practice (e.g. a very conservative assumption) and as a result, this scenario presents an overly conservative picture of the likely impact of the plant, with the predicted impacts very unlikely to occur in practice. Notwithstanding this, it should be noted that even when assuming operation of the FGF for greater than 3,700 hours per year (rather than 200), the predicted short-term PECs were below the objective concentration for the majority of receptors.

The typical operating scenario provides a more realistic modelling scenario because it covers the periods that the plant will most likely to be called upon to operate to satisfy the peak power demand on the national power grid. Of the two methodologies used, the PVMRM modelling provides a more realistic assessment of the likely impact of the plant compared to the EA Methodology because the method provides a more accurate representation of the potential oxidation of nitric oxide (NO) by ozone and more readily accounts for conversion limitations when plumes overlap<sup>8</sup>. In addition to this, assessment of the severity of the impact of the emissions for the typical operating scenario has been based on the diesel emission modelling results, which will have a higher NO<sub>x</sub> emission rate than the biodiesel which is proposed for use at the FGF.

The worse case impact of a total of 200 hours operation per year was also considered to assess the potential impact of 30hours operation beyond the typical hours modelled. The results showed that the 99.8<sup>th</sup> percentile concentration was unlikely to exceed the objective concentration at existing and future residential receptor locations (where the highest impacts were predicted for the two modelling scenarios) even when very conservative assumption were used to estimate the 18<sup>th</sup> highest concentration. Therefore, the operation of the plant for up to around 30hours more than the typical operating hours modelled is unlikely alter the severity of the impact significantly from that of the typical operating scenario at non-industrial receptor locations.

Therefore, as a result of the negligible impact on annual mean concentrations for both methodologies, a slight to negligible impact on 1-hour mean concentrations for the majority of receptor locations for the worse-case EA Methodology and at all sensitive receptors for the case-specific PVMRM modelling and taking account of the existing and future air quality, the extent of current and future population exposure and the impact of the assumptions made when undertaking the prediction of impacts, it is considered that overall or on balance, the effects of the predicted air quality impacts of emissions from the proposed FGF are not significant.

## Summary and Conclusion

Following the submission of an air quality assessment in support of the planning application for the (redesigned) Flexible Generation Facility at a site in Feeder Road, Bristol, further

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<sup>8</sup> US EPA Memorandum *Clarification on the Use of AERMOD Dispersion Modelling for Demonstrating Compliance with the NO<sub>2</sub> National Ambient Air Quality Standard* (September 2014)

information and assessment has been completed in response to concerns raised in a review of the air quality assessment undertaken by Air Quality Consultants.

Further justification of the assessment methodology used has been provided and it is considered that the PVMRM methodology was appropriate for use in this project and represents a case-specific scenario, as allowed for by the phased approach in the EA Methodology. The previous modelling has also been revised to account for an incorrect discharge temperature used in the previous air quality assessment, in addition to which, modelling has also been undertaken in accordance with the Environment Agency's (worse-case scenario) methodology for determining the level of oxidation of NO<sub>x</sub> to NO<sub>2</sub> for comparison against the results of the revised modelling.

An additional operational scenario has also been modelled which is more representative of the typical annual operating profile for the proposed FGF than the worse-case operating scenario previously presented and revised herein. This scenario has been based on data on the power demand on the national grid which allows the most likely operating hours for the plant to be identified. This data shows the operation of the plant would essentially be confined to within the two hour period of 5pm and 7pm on weekdays during winter (November to February) and better characterises the likelihood of the plant operation coinciding with the worse-case meteorology. As such, it is considered that the significance of any effect of the emission from the proposed plant should be based on the typical operating scenario rather than the worse-case scenario, which embodies highly conservative assumptions regarding the annual operational profile.

The results of the additional assessment work showed that for the PVMRM modelling under the typical operating conditions, the impact of the emissions from the plant would be negligible for annual mean concentrations and slight to negligible for 1-hour mean concentrations at all but two receptors, where a moderate impact is predicted; however, members of the public would not have access to these locations because it is located in the railway depot (Receptor R1) and industrial property (Receptor R14) to the south of the site. For the EA Methodology, greater impacts were predicted, with exceedences of the objective for 1-hour mean NO<sub>2</sub> concentrations and impacts of moderate to substantial severity being predicted at some receptor locations. However, the greatest impacts were predicted to occur at industrial receptor locations, with the majority of receptors predicted to experience minor to negligible impacts as a result of the FGF emissions. In addition, the severity of the impacts and significance of the effects were based on the results of the modelling of the typical, or representative, operating scenario for low sulphur diesel, rather than the biodiesel which is proposed for use at the plant. NO<sub>x</sub> emissions will be lower for the biodiesel and therefore the assessment of the impact severity and significance of the typical operating scenario represents the worse-case impact for this operating scenario.

An assessment of the impact of an additional 30 hours of operation per year was also undertaken using a conservative approach which indicated that while the severity of impact is likely to increase with the additional hours of operation at receptor locations, PECs are unlikely to breach the objective in any location where relevant exposure is likely to occur.

Therefore, taking account of the above, it is considered that overall the effect of the predicted impacts resulting from emissions associated with the intermittent and short operation of the proposed FGF remains not significant as previously concluded.

I would be happy to answer any further queries you may have regarding the above further information or provide further clarification of any points if necessary.



Yours sincerely

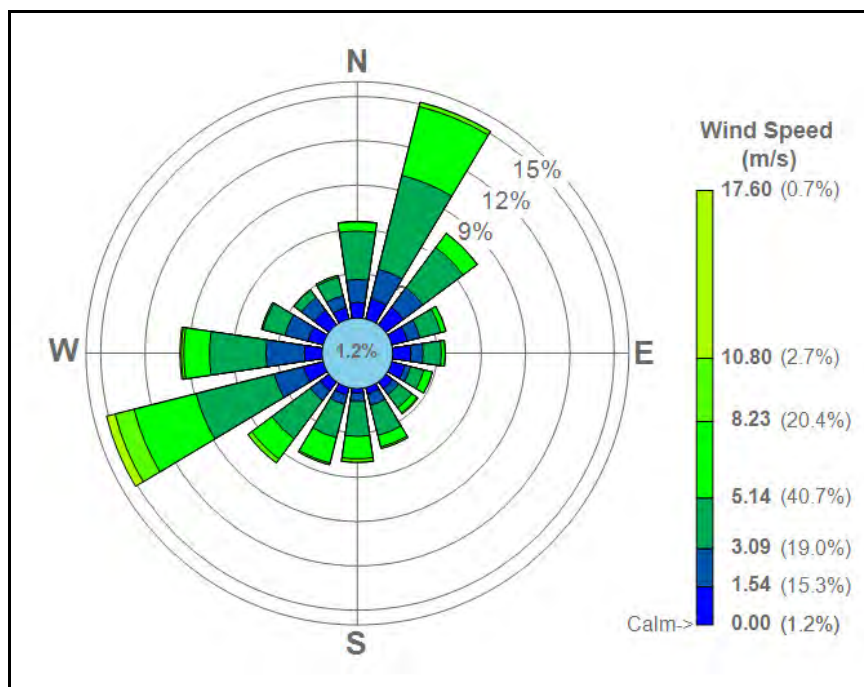
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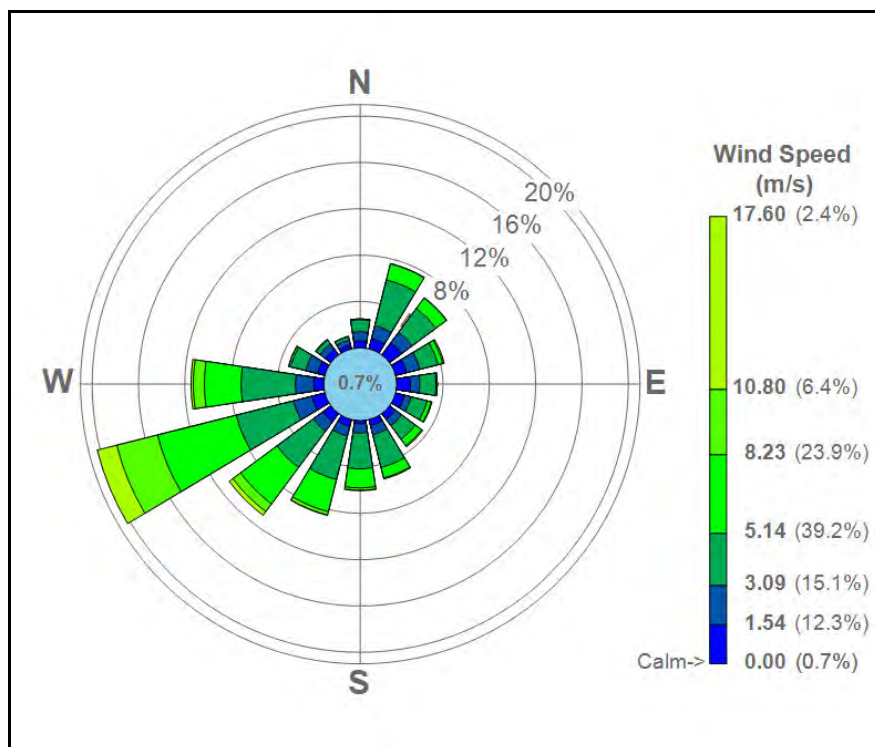
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Mob: +64 (0)223 829 722

## Appendix A1. Wind Roses & Engine Emission Data

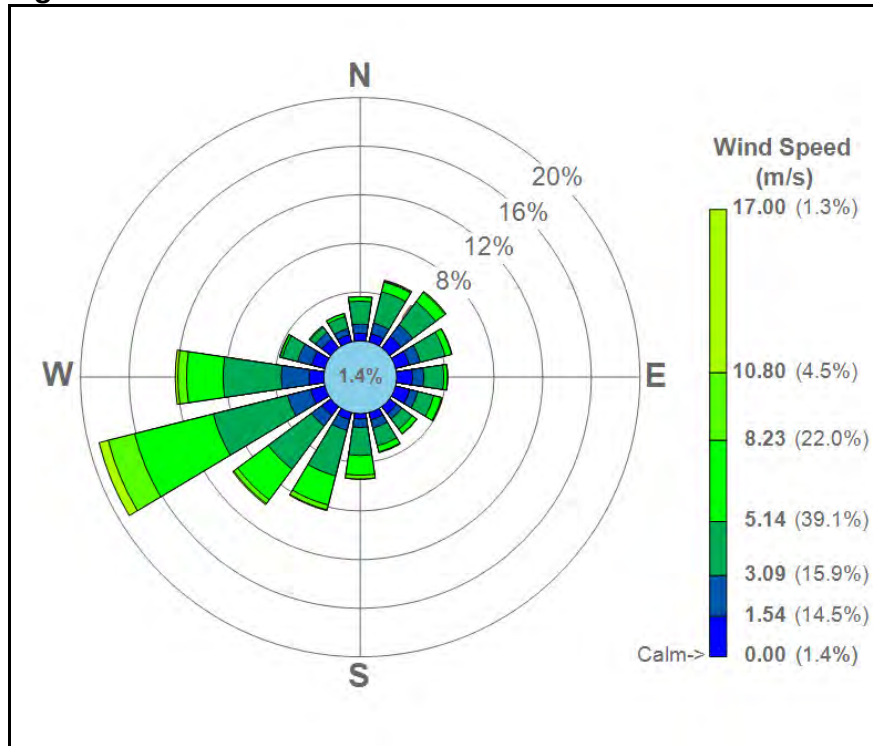
**Figure A1-1: Wind Rose for Bristol – 2010**



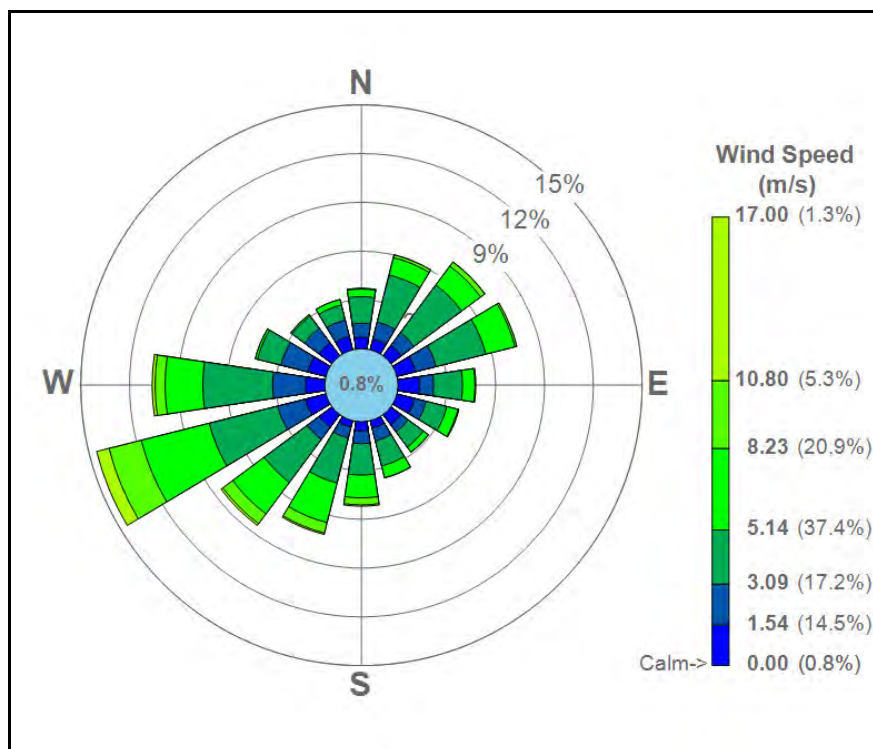
**Figure A1-2: Wind Rose for Bristol – 2011**



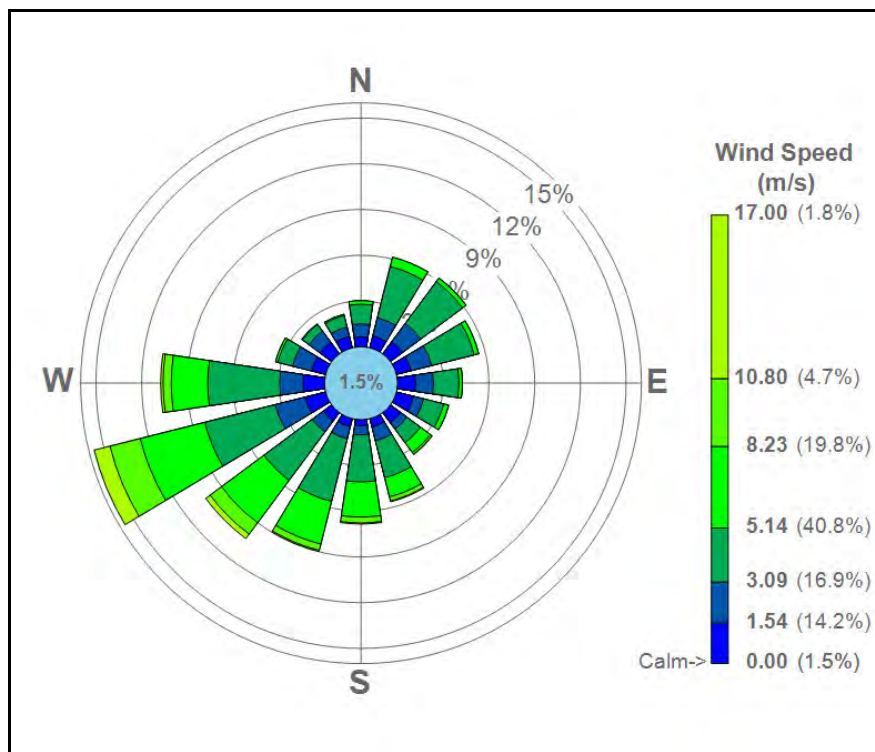
**Figure A1-3: Wind Rose for Bristol – 2012**



**Figure A1-4: Wind Rose for Bristol – 2013**



**Figure A1-5: Wind Rose for Bristol – 2014**



**Table A1-1: Engine Emissions Data**

Parameter	Unit	Engine Exhaust	Cooling Air	Combined Flow (1 engine)	4 x Combined Exhaust Flows <sup>(a)</sup>
Exhaust Temperature	°C	500	79.0	105	105
Flue gas flow rate	Am <sup>3</sup> /s	1.56	10.9	12.5	49.8
Efflux velocity	m/s	50	12.8	15.0	59.8
Stack Height	m	NA			6.2
Stack diameter	m				1.03
NO <sub>x</sub> Emissions Rate (diesel)	g/s	0.51	NA	0.51	2.04
NO <sub>x</sub> Emissions Rate (bio-diesel)	g/s	0.36	NA	0.36	1.44
(a) The data for the Combined Flows was used in the dispersion model.					

## Appendix A2. Modelling Results

**Table A2-1 Highest Predicted 99.8<sup>th</sup> Percentile 1-Hour Mean NO<sub>2</sub> Concentrations (µg/m<sup>3</sup>) at Point of Maximum Impact: Worse-Case Scenario (Diesel)**

Location	Air Quality Standard	UTM Coordinates		PC Concentration (µg/m <sup>3</sup> )	PEC (µg/m <sup>3</sup> )	PC - No. hours above 200 µg/m <sup>3</sup>
		X Coordinate	Y Coordinate			
Maximum Off-Site 1-hr Concentration (99.8th %ile)	200	530255	5699565	519.9	565.1	NA
Maximum No. of Exceedences of 200 µg/m <sup>3</sup>	18	530155	5699490	NA	NA	279

**Table A2-2 Highest Predicted 99.8<sup>th</sup> Percentile 1-Hour Mean NO<sub>2</sub> Concentrations (µg/m<sup>3</sup>) at Receptor Locations: Worse-Case Scenario (Diesel)**

Discrete Receptors		Elevation (m, agl)	UTM Coordinates		99.8th %ile of 1-hr Means (PC)	PC - No. hours above 200 µg/m <sup>3</sup>	Percentage Time Exceedences could occur	Short-term Background Concentration (µg/m <sup>3</sup> )	99.8th %ile of 1-hr Means PEC (µg/m <sup>3</sup> )
			X Coordinate	Y Coordinate					
R1	St Philip's Marsh Depot (south)	1.5	530240	5699646	130.5	0	0%	45.20	175.7
R2	St Philip's Marsh Depot (southwest)	1.5	530080	5699620	156.9	9	0%	45.20	202.1
R3	St Philip's Marsh Depot (southeast)	1.5	530408	5699615	168.2	5	0%	45.20	213.4
R4	KFC	1.5	530447	5699631	142.1	1	0%	62.80	204.9
R5	Carpark (McDonalds)	1.5	530524	5699623	106.5	0	0%	62.80	169.3
R6	Carpark (Avonmean Retail Park)	1.5	530564	5699684	59.6	0	0%	45.20	104.8
R7	Carpark (Costa)	1.5	530478	5699723	106.2	2	0%	62.80	169.0
R8	Showcase Cinema	1.5	530480	5699861	111.9	3	0%	62.80	157.1
R9	St Martins Court (Cole Rd)	1.5	530307	5699980	86.0	2	0%	62.80	148.8
R10	Merchant Trade Park	1.5	530452	5700067	66.2	0	0%	62.80	111.4
R11	Bristol Television	1.5	530197	5699868	115.7	0	0%	45.20	160.9
R12	Avonbank (industrial)	1.5	530156	5699716	217.7	22	1%	45.20	262.9
R13	Industrial site (Meriton Street)	1.5	530055	5699663	116.0	0	0%	45.20	161.2
R14	Industrial site (Albert Road)	1.5	530182	5699531	320.6	129	4%	45.20	365.8
R15	Spark Evans Park	1.5	530332	5699465	221.0	31	1%	45.20	266.2
R16	44 Edward Road	1.5	530341	5699235	104.4	0	0%	45.20	149.6
R17	Black Castle PH	1.5	530515	5699201	76.4	2	0%	62.80	139.2
R18	Sainbury's Carpark	1.5	530600	5699236	60.4	4	0%	62.80	123.2
R19	19 Whitby Road	1.5	530714	5699306	63.3	3	0%	45.20	108.5

Discrete Receptors		Elevation (m, agl)	UTM Coordinates		99.8th %ile of 1-hr Means (PC)	PC - No. hours above 200 µg/m³	Percentage Time Exceedences could occur	Short-term Background Concentration (µg/m³)	99.8th %ile of 1-hr Means PEC (µg/m³)
			X Coordinate	Y Coordinate					
R20	Whitby Road Industrial area (S)	1.5	530848	5699554	38.1	0	0%	45.20	83.3
R21	15 Hardenhuish Road	1.5	530904	5699510	36.7	0	0%	45.20	81.9
R22	5/7 Kilvert Close	1.5	531020	5699670	16.4	0	0%	45.20	61.6
R23	Whitby Road Industrial area (N)	1.5	530980	5699920	39.3	0	0%	45.20	84.5
R24	St Anne's Junior & Infant Schools	1.0	531235	5699671	14.9	0	0%	45.20	60.1
R25	3 Mardon Road	1.5	531168	5700051	36.1	0	0%	45.20	81.3
R26	Industrial Park (Avonsdie Rd)	1.5	530733	5700070	54.6	0	0%	45.20	99.8
R27	Netham Park	1.5	530852	5700219	41.7	0	0%	45.20	86.9
R28	14 Ford Street	1.5	530582	5700242	46.3	0	0%	45.20	91.5
R29	12 Beaconsfield Close	1.5	530154	5700145	57.5	0	0%	62.80	120.3
R30	Victoria Terrace Comm/Ind	1.5	529980	5699921	128.0	5	0%	45.20	173.2
R31	Playground (Kingsland Road)	1.0	529526	5700168	27.1	0	0%	45.20	72.3
R32	Industrial Area (Silverthorn Lane)	1.5	529737	5699988	51.7	2	0%	45.20	96.9
R33	Industrial area (Gamwal Road)	1.5	529732	5699646	47.9	0	0%	45.20	93.1
R34	Wholesale Fruit Centre (1)	1.5	529876	5699395	125.1	10	0%	45.20	170.3
R35	Wholesale Fruit Centre (2)	1.5	529629	5699383	52.1	2	0%	45.20	97.3
R36	Bristol Temple Meads Station	1.5	529086	5700047	23.2	0	0%	62.80	86.0
R37	Chatterton Square	1.5	528824	5699708	15.6	0	0%	45.20	60.8
R38	1 Higham Street	1.5	529228	5699328	25.5	0	0%	45.20	70.7
R39	The Thunderbolt PH	1.5	529592	5699092	45.7	0	0%	100.20	145.9
R40	226 Bath Road	1.5	529889	5699136	112.7	4	0%	100.20	212.9
R41	Paintworks Phase 3	1.5	530277	5699337	141.9	3	0%	45.20	187.1
R42	Commercial Retail Area (Castle Court)	1.5	530446	5699331	138.4	4	0%	62.80	201.2
R43	Spark Evans Park 2	1.5	530314	5699464	217.8	29	1%	45.20	263.0
R44	Spark Evans Park 3	1.5	530297	5699467	205.8	25	1%	45.20	251.0
R45	Spark Evans Park 4	1.5	530275	5699464	208.5	21	1%	45.20	253.7
R46	Spark Evans Park 5	1.5	530251	5699454	199.9	17	0%	45.20	245.1
R47	Spark Evans Park 6	1.5	530229	5699449	202.6	18	0%	45.20	247.8
R48	Paintworks Phase 3 (2)	1.5	530249	5699336	152.3	1	0%	45.20	197.5
R49	Paintworks Phase 3 (3)	1.5	530223	5699333	147.7	3	0%	45.20	192.9



Discrete Receptors		Elevation (m, agl)	UTM Coordinates		99.8th %ile of 1-hr Means (PC)	PC - No. hours above 200 µg/m <sup>3</sup>	Percentage Time Exceedences could occur	Short-term Background Concentration (µg/m <sup>3</sup> )	99.8th %ile of 1-hr Means PEC (µg/m <sup>3</sup> )
			X Coordinate	Y Coordinate					
R50	Paintworks Phase 3 (4)	1.5	530196	5699325	147.4	2	0%	45.20	192.6
R51	St Philip's Marsh Nursery School (1)	0.9	529962	5699647	105.1	0	0%	45.20	150.3
R52	St Philip's Marsh Nursery School (2)	0.9	529958	5699663	115.2	1	0%	45.20	160.4
R53	St Philip's Marsh Nursery School (3)	0.9	529953	5699675	123.0	1	0%	45.20	168.2
R54	Paintworks Phase 3 (1)	4.5	530277	5699337	142.1	3	0%	45.20	187.3
R55	Paintworks Phase 3 (1)	7	530277	5699337	143.2	3	0%	45.20	188.4
R56	Paintworks Phase 3 (1)	9.5	530277	5699337	144.4	3	0%	45.20	189.6
R57	Paintworks Phase 3 (1)	11	530277	5699337	145.2	3	0%	45.20	190.4
R58	Paintworks Phase 3 (1)	13.5	530277	5699337	145.8	3	0%	45.20	191.0
R59	Paintworks Phase 3 (2)	4.5	530248.6	5699336.2	152.4	1	0%	45.20	197.6
R60	Paintworks Phase 3 (2)	7	530248.6	5699336.2	153.2	1	0%	45.20	198.4
R61	Paintworks Phase 3 (2)	9.5	530248.6	5699336.2	153.6	1	0%	45.20	198.8
R62	Paintworks Phase 3 (2)	11	530248.6	5699336.2	154.0	1	0%	45.20	199.2
R63	Paintworks Phase 3 (2)	13.5	530248.6	5699336.2	155.6	1	0%	45.20	<b>200.8</b>
R64	Paintworks Phase 3 (3)	4.5	530223	5699333.3	148.5	3	0%	45.20	193.7
R65	Paintworks Phase 3 (3)	7	530223	5699333.3	148.1	3	0%	45.20	193.3
R66	Paintworks Phase 3 (3)	9.5	530223	5699333.3	149.3	3	0%	45.20	194.5
R67	Paintworks Phase 3 (3)	11	530223	5699333.3	152.6	3	0%	45.20	197.8
R68	Paintworks Phase 3 (3)	13.5	530223	5699333.3	153.0	3	0%	45.20	198.2
R69	Paintworks Phase 3 (4)	4.5	530196	5699324.8	147.3	2	0%	45.20	192.5
R70	Paintworks Phase 3 (4)	7	530196	5699324.8	147.5	2	0%	45.20	192.7
R71	Paintworks Phase 3 (4)	9.5	530196	5699324.8	149.5	2	0%	45.20	194.7
R72	Paintworks Phase 3 (4)	11	530196	5699324.8	149.9	2	0%	45.20	195.1
R73	Paintworks Phase 3 (4)	13.5	530196	5699324.8	150.1	2	0%	45.20	195.3
R74	St Philip's Marsh Nursery School (1A)	0.8	529962	5699647	105.0	0	0%	45.20	150.2
R75	St Philip's Marsh Nursery School (2A)	0.8	529958	5699663	115.2	1	0%	45.20	160.4
R76	St Philip's Marsh Nursery School (3A)	0.8	529953	5699675	122.9	1	0%	45.20	168.1
R77	St Philip's Marsh Nursery School (B1)	0.6	529962	5699647	104.8	0	0%	45.20	150.0
R78	St Philip's Marsh Nursery School (2B)	0.6	529958	5699663	115.0	1	0%	45.20	160.2

<i>Discrete Receptors</i>		<i>Elevation (m, agl)</i>	<i>UTM Coordinates</i>		<i>99.8th %ile of 1-hr Means (PC)</i>	<i>PC - No. hours above 200 µg/m<sup>3</sup></i>	<i>Percentage Time Exceedences could occur</i>	<i>Short-term Background Concentration (µg/m<sup>3</sup>)</i>	<i>99.8th %ile of 1-hr Means PEC (µg/m<sup>3</sup>)</i>
			<i>X Coordinate</i>	<i>Y Coordinate</i>					
R79	St Philip's Marsh Nursery School (3B)	0.6	529953	5699675	122.7	1	0%	45.20	167.9
<i>Air Quality Standard or Guideline</i>					<i>200</i>	<i>18</i>			<i>200</i>

**Table A2-3 Highest Predicted 99.8<sup>th</sup> Percentile 1-Hour Mean NO<sub>2</sub> Concentrations (µg/m<sup>3</sup>) at Point of Maximum Impact: Worse-Case Scenario (Biodiesel)**

Location	Air Quality Standard	UTM Coordinates		PC Concentration (µg/m <sup>3</sup> )	PEC (µg/m <sup>3</sup> )	PC - No. hours above 200 µg/m <sup>3</sup>
		X Coordinate	Y Coordinate			
Maximum Off-Site 1-hr Concentration (99.8th %ile)	200	530255	5699565	497.1	542.3	NA
Maximum No. of Exceedences of 200 µg/m <sup>3</sup>	18	530155	5699490	NA	NA	245

**Table A2-4 Highest Predicted 99.8<sup>th</sup> Percentile 1-Hour Mean NO<sub>2</sub> Concentrations (µg/m<sup>3</sup>) at Receptor Locations: Worse-Case Scenario (Biodiesel)**

Discrete Receptors		Elevation (m, agl)	UTM Coordinates		99.8th %ile of 1-hr Means (PC)	PC - No. hours above 200 µg/m <sup>3</sup>	Percentage Time Exceedences could occur	Short-term Background Concentration (µg/m <sup>3</sup> )	99.8th %ile of 1-hr Means PEC (µg/m <sup>3</sup> )
			X Coordinate	Y Coordinate					
R1	St Philip's Marsh Depot (south)	1.5	530240	5699646	119.26	0	0%	45.20	164.5
R2	St Philip's Marsh Depot (southwest)	1.5	530080	5699620	143.31	4	0%	45.20	188.5
R3	St Philip's Marsh Depot (southeast)	1.5	530408	5699615	144.23	2	0%	45.20	189.4
R4	KFC	1.5	530447	5699631	115.50	0	0%	62.80	178.3
R5	Carpark (McDonalds)	1.5	530524	5699623	85.59	0	0%	62.80	148.4
R6	Carpark (Avonmean Retail Park)	1.5	530564	5699684	52.84	0	0%	45.20	98.0
R7	Carpark (Costa)	1.5	530478	5699723	100.49	1	0%	62.80	163.3
R8	Showcase Cinema	1.5	530480	5699861	101.44	2	0%	62.80	146.6
R9	St Martins Court (Cole Rd)	1.5	530307	5699980	68.62	1	0%	62.80	131.4
R10	Merchant Trade Park	1.5	530452	5700067	56.47	0	0%	62.80	101.7
R11	Bristol Television	1.5	530197	5699868	110.71	0	0%	45.20	155.9
R12	Avonbank (industrial)	1.5	530156	5699716	<b>202.81</b>	18	0%	45.20	<b>248.0</b>
R13	Industrial site (Meriton Street)	1.5	530055	5699663	110.53	0	0%	45.20	155.7
R14	Industrial site (Albert Road)	1.5	530182	5699531	<b>304.17</b>	109	3%	45.20	<b>349.4</b>
R15	Spark Evans Park	1.5	530332	5699465	<b>204.61</b>	21	1%	45.20	<b>249.8</b>
R16	44 Edward Road	1.5	530341	5699235	85.60	0	0%	45.20	130.8
R17	Black Castle PH	1.5	530515	5699201	63.36	2	0%	62.80	126.2
R18	Sainbury's Carpark	1.5	530600	5699236	49.96	4	0%	62.80	112.8
R19	19 Whitby Road	1.5	530714	5699306	60.22	1	0%	45.20	105.4
R20	Whitby Road Industrial area (S)	1.5	530848	5699554	35.68	0	0%	45.20	80.9

Discrete Receptors		Elevation (m, agl)	UTM Coordinates		99.8th %ile of 1- hr Means (PC)	PC - No. hours above 200 µg/m <sup>3</sup>	Percentage Time Exceedences could occur	Short-term Background Concentration (µg/m <sup>3</sup> )	99.8th %ile of 1- hr Means PEC (µg/m <sup>3</sup> )
			X Coordinate	Y Coordinate					
R21	15 Hardenhuish Road	1.5	530904	5699510	33.44	0	0%	45.20	78.6
R22	5/7 Kilvert Close	1.5	531020	5699670	14.94	0	0%	45.20	60.1
R23	Whitby Road Industrial area (N)	1.5	530980	5699920	36.46	0	0%	45.20	81.7
R24	St Anne's Junior & Infant Schools	1.0	531235	5699671	13.77	0	0%	45.20	59.0
R25	3 Mardon Road	1.5	531168	5700051	31.20	0	0%	45.20	76.4
R26	Industrial Park (Avonsdie Rd)	1.5	530733	5700070	50.76	0	0%	45.20	96.0
R27	Netham Park	1.5	530852	5700219	37.68	0	0%	45.20	82.9
R28	14 Ford Street	1.5	530582	5700242	43.32	0	0%	45.20	88.5
R29	12 Beaconsfield Close	1.5	530154	5700145	48.70	0	0%	62.80	111.5
R30	Victoria Terrace Comm/Ind	1.5	529980	5699921	107.48	4	0%	45.20	152.7
R31	Playground (Kingsland Road)	1.0	529526	5700168	26.03	0	0%	45.20	71.2
R32	Industrial Area (Silverthorn Lane)	1.5	529737	5699988	44.45	2	0%	45.20	89.6
R33	Industrial area (Gamwal Road)	1.5	529732	5699646	38.66	0	0%	45.20	83.9
R34	Wholesale Fruit Centre (1)	1.5	529876	5699395	114.48	9	0%	45.20	159.7
R35	Wholesale Fruit Centre (2)	1.5	529629	5699383	48.44	1	0%	45.20	93.6
R36	Bristol Temple Meads Station	1.5	529086	5700047	20.95	0	0%	62.80	83.7
R37	Chatterton Square	1.5	528824	5699708	13.12	0	0%	45.20	58.3
R38	1 Higham Street	1.5	529228	5699328	23.42	0	0%	45.20	68.6
R39	The Thunderbolt PH	1.5	529592	5699092	41.82	0	0%	100.20	142.0
R40	226 Bath Road	1.5	529889	5699136	106.13	3	0%	100.20	<b>206.3</b>
R41	Paintworks Phase 3	1.5	530277	5699337	127.84	0	0%	45.20	173.0
R42	Commercial Retail Area (Castle Court)	1.5	530446	5699331	111.04	4	0%	62.80	173.8
R43	Spark Evans Park 2	1.5	530314	5699464	197.86	16	0%	45.20	<b>243.1</b>
R44	Spark Evans Park 3	1.5	530297	5699467	196.73	16	0%	45.20	<b>241.9</b>
R45	Spark Evans Park 4	1.5	530275	5699464	197.93	16	0%	45.20	<b>243.1</b>
R46	Spark Evans Park 5	1.5	530251	5699454	189.69	13	0%	45.20	<b>234.9</b>
R47	Spark Evans Park 6	1.5	530229	5699449	187.26	13	0%	45.20	<b>232.5</b>
R48	Paintworks Phase 3 (2)	1.5	530249	5699336	137.23	1	0%	45.20	182.4
R49	Paintworks Phase 3 (3)	1.5	530223	5699333	142.25	1	0%	45.20	187.5
R50	Paintworks Phase 3 (4)	1.5	530196	5699325	139.98	0	0%	45.20	185.2

Discrete Receptors		Elevation (m, agl)	UTM Coordinates		99.8th %ile of 1- hr Means (PC)	PC - No. hours above 200 µg/m <sup>3</sup>	Percentage Time Exceedences could occur	Short-term Background Concentration (µg/m <sup>3</sup> )	99.8th %ile of 1- hr Means PEC (µg/m <sup>3</sup> )
			X Coordinate	Y Coordinate					
R51	St Philip's Marsh Nursery School (1)	0.9	529962	5699647	98.36	0	0%	45.20	143.6
R52	St Philip's Marsh Nursery School (2)	0.9	529958	5699663	106.51	0	0%	45.20	151.7
R53	St Philip's Marsh Nursery School (3)	0.9	529953	5699675	112.61	0	0%	45.20	157.8
R54	Paintworks Phase 3 (1)	4.5	530277	5699337	131.33	0	0%	45.20	176.5
R55	Paintworks Phase 3 (1)	7	530277	5699337	133.16	0	0%	45.20	178.4
R56	Paintworks Phase 3 (1)	9.5	530277	5699337	132.87	0	0%	45.20	178.1
R57	Paintworks Phase 3 (1)	11	530277	5699337	132.37	0	0%	45.20	177.6
R58	Paintworks Phase 3 (1)	13.5	530277	5699337	135.11	0	0%	45.20	180.3
R59	Paintworks Phase 3 (2)	4.5	530248.6	5699336.2	137.05	1	0%	45.20	182.3
R60	Paintworks Phase 3 (2)	7	530248.6	5699336.2	136.78	1	0%	45.20	182.0
R61	Paintworks Phase 3 (2)	9.5	530248.6	5699336.2	136.39	1	0%	45.20	181.6
R62	Paintworks Phase 3 (2)	11	530248.6	5699336.2	136.11	1	0%	45.20	181.3
R63	Paintworks Phase 3 (2)	13.5	530248.6	5699336.2	139.08	1	0%	45.20	184.3
R64	Paintworks Phase 3 (3)	4.5	530223	5699333.3	141.88	1	0%	45.20	187.1
R65	Paintworks Phase 3 (3)	7	530223	5699333.3	141.21	1	0%	45.20	186.4
R66	Paintworks Phase 3 (3)	9.5	530223	5699333.3	142.09	1	0%	45.20	187.3
R67	Paintworks Phase 3 (3)	11	530223	5699333.3	142.42	1	0%	45.20	187.6
R68	Paintworks Phase 3 (3)	13.5	530223	5699333.3	144.00	1	0%	45.20	189.2
R69	Paintworks Phase 3 (4)	4.5	530196	5699324.8	140.64	0	0%	45.20	185.8
R70	Paintworks Phase 3 (4)	7	530196	5699324.8	141.91	0	0%	45.20	187.1
R71	Paintworks Phase 3 (4)	9.5	530196	5699324.8	143.20	0	0%	45.20	188.4
R72	Paintworks Phase 3 (4)	11	530196	5699324.8	142.70	0	0%	45.20	187.9
R73	Paintworks Phase 3 (4)	13.5	530196	5699324.8	142.79	0	0%	45.20	188.0
R74	St Philip's Marsh Nursery School (1A)	0.8	529962	5699647	98.30	0	0%	45.20	143.5
R75	St Philip's Marsh Nursery School (2A)	0.8	529958	5699663	106.39	0	0%	45.20	151.6
R76	St Philip's Marsh Nursery School (3A)	0.8	529953	5699675	112.51	0	0%	45.20	157.7
R77	St Philip's Marsh Nursery School (B1)	0.6	529962	5699647	98.16	0	0%	45.20	143.4
R78	St Philip's Marsh Nursery School (2B)	0.6	529958	5699663	106.14	0	0%	45.20	151.3
R79	St Philip's Marsh Nursery School (3B)	0.6	529953	5699675	112.32	0	0%	45.20	157.5

Discrete Receptors	Elevation (m, agl)	UTM Coordinates		99.8th %ile of 1- hr Means (PC)	PC - No. hours above 200 µg/m <sup>3</sup>	Percentage Time Exceedences could occur	Short-term Background Concentration (µg/m <sup>3</sup> )	99.8th %ile of 1- hr Means PEC (µg/m <sup>3</sup> )
		X Coordinate	Y Coordinate					
Air Quality Standard or Guideline				200	18			200

**Table A2-5 Highest Predicted 99.8<sup>th</sup> Percentile 1-Hour Mean NO<sub>2</sub> Concentrations (µg/m<sup>3</sup>) at Point of Maximum Impact: Worse-Case Scenario – EA Methodology (Diesel)**

Location	Air Quality Standard	Location		PC Concentration (µg/m <sup>3</sup> )	PEC (µg/m <sup>3</sup> )	PC - No. hours above 200 µg/m <sup>3</sup>
		X Coordinate	Y Coordinate			
Maximum Off-Site 1-hr Concentration	200	530230	5699540	775.2	820.4	NA
Maximum No. of Exceedences of 200 µg/m <sup>3</sup>	18	530155	5699565	NA	NA	576

**Table A2-6 Highest Predicted 99.8<sup>th</sup> Percentile 1-Hour Mean NO<sub>2</sub> Concentrations (µg/m<sup>3</sup>) at Receptor Locations: Worse-Case Scenario – EA Methodology (Diesel)**

Discrete Receptors		Elevation (m, agl)	UTM Coordinates		99.8th %ile of 1-hr Means (PC)	PC - No. hours above 200 µg/m <sup>3</sup>	Percentage Time Exceedences could occur	Short-term Background Concentration (µg/m <sup>3</sup> )	99.8th %ile of 1-hr Means PEC (µg/m <sup>3</sup> )
			X Coordinate	Y Coordinate					
R1	St Philip's Marsh Depot (south)	1.5	530240	5699646	<b>272.74</b>	78	2%	45.20	<b>317.9</b>
R2	St Philip's Marsh Depot (southwest)	1.5	530080	5699620	<b>309.02</b>	36	1%	45.20	<b>354.2</b>
R3	St Philip's Marsh Depot (southeast)	1.5	530408	5699615	<b>226.57</b>	29	1%	45.20	<b>271.8</b>
R4	KFC	1.5	530447	5699631	172.07	11	0%	62.80	<b>234.9</b>
R5	Carpark (McDonalds)	1.5	530524	5699623	127.77	6	0%	62.80	190.6
R6	Carpark (Avonmean Retail Park)	1.5	530564	5699684	99.59	0	0%	45.20	144.8
R7	Carpark (Costa)	1.5	530478	5699723	145.12	6	0%	62.80	<b>207.9</b>
R8	Showcase Cinema	1.5	530480	5699861	115.93	9	0%	62.80	161.1
R9	St Martins Court (Cole Rd)	1.5	530307	5699980	74.08	2	0%	62.80	136.9
R10	Merchant Trade Park	1.5	530452	5700067	61.61	1	0%	62.80	106.8
R11	Bristol Television	1.5	530197	5699868	127.08	1	0%	45.20	172.3
R12	Avonbank (industrial)	1.5	530156	5699716	<b>350.88</b>	139	4%	45.20	<b>396.1</b>
R13	Industrial site (Meriton Street)	1.5	530055	5699663	174.33	3	0%	45.20	<b>219.5</b>
R14	Industrial site (Albert Road)	1.5	530182	5699531	<b>417.77</b>	481	13%	45.20	<b>463.0</b>
R15	Spark Evans Park	1.5	530332	5699465	<b>260.53</b>	35	1%	45.20	<b>305.7</b>
R16	44 Edward Road	1.5	530341	5699235	109.37	3	0%	45.20	154.6
R17	Black Castle PH	1.5	530515	5699201	86.60	6	0%	62.80	149.4
R18	Sainbury's Carpark	1.5	530600	5699236	69.77	7	0%	62.80	132.6
R19	19 Whitby Road	1.5	530714	5699306	88.51	10	0%	45.20	133.7

Discrete Receptors		Elevation (m, agl)	UTM Coordinates		99.8th %ile of 1-hr Means (PC)	PC - No. hours above 200 µg/m <sup>3</sup>	Percentage Time Exceedences could occur	Short-term Background Concentration (µg/m <sup>3</sup> )	99.8th %ile of 1-hr Means PEC (µg/m <sup>3</sup> )
			X Coordinate	Y Coordinate					
R20	Whitby Road Industrial area (S)	1.5	530848	5699554	54.10	2	0%	45.20	99.3
R21	15 Hardenhuish Road	1.5	530904	5699510	49.34	0	0%	45.20	94.5
R22	5/7 Kilvert Close	1.5	531020	5699670	36.86	0	0%	45.20	82.1
R23	Whitby Road Industrial area (N)	1.5	530980	5699920	39.85	0	0%	45.20	85.0
R24	St Anne's Junior & Infant Schools	1.0	531235	5699671	28.32	0	0%	45.20	73.5
R25	3 Mardon Road	1.5	531168	5700051	30.68	0	0%	45.20	75.9
R26	Industrial Park (Avonsdie Rd)	1.5	530733	5700070	47.56	2	0%	45.20	92.8
R27	Netham Park	1.5	530852	5700219	32.71	0	0%	45.20	77.9
R28	14 Ford Street	1.5	530582	5700242	43.08	0	0%	45.20	88.3
R29	12 Beaconsfield Close	1.5	530154	5700145	56.05	0	0%	62.80	118.9
R30	Victoria Terrace Comm/Ind	1.5	529980	5699921	155.50	6	0%	45.20	<b>200.7</b>
R31	Playground (Kingsland Road)	1.0	529526	5700168	27.32	2	0%	45.20	72.5
R32	Industrial Area (Silverthorn Lane)	1.5	529737	5699988	61.50	4	0%	45.20	106.7
R33	Industrial area (Gamwal Road)	1.5	529732	5699646	54.37	0	0%	45.20	99.6
R34	Wholesale Fruit Centre (1)	1.5	529876	5699395	177.38	15	0%	45.20	<b>222.6</b>
R35	Wholesale Fruit Centre (2)	1.5	529629	5699383	74.17	6	0%	45.20	119.4
R36	Bristol Temple Meads Station	1.5	529086	5700047	20.37	0	0%	62.80	83.2
R37	Chatterton Square	1.5	528824	5699708	14.62	0	0%	45.20	59.8
R38	1 Higham Street	1.5	529228	5699328	26.85	2	0%	45.20	72.1
R39	The Thunderbolt PH	1.5	529592	5699092	69.46	5	0%	100.20	169.7
R40	226 Bath Road	1.5	529889	5699136	150.82	12	0%	100.20	<b>251.0</b>
R41	Paintworks Phase 3	1.5	530277	5699337	142.87	0	0%	45.20	188.1
R42	Commercial Retail Area (Castle Court)	1.5	530446	5699331	128.49	9	0%	62.80	191.3
R43	Spark Evans Park 2	1.5	530314	5699464	<b>276.14</b>	38	1%	45.20	<b>321.3</b>
R44	Spark Evans Park 3	1.5	530297	5699467	<b>273.74</b>	37	1%	45.20	<b>318.9</b>
R45	Spark Evans Park 4	1.5	530275	5699464	<b>234.00</b>	37	1%	45.20	<b>279.2</b>
R46	Spark Evans Park 5	1.5	530251	5699454	<b>237.85</b>	34	1%	45.20	<b>283.1</b>
R47	Spark Evans Park 6	1.5	530229	5699449	<b>253.45</b>	50	1%	45.20	<b>298.7</b>
R48	Paintworks Phase 3 (2)	1.5	530249	5699336	155.72	0	0%	45.20	<b>200.9</b>
R49	Paintworks Phase 3 (3)	1.5	530223	5699333	171.82	1	0%	45.20	<b>217.0</b>



Discrete Receptors		Elevation (m, agl)	UTM Coordinates		99.8th %ile of 1-hr Means (PC)	PC - No. hours above 200 µg/m <sup>3</sup>	Percentage Time Exceedences could occur	Short-term Background Concentration (µg/m <sup>3</sup> )	99.8th %ile of 1-hr Means PEC (µg/m <sup>3</sup> )
			X Coordinate	Y Coordinate					
R50	Paintworks Phase 3 (4)	1.5	530196	5699325	165.36	3	0%	45.20	210.6
R51	St Philip's Marsh Nursery School (1)	0.9	529962	5699647	129.67	4	0%	45.20	174.9
R52	St Philip's Marsh Nursery School (2)	0.9	529958	5699663	131.53	5	0%	45.20	176.7
R53	St Philip's Marsh Nursery School (3)	0.9	529953	5699675	138.53	6	0%	45.20	183.7
R54	Paintworks Phase 3 (1)	4.5	530277	5699337	142.81	0	0%	45.20	188.0
R55	Paintworks Phase 3 (1)	7	530277	5699337	143.07	0	0%	45.20	188.3
R56	Paintworks Phase 3 (1)	9.5	530277	5699337	149.79	0	0%	45.20	195.0
R57	Paintworks Phase 3 (1)	11	530277	5699337	149.61	1	0%	45.20	194.8
R58	Paintworks Phase 3 (1)	13.5	530277	5699337	149.20	4	0%	45.20	194.4
R59	Paintworks Phase 3 (2)	4.5	530248.6	5699336.2	156.21	0	0%	45.20	201.4
R60	Paintworks Phase 3 (2)	7	530248.6	5699336.2	156.24	0	0%	45.20	201.4
R61	Paintworks Phase 3 (2)	9.5	530248.6	5699336.2	159.21	1	0%	45.20	204.4
R62	Paintworks Phase 3 (2)	11	530248.6	5699336.2	158.49	3	0%	45.20	203.7
R63	Paintworks Phase 3 (2)	13.5	530248.6	5699336.2	164.92	4	0%	45.20	210.1
R64	Paintworks Phase 3 (3)	4.5	530223	5699333.3	171.43	1	0%	45.20	216.6
R65	Paintworks Phase 3 (3)	7	530223	5699333.3	172.08	1	0%	45.20	217.3
R66	Paintworks Phase 3 (3)	9.5	530223	5699333.3	172.07	1	0%	45.20	217.3
R67	Paintworks Phase 3 (3)	11	530223	5699333.3	172.10	3	0%	45.20	217.3
R68	Paintworks Phase 3 (3)	13.5	530223	5699333.3	175.51	5	0%	45.20	220.7
R69	Paintworks Phase 3 (4)	4.5	530196	5699324.8	167.72	3	0%	45.20	212.9
R70	Paintworks Phase 3 (4)	7	530196	5699324.8	167.22	4	0%	45.20	212.4
R71	Paintworks Phase 3 (4)	9.5	530196	5699324.8	169.49	4	0%	45.20	214.7
R72	Paintworks Phase 3 (4)	11	530196	5699324.8	168.78	4	0%	45.20	214.0
R73	Paintworks Phase 3 (4)	13.5	530196	5699324.8	167.30	5	0%	45.20	212.5
R74	St Philip's Marsh Nursery School (1A)	0.8	529962	5699647	129.52	4	0%	45.20	174.7
R75	St Philip's Marsh Nursery School (2A)	0.8	529958	5699663	131.40	5	0%	45.20	176.6
R76	St Philip's Marsh Nursery School (3A)	0.8	529953	5699675	138.36	6	0%	45.20	183.6
R77	St Philip's Marsh Nursery School (B1)	0.6	529962	5699647	129.21	4	0%	45.20	174.4
R78	St Philip's Marsh Nursery School (2B)	0.6	529958	5699663	131.15	5	0%	45.20	176.3

<i>Discrete Receptors</i>		<i>Elevation (m, agl)</i>	UTM Coordinates		<i>99.8th %ile of 1-hr Means (PC)</i>	<i>PC - No. hours above 200 µg/m<sup>3</sup></i>	<i>Percentage Time Exceedences could occur</i>	<i>Short-term Background Concentration (µg/m<sup>3</sup>)</i>	<i>99.8th %ile of 1-hr Means PEC (µg/m<sup>3</sup>)</i>
			<i>X Coordinate</i>	<i>Y Coordinate</i>					
R79	St Philip's Marsh Nursery School (3B)	0.6	529953	5699675	138.01	6	0%	45.20	183.2
<i>Air Quality Standard or Guideline</i>					<b>200</b>	<b>18</b>			<b>200</b>

**Table A2-7 Highest Predicted 99.8<sup>th</sup> Percentile 1-Hour Mean NO<sub>2</sub> Concentrations (µg/m<sup>3</sup>) at Point of Maximum Impact: Worse-Case Scenario – EA Methodology (Biodiesel)**

Location	Air Quality Standard	Location		PC Concentration (µg/m <sup>3</sup> )	PEC (µg/m <sup>3</sup> )	PC - No. hours above 200 µg/m <sup>3</sup>
		X Coordinate	Y Coordinate			
Maximum Off-Site 1-hr Concentration	200	530230	5699540	547.1	592.3	NA
Maximum No. of Exceedences of 200 µg/m <sup>3</sup>	18	530155	5699565	NA	NA	469

**Table A2-8 Highest Predicted 99.8<sup>th</sup> Percentile 1-Hour Mean NO<sub>2</sub> Concentrations (µg/m<sup>3</sup>) at Receptor Locations: Worse-Case Scenario – EA Methodology (Biodiesel)**

Discrete Receptors		Elevation (m, agl)	UTM Coordinates		99.8th %ile of 1-hr Means (PC)	PC - No. hours above 200 µg/m <sup>3</sup>	Percentage Time Exceedences could occur	Short-term Background Concentration (µg/m <sup>3</sup> )	99.8th %ile of 1-hr Means PEC (µg/m <sup>3</sup> )
			X Coordinate	Y Coordinate					
R1	St Philip's Marsh Depot (south)	1.5	530240	5699646	192.3	7	0%	45.2	237.5
R2	St Philip's Marsh Depot (southwest)	1.5	530080	5699620	218.1	22	1%	45.2	263.3
R3	St Philip's Marsh Depot (southeast)	1.5	530408	5699615	159.6	11	0%	45.2	204.8
R4	KFC	1.5	530447	5699631	121.5	2	0%	62.8	184.3
R5	Carpark (McDonalds)	1.5	530524	5699623	90.2	0	0%	62.8	153.0
R6	Carpark (Avonmean Retail Park)	1.5	530564	5699684	70.3	0	0%	45.2	115.5
R7	Carpark (Costa)	1.5	530478	5699723	102.4	4	0%	62.8	165.2
R8	Showcase Cinema	1.5	530480	5699861	81.6	4	0%	62.8	126.8
R9	St Martins Court (Cole Rd)	1.5	530307	5699980	52.3	0	0%	62.8	115.1
R10	Merchant Trade Park	1.5	530452	5700067	43.5	0	0%	62.8	88.7
R11	Bristol Television	1.5	530197	5699868	89.2	0	0%	45.2	134.4
R12	Avonbank (industrial)	1.5	530156	5699716	247.7	63	2%	45.2	292.9
R13	Industrial site (Meriton Street)	1.5	530055	5699663	123.1	0	0%	45.2	168.3
R14	Industrial site (Albert Road)	1.5	530182	5699531	294.7	282	8%	45.2	339.9
R15	Spark Evans Park	1.5	530332	5699465	183.9	15	0%	45.2	229.1
R16	44 Edward Road	1.5	530341	5699235	77.1	0	0%	45.2	122.3
R17	Black Castle PH	1.5	530515	5699201	61.1	3	0%	62.8	123.9
R18	Sainbury's Carpark	1.5	530600	5699236	49.1	6	0%	62.8	111.9
R19	19 Whitby Road	1.5	530714	5699306	61.0	5	0%	45.2	106.2

R20	Whitby Road Industrial area (S)	1.5	530848	5699554	38.2	0	0%	45.2	83.4
R21	15 Hardenhuish Road	1.5	530904	5699510	34.8	0	0%	45.2	80.0
R22	5/7 Kilvert Close	1.5	531020	5699670	26.0	0	0%	45.2	71.2
R23	Whitby Road Industrial area (N)	1.5	530980	5699920	28.1	0	0%	45.2	73.3
R24	St Anne's Junior & Infant Schools	1.0	531235	5699671	20.0	0	0%	45.2	65.2
R25	3 Mardon Road	1.5	531168	5700051	21.7	0	0%	45.2	66.9
R26	Industrial Park (Avonsdie Rd)	1.5	530733	5700070	33.4	0	0%	45.2	78.6
R27	Netham Park	1.5	530852	5700219	23.1	0	0%	45.2	68.3
R28	14 Ford Street	1.5	530582	5700242	30.4	0	0%	45.2	75.6
R29	12 Beaconsfield Close	1.5	530154	5700145	39.6	0	0%	62.8	102.4
R30	Victoria Terrace Comm/Ind	1.5	529980	5699921	109.8	5	0%	45.2	155.0
R31	Playground (Kingsland Road)	1.0	529526	5700168	19.3	0	0%	45.2	64.5
R32	Industrial Area (Silverthorn Lane)	1.5	529737	5699988	43.4	2	0%	45.2	88.6
R33	Industrial area (Gamwal Road)	1.5	529732	5699646	38.4	0	0%	45.2	83.6
R34	Wholesale Fruit Centre (1)	1.5	529876	5699395	123.7	6	0%	45.2	168.9
R35	Wholesale Fruit Centre (2)	1.5	529629	5699383	51.9	4	0%	45.2	97.1
R36	Bristol Temple Meads Station	1.5	529086	5700047	14.4	0	0%	62.8	77.2
R37	Chatterton Square	1.5	528824	5699708	10.3	0	0%	45.2	55.5
R38	1 Higham Street	1.5	529228	5699328	19.0	0	0%	45.2	64.2
R39	The Thunderbolt PH	1.5	529592	5699092	48.7	3	0%	100.2	148.9
R40	226 Bath Road	1.5	529889	5699136	105.8	7	0%	100.2	<b>206.0</b>
R41	Paintworks Phase 3	1.5	530277	5699337	100.6	0	0%	45.2	145.8
R42	Commercial Retail Area (Castle Court)	1.5	530446	5699331	90.4	6	0%	62.8	153.2
R43	Spark Evans Park 2	1.5	530314	5699464	194.9	12	0%	45.2	<b>240.1</b>
R44	Spark Evans Park 3	1.5	530297	5699467	192.8	16	0%	45.2	<b>238.0</b>
R45	Spark Evans Park 4	1.5	530275	5699464	164.9	8	0%	45.2	<b>210.1</b>
R46	Spark Evans Park 5	1.5	530251	5699454	167.8	3	0%	45.2	<b>213.0</b>
R47	Spark Evans Park 6	1.5	530229	5699449	178.8	4	0%	45.2	<b>224.0</b>
R48	Paintworks Phase 3 (2)	1.5	530249	5699336	109.8	0	0%	45.2	155.0
R49	Paintworks Phase 3 (3)	1.5	530223	5699333	121.2	0	0%	45.2	166.4
R50	Paintworks Phase 3 (4)	1.5	530196	5699325	116.7	0	0%	45.2	161.9
R51	St Philip's Marsh Nursery School (1)	0.9	529962	5699647	91.5	0	0%	45.2	136.7
R52	St Philip's Marsh Nursery School (2)	0.9	529958	5699663	92.8	2	0%	45.2	138.0

R53	St Philip's Marsh Nursery School (3)	0.9	529953	5699675	97.8	4	0%	45.2	143.0
R54	Paintworks Phase 3 (1)	4.5	530277	5699337	100.5	0	0%	45.2	145.7
R55	Paintworks Phase 3 (1)	7	530277	5699337	100.7	0	0%	45.2	145.9
R56	Paintworks Phase 3 (1)	9.5	530277	5699337	105.6	0	0%	45.2	150.8
R57	Paintworks Phase 3 (1)	11	530277	5699337	105.5	0	0%	45.2	150.7
R58	Paintworks Phase 3 (1)	13.5	530277	5699337	105.2	0	0%	45.2	150.4
R59	Paintworks Phase 3 (2)	4.5	530248.6	5699336.2	110.1	0	0%	45.2	155.3
R60	Paintworks Phase 3 (2)	7	530248.6	5699336.2	110.1	0	0%	45.2	155.3
R61	Paintworks Phase 3 (2)	9.5	530248.6	5699336.2	112.3	0	0%	45.2	157.5
R62	Paintworks Phase 3 (2)	11	530248.6	5699336.2	111.8	0	0%	45.2	157.0
R63	Paintworks Phase 3 (2)	13.5	530248.6	5699336.2	116.3	1	0%	45.2	161.5
R64	Paintworks Phase 3 (3)	4.5	530223	5699333.3	120.9	0	0%	45.2	166.1
R65	Paintworks Phase 3 (3)	7	530223	5699333.3	120.5	0	0%	45.2	165.7
R66	Paintworks Phase 3 (3)	9.5	530223	5699333.3	121.1	0	0%	45.2	166.3
R67	Paintworks Phase 3 (3)	11	530223	5699333.3	121.2	0	0%	45.2	166.4
R68	Paintworks Phase 3 (3)	13.5	530223	5699333.3	123.1	0	0%	45.2	168.3
R69	Paintworks Phase 3 (4)	4.5	530196	5699324.8	118.3	0	0%	45.2	163.5
R70	Paintworks Phase 3 (4)	7	530196	5699324.8	117.9	0	0%	45.2	163.1
R71	Paintworks Phase 3 (4)	9.5	530196	5699324.8	119.5	0	0%	45.2	164.7
R72	Paintworks Phase 3 (4)	11	530196	5699324.8	119.0	0	0%	45.2	164.2
R73	Paintworks Phase 3 (4)	13.5	530196	5699324.8	118.0	1	0%	45.2	163.2
R74	St Philip's Marsh Nursery School (1A)	0.8	529962	5699647	91.4	0	0%	45.2	136.6
R75	St Philip's Marsh Nursery School (2A)	0.8	529958	5699663	92.8	2	0%	45.2	138.0
R76	St Philip's Marsh Nursery School (3A)	0.8	529953	5699675	97.7	4	0%	45.2	142.9
R77	St Philip's Marsh Nursery School (B1)	0.6	529962	5699647	91.2	0	0%	45.2	136.4
R78	St Philip's Marsh Nursery School (2B)	0.6	529958	5699663	92.6	2	0%	45.2	137.8
R79	St Philip's Marsh Nursery School (3B)	0.6	529953	5699675	97.4	4	0%	45.2	142.6
<b>Air Quality Standard or Guideline</b>					<b>200</b>	<b>18</b>			<b>200</b>

**Table A2-9 Highest Predicted 99.8<sup>th</sup> Percentile 1-Hour Mean NO<sub>2</sub> Concentrations (µg/m<sup>3</sup>) at Point of Maximum Impact: Typical Operating Scenario (Diesel)**

Location	Air Quality Standard	UTM Coordinates		PC Concentration (µg/m <sup>3</sup> )	PEC (µg/m <sup>3</sup> )	PC - No. hours above 200 µg/m <sup>3</sup>
		X Coordinate	Y Coordinate			
Maximum Off-Site 1-hr Concentration	200	530030	5699515	834.9	880.1	NA
Maximum Off-Site 99.8th %ile 1-hr Concentration	200	530155	5699490	137.4	182.6	NA
Maximum No. of Exceedences of 200 µg/m <sup>3</sup>	18	530305	5699690	NA	NA	11
Maximum Off-Site Annual Mean	40	530155	5699490	0.68	23.3	NA

**Table A2-10 Highest Predicted 99.8<sup>th</sup> Percentile 1-Hour Mean NO<sub>2</sub> Concentrations (µg/m<sup>3</sup>) at Receptor Locations: Typical Operating Scenario (Diesel)**

Discrete Receptors		Elevation (m, agl)	UTM Coordinates		Annual Mean	Annual Mean (PEC)	Impact Severity of Annual Mean Concentrations	Maximum 1-hr Mean (PC)	99.8th %ile of 1-hr Means (PC)	Impact Severity of 1-hour Mean Concentrations	Short-term Background Concentration (µg/m <sup>3</sup> )	99.8th %ile of 1-hr Means PEC (µg/m <sup>3</sup> )
			X Coordinate	Y Coordinate								
R1	St Philip's Marsh Depot (south)	1.5	530240	5699646	0.37	23.0	NEGLECTIBLE	146.0	45.9	MODERATE	45.20	91.1
R2	St Philip's Marsh Depot (southwest)	1.5	530080	5699620	0.14	22.7	NEGLECTIBLE	130.7	22.4	SLIGHT	45.20	67.6
R3	St Philip's Marsh Depot (southeast)	1.5	530408	5699615	0.18	22.8	NEGLECTIBLE	168.8	18.2	NEGLECTIBLE	45.20	63.4
R4	KFC	1.5	530447	5699631	0.15	31.5	NEGLECTIBLE	180.6	21.4	SLIGHT	62.80	84.2
R5	Carpark (McDonalds)	1.5	530524	5699623	0.11	31.5	NEGLECTIBLE	166.3	15.4	NEGLECTIBLE	62.80	78.2
R6	Carpark (Avonmean Retail Park)	1.5	530564	5699684	0.10	22.7	NEGLECTIBLE	67.0	14.8	NEGLECTIBLE	45.20	60.0
R7	Carpark (Costa)	1.5	530478	5699723	0.18	31.6	NEGLECTIBLE	156.6	27.4	SLIGHT	62.80	90.2
R8	Showcase Cinema	1.5	530480	5699861	0.18	22.8	NEGLECTIBLE	197.6	30.9	SLIGHT	62.80	76.1
R9	St Martins Court (Cole Rd)	1.5	530307	5699980	0.17	31.6	NEGLECTIBLE	88.9	24.0	SLIGHT	62.80	86.8
R10	Merchant Trade Park	1.5	530452	5700067	0.17	22.8	NEGLECTIBLE	128.2	27.9	SLIGHT	62.80	73.1
R11	Bristol Television	1.5	530197	5699868	0.19	22.8	NEGLECTIBLE	82.3	37.3	SLIGHT	45.20	82.5
R12	Avonbank (industrial)	1.5	530156	5699716	0.26	22.9	NEGLECTIBLE	200.4	38.3	SLIGHT	45.20	83.5
R13	Industrial site (Meriton Street)	1.5	530055	5699663	0.10	22.7	NEGLECTIBLE	89.7	11.8	NEGLECTIBLE	45.20	57.0
R14	Industrial site (Albert Road)	1.5	530182	5699531	0.39	23.0	NEGLECTIBLE	178.7	76.5	MODERATE	45.20	121.7
R15	Spark Evans Park	1.5	530332	5699465	0.13	22.7	NEGLECTIBLE	207.2	3.5	NEGLECTIBLE	45.20	48.7
R16	44 Edward Road	1.5	530341	5699235	0.09	22.7	NEGLECTIBLE	113.2	8.1	NEGLECTIBLE	45.20	53.3
R17	Black Castle PH	1.5	530515	5699201	0.05	31.5	NEGLECTIBLE	168.9	1.5	NEGLECTIBLE	62.80	64.3

Discrete Receptors		Elevation (m, agl)	UTM Coordinates		Annual Mean	Annual Mean (PEC)	Impact Severity of Annual Mean Concentrations	Maximum 1-hr Mean (PC)	99.8th %ile of 1-hr Means (PC)	Impact Severity of 1-hour Mean Concentrations	Short-term Background Concentration (µg/m³)	99.8th %ile of 1-hr Means PEC (µg/m³)
			X Coordinate	Y Coordinate								
R18	Sainbury's Carpark	1.5	530600	5699236	0.05	31.4	NEGLIGIBLE	132.4	1.8	NEGLIGIBLE	62.80	64.6
R19	19 Whitby Road	1.5	530714	5699306	0.06	22.7	NEGLIGIBLE	189.0	1.5	NEGLIGIBLE	45.20	46.7
R20	Whitby Road Industrial area (S)	1.5	530848	5699554	0.07	22.7	NEGLIGIBLE	133.0	7.4	NEGLIGIBLE	45.20	52.6
R21	15 Hardenhuish Road	1.5	530904	5699510	0.06	22.7	NEGLIGIBLE	106.7	6.1	NEGLIGIBLE	45.20	51.3
R22	5/7 Kilvert Close	1.5	531020	5699670	0.05	22.6	NEGLIGIBLE	28.2	8.0	NEGLIGIBLE	45.20	53.2
R23	Whitby Road Industrial area (N)	1.5	530980	5699920	0.11	22.7	NEGLIGIBLE	107.7	16.5	NEGLIGIBLE	45.20	61.7
R24	St Anne's Junior & Infant Schools	1.0	531235	5699671	0.03	22.6	NEGLIGIBLE	17.2	6.1	NEGLIGIBLE	45.20	51.3
R25	3 Mardon Road	1.5	531168	5700051	0.10	22.7	NEGLIGIBLE	48.0	15.1	NEGLIGIBLE	45.20	60.3
R26	Industrial Park (Avonsdie Rd)	1.5	530733	5700070	0.14	22.7	NEGLIGIBLE	98.7	20.7	SLIGHT	45.20	65.9
R27	Netham Park	1.5	530852	5700219	0.11	22.7	NEGLIGIBLE	51.1	16.3	NEGLIGIBLE	45.20	61.5
R28	14 Ford Street	1.5	530582	5700242	0.12	22.7	NEGLIGIBLE	65.3	21.8	SLIGHT	45.20	67.0
R29	12 Beaconsfield Close	1.5	530154	5700145	0.14	31.5	NEGLIGIBLE	57.8	23.7	SLIGHT	62.80	86.5
R30	Victoria Terrace Comm/Ind	1.5	529980	5699921	0.11	22.7	NEGLIGIBLE	249.7	13.6	NEGLIGIBLE	45.20	58.8
R31	Playground (Kingsland Road)	1.0	529526	5700168	0.05	22.6	NEGLIGIBLE	103.5	3.7	NEGLIGIBLE	45.20	48.9
R32	Industrial Area (Silverthorn Lane)	1.5	529737	5699988	0.08	22.7	NEGLIGIBLE	147.6	5.5	NEGLIGIBLE	45.20	50.7
R33	Industrial area (Gamwal Road)	1.5	529732	5699646	0.02	22.6	NEGLIGIBLE	37.7	2.0	NEGLIGIBLE	45.20	47.2
R34	Wholesale Fruit Centre (1)	1.5	529876	5699395	0.08	22.7	NEGLIGIBLE	213.3	5.5	NEGLIGIBLE	45.20	50.7
R35	Wholesale Fruit Centre (2)	1.5	529629	5699383	0.05	22.6	NEGLIGIBLE	142.3	2.4	NEGLIGIBLE	45.20	47.6
R36	Bristol Temple Meads Station	1.5	529086	5700047	0.02	31.4	NEGLIGIBLE	32.9	2.3	NEGLIGIBLE	62.80	65.1
R37	Chatterton Square	1.5	528824	5699708	0.02	22.6	NEGLIGIBLE	24.2	0.9	NEGLIGIBLE	45.20	46.1
R38	1 Higham Street	1.5	529228	5699328	0.01	22.6	NEGLIGIBLE	19.6	0.3	NEGLIGIBLE	45.20	45.5
R39	The Thunderbolt PH	1.5	529592	5699092	0.03	50.1	NEGLIGIBLE	110.7	2.7	NEGLIGIBLE	100.20	102.9
R40	226 Bath Road	1.5	529889	5699136	0.13	50.2	NEGLIGIBLE	162.2	14.3	NEGLIGIBLE	100.20	114.5
R41	Paintworks Phase 3	1.5	530277	5699337	0.11	22.7	NEGLIGIBLE	141.9	12.0	NEGLIGIBLE	45.20	57.2
R42	Commercial Retail Area (Castle Court)	1.5	530446	5699331	0.07	31.5	NEGLIGIBLE	208.8	2.8	NEGLIGIBLE	62.80	65.6
R43	Spark Evans Park 2	1.5	530314	5699464	0.13	22.7	NEGLIGIBLE	185.0	4.5	NEGLIGIBLE	45.20	49.7
R44	Spark Evans Park 3	1.5	530297	5699467	0.13	22.7	NEGLIGIBLE	160.1	8.1	NEGLIGIBLE	45.20	53.3
R45	Spark Evans Park 4	1.5	530275	5699464	0.14	22.7	NEGLIGIBLE	193.9	13.7	NEGLIGIBLE	45.20	58.9
R46	Spark Evans Park 5	1.5	530251	5699454	0.14	22.7	NEGLIGIBLE	169.2	20.8	SLIGHT	45.20	66.0
R47	Spark Evans Park 6	1.5	530229	5699449	0.17	22.8	NEGLIGIBLE	122.0	28.9	SLIGHT	45.20	74.1

Discrete Receptors		Elevation (m, agl)	UTM Coordinates		Annual Mean	Annual Mean (PEC)	Impact Severity of Annual Mean Concentrations	Maximum 1-hr Mean (PC)	99.8th %ile of 1-hr Means (PC)	Impact Severity of 1-hour Mean Concentrations	Short-term Background Concentration ( $\mu\text{g}/\text{m}^3$ )	99.8th %ile of 1-hr Means PEC ( $\mu\text{g}/\text{m}^3$ )
			X Coordinate	Y Coordinate								
R48	Paintworks Phase 3 (2)	1.5	530249	5699336	0.11	22.7	NEGLIGIBLE	104.8	16.3	NEGLIGIBLE	45.20	61.5
R49	Paintworks Phase 3 (3)	1.5	530223	5699333	0.12	22.7	NEGLIGIBLE	89.5	22.1	SLIGHT	45.20	67.3
R50	Paintworks Phase 3 (4)	1.5	530196	5699325	0.14	22.7	NEGLIGIBLE	84.6	30.0	SLIGHT	45.20	75.2
R51	St Philip's Marsh Nursery School (1)	0.9	529962	5699647	0.06	22.7	NEGLIGIBLE	91.4	4.0	NEGLIGIBLE	45.20	49.2
R52	St Philip's Marsh Nursery School (2)	0.9	529958	5699663	0.07	22.7	NEGLIGIBLE	117.1	4.0	NEGLIGIBLE	45.20	49.2
R53	St Philip's Marsh Nursery School (3)	0.9	529953	5699675	0.07	22.7	NEGLIGIBLE	134.7	3.5	NEGLIGIBLE	45.20	48.7
R54	Paintworks Phase 3 (1)	4.5	530277	5699337	0.11	22.7	NEGLIGIBLE	142.4	11.5	NEGLIGIBLE	45.20	56.7
R55	Paintworks Phase 3 (1)	7	530277	5699337	0.11	22.7	NEGLIGIBLE	143.2	11.5	NEGLIGIBLE	45.20	56.7
R56	Paintworks Phase 3 (1)	9.5	530277	5699337	0.11	22.7	NEGLIGIBLE	144.4	11.5	NEGLIGIBLE	45.20	56.7
R57	Paintworks Phase 3 (1)	11	530277	5699337	0.11	22.7	NEGLIGIBLE	145.3	11.5	NEGLIGIBLE	45.20	56.7
R58	Paintworks Phase 3 (1)	13.5	530277	5699337	0.12	22.7	NEGLIGIBLE	142.9	12.8	NEGLIGIBLE	45.20	58.0
R59	Paintworks Phase 3 (2)	4.5	530248.6	5699336.2	0.10	22.7	NEGLIGIBLE	105.3	14.9	NEGLIGIBLE	45.20	60.1
R60	Paintworks Phase 3 (2)	7	530248.6	5699336.2	0.10	22.7	NEGLIGIBLE	106.1	15.7	NEGLIGIBLE	45.20	60.9
R61	Paintworks Phase 3 (2)	9.5	530248.6	5699336.2	0.11	22.7	NEGLIGIBLE	107.3	15.3	NEGLIGIBLE	45.20	60.5
R62	Paintworks Phase 3 (2)	11	530248.6	5699336.2	0.11	22.7	NEGLIGIBLE	98.3	14.9	NEGLIGIBLE	45.20	60.1
R63	Paintworks Phase 3 (2)	13.5	530248.6	5699336.2	0.12	22.7	NEGLIGIBLE	99.9	14.2	NEGLIGIBLE	45.20	59.4
R64	Paintworks Phase 3 (3)	4.5	530223	5699333.3	0.11	22.7	NEGLIGIBLE	75.4	20.1	SLIGHT	45.20	65.3
R65	Paintworks Phase 3 (3)	7	530223	5699333.3	0.11	22.7	NEGLIGIBLE	77.3	20.7	SLIGHT	45.20	65.9
R66	Paintworks Phase 3 (3)	9.5	530223	5699333.3	0.11	22.7	NEGLIGIBLE	89.3	20.4	SLIGHT	45.20	65.6
R67	Paintworks Phase 3 (3)	11	530223	5699333.3	0.11	22.7	NEGLIGIBLE	98.5	20.0	SLIGHT	45.20	65.2
R68	Paintworks Phase 3 (3)	13.5	530223	5699333.3	0.12	22.7	NEGLIGIBLE	116.9	20.6	SLIGHT	45.20	65.8
R69	Paintworks Phase 3 (4)	4.5	530196	5699324.8	0.13	22.7	NEGLIGIBLE	84.3	28.2	SLIGHT	45.20	73.4
R70	Paintworks Phase 3 (4)	7	530196	5699324.8	0.13	22.7	NEGLIGIBLE	91.3	26.9	SLIGHT	45.20	72.1
R71	Paintworks Phase 3 (4)	9.5	530196	5699324.8	0.13	22.7	NEGLIGIBLE	103.3	26.0	SLIGHT	45.20	71.2
R72	Paintworks Phase 3 (4)	11	530196	5699324.8	0.13	22.7	NEGLIGIBLE	112.4	25.6	SLIGHT	45.20	70.8
R73	Paintworks Phase 3 (4)	13.5	530196	5699324.8	0.13	22.7	NEGLIGIBLE	130.6	25.0	SLIGHT	45.20	70.2
R74	St Philip's Marsh Nursery School (1A)	0.8	529962	5699647	0.06	22.7	NEGLIGIBLE	91.3	4.0	NEGLIGIBLE	45.20	49.2
R75	St Philip's Marsh Nursery School (2A)	0.8	529958	5699663	0.07	22.7	NEGLIGIBLE	116.9	4.0	NEGLIGIBLE	45.20	49.2
R76	St Philip's Marsh Nursery School (3A)	0.8	529953	5699675	0.07	22.7	NEGLIGIBLE	134.6	3.5	NEGLIGIBLE	45.20	48.7



Discrete Receptors		Elevation (m, agl)	UTM Coordinates		Annual Mean	Annual Mean (PEC)	Impact Severity of Annual Mean Concentrations	Maximum 1-hr Mean (PC)	99.8th %ile of 1-hr Means (PC)	Impact Severity of 1-hour Mean Concentrations	Short-term Background Concentration (µg/m³)	99.8th %ile of 1-hr Means PEC (µg/m³)
			X Coordinate	Y Coordinate								
R77	St Philip's Marsh Nursery School (B1)	0.6	529962	5699647	0.06	22.7	NEGLIGIBLE	91.1	4.0	NEGLIGIBLE	45.20	49.2
R78	St Philip's Marsh Nursery School (2B)	0.6	529958	5699663	0.06	22.7	NEGLIGIBLE	116.7	4.0	NEGLIGIBLE	45.20	49.2
R79	St Philip's Marsh Nursery School (3B)	0.6	529953	5699675	0.07	22.7	NEGLIGIBLE	134.2	3.5	NEGLIGIBLE	45.20	48.7
Air Quality Standard or Guideline					200			18			200	18

**Table A2-11 Highest Predicted 99.8<sup>th</sup> Percentile 1-Hour Mean NO<sub>2</sub> Concentrations (µg/m<sup>3</sup>) at Point of Maximum Impact: Typical Operating Scenario – EA Methodology (Diesel)**

Location	Air Quality Standard	UTM Coordinates		PC Concentration (µg/m <sup>3</sup> )	PEC (µg/m <sup>3</sup> )	PC - No. hours above 200 µg/m <sup>3</sup>
		X Coordinate	Y Coordinate			
Maximum Off-Site 1-hr Concentration	200	530030	5699515	860.5	905.7	NA
Maximum Off-Site 99.8th %ile 1-hr Concentration	200	530155	5699490	526.1	571.3	NA
Maximum No. of Exceedences of 200 µg/m <sup>3</sup>	18	530305	5699690	NA	NA	11
Maximum Off-Site Annual Mean	40	530155	5699490	4.18	26.8	NA

**Table A2-12 Highest Predicted 99.8<sup>th</sup> Percentile 1-Hour Mean NO<sub>2</sub> Concentrations (µg/m<sup>3</sup>) at Receptor Locations: Typical Operating Scenario – EA Methodology (Diesel)**

Discrete Receptors		Elevation (m, agl)	UTM Coordinates		Annual Mean	Annual Mean (PEC)	Impact Severity of Annual Mean Concentrations	Maximum 1-hr Mean (PC)	99.8th %ile of 1-hr Means (PC)	Impact Severity of 1-hour Mean Concentration	Short-term Background Concentration (µg/m <sup>3</sup> )	99.8th %ile of 1-hr Means PEC (µg/m <sup>3</sup> )
			X Coordinate	Y Coordinate								
R1	St Philip's Marsh Depot (south)	1.5	530240	5699646	2.31	24.91	SLIGHT	292.28	112.11	SUBSTANTIAL	45.20	157.3
R2	St Philip's Marsh Depot (southwest)	1.5	530080	5699620	0.87	23.47	NEGLECTIBLE	404.89	92.48	MODERATE	45.20	137.7
R3	St Philip's Marsh Depot (southeast)	1.5	530408	5699615	0.84	23.44	NEGLECTIBLE	286.99	84.61	MODERATE	45.20	129.8
R4	KFC	1.5	530447	5699631	0.75	32.15	NEGLECTIBLE	293.51	84.12	MODERATE	62.80	146.9
R5	Carpark (McDonalds)	1.5	530524	5699623	0.57	31.97	NEGLECTIBLE	282.88	55.20	MODERATE	62.80	118.0
R6	Carpark (Avonmean Retail Park)	1.5	530564	5699684	0.65	23.25	NEGLECTIBLE	131.63	69.35	MODERATE	45.20	114.6
R7	Carpark (Costa)	1.5	530478	5699723	1.17	32.57	SLIGHT	279.92	97.72	MODERATE	62.80	160.5
R8	Showcase Cinema	1.5	530480	5699861	0.93	23.53	NEGLECTIBLE	198.46	69.99	MODERATE	62.80	115.2
R9	St Martins Court (Cole Rd)	1.5	530307	5699980	0.58	31.98	NEGLECTIBLE	81.86	51.62	MODERATE	62.80	114.4
R10	Merchant Trade Park	1.5	530452	5700067	0.39	22.99	NEGLECTIBLE	115.58	35.86	SLIGHT	62.80	81.1
R11	Bristol Television	1.5	530197	5699868	0.96	23.56	NEGLECTIBLE	155.74	104.26	SUBSTANTIAL	45.20	149.5
R12	Avonbank (industrial)	1.5	530156	5699716	1.53	24.13	NEGLECTIBLE	363.25	180.89	SUBSTANTIAL	45.20	226.1
R13	Industrial site (Meriton Street)	1.5	530055	5699663	0.61	23.21	NEGLECTIBLE	183.18	109.77	SUBSTANTIAL	45.20	155.0
R14	Industrial site (Albert Road)	1.5	530182	5699531	2.76	25.36	SLIGHT	475.95	299.60	SUBSTANTIAL	45.20	344.8
R15	Spark Evans Park	1.5	530332	5699465	0.54	23.14	NEGLECTIBLE	427.13	9.85	NEGLECTIBLE	45.20	55.0
R16	44 Edward Road	1.5	530341	5699235	0.38	22.98	NEGLECTIBLE	248.90	20.03	SLIGHT	45.20	65.2
R17	Black Castle PH	1.5	530515	5699201	0.19	31.59	NEGLECTIBLE	366.68	1.82	NEGLECTIBLE	62.80	64.6
R18	Sainbury's Carpark	1.5	530600	5699236	0.13	31.53	SLIGHT	249.75	1.19	NEGLECTIBLE	62.80	64.0

Discrete Receptors		Elevation (m, agl)	UTM Coordinates		Annual Mean	Annual Mean (PEC)	Impact Severity of Annual Mean Concentrations	Maximum 1-hr Mean (PC)	99.8th %ile of 1-hr Means (PC)	Impact Severity of 1-hour Mean Concentration	Short-term Background Concentration (µg/m³)	99.8th %ile of 1-hr Means PEC (µg/m³)
			X Coordinate	Y Coordinate								
R19	19 Whitby Road	1.5	530714	5699306	0.17	22.77	NEGLIGIBLE	331.86	2.87	NEGLIGIBLE	45.20	48.1
R20	Whitby Road Industrial area (S)	1.5	530848	5699554	0.23	22.83	NEGLIGIBLE	209.74	17.45	NEGLIGIBLE	45.20	62.7
R21	15 Hardenhuish Road	1.5	530904	5699510	0.19	22.79	NEGLIGIBLE	167.07	13.91	NEGLIGIBLE	45.20	59.1
R22	5/7 Kilvert Close	1.5	531020	5699670	0.17	22.77	NEGLIGIBLE	52.45	25.05	SLIGHT	45.20	70.2
R23	Whitby Road Industrial area (N)	1.5	530980	5699920	0.25	22.85	NEGLIGIBLE	178.95	27.11	SLIGHT	45.20	72.3
R24	St Anne's Junior & Infant Schools	1.0	531235	5699671	0.11	22.71	NEGLIGIBLE	31.34	17.80	SLIGHT	45.20	63.0
R25	3 Mardon Road	1.5	531168	5700051	0.18	22.78	NEGLIGIBLE	105.37	15.81	NEGLIGIBLE	45.20	61.0
R26	Industrial Park (Avonsdie Rd)	1.5	530733	5700070	0.30	22.90	NEGLIGIBLE	88.02	20.97	SLIGHT	45.20	66.2
R27	Netham Park	1.5	530852	5700219	0.19	22.79	NEGLIGIBLE	46.36	16.45	SLIGHT	45.20	61.6
R28	14 Ford Street	1.5	530582	5700242	0.24	22.84	NEGLIGIBLE	70.24	22.64	SLIGHT	45.20	67.8
R29	12 Beaconsfield Close	1.5	530154	5700145	0.33	31.73	NEGLIGIBLE	61.49	36.40	SLIGHT	62.80	99.2
R30	Victoria Terrace Comm/Ind	1.5	529980	5699921	0.45	23.05	NEGLIGIBLE	359.41	63.56	MODERATE	45.20	108.8
R31	Playground (Kingsland Road)	1.0	529526	5700168	0.12	22.72	NEGLIGIBLE	122.20	7.85	NEGLIGIBLE	45.20	53.1
R32	Industrial Area (Silverthorn Lane)	1.5	529737	5699988	0.25	22.85	NEGLIGIBLE	177.91	15.18	NEGLIGIBLE	45.20	60.4
R33	Industrial area (Gamwal Road)	1.5	529732	5699646	0.12	22.72	NEGLIGIBLE	61.57	6.57	NEGLIGIBLE	45.20	51.8
R34	Wholesale Fruit Centre (1)	1.5	529876	5699395	0.51	23.11	NEGLIGIBLE	509.52	26.94	SLIGHT	45.20	72.1
R35	Wholesale Fruit Centre (2)	1.5	529629	5699383	0.25	22.85	NEGLIGIBLE	400.29	16.84	NEGLIGIBLE	45.20	62.0
R36	Bristol Temple Meads Station	1.5	529086	5700047	0.05	31.45	NEGLIGIBLE	38.13	2.26	NEGLIGIBLE	62.80	65.1
R37	Chatterton Square	1.5	528824	5699708	0.03	22.63	NEGLIGIBLE	20.84	2.65	NEGLIGIBLE	45.20	47.8
R38	1 Higham Street	1.5	529228	5699328	0.06	22.66	NEGLIGIBLE	51.17	2.63	NEGLIGIBLE	45.20	47.8
R39	The Thunderbolt PH	1.5	529592	5699092	0.19	50.29	NEGLIGIBLE	218.86	5.47	NEGLIGIBLE	100.20	105.7
R40	226 Bath Road	1.5	529889	5699136	0.53	50.63	MINOR	330.98	40.98	MODERATE	100.20	141.2
R41	Paintworks Phase 3	1.5	530277	5699337	0.49	23.09	NEGLIGIBLE	189.74	28.36	SLIGHT	45.20	73.6
R42	Commercial Retail Area (Castle Court)	1.5	530446	5699331	0.27	31.67	NEGLIGIBLE	459.50	3.01	NEGLIGIBLE	62.80	65.8
R43	Spark Evans Park 2	1.5	530314	5699464	0.57	23.17	NEGLIGIBLE	349.32	13.13	NEGLIGIBLE	45.20	58.3
R44	Spark Evans Park 3	1.5	530297	5699467	0.62	23.22	NEGLIGIBLE	297.28	21.52	SLIGHT	45.20	66.7
R45	Spark Evans Park 4	1.5	530275	5699464	0.70	23.30	NEGLIGIBLE	322.70	38.60	SLIGHT	45.20	83.8
R46	Spark Evans Park 5	1.5	530251	5699454	0.81	23.41	NEGLIGIBLE	277.46	62.98	MODERATE	45.20	108.2
R47	Spark Evans Park 6	1.5	530229	5699449	1.06	23.66	NEGLIGIBLE	285.64	118.13	SUBSTANTIAL	45.20	163.3
R48	Paintworks Phase 3 (2)	1.5	530249	5699336	0.53	23.13	NEGLIGIBLE	189.71	41.16	MODERATE	45.20	86.4

Discrete Receptors		Elevation (m, agl)	UTM Coordinates		Annual Mean	Annual Mean (PEC)	Impact Severity of Annual Mean Concentrations	Maximum 1-hr Mean (PC)	99.8th %ile of 1-hr Means (PC)	Impact Severity of 1-hour Mean Concentration	Short-term Background Concentration ( $\mu\text{g}/\text{m}^3$ )	99.8th %ile of 1-hr Means PEC ( $\mu\text{g}/\text{m}^3$ )
			X Coordinate	Y Coordinate								
R49	Paintworks Phase 3 (3)	1.5	530223	5699333	0.62	23.22	NEGLIGIBLE	186.38	59.42	MODERATE	45.20	104.6
R50	Paintworks Phase 3 (4)	1.5	530196	5699325	0.75	23.35	NEGLIGIBLE	183.71	83.70	MODERATE	45.20	128.9
R51	St Philip's Marsh Nursery School (1)	0.9	529962	5699647	0.35	22.95	NEGLIGIBLE	180.22	44.37	MODERATE	45.20	89.6
R52	St Philip's Marsh Nursery School (2)	0.9	529958	5699663	0.36	22.96	NEGLIGIBLE	<b>228.77</b>	29.93	SLIGHT	45.20	75.1
R53	St Philip's Marsh Nursery School (3)	0.9	529953	5699675	0.37	22.97	NEGLIGIBLE	<b>260.18</b>	24.62	SLIGHT	45.20	69.8
R54	Paintworks Phase 3 (1)	4.5	530277	5699337	0.48	23.08	NEGLIGIBLE	190.36	28.18	SLIGHT	45.20	73.4
R55	Paintworks Phase 3 (1)	7	530277	5699337	0.49	23.09	NEGLIGIBLE	191.38	28.64	SLIGHT	45.20	73.8
R56	Paintworks Phase 3 (1)	9.5	530277	5699337	0.51	23.11	NEGLIGIBLE	192.84	30.00	SLIGHT	45.20	75.2
R57	Paintworks Phase 3 (1)	11	530277	5699337	0.53	23.13	NEGLIGIBLE	<b>207.66</b>	31.29	SLIGHT	45.20	76.5
R58	Paintworks Phase 3 (1)	13.5	530277	5699337	0.56	23.16	NEGLIGIBLE	<b>237.78</b>	32.50	SLIGHT	45.20	77.7
R59	Paintworks Phase 3 (2)	4.5	530248.6	5699336.2	0.53	23.13	NEGLIGIBLE	189.75	41.21	MODERATE	45.20	86.4
R60	Paintworks Phase 3 (2)	7	530248.6	5699336.2	0.53	23.13	NEGLIGIBLE	189.39	41.24	MODERATE	45.20	86.4
R61	Paintworks Phase 3 (2)	9.5	530248.6	5699336.2	0.55	23.15	NEGLIGIBLE	188.71	41.31	MODERATE	45.20	86.5
R62	Paintworks Phase 3 (2)	11	530248.6	5699336.2	0.56	23.16	NEGLIGIBLE	199.16	41.38	MODERATE	45.20	86.6
R63	Paintworks Phase 3 (2)	13.5	530248.6	5699336.2	0.59	23.19	NEGLIGIBLE	<b>241.60</b>	41.50	MODERATE	45.20	86.7
R64	Paintworks Phase 3 (3)	4.5	530223	5699333.3	0.61	23.21	NEGLIGIBLE	186.20	59.28	MODERATE	45.20	104.5
R65	Paintworks Phase 3 (3)	7	530223	5699333.3	0.61	23.21	NEGLIGIBLE	185.67	59.10	MODERATE	45.20	104.3
R66	Paintworks Phase 3 (3)	9.5	530223	5699333.3	0.62	23.22	NEGLIGIBLE	185.29	59.07	MODERATE	45.20	104.3
R67	Paintworks Phase 3 (3)	11	530223	5699333.3	0.63	23.23	NEGLIGIBLE	185.62	58.91	MODERATE	45.20	104.1
R68	Paintworks Phase 3 (3)	13.5	530223	5699333.3	0.65	23.25	NEGLIGIBLE	196.98	61.65	MODERATE	45.20	106.9
R69	Paintworks Phase 3 (4)	4.5	530196	5699324.8	0.75	23.35	NEGLIGIBLE	183.95	83.77	MODERATE	45.20	129.0
R70	Paintworks Phase 3 (4)	7	530196	5699324.8	0.75	23.35	NEGLIGIBLE	198.40	83.61	MODERATE	45.20	128.8
R71	Paintworks Phase 3 (4)	9.5	530196	5699324.8	0.76	23.36	NEGLIGIBLE	<b>224.34</b>	83.69	MODERATE	45.20	128.9
R72	Paintworks Phase 3 (4)	11	530196	5699324.8	0.76	23.36	NEGLIGIBLE	<b>244.04</b>	85.31	MODERATE	45.20	130.5
R73	Paintworks Phase 3 (4)	13.5	530196	5699324.8	0.78	23.38	NEGLIGIBLE	<b>283.64</b>	84.34	MODERATE	45.20	129.5
R74	St Philip's Marsh Nursery School (1A)	0.8	529962	5699647	0.35	22.95	NEGLIGIBLE	180.01	44.32	MODERATE	45.20	89.5
R75	St Philip's Marsh Nursery School (2A)	0.8	529958	5699663	0.36	22.96	NEGLIGIBLE	<b>228.49</b>	29.90	SLIGHT	45.20	75.1
R76	St Philip's Marsh Nursery School (3A)	0.8	529953	5699675	0.37	22.97	NEGLIGIBLE	<b>259.86</b>	24.59	SLIGHT	45.20	69.8

Discrete Receptors		Elevation (m, agl)	UTM Coordinates		Annual Mean	Annual Mean (PEC)	Impact Severity of Annual Mean Concentrations	Maximum 1-hr Mean (PC)	99.8th %ile of 1-hr Means (PC)	Impact Severity of 1-hour Mean Concentration	Short-term Background Concentration (µg/m³)	99.8th %ile of 1-hr Means PEC (µg/m³)
			X Coordinate	Y Coordinate								
R77	St Philip's Marsh Nursery School (B1)	0.6	529962	5699647	0.35	22.95	NEGLIGIBLE	179.58	44.21	MODERATE	45.20	89.4
R78	St Philip's Marsh Nursery School (2B)	0.6	529958	5699663	0.36	22.96	NEGLIGIBLE	227.92	29.83	SLIGHT	45.20	75.0
R79	St Philip's Marsh Nursery School (3B)	0.6	529953	5699675	0.37	22.97	NEGLIGIBLE	259.20	24.52	SLIGHT	45.20	69.7
Air Quality Standard or Guideline					200			18			200	18

**Table A2-13 Highest Predicted 99.8<sup>th</sup> Percentile 1-Hour Mean NO<sub>2</sub> Concentrations (µg/m<sup>3</sup>) at Point of Maximum Impact: Typical Operating Scenario (Biodiesel)**

Location	Air Quality Standard	UTM Coordinates		PC Concentration (µg/m <sup>3</sup> )	PEC (µg/m <sup>3</sup> )	PC - No. hours above 200 µg/m <sup>3</sup>
		X Coordinate	Y Coordinate			
Maximum Off-Site 1-hr Concentration	200	530030	5699515	589.4	634.6	NA
Maximum Off-Site 99.8th %ile 1-hr Concentration	200	530155	5699490	111.2	156.4	NA
Maximum No. of Exceedences of 200 µg/m <sup>3</sup>	18	530305	5699690	10	NA	11
Maximum Off-Site Annual Mean	40	530155	5699490	0.60	23.2	NA

**Table A2-14 Highest Predicted 99.8<sup>th</sup> Percentile 1-Hour Mean NO<sub>2</sub> Concentrations (µg/m<sup>3</sup>) at Receptor Locations: Typical Operating Scenario (Biodiesel)**

Discrete Receptors		Elevation (m, agl)	UTM Coordinates		Annual Mean	Annual Mean (PEC)	Impact Severity of Annual Mean Concentration	Maximum 1-hr Mean (PC)	99.8th %ile of 1-hr Means (PC)	Impact Severity of 1-hour Mean Concentration	Short-term Background Concentration (µg/m <sup>3</sup> )	99.8th %ile of 1-hr Means PEC (µg/m <sup>3</sup> )
			X Coordinate	Y Coordinate								
R1	St Philip's Marsh Depot (south)	1.5	530240	5699646	0.32	22.9	NEGLECTIBLE	136.8	41.2	MODERATE	45.2	86.4
R2	St Philip's Marsh Depot (southwest)	1.5	530080	5699620	0.12	22.7	NEGLECTIBLE	92.2	18.7	NEGLECTIBLE	45.2	63.9
R3	St Philip's Marsh Depot (southeast)	1.5	530408	5699615	0.16	22.8	NEGLECTIBLE	159.1	16.4	NEGLECTIBLE	45.2	61.6
R4	KFC	1.5	530447	5699631	0.13	31.5	NEGLECTIBLE	172.1	16.6	NEGLECTIBLE	62.8	79.4
R5	Carpark (McDonalds)	1.5	530524	5699623	0.10	31.5	NEGLECTIBLE	158.8	11.9	NEGLECTIBLE	62.8	74.7
R6	Carpark (Avonmean Retail Park)	1.5	530564	5699684	0.09	22.7	NEGLECTIBLE	63.1	13.1	NEGLECTIBLE	45.2	58.3
R7	Carpark (Costa)	1.5	530478	5699723	0.15	31.6	NEGLECTIBLE	144.8	24.2	SLIGHT	62.8	87.0
R8	Showcase Cinema	1.5	530480	5699861	0.16	22.8	NEGLECTIBLE	189.3	28.7	SLIGHT	62.8	73.9
R9	St Martins Court (Cole Rd)	1.5	530307	5699980	0.16	31.6	NEGLECTIBLE	74.4	21.1	SLIGHT	62.8	83.9
R10	Merchant Trade Park	1.5	530452	5700067	0.15	22.7	NEGLECTIBLE	123.4	25.3	SLIGHT	62.8	70.5
R11	Bristol Television	1.5	530197	5699868	0.17	22.8	NEGLECTIBLE	78.6	33.7	SLIGHT	45.2	78.9
R12	Avonbank (industrial)	1.5	530156	5699716	0.23	22.8	NEGLECTIBLE	185.1	32.7	SLIGHT	45.2	77.9
R13	Industrial site (Meriton Street)	1.5	530055	5699663	0.09	22.7	NEGLECTIBLE	84.5	9.8	NEGLECTIBLE	45.2	55.0
R14	Industrial site (Albert Road)	1.5	530182	5699531	0.33	22.9	NEGLECTIBLE	162.2	61.7	MODERATE	45.2	106.9

Discrete Receptors		Elevation (m, agl)	UTM Coordinates		Annual Mean	Annual Mean (PEC)	Impact Severity of Annual Mean Concentration	Maximum 1- hr Mean (PC)	99.8th %ile of 1-hr Means (PC)	Impact Severity of 1-hour Mean Concentration	Short-term Background Concentration ( $\mu\text{g}/\text{m}^3$ )	99.8th %ile of 1-hr Means PEC ( $\mu\text{g}/\text{m}^3$ )
			X Coordinate	Y Coordinate								
R15	Spark Evans Park	1.5	530332	5699465	0.11	22.7	NEGLECTIBLE	189.2	3.1	NEGLECTIBLE	45.2	48.3
R16	44 Edward Road	1.5	530341	5699235	0.08	22.7	NEGLECTIBLE	102.8	6.2	NEGLECTIBLE	45.2	51.4
R17	Black Castle PH	1.5	530515	5699201	0.05	31.4	NEGLECTIBLE	153.5	1.4	NEGLECTIBLE	62.8	64.2
R18	Sainbury's Carpark	1.5	530600	5699236	0.04	31.4	NEGLECTIBLE	121.9	1.6	NEGLECTIBLE	62.8	64.4
R19	19 Whitby Road	1.5	530714	5699306	0.05	22.7	NEGLECTIBLE	175.0	1.3	NEGLECTIBLE	45.2	46.5
R20	Whitby Road Industrial area (S)	1.5	530848	5699554	0.06	22.7	NEGLECTIBLE	124.2	6.5	NEGLECTIBLE	45.2	51.7
R21	15 Hardenhuish Road	1.5	530904	5699510	0.05	22.7	NEGLECTIBLE	99.7	5.3	NEGLECTIBLE	45.2	50.5
R22	5/7 Kilvert Close	1.5	531020	5699670	0.04	22.6	NEGLECTIBLE	26.0	7.1	NEGLECTIBLE	45.2	52.3
R23	Whitby Road Industrial area (N)	1.5	530980	5699920	0.10	22.7	NEGLECTIBLE	100.1	14.0	NEGLECTIBLE	45.2	59.2
R24	St Anne's Junior & Infant Schools	1.0	531235	5699671	0.03	22.6	NEGLECTIBLE	16.4	5.6	NEGLECTIBLE	45.2	50.8
R25	3 Mardon Road	1.5	531168	5700051	0.09	22.7	NEGLECTIBLE	44.8	12.8	NEGLECTIBLE	45.2	58.0
R26	Industrial Park (Avonsdie Rd)	1.5	530733	5700070	0.12	22.7	NEGLECTIBLE	95.0	18.0	NEGLECTIBLE	45.2	63.2
R27	Netham Park	1.5	530852	5700219	0.10	22.7	NEGLECTIBLE	49.4	13.8	NEGLECTIBLE	45.2	59.0
R28	14 Ford Street	1.5	530582	5700242	0.11	22.7	NEGLECTIBLE	62.4	17.7	NEGLECTIBLE	45.2	62.9
R29	12 Beaconsfield Close	1.5	530154	5700145	0.12	31.5	NEGLECTIBLE	55.0	22.2	NEGLECTIBLE	62.8	85.0
R30	Victoria Terrace Comm/Ind	1.5	529980	5699921	0.10	22.7	NEGLECTIBLE	234.6	11.3	NEGLECTIBLE	45.2	56.5
R31	Playground (Kingsland Road)	1.0	529526	5700168	0.04	22.6	NEGLECTIBLE	98.4	3.5	NEGLECTIBLE	45.2	48.7
R32	Industrial Area (Silverthorn Lane)	1.5	529737	5699988	0.08	22.7	NEGLECTIBLE	141.4	5.3	NEGLECTIBLE	45.2	50.5
R33	Industrial area (Gamwal Road)	1.5	529732	5699646	0.02	22.6	NEGLECTIBLE	35.8	1.9	NEGLECTIBLE	45.2	47.1
R34	Wholesale Fruit Centre (1)	1.5	529876	5699395	0.07	22.7	NEGLECTIBLE	193.3	5.1	NEGLECTIBLE	45.2	50.3
R35	Wholesale Fruit Centre (2)	1.5	529629	5699383	0.04	22.6	NEGLECTIBLE	125.5	2.0	NEGLECTIBLE	45.2	47.2
R36	Bristol Temple Meads Station	1.5	529086	5700047	0.02	31.4	NEGLECTIBLE	30.4	1.6	NEGLECTIBLE	62.8	64.4
R37	Chatterton Square	1.5	528824	5699708	0.01	22.6	NEGLECTIBLE	17.1	0.7	NEGLECTIBLE	45.2	45.9
R38	1 Higham Street	1.5	529228	5699328	0.01	22.6	NEGLECTIBLE	17.4	0.3	NEGLECTIBLE	45.2	45.5
R39	The Thunderbolt PH	1.5	529592	5699092	0.03	50.1	NEGLECTIBLE	104.8	2.4	NEGLECTIBLE	100.2	102.6
R40	226 Bath Road	1.5	529889	5699136	0.12	50.2	NEGLECTIBLE	157.7	12.8	NEGLECTIBLE	100.2	113.0
R41	Paintworks Phase 3	1.5	530277	5699337	0.10	22.7	NEGLECTIBLE	134.5	10.6	NEGLECTIBLE	45.2	55.8
R42	Commercial Retail Area (Castle Court)	1.5	530446	5699331	0.07	31.5	NEGLECTIBLE	189.5	2.7	NEGLECTIBLE	62.8	65.5
R43	Spark Evans Park 2	1.5	530314	5699464	0.12	22.7	NEGLECTIBLE	170.3	4.0	NEGLECTIBLE	45.2	49.2

Discrete Receptors		Elevation (m, agl)	UTM Coordinates		Annual Mean	Annual Mean (PEC)	Impact Severity of Annual Mean Concentration	Maximum 1- hr Mean (PC)	99.8th %ile of 1-hr Means (PC)	Impact Severity of 1-hour Mean Concentration	Short-term Background Concentration ( $\mu\text{g}/\text{m}^3$ )	99.8th %ile of 1-hr Means PEC ( $\mu\text{g}/\text{m}^3$ )
			X Coordinate	Y Coordinate								
R44	Spark Evans Park 3	1.5	530297	5699467	0.12	22.7	NEGLECTIBLE	147.6	7.1	NEGLECTIBLE	45.2	52.3
R45	Spark Evans Park 4	1.5	530275	5699464	0.12	22.7	NEGLECTIBLE	180.7	12.2	NEGLECTIBLE	45.2	57.4
R46	Spark Evans Park 5	1.5	530251	5699454	0.13	22.7	NEGLECTIBLE	158.6	18.5	NEGLECTIBLE	45.2	63.7
R47	Spark Evans Park 6	1.5	530229	5699449	0.15	22.7	NEGLECTIBLE	115.0	25.3	SLIGHT	45.2	70.5
R48	Paintworks Phase 3 (2)	1.5	530249	5699336	0.10	22.7	NEGLECTIBLE	99.9	14.7	NEGLECTIBLE	45.2	59.9
R49	Paintworks Phase 3 (3)	1.5	530223	5699333	0.11	22.7	NEGLECTIBLE	83.4	20.4	SLIGHT	45.2	65.6
R50	Paintworks Phase 3 (4)	1.5	530196	5699325	0.12	22.7	NEGLECTIBLE	77.2	25.6	SLIGHT	45.2	70.8
R51	St Philip's Marsh Nursery School (1)	0.9	529962	5699647	0.05	22.7	NEGLECTIBLE	86.3	2.8	NEGLECTIBLE	45.2	48.0
R52	St Philip's Marsh Nursery School (2)	0.9	529958	5699663	0.06	22.7	NEGLECTIBLE	110.6	3.0	NEGLECTIBLE	45.2	48.2
R53	St Philip's Marsh Nursery School (3)	0.9	529953	5699675	0.06	22.7	NEGLECTIBLE	127.3	3.1	NEGLECTIBLE	45.2	48.3
R54	Paintworks Phase 3 (1)	4.5	530277	5699337	0.10	22.7	NEGLECTIBLE	135.0	10.4	NEGLECTIBLE	45.2	55.6
R55	Paintworks Phase 3 (1)	7	530277	5699337	0.10	22.7	NEGLECTIBLE	135.8	10.3	NEGLECTIBLE	45.2	55.5
R56	Paintworks Phase 3 (1)	9.5	530277	5699337	0.10	22.7	NEGLECTIBLE	136.9	10.3	NEGLECTIBLE	45.2	55.5
R57	Paintworks Phase 3 (1)	11	530277	5699337	0.10	22.7	NEGLECTIBLE	137.8	10.5	NEGLECTIBLE	45.2	55.7
R58	Paintworks Phase 3 (1)	13.5	530277	5699337	0.11	22.7	NEGLECTIBLE	135.3	10.3	NEGLECTIBLE	45.2	55.5
R59	Paintworks Phase 3 (2)	4.5	530248.6	5699336.2	0.09	22.7	NEGLECTIBLE	100.3	13.4	NEGLECTIBLE	45.2	58.6
R60	Paintworks Phase 3 (2)	7	530248.6	5699336.2	0.09	22.7	NEGLECTIBLE	101.1	14.5	NEGLECTIBLE	45.2	59.7
R61	Paintworks Phase 3 (2)	9.5	530248.6	5699336.2	0.10	22.7	NEGLECTIBLE	102.3	13.7	NEGLECTIBLE	45.2	58.9
R62	Paintworks Phase 3 (2)	11	530248.6	5699336.2	0.10	22.7	NEGLECTIBLE	93.2	13.3	NEGLECTIBLE	45.2	58.5
R63	Paintworks Phase 3 (2)	13.5	530248.6	5699336.2	0.10	22.7	NEGLECTIBLE	94.7	12.6	NEGLECTIBLE	45.2	57.8
R64	Paintworks Phase 3 (3)	4.5	530223	5699333.3	0.10	22.7	NEGLECTIBLE	69.2	19.3	NEGLECTIBLE	45.2	64.5
R65	Paintworks Phase 3 (3)	7	530223	5699333.3	0.10	22.7	NEGLECTIBLE	71.9	18.2	NEGLECTIBLE	45.2	63.4
R66	Paintworks Phase 3 (3)	9.5	530223	5699333.3	0.10	22.7	NEGLECTIBLE	83.2	18.4	NEGLECTIBLE	45.2	63.6
R67	Paintworks Phase 3 (3)	11	530223	5699333.3	0.10	22.7	NEGLECTIBLE	91.7	18.6	NEGLECTIBLE	45.2	63.8
R68	Paintworks Phase 3 (3)	13.5	530223	5699333.3	0.11	22.7	NEGLECTIBLE	108.8	18.4	NEGLECTIBLE	45.2	63.6
R69	Paintworks Phase 3 (4)	4.5	530196	5699324.8	0.11	22.7	NEGLECTIBLE	76.8	25.7	SLIGHT	45.2	70.9
R70	Paintworks Phase 3 (4)	7	530196	5699324.8	0.11	22.7	NEGLECTIBLE	83.0	22.6	SLIGHT	45.2	67.8
R71	Paintworks Phase 3 (4)	9.5	530196	5699324.8	0.11	22.7	NEGLECTIBLE	93.9	21.7	SLIGHT	45.2	66.9
R72	Paintworks Phase 3 (4)	11	530196	5699324.8	0.11	22.7	NEGLECTIBLE	102.1	21.3	SLIGHT	45.2	66.5



Discrete Receptors		Elevation (m, agl)	UTM Coordinates		Annual Mean	Annual Mean (PEC)	Impact Severity of Annual Mean Concentration	Maximum 1- hr Mean (PC)	99.8th %ile of 1-hr Means (PC)	Impact Severity of 1-hour Mean Concentration	Short-term Background Concentration ( $\mu\text{g}/\text{m}^3$ )	99.8th %ile of 1-hr Means PEC ( $\mu\text{g}/\text{m}^3$ )
			X Coordinate	Y Coordinate								
R73	Paintworks Phase 3 (4)	13.5	530196	5699324.8	0.11	22.7	NEGLIGIBLE	118.7	21.4	SLIGHT	45.2	66.6
R74	St Philip's Marsh Nursery School (1A)	0.8	529962	5699647	0.05	22.7	NEGLIGIBLE	86.2	2.8	NEGLIGIBLE	45.2	48.0
R75	St Philip's Marsh Nursery School (2A)	0.8	529958	5699663	0.06	22.7	NEGLIGIBLE	110.5	3.0	NEGLIGIBLE	45.2	48.2
R76	St Philip's Marsh Nursery School (3A)	0.8	529953	5699675	0.06	22.7	NEGLIGIBLE	127.2	3.1	NEGLIGIBLE	45.2	48.3
R77	St Philip's Marsh Nursery School (B1)	0.6	529962	5699647	0.05	22.7	NEGLIGIBLE	86.0	2.8	NEGLIGIBLE	45.2	48.0
R78	St Philip's Marsh Nursery School (2B)	0.6	529958	5699663	0.06	22.7	NEGLIGIBLE	110.2	3.0	NEGLIGIBLE	45.2	48.2
R79	St Philip's Marsh Nursery School (3B)	0.6	529953	5699675	0.06	22.7	NEGLIGIBLE	126.9	3.1	NEGLIGIBLE	45.2	48.3
Air Quality Standard or Guideline					200			18			200	18

**Table A2-15 Highest Predicted 99.8<sup>th</sup> Percentile 1-Hour Mean NO<sub>2</sub> Concentrations (µg/m<sup>3</sup>) at Point of Maximum Impact: Typical Operating Scenario – EA Methodology (Biodiesel)**

Location	Air Quality Standard	UTM Coordinates		PC Concentration (µg/m <sup>3</sup> )	PEC (µg/m <sup>3</sup> )	PC - No. hours above 200 µg/m <sup>3</sup>
		X Coordinate	Y Coordinate			
Maximum Off-Site 1-hr Concentration	200	530030	5699515	589.4	634.6	NA
Maximum Off-Site 99.8th %ile 1-hr Concentration	200	530155	5699490	111.2	156.4	NA
Maximum No. of Exceedences of 200 µg/m <sup>3</sup>	18	530305	5699690	NA	NA	10
Maximum Off-Site Annual Mean	40	530155	5699490	0.60	23.2	NA

**Table A2-16 Highest Predicted 99.8<sup>th</sup> Percentile 1-Hour Mean NO<sub>2</sub> Concentrations (µg/m<sup>3</sup>) at Receptor Locations: Typical Operating Scenario – EA Methodology (Biodiesel)**

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Discrete Receptors		Elevation (m, agl)	UTM Coordinates		Annual Mean	Annual Mean (PEC)	Impact Severity of Annual Mean Concentrations	Maximum 1-hr Mean (PC)	99.8th %ile of 1-hr Means (PC)	Impact Severity of 1-hour Mean Concentrations	Short-term Background Concentration (µg/m <sup>3</sup> )	99.8th %ile of 1-hr Means PEC (µg/m <sup>3</sup> )
			X Coordinate	Y Coordinate								
R1	St Philip's Marsh Depot (south)	1.5	530240	5699646	1.63	24.2	NEGLIGIBLE	206.3	78.7	SUBSTANTIAL	45.2	123.9
R2	St Philip's Marsh Depot (southwest)	1.5	530080	5699620	0.61	23.2	NEGLIGIBLE	285.8	52.3	MODERATE	45.2	97.5
R3	St Philip's Marsh Depot (southeast)	1.5	530408	5699615	0.59	23.2	NEGLIGIBLE	202.6	59.7	MODERATE	45.2	104.9
R4	KFC	1.5	530447	5699631	0.53	31.9	NEGLIGIBLE	207.2	57.3	MODERATE	62.8	120.1
R5	Carpark (McDonalds)	1.5	530524	5699623	0.41	31.8	NEGLIGIBLE	199.7	39.0	SLIGHT	62.8	101.8
R6	Carpark (Avonmean Retail Park)	1.5	530564	5699684	0.46	23.1	NEGLIGIBLE	92.9	37.9	SLIGHT	45.2	83.1
R7	Carpark (Costa)	1.5	530478	5699723	0.83	32.2	MINOR	197.6	67.7	MODERATE	62.8	130.5
R8	Showcase Cinema	1.5	530480	5699861	0.66	23.3	NEGLIGIBLE	140.1	49.4	MODERATE	62.8	94.6
R9	St Martins Court (Cole Rd)	1.5	530307	5699980	0.41	31.8	NEGLIGIBLE	57.8	35.9	SLIGHT	62.8	98.7
R10	Merchant Trade Park	1.5	530452	5700067	0.28	22.9	NEGLIGIBLE	81.6	22.3	SLIGHT	62.8	67.5
R11	Bristol Television	1.5	530197	5699868	0.68	23.3	NEGLIGIBLE	109.9	73.6	SUBSTANTIAL	45.2	118.8
R12	Avonbank (industrial)	1.5	530156	5699716	1.08	23.7	NEGLIGIBLE	256.4	96.3	SUBSTANTIAL	45.2	141.5
R13	Industrial site (Meriton Street)	1.5	530055	5699663	0.43	23.0	NEGLIGIBLE	129.3	31.6	SLIGHT	45.2	76.8
R14	Industrial site (Albert Road)	1.5	530182	5699531	1.95	24.5	NEGLIGIBLE	336.0	211.5	SUBSTANTIAL	45.2	256.7

Discrete Receptors		Elevation (m, agl)	UTM Coordinates		Annual Mean	Annual Mean (PEC)	Impact Severity of Annual Mean Concentrations	Maximum 1-hr Mean (PC)	99.8th %ile of 1-hr Means (PC)	Impact Severity of 1-hour Mean Concentrations	Short-term Background Concentration ( $\mu\text{g}/\text{m}^3$ )	99.8th %ile of 1-hr Means PEC ( $\mu\text{g}/\text{m}^3$ )
			X Coordinate	Y Coordinate								
R15	Spark Evans Park	1.5	530332	5699465	0.38	23.0	NEGLIGIBLE	301.5	7.0	NEGLIGIBLE	45.2	52.2
R16	44 Edward Road	1.5	530341	5699235	0.27	22.9	NEGLIGIBLE	175.7	14.1	NEGLIGIBLE	45.2	59.3
R17	Black Castle PH	1.5	530515	5699201	0.13	31.5	NEGLIGIBLE	258.8	1.3	NEGLIGIBLE	62.8	64.1
R18	Sainbury's Carpark	1.5	530600	5699236	0.09	31.5	NEGLIGIBLE	176.3	0.8	NEGLIGIBLE	62.8	63.6
R19	19 Whitby Road	1.5	530714	5699306	0.12	22.7	NEGLIGIBLE	234.3	1.1	NEGLIGIBLE	45.2	46.3
R20	Whitby Road Industrial area (S)	1.5	530848	5699554	0.16	22.8	NEGLIGIBLE	148.1	11.5	NEGLIGIBLE	45.2	56.7
R21	15 Hardenhuish Road	1.5	530904	5699510	0.13	22.7	NEGLIGIBLE	117.9	9.8	NEGLIGIBLE	45.2	55.0
R22	5/7 Kilvert Close	1.5	531020	5699670	0.12	22.7	NEGLIGIBLE	37.0	10.6	NEGLIGIBLE	45.2	55.8
R23	Whitby Road Industrial area (N)	1.5	530980	5699920	0.18	22.8	NEGLIGIBLE	126.3	12.3	NEGLIGIBLE	45.2	57.5
R24	St Anne's Junior & Infant Schools	1.0	531235	5699671	0.08	22.7	NEGLIGIBLE	22.1	7.5	NEGLIGIBLE	45.2	52.7
R25	3 Mardon Road	1.5	531168	5700051	0.13	22.7	NEGLIGIBLE	74.4	9.0	NEGLIGIBLE	45.2	54.2
R26	Industrial Park (Avonsdie Rd)	1.5	530733	5700070	0.21	22.8	NEGLIGIBLE	62.1	14.8	NEGLIGIBLE	45.2	60.0
R27	Netham Park	1.5	530852	5700219	0.13	22.7	NEGLIGIBLE	32.7	9.7	NEGLIGIBLE	45.2	54.9
R28	14 Ford Street	1.5	530582	5700242	0.17	22.8	NEGLIGIBLE	49.6	11.9	NEGLIGIBLE	45.2	57.1
R29	12 Beaconsfield Close	1.5	530154	5700145	0.24	31.6	NEGLIGIBLE	43.4	22.4	NEGLIGIBLE	62.8	85.2
R30	Victoria Terrace Comm/Ind	1.5	529980	5699921	0.32	22.9	NEGLIGIBLE	253.7	22.9	SLIGHT	45.2	68.1
R31	Playground (Kingsland Road)	1.0	529526	5700168	0.08	22.7	NEGLIGIBLE	86.3	2.7	NEGLIGIBLE	45.2	47.9
R32	Industrial Area (Silverthorn Lane)	1.5	529737	5699988	0.18	22.8	NEGLIGIBLE	125.6	6.8	NEGLIGIBLE	45.2	52.0
R33	Industrial area (Gamwal Road)	1.5	529732	5699646	0.08	22.7	NEGLIGIBLE	43.5	2.2	NEGLIGIBLE	45.2	47.4
R34	Wholesale Fruit Centre (1)	1.5	529876	5699395	0.36	23.0	NEGLIGIBLE	359.7	9.5	NEGLIGIBLE	45.2	54.7
R35	Wholesale Fruit Centre (2)	1.5	529629	5699383	0.18	22.8	NEGLIGIBLE	282.6	2.0	NEGLIGIBLE	45.2	47.2
R36	Bristol Temple Meads Station	1.5	529086	5700047	0.03	31.4	NEGLIGIBLE	26.9	1.6	NEGLIGIBLE	62.8	64.4
R37	Chatterton Square	1.5	528824	5699708	0.02	22.6	NEGLIGIBLE	14.7	0.4	NEGLIGIBLE	45.2	45.6
R38	1 Higham Street	1.5	529228	5699328	0.04	22.6	NEGLIGIBLE	36.1	0.3	NEGLIGIBLE	45.2	45.5
R39	The Thunderbolt PH	1.5	529592	5699092	0.13	50.2	NEGLIGIBLE	154.5	3.6	NEGLIGIBLE	100.2	103.8
R40	226 Bath Road	1.5	529889	5699136	0.37	50.5	NEGLIGIBLE	233.6	28.9	SLIGHT	100.2	129.1
R41	Paintworks Phase 3	1.5	530277	5699337	0.34	22.9	NEGLIGIBLE	133.9	20.0	SLIGHT	45.2	65.2
R42	Commercial Retail Area (Castle Court)	1.5	530446	5699331	0.19	31.6	NEGLIGIBLE	324.4	2.1	NEGLIGIBLE	62.8	64.9
R43	Spark Evans Park 2	1.5	530314	5699464	0.41	23.0	NEGLIGIBLE	246.6	9.3	NEGLIGIBLE	45.2	54.5

Discrete Receptors		Elevation (m, agl)	UTM Coordinates		Annual Mean	Annual Mean (PEC)	Impact Severity of Annual Mean Concentrations	Maximum 1-hr Mean (PC)	99.8th %ile of 1-hr Means (PC)	Impact Severity of 1-hour Mean Concentrations	Short-term Background Concentration (µg/m³)	99.8th %ile of 1-hr Means PEC (µg/m³)
			X Coordinate	Y Coordinate								
R44	Spark Evans Park 3	1.5	530297	5699467	0.44	23.0	NEGLIGIBLE	209.8	15.2	NEGLIGIBLE	45.2	60.4
R45	Spark Evans Park 4	1.5	530275	5699464	0.49	23.1	NEGLIGIBLE	227.8	27.2	SLIGHT	45.2	72.4
R46	Spark Evans Park 5	1.5	530251	5699454	0.57	23.2	NEGLIGIBLE	195.9	44.5	MODERATE	45.2	89.7
R47	Spark Evans Park 6	1.5	530229	5699449	0.75	23.3	NEGLIGIBLE	201.6	83.4	SUBSTANTIAL	45.2	128.6
R48	Paintworks Phase 3 (2)	1.5	530249	5699336	0.38	23.0	NEGLIGIBLE	133.9	29.1	SLIGHT	45.2	74.3
R49	Paintworks Phase 3 (3)	1.5	530223	5699333	0.43	23.0	NEGLIGIBLE	131.6	41.9	MODERATE	45.2	87.1
R50	Paintworks Phase 3 (4)	1.5	530196	5699325	0.53	23.1	NEGLIGIBLE	129.7	59.1	MODERATE	45.2	104.3
R51	St Philip's Marsh Nursery School (1)	0.9	529962	5699647	0.25	22.8	NEGLIGIBLE	127.2	5.5	SLIGHT	45.2	50.7
R52	St Philip's Marsh Nursery School (2)	0.9	529958	5699663	0.25	22.9	NEGLIGIBLE	161.5	7.7	SLIGHT	45.2	52.9
R53	St Philip's Marsh Nursery School (3)	0.9	529953	5699675	0.26	22.9	NEGLIGIBLE	183.7	4.6	SLIGHT	45.2	49.8
R54	Paintworks Phase 3 (1)	4.5	530277	5699337	0.34	22.9	NEGLIGIBLE	134.4	19.9	SLIGHT	45.2	65.1
R55	Paintworks Phase 3 (1)	7	530277	5699337	0.35	22.9	NEGLIGIBLE	135.1	20.2	SLIGHT	45.2	65.4
R56	Paintworks Phase 3 (1)	9.5	530277	5699337	0.36	23.0	NEGLIGIBLE	136.1	21.2	SLIGHT	45.2	66.4
R57	Paintworks Phase 3 (1)	11	530277	5699337	0.37	23.0	NEGLIGIBLE	146.6	22.1	SLIGHT	45.2	67.3
R58	Paintworks Phase 3 (1)	13.5	530277	5699337	0.39	23.0	NEGLIGIBLE	167.8	22.9	SLIGHT	45.2	68.1
R59	Paintworks Phase 3 (2)	4.5	530248.6	5699336.2	0.37	23.0	NEGLIGIBLE	133.9	29.1	SLIGHT	45.2	74.3
R60	Paintworks Phase 3 (2)	7	530248.6	5699336.2	0.38	23.0	NEGLIGIBLE	133.7	29.1	SLIGHT	45.2	74.3
R61	Paintworks Phase 3 (2)	9.5	530248.6	5699336.2	0.39	23.0	NEGLIGIBLE	133.2	29.2	SLIGHT	45.2	74.4
R62	Paintworks Phase 3 (2)	11	530248.6	5699336.2	0.40	23.0	NEGLIGIBLE	140.6	29.2	SLIGHT	45.2	74.4
R63	Paintworks Phase 3 (2)	13.5	530248.6	5699336.2	0.41	23.0	NEGLIGIBLE	170.5	29.3	SLIGHT	45.2	74.5
R64	Paintworks Phase 3 (3)	4.5	530223	5699333.3	0.43	23.0	NEGLIGIBLE	131.4	41.8	MODERATE	45.2	87.0
R65	Paintworks Phase 3 (3)	7	530223	5699333.3	0.43	23.0	NEGLIGIBLE	131.1	41.7	MODERATE	45.2	86.9
R66	Paintworks Phase 3 (3)	9.5	530223	5699333.3	0.44	23.0	NEGLIGIBLE	130.8	41.7	MODERATE	45.2	86.9
R67	Paintworks Phase 3 (3)	11	530223	5699333.3	0.45	23.0	NEGLIGIBLE	131.0	41.6	MODERATE	45.2	86.8
R68	Paintworks Phase 3 (3)	13.5	530223	5699333.3	0.46	23.1	NEGLIGIBLE	139.0	43.5	MODERATE	45.2	88.7
R69	Paintworks Phase 3 (4)	4.5	530196	5699324.8	0.53	23.1	NEGLIGIBLE	129.8	59.1	MODERATE	45.2	104.3
R70	Paintworks Phase 3 (4)	7	530196	5699324.8	0.53	23.1	NEGLIGIBLE	140.0	59.0	MODERATE	45.2	104.2
R71	Paintworks Phase 3 (4)	9.5	530196	5699324.8	0.53	23.1	NEGLIGIBLE	158.4	59.1	MODERATE	45.2	104.3
R72	Paintworks Phase 3 (4)	11	530196	5699324.8	0.54	23.1	NEGLIGIBLE	172.3	60.2	MODERATE	45.2	105.4

Discrete Receptors		Elevation (m, agl)	UTM Coordinates		Annual Mean	Annual Mean (PEC)	Impact Severity of Annual Mean Concentrations	Maximum 1-hr Mean (PC)	99.8th %ile of 1-hr Means (PC)	Impact Severity of 1-hour Mean Concentrations	Short-term Background Concentration (µg/m³)	99.8th %ile of 1-hr Means PEC (µg/m³)
			X Coordinate	Y Coordinate								
R73	Paintworks Phase 3 (4)	13.5	530196	5699324.8	0.55	23.2	NEGLIGIBLE	200.2	59.5	MODERATE	45.2	104.7
R74	St Philip's Marsh Nursery School (1A)	0.8	529962	5699647	0.25	22.8	NEGLIGIBLE	127.1	5.5	NEGLIGIBLE	45.2	50.7
R75	St Philip's Marsh Nursery School (2A)	0.8	529958	5699663	0.25	22.9	NEGLIGIBLE	161.3	7.7	NEGLIGIBLE	45.2	52.9
R76	St Philip's Marsh Nursery School (3A)	0.8	529953	5699675	0.26	22.9	NEGLIGIBLE	183.4	4.6	NEGLIGIBLE	45.2	49.8
R77	St Philip's Marsh Nursery School (B1)	0.6	529962	5699647	0.24	22.8	NEGLIGIBLE	126.8	5.5	NEGLIGIBLE	45.2	50.7
R78	St Philip's Marsh Nursery School (2B)	0.6	529958	5699663	0.25	22.9	NEGLIGIBLE	160.9	7.7	NEGLIGIBLE	45.2	52.9
R79	St Philip's Marsh Nursery School (3B)	0.6	529953	5699675	0.26	22.9	NEGLIGIBLE	183.0	4.6	NEGLIGIBLE	45.2	49.8
Air Quality Standard or Guideline					200			18			200	18

**Review of Air Quality  
Assessment:**  
Flexible Generation  
Facility, Feeder Road,  
Bristol

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July 2016



Experts in air quality  
management & assessment

## Document Control

<b>Client</b>	Residents Against Dirty Energy	<b>Principal Contact</b>	Bruce Yates
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<b>Job Number</b>	J2636
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<b>Report Prepared By:</b>	Dr Ben Marner and Kieran Laxen
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### Document Status and Review Schedule

Report No.	Date	Status	Reviewed by
J2636/1/F1	12 July 2016	Note	Prof. Duncan Laxen (Managing Director)

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## 1 Introduction

- 1.1 This note has been prepared by Air Quality Consultants Ltd. on behalf of Residents Against Dirty Energy (RADE). It reviews the updated air quality assessment ('the Assessment') for the proposed Flexible Generation Facility, Feeder Road, St Phillip's March, Bristol, submitted on 02/06/16<sup>1</sup>.
- 1.2 Owing to the timescale for conducting this review, it has not been possible to go through all the other information on the planning portal website or to deal with every aspect of the Assessment in detail. This note thus focuses on what are considered to be the key issues with the Assessment. It focuses on the operational impacts of the proposals on nitrogen dioxide (NO<sub>2</sub>) concentrations, since professional experience suggests that these are likely to be the most significant impacts associated with a scheme such as this.

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<sup>1</sup> [http://planningonline.bristol.gov.uk/online-applications/files/117FBAD057D946F40E64E27A894E1D4E/pdf/16\\_00719\\_F-AIR\\_QUALITY\\_ASSESSMENT\\_-\\_MAIN\\_REPORT-1490166.pdf](http://planningonline.bristol.gov.uk/online-applications/files/117FBAD057D946F40E64E27A894E1D4E/pdf/16_00719_F-AIR_QUALITY_ASSESSMENT_-_MAIN_REPORT-1490166.pdf)



## 2 Model Input Parameters

### Emission Rate

- 2.1 The nitrogen oxides (NO<sub>x</sub>) emission rate from each generator has been assumed to be 0.51 g/s. The Assessment states that this emission rate was supplied by Progress Group but gives no further details. Diesel generators are usually regulated according to the United States Environmental Protection Agency (USEPA) emissions standards. The latest - and cleanest - standard is termed 'Tier 4'. Tier 4 engines would emit significantly less than 0.51 g/s of NO<sub>x</sub>, and so it is assumed that the generators conform to the older - and dirtier - 'Tier 3' standard. If that is the case, then it would be usual to model emissions at the emissions limits for these plant, which is 3,500 mg/KWh, or effectively 1.2 g/s (i.e. more than twice the emissions that have been assumed).
- 2.2 Ideally, the generators should be specified to conform to the latest Tier 4 standard, which would minimise the impacts. If this is not to be the case then continuous monitoring of the emissions should be undertaken to ensure that the generators will emit no more than 0.51 g/s. If NO<sub>x</sub> emissions exceed 0.51 g/s per generator then the plant should be shut down until this emission rate can be confidently achieved.

### Exhaust Velocity

- 2.3 The modelling has assumed an exit velocity of 59.8 m/s<sup>2</sup>. Even considering the addition of cooling air, this is an extremely high velocity for this type of plant. The authors of this review are not qualified to comment on the technical feasibility of this design, but are nevertheless quite surprised that neither the noise<sup>3</sup>, nor the back pressures involved are prohibitive to this design.
- 2.4 The model results will be very sensitive to this parameter. For example, a basic model run carried out by AQC using the ADMS-5 dispersion model, the Bristol (2010) meteorological dataset, and the same model input parameters presented in the Assessment<sup>4</sup> showed that the contribution of the plant to 99.8<sup>th</sup> percentile of 1-hour mean NO<sub>2</sub> concentrations at St Philips Marsh Nursery would be predicted to increase by 160% (i.e. it would be 2.6 times the presented value) if the cooling air was removed from the exhaust stream (thus reducing the exit volumes to those achievable by the generators on their own).

<sup>2</sup> Which is 134 mph. Across all stacks, this is almost 600 m<sup>3</sup>/s (or the volume of an Olympic sized swimming pool being blown out of the stacks every 4 seconds).

<sup>3</sup> The noise assessment ([http://planningonline.bristol.gov.uk/online-applications/files/7DCD20A1C22234384FB745ED599DB392/pdf/16\\_00719\\_F-NOISE\\_IMPACT\\_ASSESSMENT-1392680.pdf](http://planningonline.bristol.gov.uk/online-applications/files/7DCD20A1C22234384FB745ED599DB392/pdf/16_00719_F-NOISE_IMPACT_ASSESSMENT-1392680.pdf)) does not make specific reference to the 134 mph exhaust jets and appears to consider only noise from the generator engines themselves. It is thus unclear whether the noise from these jets was considered.

<sup>4</sup> With the exception of building wake effects or terrain.

- 2.5 Given that the model results are dependent upon this exit velocity being achieved consistently, it is suggested that continuous monitoring is put in place to ensure the velocity does not drop below 59.8 m/s. If the velocity drops below this rate, it is suggested that the plant should shut down until this rate can be confidently maintained.

### Exhaust Temperature

- 2.6 The temperature of the exhaust gas has been calculated to take account of the combined temperatures of the generator exhaust and the cooling air. It appears that this calculation has been done incorrectly. When calculating a combined temperature of two mixed gas streams, it is necessary to first express both volumes normalised to the same temperature. It appears that this was not done. Based on the information provided in the assessment, AQC has calculated the combined temperature to be 107°C, which is significantly less than the 148°C that has been modelled. The effect of this error will be to over-state the plume buoyancy and thus under-predict the impacts. The Assessment is thus likely to have under-predicted the impacts of the proposed development.

### Meteorological Data

- 2.7 The Assessment began by looking at five years of meteorological data from the Bristol meteorological site. It determined that some of the individual years of data gave higher predictions at some receptors, while others gave higher predictions at other receptors. Rather than taking the more usual, and worst-case, approach of presenting the maximum prediction at any receptor across any year of data, all of the results presented are for a single year of data (2010), since this gave the highest predictions at certain receptors<sup>5</sup>. It is inevitable that using one of the alternative years would give higher predictions at some receptors than those that have been presented. Given that meteorological conditions vary year-on-year, the results for some receptors will not be robust; even if the results for the worst-case receptors are<sup>5</sup>.

### Assumed Operating Hours

- 2.8 The model has been run assuming that the plant will not be permitted to operate outside of the hours set out in Table D2 of the Assessment. For example, this means no operation between the hours of 8.30 PM and 7:00 AM between October and February. The potential impacts of operation outside of these periods have not been assessed and so the development should be prohibited from operating outside of these periods. The assumption is also made that the plant would only run for a maximum of 200 hours per year, but as explained in Paragraph 4.5 below, the way in which this was assessed was inappropriate and so this part of the Assessment should be ignored in any event.

<sup>5</sup> Ironically, the Assessment discounts any impacts at these particular receptors in any event, since they do not represent relevant exposure to the objective.

### 3 Modelling Approach

- 3.1 The Assessment has used the AERMOD dispersion model, which is considered to be suitable. To calculate NO to NO<sub>2</sub> conversion in the plume, the assessment has used the Plume Volume Molar Ratio Method (PVMRM). This method is not often used in the UK since it is usually considered that there are simpler, and more robust, methods. The authors of the Assessment submitted with the application have, separately, carried out a sensitivity test based on using the PVMRM as well as an approach recommended by the UK Environment Agency, and have shown that the PVMRM is worst-case. However, this sensitivity test has been carried out using the estimated biodiesel emissions only. It is unclear why this sensitivity test was not carried out using the same diesel-based emissions as used in the Assessment. The PVMRM will give lower conversion rates at higher predicted concentrations, and so it is possible that, had the sensitivity test been based on the same emissions data as the assessment, it may have shown higher predictions using the UK Environment Agency approach. It is therefore possible that the assessment is not worst case.

#### Isopleths

- 3.2 The shapes of the contour isopleths are quite unusual for Bristol meteorological data. The predominant impacts are to the southwest. It would be more usual to see the biggest impacts, even short-term impacts, toward the northeast. Without access to more details on the model setup, it is not possible to see whether this is a genuine affect, or whether it represents an error.

#### Baseline Concentrations

- 3.3 It is not clear from the Assessment whether existing baseline levels have been included in the predicted concentrations. Given that there is no mention that baseline concentrations are included, it has been assumed that they have not, and that the numbers presented all relate to the Process Contributions (PCs) alone. A common approach used in the UK when adding baseline values to short-term predictions is to add twice the expected annual mean concentration.
- 3.4 The Assessment comments that measurements made at the urban background monitoring site at Higham Street will be representative of background concentrations at the site. While this may be true, the impacts of the proposed development cover a large number of roadside locations (and locations which will be influenced by other local emissions) and so existing concentrations at these receptors will be well above background levels.
- 3.5 Table 6 of the Assessment shows that annual mean nitrogen dioxide concentrations at roadside locations in this area were as high as 55.8 µg/m<sup>3</sup> in 2014. If twice this value (111.6 µg/m<sup>3</sup>) were

added to the short-term PCs that are shown in the report, exceedences of the short-term objective would be predicted over a much larger area<sup>6</sup>.

- 3.6 The tabulated results and contour plots which show the number of hourly mean concentrations in exceedence of  $200 \mu\text{g}/\text{m}^3$  are thus all extremely misleading, since they take no account that a PC of less than  $200 \mu\text{g}/\text{m}^3$  may, when added to the existing concentrations, lead to an exceedence of the  $200 \mu\text{g}/\text{m}^3$  standard<sup>7</sup>.

### Averaging Periods

- 3.7 The assessment has focused on short-term impacts, stating that 200 hours of operation per year cannot have significant impacts in relation to annual mean concentrations. This is frequently not true. For example, if a plant were to add  $100 \mu\text{g}/\text{m}^3$  to a receptor for 200 hours, this would result in an increment to annual mean concentrations of  $2.3 \mu\text{g}/\text{m}^3$  (i.e.  $100 * 200 / 8760$ ). Given that the predicted 99.8<sup>th</sup> percentiles of 1-hour mean concentrations are well above  $100 \mu\text{g}/\text{m}^3$  at many receptors, the predicted increments to annual mean concentrations should also have been presented.

## 4 Interpretation

### 99.8<sup>th</sup> Percentiles of 1-hour Mean NO<sub>2</sub> Concentrations

- 4.1 Figure 6 shows the predicted 99.8<sup>th</sup> percentile of 1-hour mean NO<sub>2</sub> concentrations, based on the assumption that 18 of the hours of operation would coincide with the 18 hours of worst-case meteorology for each point on the grid (i.e. the impacts at any given point shown in Figure 6 could be experienced even if the plant were only to operate for 18 hours in a year, albeit that the chance of these hours coinciding with the 18 worst-case hours for meteorology is slim). Thus, discounting the comments made above regarding limitations in the model parameters, the predictions in Figure 6 provide a reasonable worst-case set of predicted PCs (i.e. the impacts of the plant on their own). Even without considering existing baseline levels, the area shown in red in Figure 6 (which represents the  $200 \mu\text{g}/\text{m}^3$  contour) is predicted to exceed the 1-hour objective.
- 4.2 As explained in Paragraph 3.5, in order to predict whether or not the 1-hour mean NO<sub>2</sub> objective would be exceeded, it would be appropriate to add between  $45 \mu\text{g}/\text{m}^3$  and  $112 \mu\text{g}/\text{m}^3$  to these predictions. On this basis, the area exceeding the objective would either (approximately) follow the  $140 \mu\text{g}/\text{m}^3$  contour, or the  $80 \mu\text{g}/\text{m}^3$  contour, depending on the proximity to an existing emission source such as a road. This means that the 1-hour NO<sub>2</sub> objective could be exceeded at St Philips

<sup>6</sup> Even if twice the assumed annual mean background concentration ( $22.6 \mu\text{g}/\text{m}^3 \times 2 = 45.2 \mu\text{g}/\text{m}^3$ ) were added, it would add significantly to the area over which the 1-hour mean objective is predicted to be exceeded.

<sup>7</sup> There are also other issues with these results, as explained in Paragraph 4.5.

Marsh Nursery, at the Paintworks development, and across a large part of the area shown in Figure 6 of the Assessment.

- 4.3 In terms of Table A, total 99.8<sup>th</sup> percentiles of 1-hour mean concentrations may be estimated by adding either 45  $\mu\text{g}/\text{m}^3$  or 112  $\mu\text{g}/\text{m}^3$  (depending upon whether or not the receptor is near to an existing emission source) to all of the receptor-specific predicted 99.8<sup>th</sup> percentile concentrations. This results in considerably more receptors where exceedences are predicted. St Philips Marsh Nursery is not, however, included as a receptor<sup>8</sup>. Given the sensitivity of this receptor, this is an important omission.

### Calculating the Number of Hourly Exceedences of 200 $\mu\text{g}/\text{m}^3$

- 4.4 As well as presenting the 99.8<sup>th</sup> percentiles of 1-hour mean  $\text{NO}_2$  concentrations, the Assessment has presented the number of exceedences of 200  $\mu\text{g}/\text{m}^3$  as a 1-hour mean concentration. This is not usually done for assessments against the UK objectives. The reason for this is that meteorological data usually contain gaps, and 'calm' conditions which cannot be modelled. For example, the 2010 meteorological dataset for Bristol contains 23 hours with no wind data at all, and a further 108 hours of calm conditions which cannot usually be modelled<sup>9</sup>. This makes the predicted number of hours with an exceedence a meaningless statistic, since there may be an additional 131 hours with exceedences which were probably not considered. Thus, the focus should be – as is usually the case with assessments done in the UK – on the 99.8<sup>th</sup> percentiles of 1-hour mean concentrations.

### Scaling to 200 hours

- 4.5 Even though just 18 hours of operation could, on their own, give rise to the receptor-specific impacts shown in Figure 6, this is quite unlikely. Rather than calculating the probability of exceedences (i.e. how likely it is that meteorological conditions with the potential to give rise to impacts would coincide with the plant operating) the Assessment has taken the approach of simply reducing all of the predicted numbers of hourly exceedences by 94%. This reduction was derived on the basis that the plant will only run for 6% of the assumed model duration (i.e. 200 hours out of 3,607 hours). Given the limitations in calculating the number of hourly exceedences, this is not appropriate. In any event, it would not provide a reasonable worst-case assessment. This approach is considered to be an over-simplification which will present an optimistic picture of the impacts of the facility. A more robust, probability-based, assessment has not been carried out.
- 4.6 For the reasons given above, it is suggested that Figures 8 and 12 of the Assessment, along with all other aspects which scale the results down to take account of 200 hours of operation, are disregarded. This includes the assessment using the Institute of Air Quality Management impact

<sup>8</sup> This particular error in the assessment has already been raised by the Council.

<sup>9</sup> This is based on the dataset from the same observation station that is held by AQC. AQC does not have access to the precise data used in the Assessment.

descriptors. Without a robust assessment of the probability of the proposed plant having significant impacts, the only robust assessment is that shown in Figure 6, as described above, which shows potentially significant impacts.

## 5 Conclusions

- 5.1 If the Assessment had taken account of baseline concentrations, and focused on the robust set of predictions, then it would have predicted exceedences of the objective at many locations, including St Philips Marsh Nursery, and the Paintworks development. There are also issues with the way in which the model itself has been run and these may have caused the impacts to have been under-predicted.
- 5.2 It is unclear whether the assumptions made in the Assessment are the same as those in the noise assessment. A key concern in this respect is whether the noise assessment has accounted for a 134 mph exhaust velocity from the proposed stacks.
- 5.3 If, despite the potential for significant impacts, the development does proceed, monitoring of the emissions and release conditions should be carried out. This will be necessary in order to ensure that the impacts will not be significantly greater than those which have been predicted.
- 5.4 As explained in Section 1, this review has been carried out over a very short timeframe and thus the list of issues raised reflects what was identified in this time and may not be exhaustive.

## 6 Appendices

A1 Professional Experience.....10

## A1 Professional Experience

### **Prof. Duncan Laxen, BSc (Hons) MSc PhD MEnvSc FIAQM**

Prof Laxen is the Managing Director of Air Quality Consultants, a company which he founded in 1993. He has over forty years' experience in environmental sciences and has been a member of Defra's Air Quality Expert Group and the Department of Health's Committee on the Medical Effects of Air Pollution. He has been involved in major studies of air quality, including nitrogen dioxide, lead, dust, acid rain, PM<sub>10</sub>, PM<sub>2.5</sub> and ozone and was responsible for setting up the UK's urban air quality monitoring network. Prof Laxen has been responsible for appraisals of all local authorities' air quality Review & Assessment reports and for providing guidance and support to local authorities carrying out their local air quality management duties. He has carried out air quality assessments for power stations; road schemes; ports; airports; railways; mineral and landfill sites; and residential/commercial developments. He has also been involved in numerous investigations into industrial emissions; ambient air quality; indoor air quality; nuisance dust and transport emissions. Prof Laxen has prepared specialist reviews on air quality topics and contributed to the development of air quality management in the UK. He has been an expert witness at numerous Public Inquiries, published over 70 scientific papers and given numerous presentations at conferences. He is a Fellow of the Institute of Air Quality Management.

### **Dr Ben Marner, BSc (Hons) PhD CSci MEnvSc MIAQM**

Dr Marner is a Technical Director with AQC and has seventeen years' experience in the field of air quality. He has been responsible for air quality and greenhouse gas assessments of road schemes, rail schemes, airports, power stations, waste incinerators, commercial developments and residential developments in the UK and abroad. He has been an expert witness at several public inquiries, where he has presented evidence on health-related air quality impacts, the impacts of air quality on sensitive ecosystems, and greenhouse gas impacts. He has extensive experience of using detailed dispersion models, as well as contributing to the development of modelling best practices. Dr Marner has arranged and overseen air quality monitoring surveys, as well as contributing to Defra guidance on harmonising monitoring methods. He has been responsible for air quality review and assessments on behalf of numerous local authorities. He has also developed methods to predict nitrogen deposition fluxes on behalf of the Environment Agency, provided support and advice to the UK Government's air quality review and assessment helpdesk, Transport Scotland, Transport for London, and numerous local authorities. He is a Member of the Institute of Air Quality Management and a Chartered Scientist.



**Kieran Laxen, MEng (Hons) AMIEnvSc MIAQM**

Mr Laxen is a Senior Consultant with AQC with over seven years' experience in the field of air quality management and assessment. Previously having two years' experience in scientific research on internal combustion engines, he now works in the field of air quality. He is involved in a wide range of development projects, most of which have involved use of ADMS modelling methodologies for biomass boilers, CHP plant and roads, and is also competent in the assessment of construction dust. He has pioneered the use of OpenAir software within the Company, which is used to analyse air quality monitoring data, and is responsible for routine calibration of air quality monitoring stations, together with data ratification. He is a Member of the Institute of Air Quality Management.

**Ricky Gellatly, BSc (Hons) AMIEnvSc MIAQM**

Mr Gellatly is a Senior Consultant with AQC with over four years' relevant experience. Prior to joining AQC he worked as an air quality consultant at Odournet UK Ltd. He has also worked as an oceanographer, and holds a first class degree in meteorology and oceanography from the University of East Anglia. He has undertaken air quality assessments for a wide range of projects, assessing many different pollution sources using both qualitative and quantitative methodologies, with most assessments having included dispersion modelling (using a variety of models). He has assessed road schemes, airports, energy from waste facilities, anaerobic digesters, poultry farms, urban extensions, rail freight interchanges, energy centres, waste handling sites, sewage works and shopping and sports centres, amongst others. He also has experience in ambient air quality monitoring, the analysis and interpretation of air quality monitoring data, monitoring and assessment of nuisance odours and the monitoring and assessment of construction dust.

Full CVs are available at [www.aqconsultants.co.uk](http://www.aqconsultants.co.uk).



Our Ref: AP05675  
Your Ref: 16/00719/F

Wednesday, 24 August 2016

Mr Ken Reid  
Development Management  
Brunel House  
Second Floor  
Bazaar Wing  
Bristol City Council  
PO Box 3176  
Bristol  
BS3 9FS

Dear Mr Reid

**RE: PLANNING APPLICATION FOR PROPOSED INSTALLATION OF LOW CARBON, BIO-DIESEL POWERED GENERATORS AND ASSOCIATED INFRASTRUCTURE FOR THE PROVISION OF A FLEXIBLE GENERATION FACILITY TO PROVIDE ENERGY BALANCING SERVICES VIA THE CAPACITY MARKET FOR THE NATIONAL GRID**

**AT AVONBANK, FEEDER ROAD, BRISTOL**

**PLANNING REF: 16/00719/F**

The planning application for the proposed Flexible Generation Facility at Avonbank, Feeder Road was reported to Development Control Committee B on Wednesday, 13 July 2016. The planning application was **recommended for approval, with no objections raised by any of the Council's officers or statutory consultees.** It was decided by the members of the Development Control Committee to defer a decision on the application and to seek clarification and further information on certain matters.

This Covering Letter is accompanied by a response from the Project's Air Quality Consultant and Noise Consultant. The following matters are dealt with in this Covering Letter:

- Toxicity of Catalyst in Green Diesel;
- Noise Assessment;
- Air Quality Assessment
- Renewable Obligation Certificates;
- Other Matters.

### **Toxicity of Catalyst in Green Diesel**

Bristol City Council has asked for confirmation as to whether Cerium Oxide is a component of the bio fuel that is being proposed for use in the engines.

Plutus Energy Ltd propose to use a Hydrogenated Vegetable Oil (HVO) that is manufactured from 100% renewable products. The HVO includes a pollution reducing additive of Cerium Oxide (CeO<sub>2</sub>). The Applicant has chosen this combination, together with selecting EU Stage IIIA engines, as it believes the lowest possible NOx emissions available on the market in the UK.

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WYG Environment Planning Transport Limited. Registered in England & Wales Number 06190777  
Registered Office: Arndale Court, Headingley, Leeds, LS6 2UJ



The additive is a catalyst that also reduces carbon monoxide and particulates and improves engine performance. Cerium Oxide has no harmful side effects and is widely used in catalytic converters around the world to reduce emissions. In this application, the additive is a nano-technology specifically targeted for use in diesel engine environments. It is manufactured by a company called Energetics and the product is called Envirox.

Energetics has a long track record of working with engine manufacturers and fuel suppliers to reduce emissions. Attached under Appendix A of this Covering Letter are some pertinent testimonials to the benefits of using the Envirox additive. It is worth noting that Stagecoach West, have been using this additive for buses in the Bristol area, for several years now and have been impressed with the results. The following is a quote from the *Stagecoach West Annual Report, May 2014 to April 2015*:

*"Stagecoach Group has recently achieved the Carbon Trust Standard for reducing energy consumption, and has announced a challenging CO2 reduction programme for the next 5 years. All our fleet runs on low sulphur diesel, with a high-tech additive Envirox to reduce pollution and improve fuel consumption. Vehicle engines must meet increasingly higher Euro standards of exhaust emissions. 100% of our fleet meets at least the Euro 3 standard and 53% of our fleet meets the Euro 5 standard."*

For ease of reference, the *Stagecoach West Annual Report, May 2014 to April 2015* is provided under Appendix A of this Covering Letter. In summary, CeO<sub>2</sub> is a globally used catalyst that reduces NO<sub>x</sub>, CO and particulates with no ill-health effects.

### Noise Assessment

Bristol City Council has asked for details of any tonal impacts associated with the proposed generators and to provide an analysis in accordance with BS 4142: 2014.

The references to BS 4142: 1997 were included on the basis Bristol City Council's City Development Standard Planning Conditions (updated on July 2016) refers to BS 4142: 1997. However, the Noise Impact Assessment is now updated to make reference to BS 4141: 2014.

The updated Noise Impact Assessment accompanies this Covering Letter and also includes an analysis of tonal noise. The assessment includes a correction factor for tonality and applies a specific noise level of +6 dB to derive the expected rating level in accordance with BS 4142: 2014. The engine manufacturers have confirmed that the use of their bespoke acoustic enclosure reduces the generator to a sound pressure level of 78 dB(A) at 1m (LwA 98 dB). Full details of the bespoke acoustic enclosure are provided in Appendix F of the Noise Impact Assessment.

A three dimensional noise model was generated using the generator sound pressure level of 78 dB(A) at 1m. This indicates a predicted noise level of 35 dB at the nearest residential receptor on Edward Road. This is lower than the environmental noise survey conducted at Edward Road, which indicated a variation between 41 dB and 62 dB (LAeq, 5min) during the survey period.

Further to this, the Noise Impact Assessment considered the impact of the proposed Flexible Generation Facility on the approved residential scheme referred to as 'The Paintworks' (Planning Ref: 13/04275/M). The noise survey report submitted as part of the Paintworks planning application, written by Ion Acoustics (A860/R01a), confirms that the lowest background noise level measured at the proposed Paintworks site during which the proposed Flexible Generation Facility may be in operation was approximately LA90 45 dB. In accordance with Bristol City Council's Standard Planning Conditions, noise from the proposed Flexible Generation Facility would therefore be required to achieve a noise emission limit of LAr,Tr 40 dB. The noise

map indicates that the resultant noise level arising from the proposed development at the closest part of The Paintworks site would be approximately 34 dB(A), which corresponds to a rating level of 40 dB(A) following application of the tonality correction. As such, noise from the proposed Flexible Generation Facility will be controlled to acceptable levels at the Paintworks site.

In summary, the Noise Impact Assessment provides a worse-case scenario, which demonstrates that the proposed Flexible Generation Facility meets the requisite acoustic standards, whilst taking account of the lowest background levels surveyed.

### **Air Quality Assessment**

The Air Quality Assessment submitted as part of the planning application was subject to extensive consultation with the Environmental Health Officer (EHO) at Bristol City Council. In this regard, the methodology, modelling and presentation of results were subject to detailed discussions with the EHO. Following a rigorous assessment of the Air Quality Assessment, the EHO confirmed that there were no objections on the basis of air quality.

An air quality consultant was commissioned separately by the group referred to as RADE and a 'Review of Air Quality Assessment' was presented on the morning of the Development Control Committee. The Project's Air Quality Consultant (PJD Consultants) has reviewed this document and sought to respond to the points raised. The full response from PJD Consultants accompanies this Covering Letter.

In summary, further justification of the assessment methodology has been provided and it is considered that this demonstrates that the PVMRM methodology was appropriate for use in this project and represents a case-specific scenario, as allowed for by the phased approach in the EA Methodology. The previous modelling has also revised to take account of the discharge temperature. Additional modelling has also been undertaken in accordance with the Environment Agency's (worse-case scenario) methodology for determining the level of oxidation of NO<sub>x</sub> to NO<sub>2</sub> for comparison against the results of the revised modelling.

An additional operational scenario has also been modelled which is more representative of the typical annual operating profile for the proposed Flexible Generation Facility than the worse-case operating scenario previously presented and revised herein. This scenario is based on data pertaining to the power demand on the National Grid which allows the most likely operating hours for the plant to be identified. This data shows the operation of the plant would essentially be confined to within the two hour period of 5pm and 7pm on weekdays during winter (November to February) and better characterises the likelihood of the plant operation coinciding with the worse-case meteorology. As such, it is considered that the significance of any effect of the emission from the proposed plant should be based on the typical operating scenario rather than the worse-case scenario, which embodies highly conservative assumptions regarding the annual operational profile.

The results of the additional assessment work showed that for the PVMRM modelling under the typical operating conditions, the impact of the emissions from the plant would be negligible for annual mean concentrations and slight to negligible for 1-hour mean concentrations at all bar one receptor, where a moderate impact is predicted; however, members of the public would not have access to this location because it is located in the railway depot to the south of the site. For the EA Methodology, greater impacts were predicted, with exceedences of the objective for 1-hour mean NO<sub>2</sub> concentrations and impacts of moderate to substantial severity being predicted at some receptor locations. However, the greatest impacts were predicted to occur at industrial receptor locations, with the majority of receptors predicted to experience minor to negligible impacts as a result of the Flexible Generation Facility emissions. In

addition, the modelling of the typical, or representative operating scenario was undertaken using emission data for low sulphur diesel, rather than the biodiesel which is proposed for use at the plant. NOx emissions will be lower for the biodiesel and therefore the results of the typical operating scenario modelling represent the worse-case impact for this operating scenario.

Therefore, taking account of the above, it is considered that overall the effect of the predicted impacts resulting from emissions associated with the intermittent and short operation of the proposed Flexible Generation Facility is not significant.

### **Renewable Obligation Certificates**

The proposed fuel is eligible for Renewable Obligation Certificates (ROCs) issued under the Renewables Obligation Order 2009 (ROO). This means that the fuel is classified as a renewable source of generation.

It should be noted that Plutus Energy Ltd will not be claiming this subsidy. The reason that Plutus Energy Ltd will not be claiming the subsidy is very straightforward. In order for the Applicant to obtain a Capacity Mechanism contract from the National Grid (to provide emergency power), it cannot receive any form of 'subsidy' from the fuel it uses. ROC's are a subsidy to encourage renewable generation, but the Applicant will not be claiming them.

### **Other Matters**

Other matters were raised at the Development Control Committee that we consider it is necessary to clarify.

#### Environmental Impact Assessment

Firstly, a query was raised as to why an Environmental Impact Assessment (EIA) was not undertaken as part of the planning application. The requirement for an EIA is governed by the Town and Country Planning (Environmental Impact Assessment) Regulations 2011 (as amended).

The project categories listed in Schedule 1 of the EIA Regulations require a mandatory EIA. The proposed development does not fall within a category listed within Schedule 1.

The project categories listed in Schedule 2 of the EIA Regulations may require an EIA. In Schedule 2, the proposed Flexible Generation Facility may be classified under the category of *"industrial installations for the production of electricity, steam and hot water"*. The applicable threshold for such Schedule 2 development that requires consideration of the need for possible EIA is if the area of development exceeds 0.5 hectares. In the case of the Application Site, the proposed area of development comprises approximately 0.36 hectares. As such, the development proposals are below the relevant threshold and hence are not EIA development.

#### Sustainability Criteria of the Proposed Fuel

Some of the objectors that spoke at Committee questioned the sustainability criteria of the fuel, with one of the objectors referring to the 2010 Appeal for the Biofuel Plant at Avonmouth (Planning Ref: 09/03235/F). The objector stated that the aforementioned Appeal established that the fuel of a power station was a 'material consideration' in planning terms.

However, in the case of that Appeal, the Secretary of **State's Decision clearly outlined** that the debate centred on the sustainability of the fuel with reference to the sustainability criteria required by Renewable Obligation Certificates (ROCs). As such, the concern raised by the objectors was whether the operator would use a different fuel at a later date, which did not comply with the same sustainability criteria as a ROCs certified fuel.

In the Avonmouth case, the Appeal was allowed and planning permission granted (Appeal Ref: APP/Z0116/A/10/2126342). In reaching its determination, the Secretary of State considered that a condition



could be attached to the planning permission requiring the facility to provide annual reports on the sustainability of the fuel used.

In the case of the Plutus application at Feeder Road, the sustainability of the fuel is not in question. The proposed fuel is eligible for ROCs, meaning it is classified as a renewable source of generation. Furthermore, the Committee Report recommends a planning condition (No. 15) requiring that the fuel to be used shall comprise of Hydrotreated Vegetable Oil (HVO) only.

To conclude, the argument pertaining to the sustainability criteria of the fuel (as raised in the 2010 Appeal for the Avonmouth site) is a matter that the Feeder Road proposal already adheres to.

### **Summary and Conclusion**

**We trust that this Covering Letter and the accompanying responses from the Project's Air Quality and Noise Consultants provides clarification on the relevant points raised at the Development Control Committee.**

The planning application accords with the policies of the development plan and complies with strict environmental standards. The proposed development meets an acute need for back-up energy supply. It is therefore, respectfully submitted that the proposed development is in accordance with the principles of proper planning and sustainable development and that planning permission should be granted.

Yours sincerely

**Alan Hannify**  
Associate Director

Enc.



## **Appendix A**

**Stagecoach West Annual Report, May 2014 to April 2015**



# annual performance

## May 2014 to April 2015

### key facts

✓ 23.98 million passenger journeys

✓ 11.25 million miles operated

carrying customers on our network

✓ 242 buses

operating about 100 different routes across Gloucestershire, Wiltshire, Swindon and Herefordshire with some journeys extending into Bristol, South Gloucestershire, Wales and Oxfordshire

✓ 662 staff

working across the 5 depots which serve Stagecoach West in Cheltenham, Gloucester, Ross-on-Wye, Stroud & Swindon

✓ £5.2 investment

on 15 brand new double deckers and 19 single decker buses

✓ 95.6% service reliability

✓ 99.7% service punctuality

#### Stagecoach Customer Services

Stagecoach West  
3rd Floor, 65 London Rd  
Gloucester  
GL1 3HF

enquiries [west.enquiries@stagecoachbus.com](mailto:west.enquiries@stagecoachbus.com)  
**01452 418630**

website  
[www.stagecoachbus.com/west](http://www.stagecoachbus.com/west)

ticket sales  
[www.buymymegarider.com](http://www.buymymegarider.com)

#### bus users uk

exists to help you get the best from your bus service. If you need advice or if you have complained about a bus service and have not had a satisfactory response, they can be contacted on:

**Tel: 01932 232574**

**PO Box 119  
Shepperton  
TW17 8UX**

#### Bus timetable information:

**traveline**   
**0871 200 22 33\***  
[www.traveline.info](http://www.traveline.info)

\* Calls cost 10p per minute from a BT landline.  
Calls from other service providers and mobiles may vary.



[www.stagecoachbus.com](http://www.stagecoachbus.com)

## annual report

May 2014 to April 2015

**Greener Smarter Travel**





# 2014-2015 results

## about us

Stagecoach West provides local bus services in Gloucestershire, Wiltshire, Swindon and Herefordshire with some journeys extending into Bristol, South Gloucestershire and Oxfordshire. Our Head Office is in Gloucester with local depots in Cheltenham, Gloucester, Ross-on-Wye, Stroud & Swindon. We are a subsidiary of Stagecoach Group plc, an international provider of bus, coach, tram and rail services in the UK, USA and Canada. Our aim is to provide safe, reliable, punctual, clean and comfortable services with a good value-for-money range of tickets and fares. This annual report covers the year from May 2014 to April 2015.

## our passengers

We carried a total of 23.98 million passengers over the year, an increase of 1.1% over the previous year.

We received a total of 1,978 passenger complaints about our services equating to one complaint per 12,123 passengers. We comply with our industry code of practice, and every complaint is investigated and action taken to avoid repetition of the problem.

## our services

We operated a total of 11.25 million miles over the year, an increase of 1.3% over the previous year.

One key measure of performance is the reliability and punctuality of our services. In the past year we operated 99.7% of our scheduled services, with 0.2% failure due to internal reasons, and 0.1% due to external reasons such as congestion, diversions and weather. We monitor our services for punctuality and 95.6% of our services operated within 5 minutes of their scheduled time. We continue to seek improvements by rescheduling services and through ongoing discussions with our local highway authorities.

We have made further improvements to services over the past year including the introduction of 10 brand new Scania E400 double deck vehicles onto the Swindon local network, 5 brand new Scania E400 double deckers onto service 94U in partnership with the University Of Gloucestershire and 19 brand new single deckers into Cheltenham which has reduced the average fleet age to just 3.5 years.

We also started a new coach service between Gloucester and North Bristol in March 2015.

99.7% of all journeys operated- 0.1% of miles were not operated due to external reasons such as weather and congestion caused by roadworks, accidents and other events.



## our staff

We are a major local employer with about 515 drivers, 95 engineers and cleaners, and 55 supervisors, managers and clerical staff all based locally.

We continue to invest in training our staff. Every driver undertakes a training day to enable them to hold a Certificate of Professional Competence (CPC). The focus of these courses during the past 12 months has been on providing memorable customer service.

We employ 3 apprentices to provide skills for the future. Our supervisors and managers have all completed relevant training courses for their various professions.

## our fares

We increased fares in May 2015 by an average of 2% to cover our increased costs of pay and insurance whilst providing for further investment in new vehicles, plant and equipment.

## our fleet

We operate a fleet of 242 buses and coaches, of which we replaced 34 over the past year with a total investment of £5.2 million. 100 % of our fleet are low floor or wheelchair lift equipped to provide easy access for the elderly, disabled and buggies.

All our vehicles are inspected by our engineers at least every 3 weeks, and maintained to much higher standards than the legal minimum to ensure safety and comfort. Every vehicle is cleaned inside and outside daily. During the past 12 months we have started carrying out additional daytime cleaning on Gold Services 10, 66 and 94.

## our achievements

The mixture of ongoing investment in new buses, timetable improvements and marketing resulted in year on year passenger growth on a number of our routes, most notably:

- Cheltenham Services 41 / 42 increased by 5%**
- Gloucester Services 1, 10, 30 and 31 increased by 1%**
- Ross-on-Wye Service 36 increased by 28%**
- Stroud Service 63 (was previously 93) increased by 20%**
- Swindon Service 51 increased by 8%, Service 55 increased by 4% and Service 66 increased by 5%**



95.6% of our services operated within 5 minutes of their scheduled time, traffic congestion being again the main reason for delay.



Other noticeable achievements include:

- New coach service launched between Gloucester and North Bristol
- Launch of 24 new buses for Cheltenham mainly operated on routes C, D, 41 and 94U.
- Launch of 10 new buses for services in Swindon including an increased Frequency on Gold route 66 between Swindon and Oxford
- New Stroud network introduced in November 2014
- Transported over 80,000 customers at this years Cheltenham Race Festival
- Reduced our Fleet CO2 Emissions per customer journey by 4.5%

## our environment

We used 6.7 million litres of diesel last year, at an average of 7.69 miles per gallon. We are working to improve fuel consumption through technical measures, and all our drivers have completed a safe and fuel-efficient driving course. We have installed a telematic system called Green Road to all of our service vehicles. This system allows us to better manage our drivers' performance both in terms of actual driving standard to improve customer comfort but also improve their driving style to achieve better fuel economies. These factors have led us to improve our fuel consumption by 3.1% during the past 12 months.

Stagecoach Group has recently achieved the Carbon Trust Standard for reducing energy consumption, and has announced a challenging CO2 reduction programme for the next 5 years. All our fleet runs on low sulphur diesel, with a high-tech additive Envirox to reduce pollution and improve fuel consumption. Vehicle engines must meet increasingly higher Euro standards of exhaust emissions. 100% of our fleet meets at least the Euro 3 standard and 53% of our fleet meets the Euro 5 standard.

We recycle most of our waste, such as litter, used oils, filters, batteries, parts, etc. We also recycle the water we use to wash our vehicles every night.

100% of our fleet is low floor or wheelchair lift equipped.

### **Flexible Generation Facility Feeder Road: 16/00719/F**

#### **Bristol City Council Air Quality Officer Comments to BCC Planning Team**

A decision on this application was deferred at the last planning committee meeting held on 13<sup>th</sup> July 2016 due to concerns raised with regards to the air quality impacts associated with the proposal.

A report was submitted to BCC at the last minute which provided a critique on the air quality assessment submitted for the planning application and on which the officer recommendation was based. The applicant has subsequently responded to this critique by thoroughly addressing all the points raised and carrying out further assessment and reporting on the revised predictions on potential air quality impacts.

The original air quality assessment reported predicted impacts assuming the engines would operate continuously during all the hours that it could be called into operation (3607 hours per annum). This ensured that the meteorological conditions that may give rise to an exceedence could be identified and the frequency of these conditions quantified at each receptor location. A probable number of exceedences were then derived based on the maximum of 200 hours of operation in any one year (6% of the time).

This type of back-up power generation plant is relatively new type of development in terms of the characteristics of its operation throughout the year. As a result, there is not an accepted tried and tested methodology for realistically and reasonably assessing air quality impacts. The issue is one of the uncertainties in determining the frequency with which the development could and is likely to operate at times during which weather conditions result in poor dispersion of pollutants. In response to the critique of the original air quality assessment, the applicant has reported results using a revised methodology which considers typical operating hours linked to hours of peak energy demand. A review of average national power demand data was included within the air quality assessment which showed that peak energy demand occurs between the hours of 5pm -7pm on weekdays between the months of November and February and therefore; it is during these hours that the plant is likely to operate. These hours amount to 170 in total and have been combined with results from an additional 30 hours of operation to report results for a 200 hour operating scenario.

The relative newness of these types of developments is reflected by the fact that Defra have yet to consult on options for legislation that would set binding emission limit values on relevant air pollutants from diesel engines used for back-up power generation. Defra have stated that legislation is proposed to be in force by no later than January 2019. Until that time, the Local Air Quality Management Regime, which considers the significance and acceptability of air quality impacts through air quality assessments, is the main mechanism for controlling emission of pollutants.

#### **Predicted Nitrogen Dioxide Impacts**

The revised assessment of air quality focuses on the impact on short-term nitrogen dioxide (NO<sub>2</sub>) concentrations as it is this pollutant and its potential impact upon hourly concentrations which are of greatest relevance for a development of this nature. Impacts upon annual concentrations of NO<sub>2</sub> were also considered in the revised assessment.

If the average hourly concentration of  $200\mu\text{g}/\text{m}^3$  of  $\text{NO}_2$  is exceeded more than 18 times per year, in a location where members of the general public can be expected to be present for an hour or more, this objective is considered to have been breached.

The focus of the discussion of predicted air quality impacts and effects is on those areas where the largest air quality impacts are predicted to coincide with locations at which members of the public may be exposed, in this case, Spark Evans Park and Paintworks Phase 3. Whilst not being a location at which the largest impacts are predicted, discussion is also included with regards to predicted impacts at St Phillip's Marsh Nursery due to the sensitive nature of this particular location.

Under what is considered to be a realistic prediction of likely air quality impacts for 200 hours of operation, the revised air quality assessment shows that there is a risk of the short term air quality objective for  $\text{NO}_2$  being exceeded at Spark Evans Park. When considering the significance of air quality impact guidance states that the likelihood of people being exposed to poor air quality in a particular location and the number of people impacted needs to be considered. Due to the likely operating profile of the plant, between 5pm and 7pm on winter evenings, it is unlikely that people will be exposed at these times in this location for the relevant hourly period and therefore, the significance of this impact and resultant effect are determined with this in mind.

The largest impacts upon residential receptor locations are predicted to occur at the Paintwork Phase 3 development. The 18<sup>th</sup> highest hourly concentration predicted at this location (R73 in the assessment), when account has been made for existing background air quality concentrations is  $190.1\mu\text{g}/\text{m}^3$ . This value is close to but under the  $200\mu\text{g}/\text{m}^3$  objective. This value is for 200 hours of operation using the Environment Agency modelling methodology. When using the alternative PVMRM modelling methodology the predicted 18<sup>th</sup> highest hourly concentration at this receptor location is  $171.3\mu\text{g}/\text{m}^3$ . Whilst predicted to be close to the objective, no exceedence of the objective is predicted in this location or any other residential locations considered in the assessment.

No exceedences of the health based short term  $\text{NO}_2$  air quality objective at St Phillips Marsh Nursery are predicted for any of the assessment scenarios considered. This includes the unrealistic worst case scenarios which have reported results with the plant operating for over 3000 hours per year.

## **Conclusions**

The significance of short-term (hourly) air quality impacts can be determined through a methodology outlined in the Institute of Air Quality Management (IAQM)/Environmental Protection UK (EPUK) Land-use Planning and Development Control: Planning for Air Quality (May 2015) Guidance document.

In relation to short-term impacts, the IAQM and EPUK guidance states that:

*'6.38 Where such peak short term concentrations from an elevated source are in the range 10-20% of the relevant AQAL (Air Quality Assessment Level), then their magnitude can be described as small, those in the range 20-50% medium and those above 50% as large. These are the maximum concentrations experienced in any year and the severity of this impact can be described as slight, moderate and substantial respectively, without the need to reference background or baseline concentrations.'*

For a number of residential receptor locations the impact is described as moderate, however, the IAQM/EPUK Guidance makes it clear that it is important to distinguish between the meaning of 'impact' and 'effect'. The guidance states that *'An impact is the change in concentration of an air pollutant, as experienced by a receptor. This may have an effect on health of a human receptor, depending on the severity of the impact and other factors that may need to be taken into account.'*

In this particular case, the other factors that have been taken into account, in order to determine the potential 'effect' of the development proposal, is the limited hours of operation of the development, of no more than 200 hours per annum, the likelihood of relevant exposure for the hourly averaging period at receptor locations and the 99.8<sup>th</sup> percentile values predicted which give an indication of effect in relation to the health based air quality objectives.

#### Required Planning Conditions

In order to ensure that the development proposal is operating in line with the modelled engine emission limits, regular inspection and maintenance of the engines, in line with the manufacturers recommendations, should be conditioned. Reporting of engine stack emissions should also be conditioned.

A condition should also be set that requires the applicant to be limited to a maximum of 200 hours of operation in any one year, as this is the basis upon which the air quality impacts have been determined. The applicant should report to BCC on the hours of operation to ensure compliance with this condition.

An ambient air quality monitoring programme should be conditioned to confirm the level of impact that the development proposal has on local air quality. Due to the short term nature of pollution, this will be in the form of real-time monitoring to a standard that is compliant with the existing reference method real-time monitoring equipment used by Bristol City Council. All costs for site installation, commissioning and ongoing running costs will be covered by the applicant.

The required planning conditions should ensure that the development operates within the parameters modelled in the air quality assessment and therefore I do not object to this development on the grounds of air quality effects, based on the predictions contained within the air quality assessment.



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### Audit Sheet

Revision	Description	Date	Issued by	Reviewed by
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02	For Issue	21/05/2015	TH	BD
03	For Issue	03/08/2016	TH	-
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05	Final Issue	26/08/2016	TH	-
06	Final Issue	13/09/2016	TH	-

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## 1.0 Introduction

Hoare Lea Acoustics has been appointed by Plutus Energy Limited to conduct a noise impact assessment in order to support the planning application for the proposed installation of bio-diesel power generators and transformers for the generation of flexible generation electricity to the Local Distribution Network at the existing brownfield site on Feeder Road in Bristol.

The proposal comprises 48 bio-diesel generators, 12 transformers and associated infrastructure, including a switch room, a substation and a 33-11kV transformer. The proposed development will operate for approximately 200 hours per year, with a desired energy output of up to 20MW. The development will operate when called upon and therefore the operation will be intermittent, however, the development will not operate outside the hours of 0700 to 2230.

An environmental noise survey is required to quantify the existing ambient and background noise levels at the site in order to establish the design constraints on noise emissions from the operation of plant.

This report provides a description of the results from the noise survey undertaken and an assessment to determine the external noise limits for the proposed plant required to meet the Local Authority's general noise emission limits.



## 2.0 Site Description

### 2.1 Existing Site

The existing site is situated to the south of Feeder Road in the area of St Philip's Marsh in Bristol. The site itself is brownfield comprising a hardstanding area with dense landscape screening along each of its boundaries.

The buildings surrounding the site are industrial in nature, with existing train lines and a terminal located to the south. Additionally to the east of the site is St Philip's Causeway (A4320) and further afield to the south is Bath Road (A4).

The proposed development site (indicative only) is identified in Figure 1 below.

### 2.2 Local Noise Environment

The surrounding noise climate is predominantly formed of road traffic noise from the road network immediately around the site, in particular St Philip's Causeway (A432) to the east, but also from more distant main roads including Bath Road (A4) to the south.

Additionally, during the morning site visit (0700 to 0900) the surrounding noise climate was observed to be formed from building services plant noise associated with the industrial units adjacent to the proposed site. However, it should be noted that all building services plant was not observed to be in operation during the evening site visit (2030 to 2230).



Figure 1: Plan of Existing Site (Indicative)

### 3.0 Basis of Assessment

#### 3.1 National Planning Policy Framework (NPPF)

The National Planning Policy Framework <sup>(1)</sup> sets out the Government's current planning policies for England and how these are expected to be applied.

With regards to local noise planning policies, Section 11 paragraph 123 of the NPPF states:

'Planning policies and decisions should aim to:

- Avoid noise from giving rise to significant adverse impacts on health and quality of life as a result of new development;
- Mitigate and reduce to a minimum other adverse impacts on health and quality of life arising from noise from new development, including through the use of conditions;
- Recognise that development will often create some noise and existing businesses wanting to develop in continuance of their business should not have unreasonable restrictions put upon them because of changes in nearby land uses since they were established;
- Identify and protect areas of tranquillity which have remained relatively undisturbed by noise and are prized for their recreational and amenity value for this reason.'

Reference is made to the DEFRA Noise Policy Statement for England 2010 (NPSfE). This latter document is intended to apply to all forms of noise other than that which occurs in the workplace and includes environmental noise and neighbourhood noise in all forms.

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

In the absence of specific guidance for assessment of environmental noise within the NPPF and the NPSfE, it is considered appropriate to base assessment on current British Standards and national guidance. These are considered to be Local Authority guidance, BS 4142 <sup>(2)</sup>, BS 8233 <sup>(3)</sup> and the World Health Organisations <sup>(4)</sup> (WHO) guidelines.

#### 3.2 BS 4142: 2014

Current Government advice to Local Planning Authorities in both England and Wales makes reference to BS 4142 <sup>(2)</sup> as being the appropriate guidance for assessing commercial operations and fixed building services plant noise. This British Standard provides an objective method for rating the likelihood of complaint from industrial and commercial operations. It also describes means of determining noise levels from fixed plant installations and determining the background noise levels that prevail on a site.

The assessment of impacts is based on the subtraction of the measured background noise level from the rating level determined. The rating level is the source noise level (either measured or predicted) corrected for tone or character (if necessary). The difference is compared to the following criteria to evaluate the impact.

- A difference of around +10 dB or more is likely to be an indication of a significant adverse impact.
- A difference of around +5 dB indicates is likely to be an indication of an adverse impact.

- Where the rating level does not exceed the background noise level, this is an indication of the specific sound source having a low impact.

### 3.3 Local Planning Policy

#### 3.3.1 Bristol Development Framework: Core Strategy, June 2011

Bristol City Council's Core Strategy adopted in June 2011 is the primary document in the Bristol Development Framework (BDF) setting out the spatial vision and strategic objectives for Bristol City. The Core Strategy provides broad guidance for delivering new developments and should be read as a whole along with the other BDF documents. In respect of noise, the document provides a single relevant policy, Policy BCS23.

##### 3.3.1.1 Policy BCS23

Policy BCS23 states the following:

*"Development should be sited and designed in a way as to avoid adversely impacting upon:*

- *Environmental amenity or biodiversity of the surrounding area by reason of fumes, dust, noise, vibration, smell, light or other forms of air, land, water pollution, or creating exposure to contaminated land.*
- *The quality of underground or surface water bodies.*

*In locating and designing development, account should also be taken of:*

- *The impact of existing sources of noise or other pollution on the new development; and*
- *The impact of the new development on the viability of existing uses by reason of its sensitivity to noise or other pollution.*

*Water quality and associated habitat of surface watercourses should be preserved or enhanced."*

#### 3.3.2 Bristol City Development – Standard Planning Conditions – Noise from Plant & Equipment

Bristol City Council's City Development Standard Planning Conditions, last updated 14<sup>th</sup> July 2016, state that all building services plant be subject to the following standard condition:

*"No development shall take place until an assessment to show that the rating level of any plant and equipment, as part of this development, will be at least 5 dB below the background level has been submitted to and approved in writing by the Local Planning Authority.*

*The assessment must be carried out by a suitably qualified acoustic consultant / engineer and be in accordance with BS 4142: 1997 – "Method of rating industrial noise affecting mixed residential and industrial areas."*<sup>(5)</sup>

On the basis of the Council's standard planning condition, all building services plant is required to achieve the noise emission limits shown below in Table 1.

Description of Noise Source	Noise Emission Limit
Building Services	$L_{A,T,r} = L_{A90,T} - 5 \text{ dB(A)}$

Table 1: Bristol City Council's Noise Emission Limits for Building Services

Plutus Energy Limited

Flexible Generation Facility, Bristol

Noise Impact Assessment



The methodology used here follows BS 4142. This is to ensure that the criterion stated within the above planning condition is achieved.



#### 4.0 Environmental Noise Surveying

An acoustic survey has been carried out at the proposed development site to establish the prevailing environmental noise conditions local to the site, so as to determine plant noise emission limits.

#### 4.1 Methodology

The survey comprised a series of attended measurements at a single position during the quietest period in which the proposed development may be in operation, 0700 to 0900 and 2030 to 2230. The position of this noise monitor was chosen to be representative of the nearest noise sensitive receptor and is shown as position S1 in Figure 2 below. This measurement position was considered free-field at a height of approximately 1.2 metres above local ground floor level.

Measurements recorded consisted of five minute samples of ambient noise levels ( $L_{Aeq,5min}$  in dB), maximum noise levels ( $L_{Amax,5min}$  in dB) and background noise levels ( $L_{A90,5min}$  in dB) on Wednesday 6<sup>th</sup> May 2015 and on Monday 11<sup>th</sup> May 2015. These measurements were recorded across a frequency spectrum.



Figure 2: Measurement Position

The measurement instrumentation used is listed in Appendix A attached and a general acoustic terminology is provided in Appendix B.

During the measurement period, temperatures remained cold with no precipitation and winds varying in both direction and strength. It should be noted that measurements were aborted on Wednesday 6<sup>th</sup> May 2015 at 2200 due to unfavourable weather conditions (rain).

## 4.2 Results Summary

A time history of the  $L_{Aeq}$ ,  $L_{A90}$  and  $L_{Amax}$  from the attended measurements recorded during each survey period at position S1 is shown in Appendix C attached.

The results of the attended measurements have been calculated into equivalent levels ( $L_{Aeq,1hr}$ ) and are shown with the associated background noise level ( $L_{A90,1hr}$ ) and maximum instantaneous measured noise level ( $L_{Amax,T}$ ) in Table 2 below. It should be noted that the background noise level ( $L_{A90,1hr}$ ) shown below is the arithmetic average of the measured background noise levels ( $L_{A90,5min}$ ) in an hourly period.

Measurement Position		Position S1		
Measurement Date	Time	Daytime		
		$L_{Aeq,T}$ dB	$L_{A90,1hr}$ dB	Max $L_{Amax,T}$ dB
Wednesday 6 <sup>th</sup> May 2015	0700 – 0800	54	51	80
	0800 – 0900	58	53	82
Wednesday 6 <sup>th</sup> May 2015	2030 – 2130	48	44	68
	2130 – 2200*	46	44	59
Monday 11 <sup>th</sup> May 2015	2030 – 2130	51	41	90
	2130 – 2230	44	40	70

Table 2: Measured Noise Levels at Position S1

Note \*: Measurements were aborted at 2200 due to unfavourable weather conditions (rain).

As shown in Table 2 above, background noise levels measured by the unattended noise logger at position S1 indicate that the lowest levels could drop to approximately  $L_{A90,1hr}$  40 dB during the daytime.

Full details of the octave band measurements at position S1 are shown in the tables within Appendix D attached.

## 5.0 Noise Sensitive Areas

A noise sensitive area is defined as landscapes or buildings where the occupiers are likely to be sensitive to noise created by new plant installed as part of the proposed redevelopment, including residential areas. The nearest noise sensitive area is therefore identified as existing residential dwellings along Edward Road (approximately 435m to the south), as indicated in Figure 3 below.



Figure 3: Nearest Noise Sensitive Receptor

## 6.0 Noise Emissions of Fixed Plant

Noise levels due to the flexible generation facility are advised to meet the following noise level criteria shown below in Table 3 one metre from the nearest noise sensitive area as defined within Section 5.0 above. These are based on the background noise levels measured at the nearest residential dwelling on Edward Road (position S1).

It is understood that the proposed facility will only operate for a maximum of 200 hours a year between the hours of 0700 and 2230. As such, noise emission limits have been determined on the basis of the lowest measured background noise level during this period.

Period	Lowest Prevailing Background Noise Level $L_{A90,T}$ dB	Noise Emission Limit Calculation $L_{Ar,Tr}$ dB
Daytime (0700 to 2230)	40	35

Table 3: Building Services Noise Emission Limits

It should be noted that these are the combined operational noise levels of proposed fixed plant at the nearest noise sensitive façade. As such, the combined operational noise levels of all plant are required to achieve the noise limits defined within Table 3.

For plant noise that is tonal, contains a specific character or is intermittent, the limits of Table 3 above need to include a character correction as defined within BS 4142: 2014.



## 7.0 Plant Noise Assessment

The current proposal is understood to comprise a total of up to 48 bio-diesel generators (500 kVA) and 12 transformers with associated infrastructure on a concrete hard standing formed as shown in Figure 4 below.

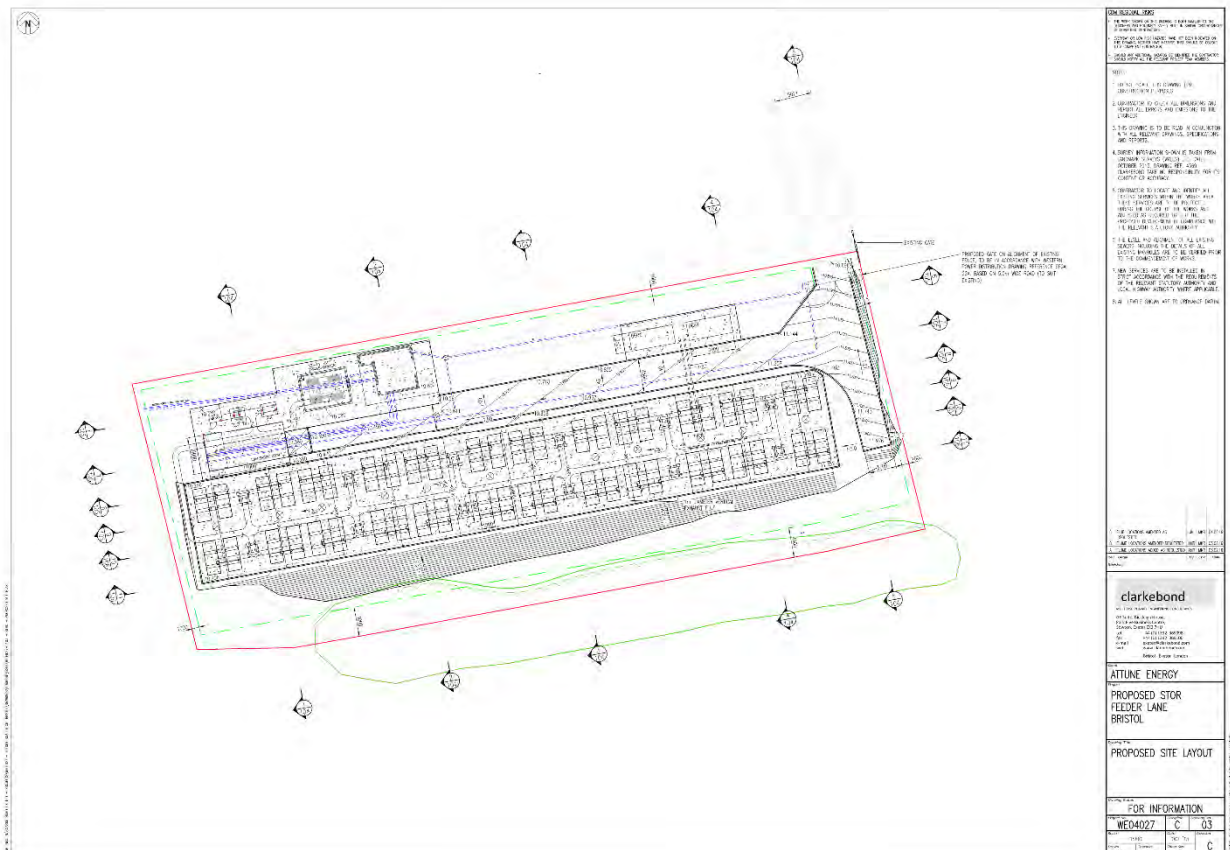


Figure 4: Proposed Site Layout

Each generator will be located within individual modular acoustic enclosures and an imperforate acoustic fence is proposed to surround the entire development. The acoustic fence will be installed at a height of 3m and have a mass per unit area of at least 15 kg/m<sup>2</sup>. In addition, the exhaust flue of each set of four generators is ducted to a common flue of maximum height 6m above ground floor level (1m diameter with air velocity 59.8m/s).

The proposed development is understood to operate for a maximum of 200 hours per year between the hours of 0700 and 2230, with a maximum operation of 2 hours continuously at any one time (average running time estimated at 55 minutes). In general, it is understood that the typical operating period is between 1700 and 1900 when the demand is greatest. Table 4 below summarises the permitted start and end times for the proposed development.

Season	Weekday		Non-Weekday	
	Start Time	End Time	Start Time	End Time
1 <sup>st</sup> April – 29 <sup>th</sup> April	0700	1330	1000	1400
	1900	2200	1930	2200
30 <sup>th</sup> April – 19 <sup>th</sup> August	0730	1400	0930	1330
	1600	1800	1930	2230
	1930	2230	-	-
20 <sup>th</sup> August – 23 <sup>rd</sup> September	0730	1400	1030	1330
	1600	2130	1900	2200
24 <sup>th</sup> September – 28 <sup>th</sup> October	0700	1330	1030	1330
	1630	2100	1730	2100
29 <sup>th</sup> October – 3 <sup>rd</sup> February	0700	1330	1030	1330
	1600	2100	1600	2030
4 <sup>th</sup> February – 31 <sup>st</sup> March	0700	1330	1030	1330
	1630	2100	1630	2100

Table 4: Permitted Operational Times of Proposed Development

On the basis that the proposed development may only operate during the daytime, an assessment of the noise emissions from the generators and transformers has been undertaken to ensure compliance with the daytime plant noise emission limits provided in Section 6.0 above. The manufacturers' acoustic data has been used for each item of plant and is provided below in Table 5 (see Appendix E for further specification information).

Item of Plant	Sound Pressure Level per Octave Band Frequency in Hz								L <sub>p(A)</sub> dB
	63	125	250	500	1000	2000	4000	8000	
Generator (at 1m)	89	91	86	84	78	76	73	75	85
Transformer (at 15m)	-	49	43	34	30	22	35	16	41

Table 5: Sound Pressure Levels of Proposed Plant

The most appropriate way of determining noise emissions from multiple items of plant is through the use of the individual source sound power levels. Whilst this data is not readily available, an area correction (based on the surface area at 1 metre from the generator and 15 metres from the transformer) can be applied to the sound pressure levels to estimate the source sound power levels.

In order to model noise associated with each exhaust flue, an estimation of the sound power level has been made using guidance contained within the "Woods Practical Guide to Noise Control" and SRL's "Noise Control in Building Services" for an air exhaust of velocity 59.8m/s and diameter 1m. The following table summarises the predicted sound power level of each generator, transformer and exhaust flue.

Item of Plant	Sound Power Level per Octave Band Frequency in Hz								L <sub>w(A)</sub> dB
	63	125	250	500	1000	2000	4000	8000	
Generator	109	111	106	103	98	96	93	95	106
Transformer	-	84	78	69	65	57	70	51	76
Exhaust Flue	96	92	88	83	78	78	78	78	87

Table 6: Predicted Sound Power Levels of Proposed Plant

In order to determine the resultant sound pressure level one metre from the nearest window of the residential dwelling on Edward Road, a three dimensional noise model has been created using Cadna/A environmental noise prediction and mapping software. A model of the proposed site and general surroundings was generated and each item of plant was assigned the appropriate source sound power level, as shown in Table 6 above.

The software then uses the principles of ISO 9613-2<sup>(6)</sup> to predict the sound pressure level at a specific receiver point, in this case the nearest residential dwelling on Edward Road, taking into consideration distance attenuation, the screening provided by the acoustic fence and neighbouring buildings and any ground effects. Table 7 below shows the predicted sound pressure level, one metre from the nearest residential façade and Figure 5 overleaf displays a noise map at a height of 3.5m above ground floor level (approximately first floor receiver) with the proposed development in operation.

	Sound Pressure Level per Octave Band Frequency in Hz								L <sub>p(A)</sub> dB
	63	125	250	500	1000	2000	4000	8000	
L <sub>p</sub> at Receiver	47	47	40	34	27	22	9	0	37

Table 7: Resultant Sound Pressure Level at Nearest Noise Sensitive Receiver

Comparison of the predicted plant noise level at the nearest residential dwelling on Edward Road with the proposed external noise limits is presented in Table 8. Sufficient data is not available to determine whether the proposed generators are tonal, as such a worst case +6 dB correction has been applied to the specific noise level to derive the rating level in accordance with BS 4142: 2014.

For ease of reference the specific sound level is defined as the sound pressure level at the assessment position due to a specific noise source operating over a given time interval. The rating noise level is defined as the specific sound level plus any adjustment for the characteristic features of the sound.

Period	Plant Noise Rating Limit L <sub>Aeq,T</sub> dB	Predicted Plant Noise Level L <sub>Aeq,T</sub> dB	
		Specific Level	Rating Level
0700 – 2230	35	37	43

Table 8: Proposed Noise Emission Limits & Predicted Noise Level

It can be seen from Table 8 above that the combined noise emissions exceed the defined noise emission limits at the nearest noise sensitive receptor. As such, noise control measures are required to enable compliance with the noise emission limits.

It can be seen from Table 6 above that the generators are the dominant source of noise at the proposed development. Additionally, due to the relative distances involved, any increase in height of the acoustic fence will provide almost no additional attenuation. As such, in order to provide combined noise emissions in compliance with the defined noise emission limits, noise from the generators are required to be reduced by a minimum of 8 dB(A).

The manufacturers have confirmed that the use of their bespoke acoustic enclosure will reduce the generator to a sound pressure level of 78 dB(A) at 1m (L<sub>WA</sub> 98 dB). Full details of the bespoke acoustic enclosure are provided in Appendix F.

A revised three dimensional noise model has been generated using the quoted generator sound pressure level of 78 dB(A) at 1m. Table 9 overleaf shows the predicted sound pressure level, one metre from the nearest residential façade. Figure 6 overleaf displays a noise map at a height of 3.5m above ground floor level (approximately first floor receiver) with the proposed development in operation.

	Sound Pressure Level per Octave Band Frequency in Hz								$L_{p(A)}$ dB
	63	125	250	500	1000	2000	4000	8000	
$L_p$ at Receiver	40	40	32	28	19	15	1	0	29

Table 9: Resultant Sound Pressure Level at Nearest Noise Sensitive Receiver with Bespoke Enclosure

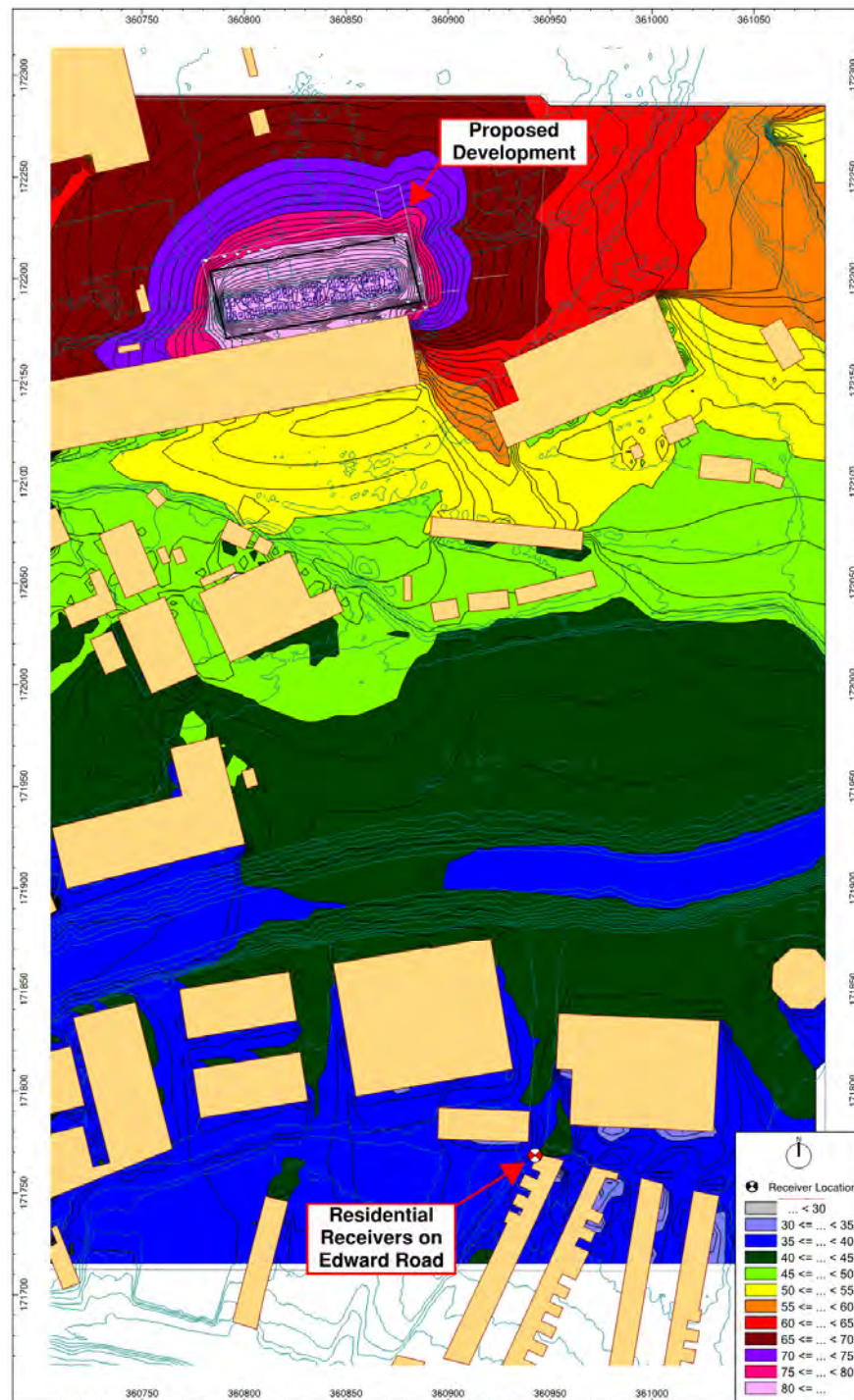


Figure 5: Noise Map at 3.5m above Ground Floor Level with Proposed Development in Operation



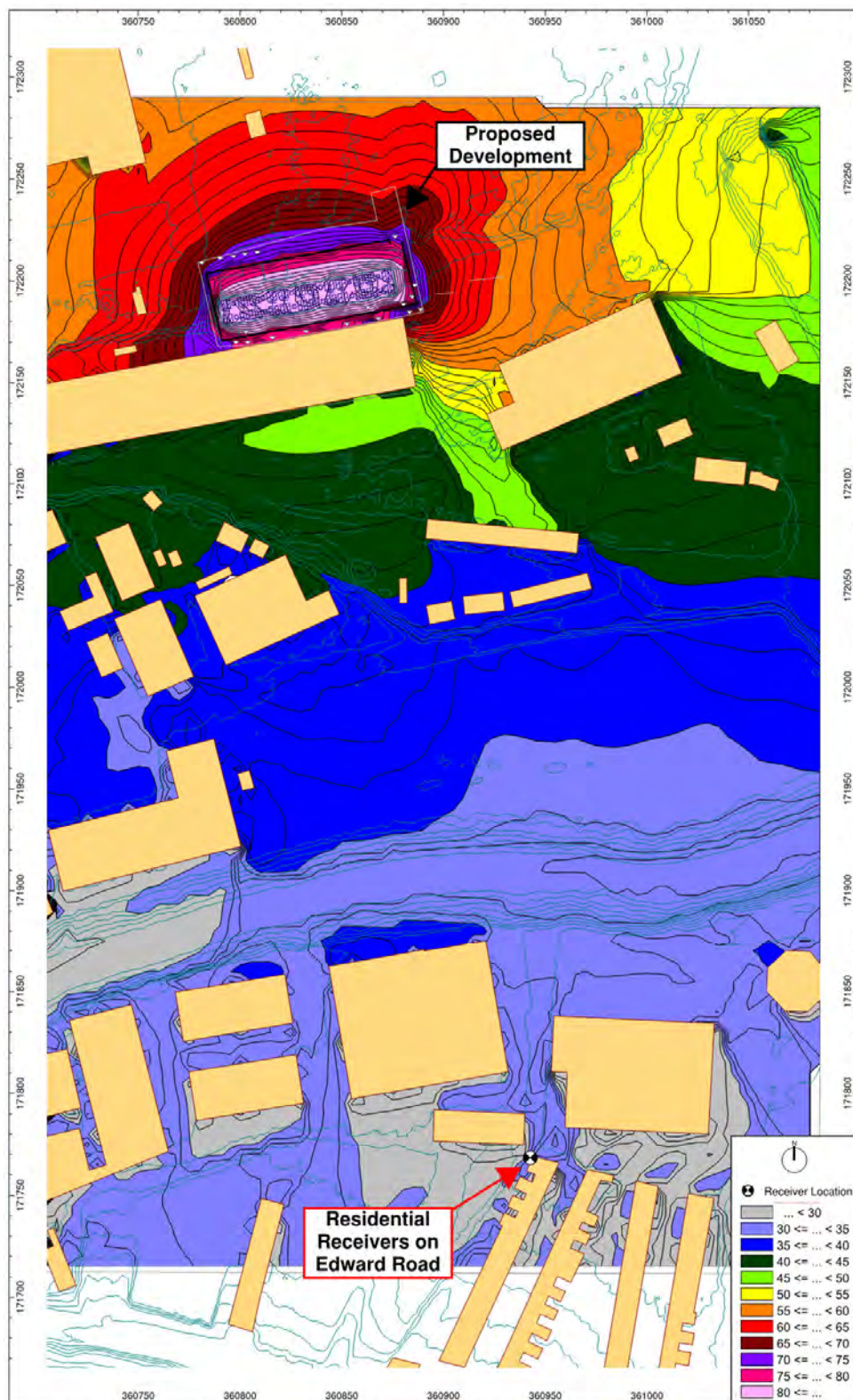


Figure 6: Noise Map at 3.5m above Ground Floor Level with Proposed Development in Operation with Bespoke Acoustic Enclosure

Comparison of the predicted plant noise level with the tonal correction applied at the nearest residential dwelling on Edward Road with the proposed external noise limits is presented in Table 10. Sufficient data is not available to determine whether the proposed generators with bespoke acoustic enclosures are tonal. As such, a worst case +6 dB correction has been applied to the specific level to derive the rating level.

Period	Plant Noise Rating Limit $L_{Aeq,T}$ dB	Predicted Plant Noise Level $L_{Aeq,T}$ dB	
		Specific Level	Rating Level
0700 – 2230	35	29	35

Table 10: Proposed Noise Emission Limits & Predicted Noise Level with Bespoke Acoustic Enclosure

It can be seen from Table 10 above that the combined noise emissions achieve the defined noise emission limits at the nearest noise sensitive receptor, thereby indicating that the bespoke acoustic enclosures provide sufficient mitigation of the proposed development.

From Table 2 above it can be seen that the quietest measured equivalent noise level at position S1 ( $L_{Aeq,1hr}$ ) was 44 dB, with an observed variation between 41 dB and 62 dB ( $L_{Aeq,5min}$ ) during the survey period. These noise levels are considerably higher than the predicted plant noise level (35 dB) and will provide additional masking which will further reduce the impact of the proposed development at the nearest noise sensitive receptor. In reality, noise levels throughout the daytime will be higher than those observed during the survey, which will assist in providing additional masking.

Similarly, the likely impact at the nearest noise sensitive receptor will be limited by the maximum operational hours of the proposed development (maximum of 2 hours continual operation with an average running time estimated at 55 minutes).

It should also be noted that the assessment provided within this Section is considered worst case as it assumes all 48 bio-diesel generators and 12 transformers are operating at maximum duty at one time and includes a worst case 6 dB correction for tonality. As defined in BS 4142: 2014, tonal corrections are applied on a sliding scale from 0 to 6 dB, depending on the prominence of a tone using the subjective and reference methods. As such, if there is no or low prominence of tones the correction factor will be less, such that the rating level from the development will be below the noise emission limits.

### 7.1 The Paintworks Phase 3

It is understood that planning permission has been granted for a mixed use scheme on land to the west of Edward Road, known as The Paintworks Phase 3. The proposed scheme will introduce up to 210 new residential units with vehicular access off Bath Road along with retail space and up to 11 live / work units. The proposed residential dwellings will be located approximately 350m from the proposed flexible generation facility and will therefore be located at closer distances than the residential receivers on Edward Road.

The noise survey report submitted as part of the Paintworks planning application, written by Ion Acoustics (A860/R01a), confirms that the lowest background noise level measured at the proposed Paintworks site (Position A) during which the proposed flexible generation facility may be in operation was approximately  $L_{A90}$  45 dB. In accordance with Bristol City Council's Standard Planning Conditions, noise from the proposed flexible generation facility would therefore be required to achieve a noise emission limit of  $L_{A,Tr}$  40 dB.

The noise map indicates that the resultant noise level due to the proposed development at the closest part of The Paintworks Phase 3 site would be approximately 34 dB(A), which corresponds to a rating level of 40 dB(A) following application of the tonality correction. As such, noise from the proposed flexible generation facility will be controlled to acceptable levels at the Paintworks Phase 3 site.



## 7.2 St Philip's Marsh Nursery

In addition to the existing and proposed residential dwellings discussed above, St Philip's Marsh Nursery is located approximately 240m to the west of the proposed facility, as shown in Figure 7 below.

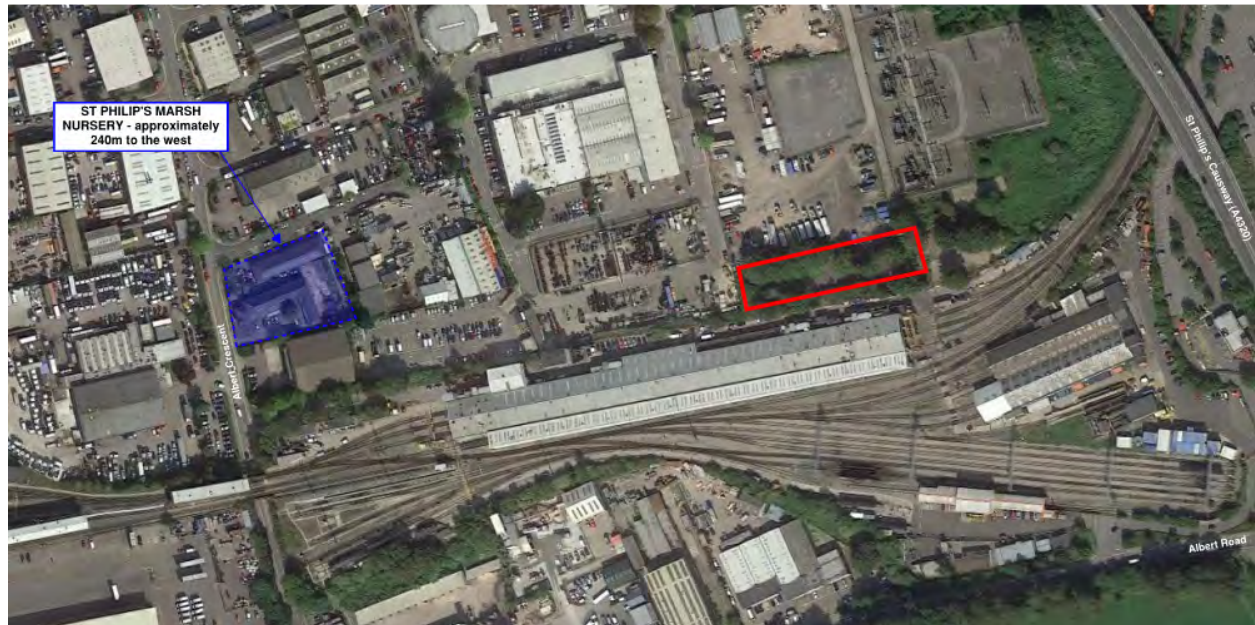


Figure 7: St Philip's Marsh Nursery

The noise emission limits defined within Table 3 are applicable at the nearest residential properties along Edward Road and have been defined in accordance with BS 4142. The scope of BS 4142 specifically states that *"the methods described in this British Standard use outdoor sound levels to assess the likely effects of sound on people who might be inside or outside a dwelling or premises used for residential purposes upon which sound is incident."*

The methodology described in BS 4142 is an external measurement which is specifically intended to assess the effects of people inside or outside a residential dwelling. In relation to Schools, the only relevant guidance is contained within Building Bulletin 93 (BB 93) <sup>(7)</sup> which provides indoor ambient noise levels to provide a suitable learning environment and allow clear communication within school classrooms. In addition, BB93 provides guidance on suitable external noise levels to allow teaching activities within external amenity spaces.

On the basis of guidance provided within BB 93, internal noise levels within classrooms should not exceed 40 dB  $L_{Aeq,30min}$  assuming ventilation is provided via open windows, and noise levels within external teaching areas should not exceed 50 dB  $L_{Aeq,30min}$ .

Guidance provided within PPG 24 states that *"the insulation provided by any type of window when partially open will be in the region of 10-15 dB(A)."* Based on the level of noise that should be acceptable inside a classroom from external noise sources, the proposed facility could produce a noise level of 50 dB at one metre from a classroom with opening windows. This is determined on the basis that a partially open window will provide a worst case 10 dB(A) reduction.

On the basis of the noise model discussed in Section 7.0, an assessment has been conducted to determine the resultant sound pressure level at St Philip's Marsh Nursery due to the proposed facility (generators within bespoke acoustic enclosures).

Table 11 below shows the predicted sound pressure level, one metre from the most exposed school façade and Figure 8 below displays a noise map at a height of 1.5m above ground floor level with the proposed development in operation.

	Sound Pressure Level per Octave Band Frequency in Hz dB								L <sub>p(A)</sub> dB
	63	125	250	500	1000	2000	4000	8000	
L <sub>p</sub> at Receiver	55	57	52	48	42	39	29	6	50

Table 11: Resultant Sound Pressure Level at St Philip's Marsh Nursery with Bespoke Enclosure

It can be seen from Table 11 above that the combined noise emissions achieve the noise emission limit derived above at the Nursery School. In addition, it can be seen in Figure 8 that the noise emissions within the external amenity area do not exceed 50 dB and are therefore commensurate with those levels required to allow outdoor teaching activities. As such, the impact of the proposed facility on the operation of the Nursery will not be significant.

As discussed previously, it should be noted that the assessment provided within this Section is considered worst case as it assumes all 48 bio-diesel generators and 12 transformers are operating at maximum duty at one time. In addition, the typical operating period of the proposed facility is 1700 to 1900, during which time the Nursery will not be operational and therefore there will be no impact on the Nursery School.

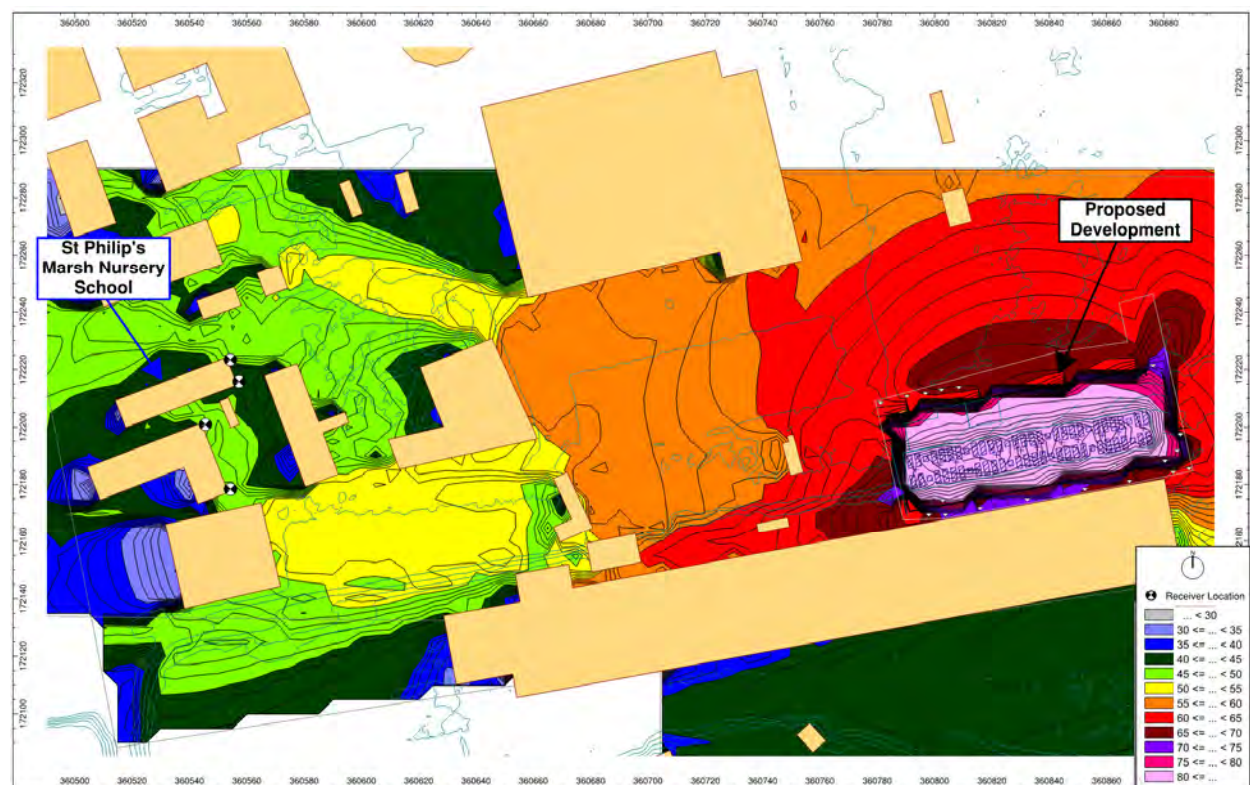


Figure 8: Noise Map at 1.5m above Ground Floor Level with Proposed Development in Operation with Bespoke Acoustic Enclosure



## 8.0 Summary and Conclusions

Hoare Lea Acoustics has conducted an environmental noise survey and noise impact assessment for the proposed installation of 48 bio-diesel generators and 12 transformers with associated infrastructure for the generation of flexible generation electricity at the existing brownfield site on Feeder Road in Bristol. Attended noise monitoring during the quietest periods at which the proposed development may be in operation was conducted.

Background noise levels typical of the quietest period during the daytime have been measured and used to define plant noise emission limits at the nearest noise sensitive receptors. The nearest receptors have been identified as existing residential dwellings along Edward Road to the south.

The combined building services plant noise emission contribution limit advised is 35 dB(A), one metre from the nearest residential façade.

A worst case assessment of noise associated with the operation of the proposed generators and transformers has been undertaken taking into account the screening provided by the proposed acoustic fence. The assessment indicates that the predicted noise level exceeds the defined noise emission limit by 8 dB(A) during the daytime with a tonal correction applied. As such, noise control measures are required.

In order to provide noise emission limits in compliance with the defined noise emission limit, the generator must not exceed a sound pressure level of 78 dB(A) at 1m (maximum  $L_{wA}$  98 dB). The generator manufacturers have confirmed that their bespoke acoustic enclosure will enable achievement of these maximum noise levels.

As such, incorporation of the above bespoke acoustic enclosure is sufficient to provide noise emissions in compliance with the derived noise emission limit.

Additionally, consideration to the context of the sound present at the nearest noise sensitive receptor will provide additional masking which will further reduce the impact of the proposed development.

Consideration has also been given to the level of noise associated with the proposed flexible generation facility at the Paintworks Phase 3 site which has recently been granted planning permission and St Philip's Marsh Nursery School to the west. The assessment indicates that the worst case noise level at the Paintworks site will achieve a level of 5 dB(A) below the lowest background noise level measured at the Paintworks site during which the proposed facility may be in operation. The assessment also indicates that the worst case noise level at the Nursery will achieve the defined noise limits and not be significant in terms of its impact on the operation of the Nursery.

As such, the proposed acoustic enclosures and acoustic fence will control noise emissions to acceptable levels.

## 9.0 References

1. *National Planning Policy Framework, Department for Communities and Local Government, March 2012.*
2. *BS 4142: 2014: 'Method for rating industrial and commercial sound'.*
3. *BS 8233: 2014, "Guidance on Sound Insulation and Noise Reduction for Buildings", BSI.*
4. *World Health Organisation (WHO) - Guidelines for Community Noise, 2000.*
5. *BS 4142: 1997: 'Method for rating industrial noise affecting mixed residential and industrial areas'.*
6. *ISO 9613-2: 1996, 'Acoustics - Attenuation of Sound during Propagation Outdoors - Part 2'.*
7. *Building Bulletin 93, Acoustic Design of Schools: Performance Standards, Department for Education, February 2015.*

# APPENDICES

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## **Appendix A: List of Measurement Equipment**

### **Environmental Noise Survey**

#### **Noise Spectral Analyser (Octave Band Measurements - Attended)**

- Brüel and Kjær 2250 Sound Level Meter (Serial Number 3004428)
- Brüel and Kjær 2C0032 Pre-Amplifier (Serial Number 19730)
- Brüel and Kjær 4231 Sound Calibrator (Serial Number 2147258)
- Brüel and Kjær 4189 Microphone (Serial Number 2887259)

Sound level meters were field calibrated before and after noise survey and no discernible variations occurred.

## Appendix B: Acoustic Terminology

### Sound

Sound is produced by mechanical vibration of a surface, which sets up rapid pressure fluctuations in the surrounding air.

### The Sound Pressure

The Sound Pressure is the force (N) of sound on a surface area (m<sup>2</sup>) perpendicular to the direction of the sound. The SI-units for the Sound Pressure are Nm<sup>-2</sup> or Pa (Pascal).

Sound is measured with microphones responding proportionally to the sound pressure –  $p$ . The power is proportional to the square of the sound pressure.

### The Sound Pressure Level

The human ear has an approximately logarithmic response to sound pressure over a very large dynamic range. The lowest audible sound pressure approximately  $2 \times 10^{-5}$  Pa (2 ten billionths of an atmosphere) and the highest is approximately 100 Pa.

It is therefore convenient to express the sound pressure as a logarithmic decibel scale related to this lowest human audible sound, where:

$$L_p = 10 \log \left( \frac{p^2}{p_{ref}^2} \right) = 10 \log \left( \frac{p}{p_{ref}} \right)^2 = 20 \log \left( \frac{p}{p_{ref}} \right)$$

Where:  $L_p$  = sound pressure level (dB)

$p$  = sound pressure (Pa)

$p_{ref} = 2 \times 10^{-5}$  – reference sound pressure (Pa)

In accordance with the logarithmic scale, doubling the sound pressure level gives an increase of 6 dB.

### Decibel (dB)

The decibel is the unit used to quantify sound pressure levels as well as sound intensity and power levels.

In accordance with the logarithmic scale, an increase of 10 dB in sound pressure level is equivalent to an increase by a factor of 10 in the sound pressure level (measured in Pa). Subjectively, this increase would correspond to a doubling of the perceived loudness of the sound.

### Sound Pressure Level of Some Common Sources

An indication of the range of sound levels commonly found in the environment is given in the following Table.

Source	Sound Pressure Level dB
Threshold of Hearing	0
Rustling Leaves	20
Quiet Whisper	30
Home	40
Quiet Street	50
Conversation	60
Inside a Car	70
Loud Singing	80
Motorcycle (10m)	90
Lawn Mower (1m)	100
Diesel Truck (1m)	110
Amplified Music (1m)	120
Jet Plane (1m)	130

### Frequency

The rate at which the pressure fluctuations occur determines the pitch or *frequency* of the sound. The frequency is expressed in Hertz (Hz) or cycles per second.

### Octave and Third Octave Bands

An octave is the interval between two points where the frequency at the second point is twice the frequency of the first.

There are many methods of describing the frequency content of a noise. The most common methods split the frequency range into defined bands, in which the mid-frequency is used as the band descriptor and in the case of octave bands is double that of the band lower. For example, two adjacent octave bands are 250 Hz and 500 Hz.

Third octave bands provided a fine resolution by dividing each octave band into three bands. For examples, third octave bands would be 160 Hz, 250 Hz and 315 Hz for the same 250 Hz octave band.

The human ear is sensitive to sound over a range of frequencies between approximately 20 Hz to 20 kHz and is generally more sensitive to medium and high frequency than to low frequencies within the range. This is the basis of the A-weighting.

### A-Weighting

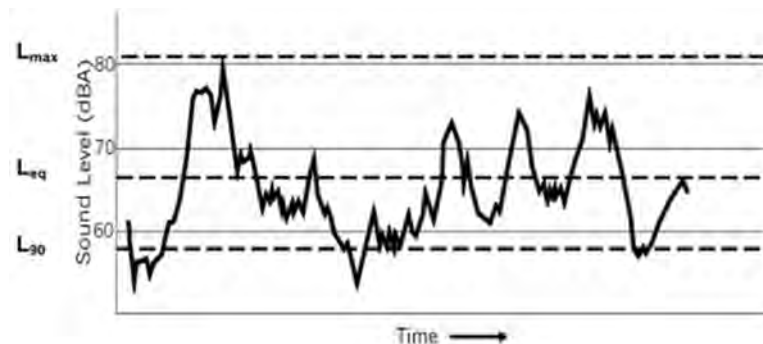
The A-weighting is a correction term applied to the frequency range in order to mimic the sensitivity of the human ear to noise. It is generally used to obtain an overall noise level from octave or third octave band frequencies.

An A weighted value would be written as dB(A), or including A within the parameter term.

### Noise Units

In order to assess environmental noise, measurements are carried out by sampling over specific periods of time, such as five minutes, the statistically determined results being used to quantify various aspects of the noise.

The figure below shows an example of sound level varying with time. Because of this time variation the same period of noise can be described by several different levels. The most common of these are described below.



#### $L_{eq,T}$

The  $L_{eq,T}$  is a parameter defined as the equivalent continuous sound pressure level over a defined time period 'T'. It is the sound pressure level equivalent to the acoustic energy of the fluctuating sound signal.

The  $L_{eq,T}$  can be thought of as an 'average' sound pressure level over a given time period (although it is not an arithmetic average). Typically the  $L_{eq,T}$  will be an A-weighted noise level in dB(A) and is commonly used to describe all types of environmental noise sources.

#### $L_{01,T}$

The  $L_{01,T}$  is a parameter defined as the sound pressure level exceeded for 1% of the measurement period 'T'.

It is a statistical parameter and cannot be directly combined to other acoustic parameter.

#### $L_{10,T}$

The  $L_{10,T}$  is a parameter defined as the sound pressure level exceeded for 10% of the measurement period 'T'.

It is a statistical parameter and cannot be directly combined to other acoustic parameter and is generally used to describe road traffic noise.

#### $L_{90,T}$

The  $L_{90,T}$  is a parameter defined as the sound pressure level exceeded for 90% of the measurement period 'T'.

It is a statistical parameter and cannot be directly combined to other acoustic parameter and is generally used to describe the prevailing background noise level.

#### $L_{max,T}$

The  $L_{max,T}$  is a parameter defined as the maximum noise level measured during the specified period 'T'.

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**Specific Noise Level,  $L_{Aeq,T}$** 

This is the equivalent continuous A-weighted sound pressure level at the assessment position due to a specific noise source operating over a given time interval.

**Free Field**

A measurement taken in the free field is at least 3.5m from reflecting vertical surfaces and 1.2m from the ground.

**Façade**

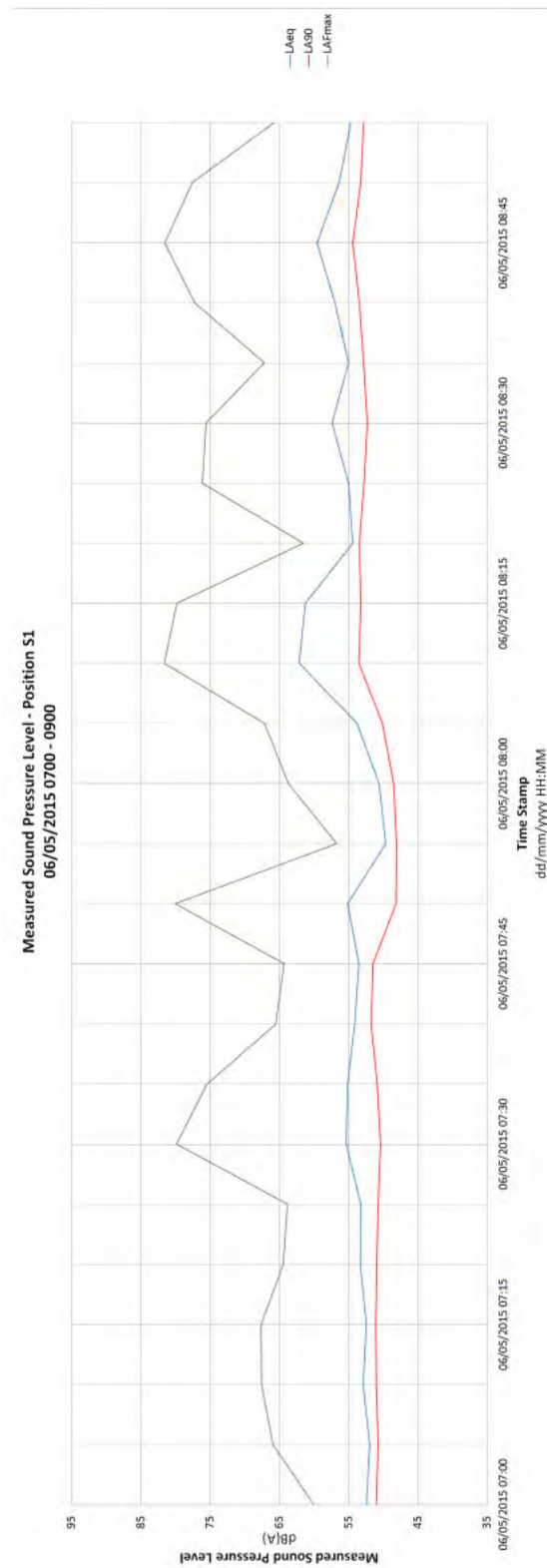
A measurement is influenced by the reflection of sound from the façade of a building within 3.5m. A façade measurement is made 1m in front of the vertical building surface.

 **$R_w$** 

A single-number quantity which characterizes the airborne sound insulation of a material or building element in the laboratory. See BS EN ISO 717-1: 1997.

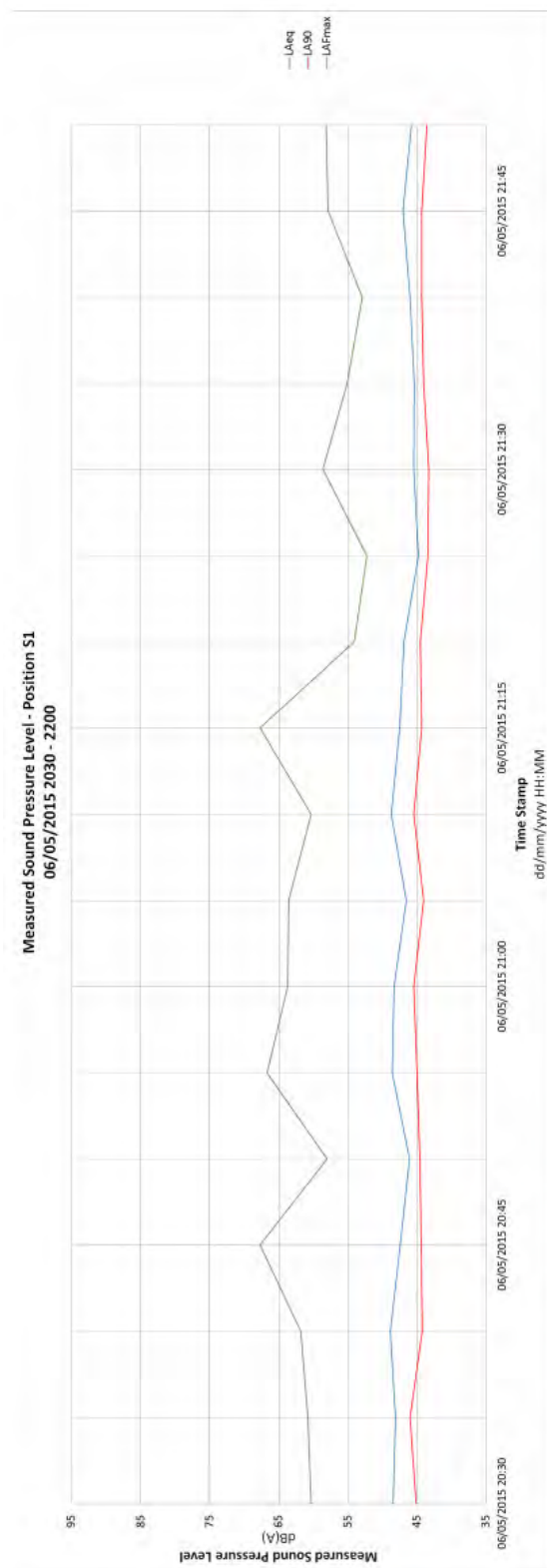


## Appendix C: Time History of Unattended Measurements at Position S1 Wednesday 6<sup>th</sup> May 2015 (0700 to 0900)



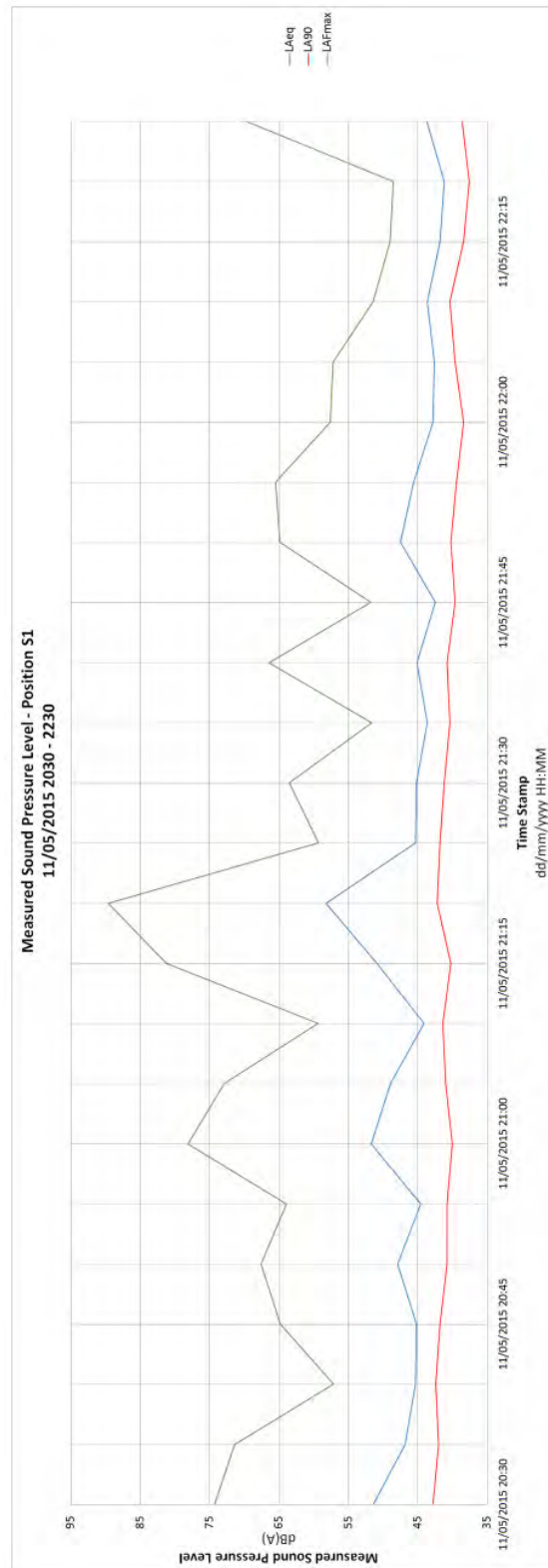
## Appendix C: Time History of Unattended Measurements at Position S1

Wednesday 6<sup>th</sup> May 2015 (2030 to 2200)



## Appendix C: Time History of Unattended Measurements at Position S1

Monday 11<sup>th</sup> May 2015 (2030 to 2230)



## Appendix D: Octave Band Levels at Position S1

Position	Measurement Period	Duration	Sound Pressure Level per Octave Band Frequency in dB										L <sub>aeq,T</sub> dB
			16 Hz	31.5 Hz	63 Hz	125 Hz	250 Hz	500 Hz	1 kHz	2 kHz	4 kHz	8 kHz	
S1	06/05/2015 07:00	00:05:00	58.3	62.2	57.3	56.0	55.4	50.1	46.9	41.5	31.7	23.1	52.4
	06/05/2015 07:05	00:05:00	59.4	63.5	57.0	56.3	54.9	49.5	46.6	41.2	31.8	24.2	52.0
	06/05/2015 07:10	00:05:00	59.8	62.7	57.6	54.8	54.7	49.4	47.4	43.2	42.6	34.7	53.0
	06/05/2015 07:15	00:05:00	59.3	62.7	57.8	55.0	55.0	49.6	47.0	43.0	36.0	28.9	52.5
	06/05/2015 07:20	00:05:00	58.2	62.2	57.3	56.2	55.7	51.3	47.1	43.7	37.5	28.0	53.3
	06/05/2015 07:25	00:05:00	62.3	63.6	58.4	55.0	54.2	50.1	47.8	45.2	39.9	34.9	53.3
	06/05/2015 07:30	00:05:00	65.3	65.5	58.5	55.7	56.0	51.2	50.0	48.7	41.8	33.6	55.3
	06/05/2015 07:35	00:05:00	67.6	70.4	61.0	57.9	55.8	50.8	49.6	48.3	41.6	35.0	55.1
	06/05/2015 07:40	00:05:00	59.1	69.3	63.1	58.3	55.3	51.2	49.0	44.8	38.7	28.1	54.2
	06/05/2015 07:45	00:05:00	60.9	63.6	60.2	57.3	56.2	49.9	47.8	44.4	38.3	31.5	53.5
	06/05/2015 07:50	00:05:00	58.6	63.2	60.1	59.1	56.8	49.8	49.4	48.4	41.3	33.0	55.1
	06/05/2015 07:55	00:05:00	59.0	62.5	57.7	53.2	47.4	46.0	45.7	41.5	34.3	28.6	49.7
	06/05/2015 08:00	00:05:00	59.1	62.5	58.5	55.4	49.2	46.7	46.5	42.1	35.2	28.5	50.6
	06/05/2015 08:05	00:05:00	63.6	63.9	59.3	56.0	56.2	50.9	48.3	44.9	38.3	24.1	53.8
	06/05/2015 08:10	00:05:00	67.0	67.7	64.5	59.6	60.6	57.0	55.6	56.9	52.0	44.0	62.1
	06/05/2015 08:15	00:05:00	63.4	70.5	65.4	60.2	60.0	57.7	55.8	54.3	50.0	44.9	61.2
	06/05/2015 08:20	00:05:00	61.3	61.8	59.1	58.0	58.3	52.3	47.8	43.0	35.2	28.3	54.4
	06/05/2015 08:25	00:05:00	62.8	62.9	60.1	58.1	57.6	52.3	49.8	45.0	36.9	29.6	55.0
	06/05/2015 08:30	00:05:00	63.1	71.3	65.5	59.2	57.4	53.9	52.1	50.2	43.4	36.4	57.4
	06/05/2015 08:35	00:05:00	61.3	62.3	60.0	58.6	56.8	51.6	49.6	47.1	38.5	31.1	55.0
	06/05/2015 08:40	00:05:00	60.4	64.9	65.0	61.7	59.3	53.3	50.9	48.3	43.2	36.6	57.0
	06/05/2015 08:45	00:05:00	62.6	68.5	66.9	61.5	58.9	54.0	53.7	53.6	48.9	42.9	59.6
	06/05/2015 08:50	00:05:00	63.7	67.0	66.0	59.9	58.3	52.9	50.9	47.9	40.8	32.6	56.4
	06/05/2015 08:55	00:05:00	63.4	64.9	64.8	57.9	56.5	51.4	49.5	45.8	38.8	31.3	54.7
	06/05/2015 20:30	00:05:00	61.9	66.1	54.8	49.5	46.5	43.1	45.2	40.5	33.5	27.6	48.5
	06/05/2015 20:35	00:05:00	59.5	61.5	55.6	47.7	46.0	43.3	44.9	40.0	32.9	26.3	48.1
	06/05/2015 20:40	00:05:00	56.3	67.5	60.6	49.7	47.5	43.5	45.1	41.1	33.7	26.1	48.9
	06/05/2015 20:45	00:05:00	57.8	59.2	52.8	46.4	44.4	41.7	43.8	40.0	36.1	26.2	47.4
	06/05/2015 20:50	00:05:00	57.7	59.3	53.1	45.3	43.8	41.3	43.4	37.2	26.8	18.6	46.1
	06/05/2015 20:55	00:05:00	54.1	60.3	56.6	46.2	44.1	43.0	44.8	42.5	33.4	21.8	48.6
	06/05/2015 21:00	00:05:00	57.6	68.1	57.5	48.1	46.1	42.8	44.9	40.5	33.6	30.0	48.3
	06/05/2015 21:05	00:05:00	53.5	55.0	49.8	44.1	43.0	40.4	44.2	38.1	31.0	15.8	46.5
	06/05/2015 21:10	00:05:00	59.3	72.1	64.5	49.4	46.7	43.4	44.6	39.7	34.2	28.2	48.7
	06/05/2015 21:15	00:05:00	57.6	61.0	52.3	46.5	44.7	42.5	43.6	39.5	37.0	32.6	47.5
	06/05/2015 21:20	00:05:00	56.2	55.4	51.0	44.5	43.2	40.7	44.4	39.3	24.8	14.7	46.9
	06/05/2015 21:25	00:05:00	64.7	60.1	51.5	44.5	43.3	40.3	42.0	35.6	25.5	17.2	44.8
	06/05/2015 21:30	00:05:00	54.7	54.6	50.9	44.9	43.2	40.5	42.7	36.8	27.8	18.6	45.5
	06/05/2015 21:35	00:05:00	56.8	55.2	51.7	45.8	44.6	41.0	42.5	36.2	25.4	15.9	45.4
	06/05/2015 21:40	00:05:00	51.9	53.5	50.7	44.6	43.5	40.8	43.5	37.4	27.2	18.5	46.0
	06/05/2015 21:45	00:05:00	53.6	56.9	55.4	48.7	46.2	42.6	43.6	38.4	30.1	20.4	47.0
	06/05/2015 21:50	00:05:00	53.9	53.7	54.4	43.8	42.9	41.5	43.3	36.4	24.0	15.1	45.8
	11/05/2015 20:30	00:05:00	-	-	-	-	-	-	-	-	-	-	51.4
	11/05/2015 20:35	00:05:00	-	-	-	-	-	-	-	-	-	-	46.8
	11/05/2015 20:40	00:05:00	-	-	-	-	-	-	-	-	-	-	45.3
	11/05/2015 20:45	00:05:00	-	-	-	-	-	-	-	-	-	-	45.2
	11/05/2015 20:50	00:05:00	-	-	-	-	-	-	-	-	-	-	47.9
	11/05/2015 20:55	00:05:00	-	-	-	-	-	-	-	-	-	-	44.6
	11/05/2015 21:00	00:05:00	-	-	-	-	-	-	-	-	-	-	51.7
	11/05/2015 21:05	00:05:00	-	-	-	-	-	-	-	-	-	-	48.9
	11/05/2015 21:10	00:05:00	-	-	-	-	-	-	-	-	-	-	44.1
	11/05/2015 21:15	00:05:00	-	-	-	-	-	-	-	-	-	-	50.9
	11/05/2015 21:20	00:05:00	-	-	-	-	-	-	-	-	-	-	58.2
	11/05/2015 21:25	00:05:00	-	-	-	-	-	-	-	-	-	-	45.3
	11/05/2015 21:30	00:05:00	-	-	-	-	-	-	-	-	-	-	45.2
	11/05/2015 21:35	00:05:00	-	-	-	-	-	-	-	-	-	-	43.6
	11/05/2015 21:40	00:05:00	-	-	-	-	-	-	-	-	-	-	45.1
	11/05/2015 21:45	00:05:00	-	-	-	-	-	-	-	-	-	-	42.5
	11/05/2015 21:50	00:05:00	-	-	-	-	-	-	-	-	-	-	47.5
	11/05/2015 21:55	00:05:00	-	-	-	-	-	-	-	-	-	-	45.6
	11/05/2015 22:00	00:05:00	-	-	-	-	-	-	-	-	-	-	42.8
	11/05/2015 22:05	00:05:00	-	-	-	-	-	-	-	-	-	-	42.6
	11/05/2015 22:10	00:05:00	-	-	-	-	-	-	-	-	-	-	43.6
	11/05/2015 22:15	00:05:00	-	-	-	-	-	-	-	-	-	-	41.8
	11/05/2015 22:20	00:05:00	-	-	-	-	-	-	-	-	-	-	41.2
	11/05/2015 22:25	00:05:00	-	-	-	-	-	-	-	-	-	-	43.7

Table 12: Ambient Levels Measured at all Positions




## Appendix D (cont): Octave Band Levels at Position S1

Position	Measurement Period	Duration	Sound Pressure Level per Octave Band Frequency in dB										L <sub>eq</sub> 1 dB
			16 Hz	31.5 Hz	63 Hz	125 Hz	250 Hz	500 Hz	1 kHz	2 kHz	4 kHz	8 kHz	
S1	06/05/2015 07:00	00:05:00	55.2	59.2	54.4	53.1	52.8	47.9	44.9	39.5	27.8	17.1	51.0
	06/05/2015 07:05	00:05:00	56.0	59.7	54.0	52.8	52.6	47.9	44.6	39.0	27.4	14.4	50.8
	06/05/2015 07:10	00:05:00	56.7	59.2	53.8	52.4	52.8	47.6	45.0	39.6	28.1	15.1	51.0
	06/05/2015 07:15	00:05:00	56.6	59.3	54.1	52.6	53.2	47.6	44.9	40.0	29.5	17.2	51.1
	06/05/2015 07:20	00:05:00	54.7	59.3	54.4	53.0	53.2	47.8	44.1	39.7	31.7	19.5	51.0
	06/05/2015 07:25	00:05:00	51.9	59.2	54.5	49.8	51.0	46.8	45.2	41.3	31.4	20.5	50.7
	06/05/2015 07:30	00:05:00	51.9	59.9	54.9	49.8	51.2	46.3	44.6	40.8	31.3	20.7	50.4
	06/05/2015 07:35	00:05:00	52.2	59.0	54.4	51.0	51.8	46.8	45.2	41.4	32.3	21.5	50.9
	06/05/2015 07:40	00:05:00	51.6	59.1	56.2	52.7	52.2	47.2	46.2	42.5	32.9	21.1	51.8
	06/05/2015 07:45	00:05:00	52.5	59.5	56.5	53.6	53.2	47.2	45.0	41.1	32.1	20.0	51.5
	06/05/2015 07:50	00:05:00	51.6	59.0	54.3	49.8	45.2	44.2	43.9	39.2	29.8	17.2	48.2
	06/05/2015 07:55	00:05:00	50.6	56.9	53.7	49.2	44.6	43.8	43.8	39.0	28.7	16.7	48.1
	06/05/2015 08:00	00:05:00	49.9	57.9	55.2	50.4	45.7	44.3	44.0	39.3	29.3	17.1	48.5
	06/05/2015 08:05	00:05:00	53.1	58.6	56.3	52.3	47.5	46.1	45.7	40.2	30.0	17.3	50.2
	06/05/2015 08:10	00:05:00	56.2	60.2	56.9	54.7	55.8	51.1	47.2	41.8	30.9	19.0	53.5
	06/05/2015 08:15	00:05:00	56.8	60.9	56.0	54.6	55.5	50.9	46.3	40.7	30.2	18.6	53.3
	06/05/2015 08:20	00:05:00	55.6	58.7	55.6	55.7	56.3	50.7	45.8	39.8	28.7	16.6	53.5
	06/05/2015 08:25	00:05:00	55.4	58.5	56.7	55.5	54.6	49.6	45.8	40.4	29.9	18.0	52.8
	06/05/2015 08:30	00:05:00	57.1	59.6	56.4	56.0	54.4	49.2	45.2	40.1	30.3	18.8	52.3
	06/05/2015 08:35	00:05:00	56.3	58.6	56.3	56.0	54.5	49.6	45.9	41.0	31.7	19.7	52.8
	06/05/2015 08:40	00:05:00	56.5	59.3	57.9	57.4	55.5	50.1	46.5	41.2	31.4	19.6	53.5
	06/05/2015 08:45	00:05:00	57.1	61.0	62.0	57.7	55.9	50.8	47.8	43.1	34.2	22.8	54.4
	06/05/2015 08:50	00:05:00	57.2	61.5	56.9	56.2	55.0	49.7	46.9	41.9	32.7	20.0	53.2
	06/05/2015 08:55	00:05:00	55.2	59.7	57.1	55.2	53.8	49.1	46.5	42.2	33.9	23.0	52.8
	06/05/2015 20:30	00:05:00	48.2	51.8	47.6	41.8	41.5	39.4	42.4	36.6	24.4	13.2	45.2
	06/05/2015 20:35	00:05:00	50.1	51.7	48.3	42.7	42.5	40.5	42.9	37.4	25.9	14.2	46.0
	06/05/2015 20:40	00:05:00	48.3	50.3	47.8	41.4	41.4	39.0	41.4	35.0	22.6	12.3	44.3
	06/05/2015 20:45	00:05:00	49.1	50.6	47.1	41.6	41.2	39.0	41.4	34.8	21.7	12.4	44.3
	06/05/2015 20:50	00:05:00	48.6	51.5	47.6	41.4	41.2	39.0	41.6	35.2	22.3	13.2	44.6
	06/05/2015 20:55	00:05:00	49.6	52.6	48.8	42.3	41.9	39.7	41.8	35.5	24.0	13.9	45.0
	06/05/2015 21:00	00:05:00	49.2	52.2	47.7	41.7	41.9	39.7	42.5	36.1	23.6	13.5	45.4
	06/05/2015 21:05	00:05:00	49.0	51.1	46.8	40.8	40.7	38.4	41.3	34.8	21.4	12.1	44.0
	06/05/2015 21:10	00:05:00	48.8	52.3	48.4	43.1	42.1	40.0	42.3	36.0	22.9	12.9	45.4
	06/05/2015 21:15	00:05:00	49.9	49.8	46.1	39.9	40.5	38.8	41.2	35.5	23.4	13.1	44.3
	06/05/2015 21:20	00:05:00	47.7	51.7	47.8	41.3	41.0	38.7	41.5	35.2	22.2	12.4	44.5
	06/05/2015 21:25	00:05:00	49.2	51.3	47.5	40.7	40.7	38.2	40.4	33.8	20.3	12.1	43.4
	06/05/2015 21:30	00:05:00	47.0	50.7	47.3	41.4	40.6	38.2	40.5	34.3	22.5	12.7	43.3
	06/05/2015 21:35	00:05:00	49.9	51.0	47.2	41.6	41.0	38.8	40.8	34.3	21.7	12.3	44.0
	06/05/2015 21:40	00:05:00	48.2	50.8	47.7	41.0	41.0	38.8	41.5	35.1	22.8	12.6	44.3
	06/05/2015 21:45	00:05:00	48.7	51.3	48.1	41.4	41.6	39.1	41.3	34.7	22.4	12.8	44.3
	06/05/2015 21:50	00:05:00	46.3	50.3	47.4	40.4	40.4	38.2	40.9	34.1	19.9	12.0	43.6
	11/05/2015 20:30	00:05:00	-	-	-	-	-	-	-	-	-	-	42.8
	11/05/2015 20:35	00:05:00	-	-	-	-	-	-	-	-	-	-	42.0
	11/05/2015 20:40	00:05:00	-	-	-	-	-	-	-	-	-	-	42.4
	11/05/2015 20:45	00:05:00	-	-	-	-	-	-	-	-	-	-	41.8
	11/05/2015 20:50	00:05:00	-	-	-	-	-	-	-	-	-	-	40.8
	11/05/2015 20:55	00:05:00	-	-	-	-	-	-	-	-	-	-	40.8
	11/05/2015 21:00	00:05:00	-	-	-	-	-	-	-	-	-	-	40.0
	11/05/2015 21:05	00:05:00	-	-	-	-	-	-	-	-	-	-	41.0
	11/05/2015 21:10	00:05:00	-	-	-	-	-	-	-	-	-	-	41.4
	11/05/2015 21:15	00:05:00	-	-	-	-	-	-	-	-	-	-	40.2
	11/05/2015 21:20	00:05:00	-	-	-	-	-	-	-	-	-	-	42.2
	11/05/2015 21:25	00:05:00	-	-	-	-	-	-	-	-	-	-	41.8
	11/05/2015 21:30	00:05:00	-	-	-	-	-	-	-	-	-	-	41.2
	11/05/2015 21:35	00:05:00	-	-	-	-	-	-	-	-	-	-	40.4
	11/05/2015 21:40	00:05:00	-	-	-	-	-	-	-	-	-	-	40.8
	11/05/2015 21:45	00:05:00	-	-	-	-	-	-	-	-	-	-	39.6
	11/05/2015 21:50	00:05:00	-	-	-	-	-	-	-	-	-	-	40.2
	11/05/2015 21:55	00:05:00	-	-	-	-	-	-	-	-	-	-	39.4
	11/05/2015 22:00	00:05:00	-	-	-	-	-	-	-	-	-	-	38.4
	11/05/2015 22:05	00:05:00	-	-	-	-	-	-	-	-	-	-	39.6
	11/05/2015 22:10	00:05:00	-	-	-	-	-	-	-	-	-	-	40.4
	11/05/2015 22:15	00:05:00	-	-	-	-	-	-	-	-	-	-	38.4
	11/05/2015 22:20	00:05:00	-	-	-	-	-	-	-	-	-	-	37.6
	11/05/2015 22:25	00:05:00	-	-	-	-	-	-	-	-	-	-	38.6

Table 13: Background Levels Measured at all Positions

## Appendix E: Manufacturers' Information – MTU 10V1600G20F Generator Specification

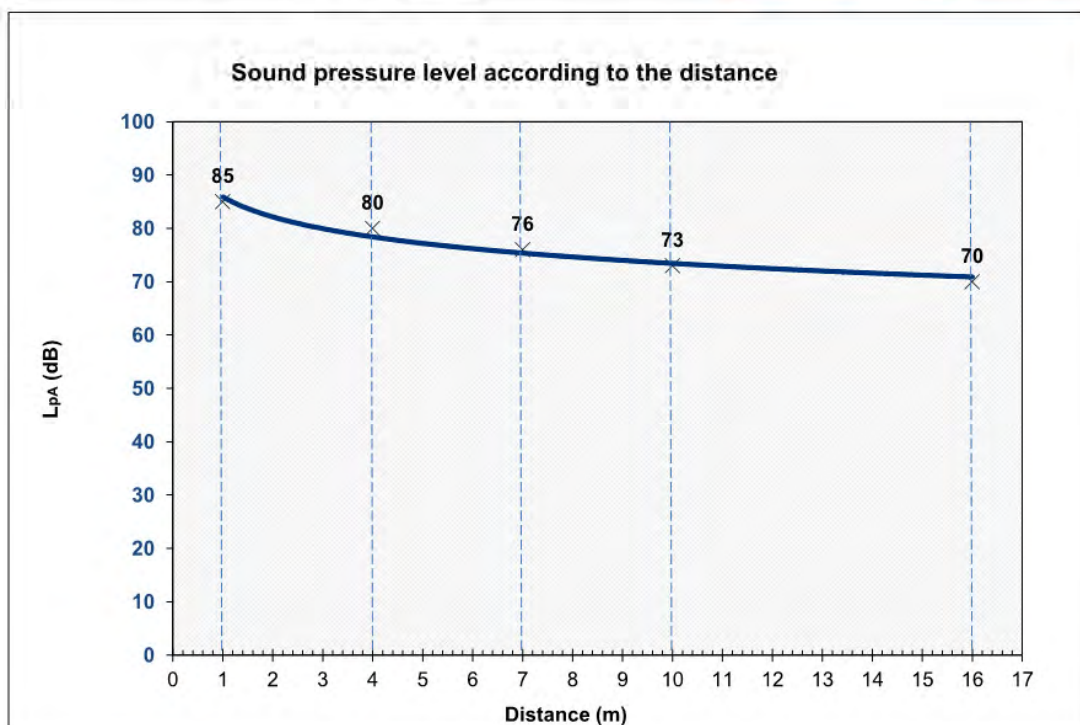
	Technical testing	Date:	17/04/2015
	Acoustic Study	Review :	3.0
	I+D+I Department	Directive:	2000/14/CE

## GENERATING SET - SOUNDPROOF - H1

MODEL:	HMW-515 T5	TYPE:	<input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/>
ENGINE:	MTU	MODEL:	10V1600G20F
ALTERNATOR:	MECC ALTE	MODEL:	HCI544D
POWER PRP (kVA):	507	DIMENSIONS (mm):	4500 X 1800 X 2340 (length x width x height)
POWER PRP (kW):	406	MANUFACTURING:	MTU 2015
Measurement with CESVA sound level meter model SC-160 (serial number 1234938)			

## RESULTS

* LWA (dB)	105	** Distance (m)	1	4	7	10	16
Uncertainty	2,3	LpA (dB)	85	80	76	73	70



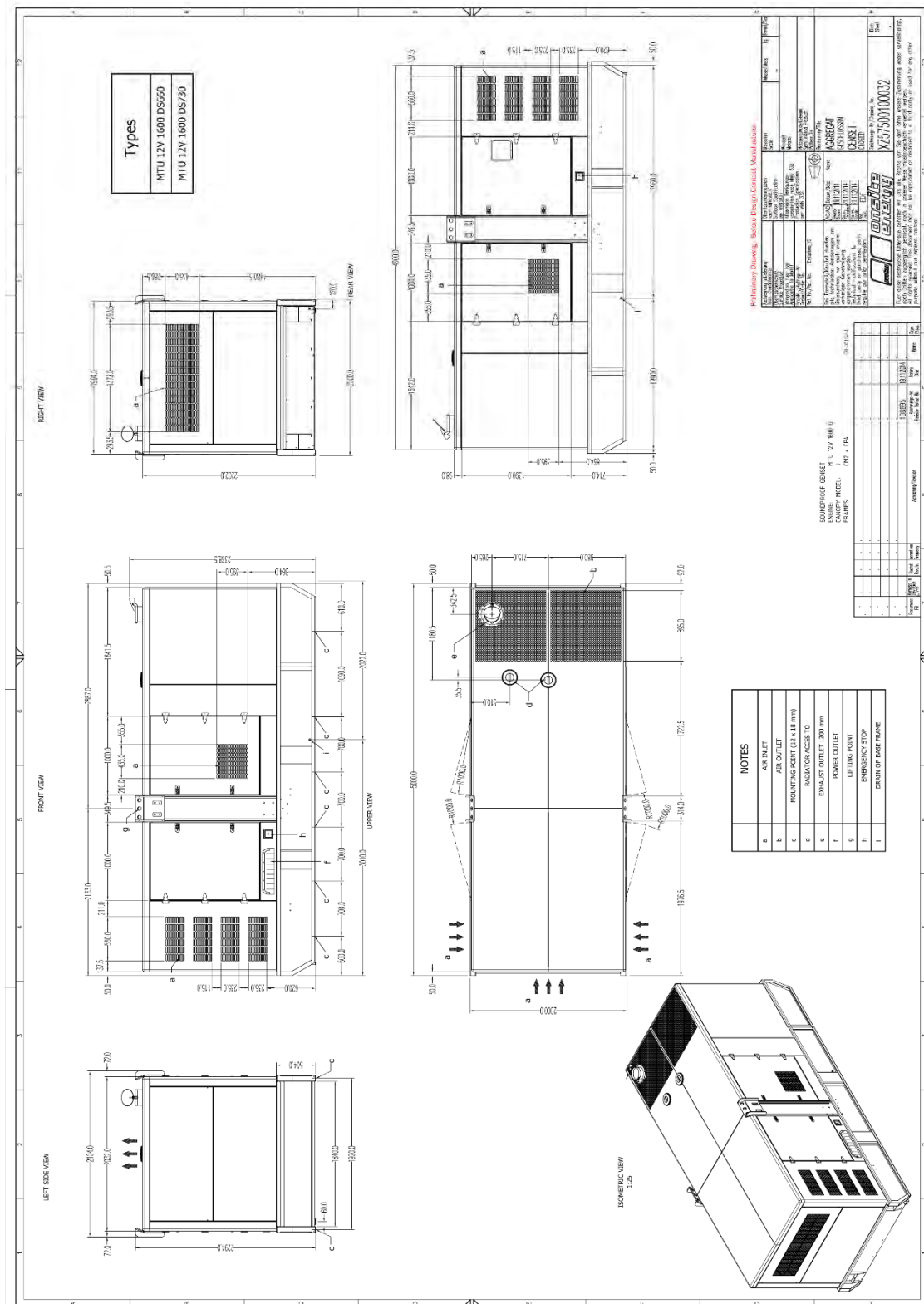
Sound pressure level according 2000/14/CE directive

\* LWA: guaranteed power level.

\*\* The distance in meters from the noise measurement is based on the parallelepiped method.

Review 01 06/2015

## Appendix F: Manufacturers' Information – Bespoke Acoustic Enclosure





**From:** [Mark Curtis](#)  
**To:** [Ken Reid](#)  
**Subject:** FW: 16/00719 Avonbank  
**Date:** 15 September 2016 11:47:42

---

Hi Ken

I have looked at the revised acoustic report for this application and would comment as follows:

An assessment of the predicted noise from this development has been carried out in accordance with BS4142 2014. The report states on both page 15 first paragraph that 'Sufficient data is not available to determine whether the proposed generators with bespoke acoustic enclosures are tonal. As a worst case +6 dB correction has been applied'. This is the maximum correction that can be applied in a BS4142 assessment for tonality and I am happy with this approach. I would confirm that the assessment has been made on the basis that all the generators will be on for the whole of the assessment period and does not take into account any 'off time' during the assessment period and that this would be a worst case scenario. The report predicts that at this worst case scenario with all units operating that the noise at the nearest residential property and nearest proposed residential properties at Paintworks Phase 3 will be 5 dB under the background noise level which is in line with our standard requirement for all plant & equipment noise including plant or equipment that will operate more frequently.

Whilst no background noise levels have been taken near to the nursery but the predicted noise levels at the nursery have been compared to the recommended noise levels given in Building Bulletin 93, Acoustic Design of Schools: Performance Standards, Department for Education, February 2015. The report predicts that the noise level from all the units operating will be within the guideline values for both inside and outside spaces from Building Bulletin 93. The report also states that 'the typical operating period of the proposed facility is 1700 to 1900, during which time the Nursery will not be operational and therefore there will be no impact on the Nursery School' according to the school website the school is open from 07.45 to 17.45 (after school club from 15.15 to 17.45). There will be some use of the school after 17.00 and it is stated that the development will operate between 0700 to 2230 so there is the potential for the units to operate whilst the school is in use.

The report does previously state that 'noise emissions within the external amenity area do not exceed 50 dB and are therefore commensurate with those levels required to allow outdoor teaching activities. As such, the impact of the proposed facility on the operation of the Nursery will not be significant'. I would agree that due to the maximum number of hours the development will be used a year and the peak times for use that this is likely to be the case for both internal and external noise at the nursery.

I would therefore ask for the following conditions should the application be approved:

1. Noise from plant & equipment affecting residential

The rating level of any noise generated by plant & equipment as part of the development shall be at least 5 dB below the pre-existing background level as determined by BS4142: 2014



Methods for rating and assessing industrial and commercial sound.

The mitigation measures also include the provision of an acoustic fence and this is detailed in the planning statements but I can't see any plans relating to this, sorry if I've missed them. Could I therefore ask for a condition requesting details of the acoustic fence to be submitted:

## 2. Acoustic barrier

No development shall take place until full details of the acoustic barrier detailed in the acoustic report submitted with the application have been submitted to and approved in writing by the Council.

The approved acoustic barrier shall be implemented prior to the commencement of the use and be permanently maintained thereafter.

3. Within 1 month of the granting of this application an assessment of noise generated by the development shall be submitted to and approved by the Local Planning Authority. Should the assessment show that noise generated by the development is above the noise levels predicted in the acoustic report submitted with the application then a further report detailing mitigation measures shall be submitted, approved in writing and works completed in full within 2 months of the commencement of the use.

The methodology to be used for the assessment shall be agreed in advance with an officer of Bristol City Council's Pollution Control Team.

Thanks

Mark

Mark Curtis  
Pollution Control Team  
Bristol City Council

0117 922 3256

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**From:** Mark Curtis  
**Sent:** 27 November 2015 16:33  
**To:** Rob McGovern  
**Subject:** 15/02310 - Avonbank

Hi Rob

I have had a look at the acoustic report submitted with this application and am happy with it.

I would therefore ask for the following condition should the application be approved:

1. Noise from plant & equipment affecting residential

The rating level of any noise generated by plant & equipment as part of the development shall be at least 5 dB below the pre-existing background level as determined by BS4142: 2014 Methods for rating and assessing industrial and commercial sound.

Thanks

Mark

Mark Curtis  
Pollution Control Team  
Bristol City Council

0117 922 3256

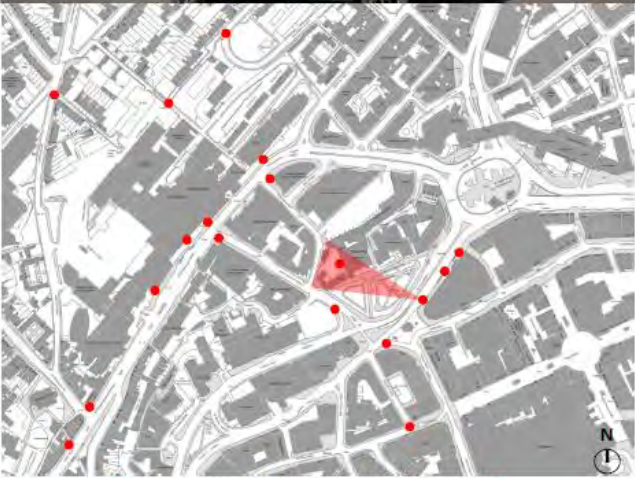
## **Supporting Documents**

### **2. Old Bristol Royal Infirmary Building, Marlborough Street**

1. Key Views – Photomontages
2. Old Building – Medical School foyer & refuse store – Proposed level 0 (-2)
3. Old Building – Medical School – Proposed level 1 (-1)
4. Old Building – Medical School – Proposed level 2 (0)
5. Old Building – Offices – Proposed level 3 (01)
6. Old Building – Offices – Proposed level 4 (02)
7. Old Building – Offices – Proposed level 5 (03)
8. Old Building – Offices – Proposed level 6 (04)
9. Old Building – Offices – Proposed level 7 (05)
10. Old Building – Proposed front elevation
11. Old Building – Proposed rear elevation
12. Old Building – Proposed section
13. Proposed aerial views
14. Proposed demolition site plan
15. Proposed site layout and landscaping
16. Proposed Site Section – Lower Maudlin St to Whitson St (showing courtyard)
17. Proposed Site Section – Marlborough St to Whitson St (lower)
18. Proposed Street Elevation – Lower Maudlin Street
19. Proposed Street Elevation – Whitson St (upper section)
20. Proposed Street elevation – Whitson St
21. Proposed Student Blocks – Level 00-01
22. Proposed Student Blocks – Level 02-05
23. Proposed Student Blocks – Level 06-07
24. Proposed Student Blocks – Level 08-13
25. Proposed Student Blocks – Level 14-19

verified view 02

View from The Haymarket towards St. James Parade





mixed use development at BRI 'old building' - design & access statement - addendum

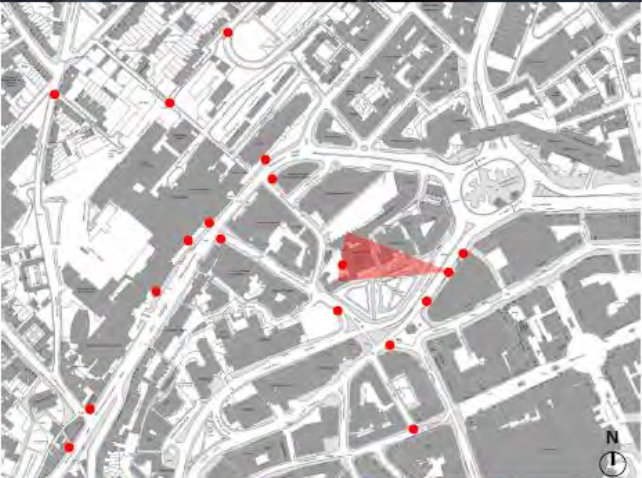
verified view 02  
View from The Haymarket towards St. James Parade





verified view 03

View from The Haymarket towards St. James Priory





mixed use development at BRI 'old building' - design & access statement - addendum

verified view 03  
View from The Haymarket towards St. James Priory





verified view 04

view from The Haymarket showing the Premier Inn





mixed use development at BRI 'old building' - design & access statement - addendum

#### verified view 04

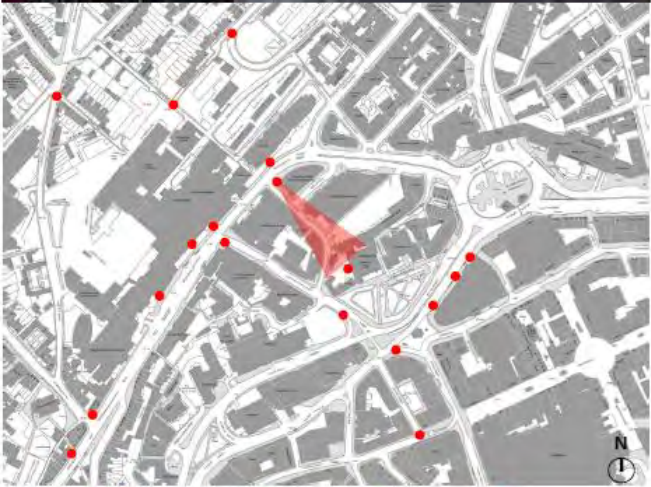
view from The Haymarket showing the Premier Inn





verified view 05

view down Whitson Street



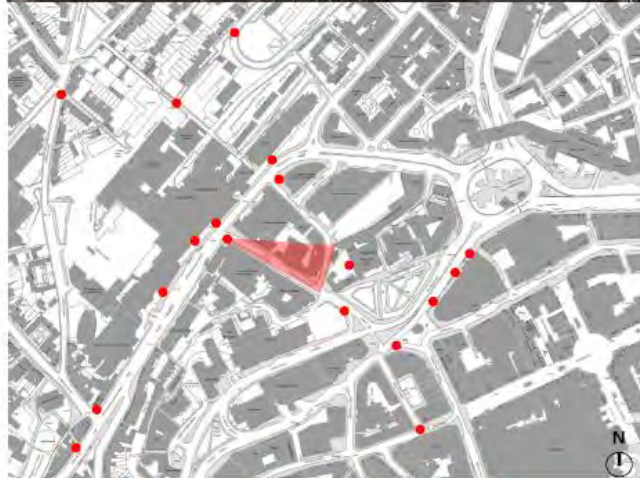


verified view 06

view down Lower Maudlin Street



Existing view



Architecture Sustainability Interiors Visualisation





mixed use development at BRI 'old building' - design & access statement - addendum

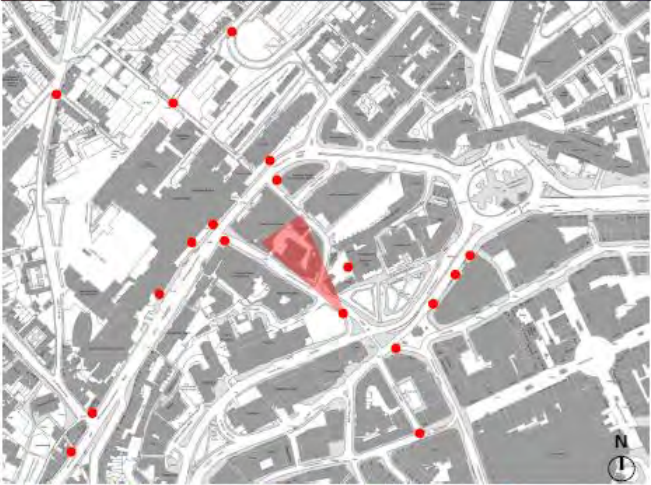


verified view 06  
view down Lower Maudlin Street



verified view 07

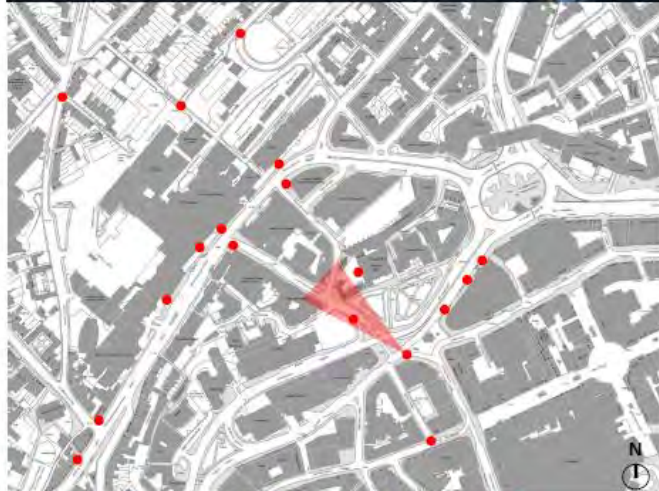
view up Lower Maudlin Street





### verified view 08

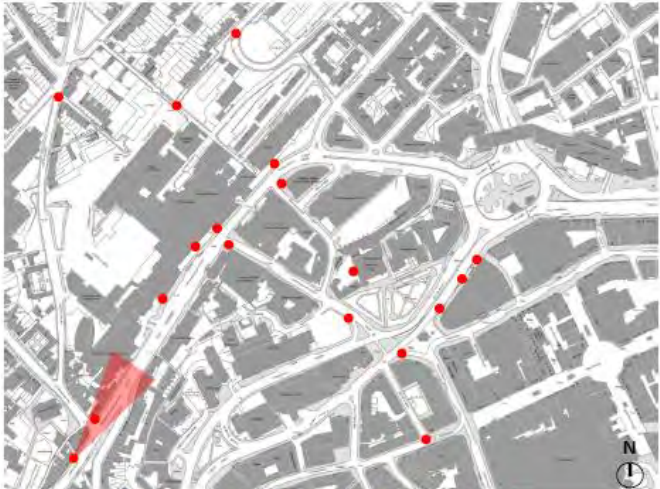
view from Bridewell Street/The Haymarket





verified view 09

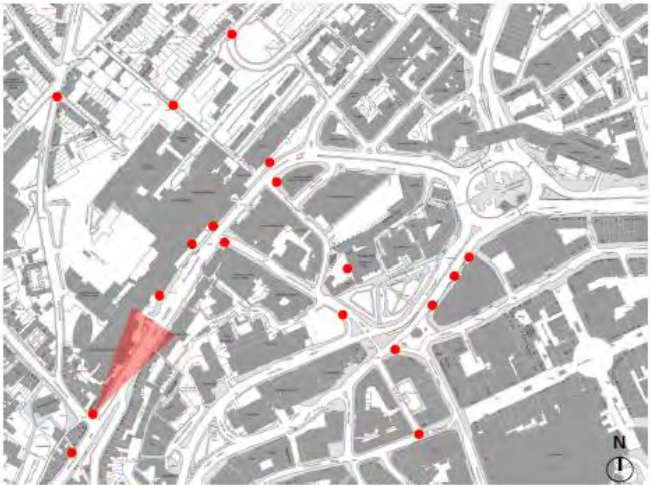
view from the top of Christmas Steps



Architecture Sustainability Interiors Visualisation

verified view 10

view from the corner of St.Michael's Hill





mixed use development at BRI 'old building' - design & access statement - addendum

**verified view 10**

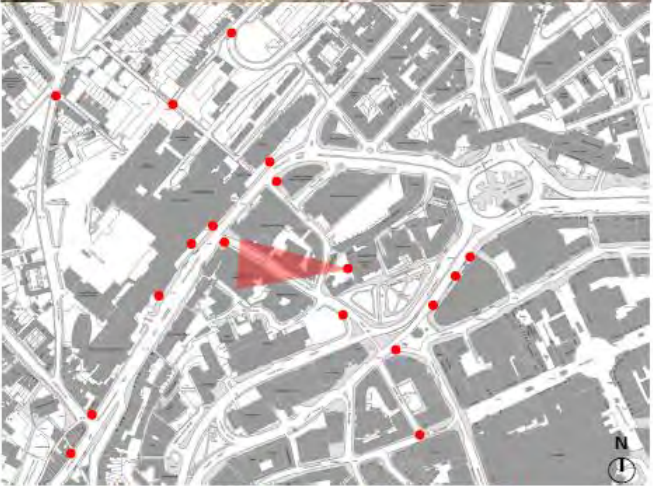
view from the corner of St. Michael's Hill





verified view 11

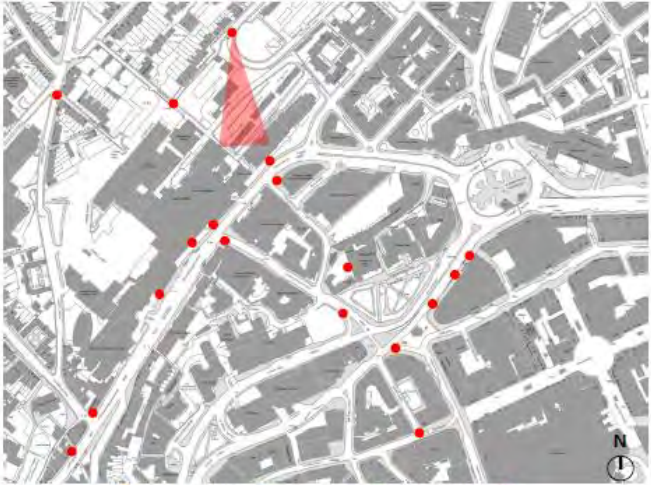
view from St.James' Priory Courtyard





verified view 12

view from Dove Street





verified view 12

view from Dove Street





verified view 13  
view from Cottage Place







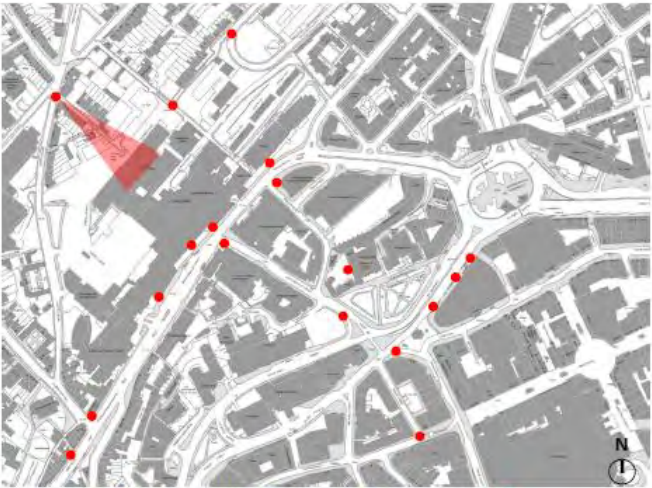
verified view 13

view from Cottage Place



verified view 14

view from Alfred Hill



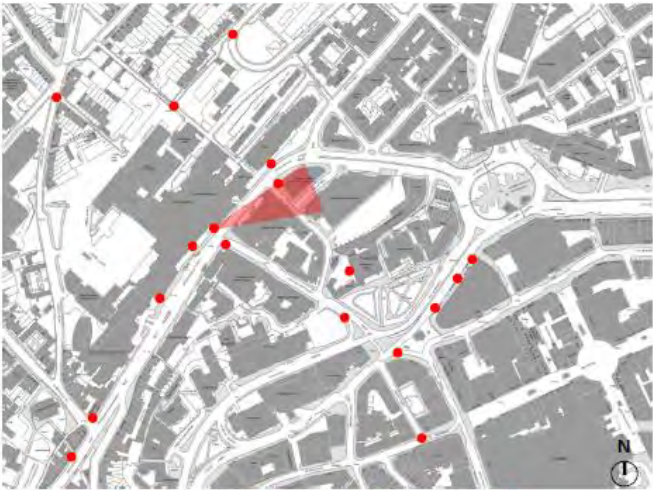


verified view 15  
view from Marlborough Street



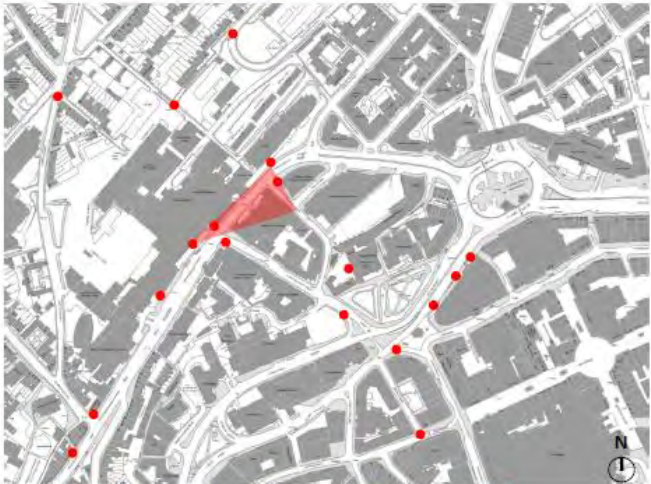
Architecture Sustainability Interiors Visualisation

verified view 16  
view from Marlborough Street

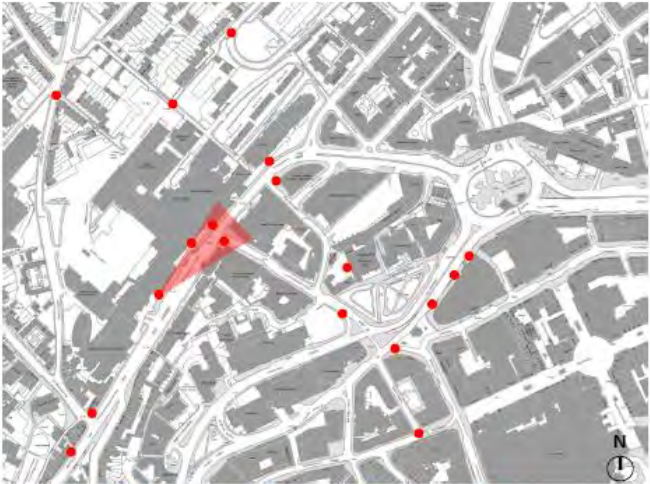




verified view 17  
view from Marlborough Street



verified view 18  
view from Marlborough Street





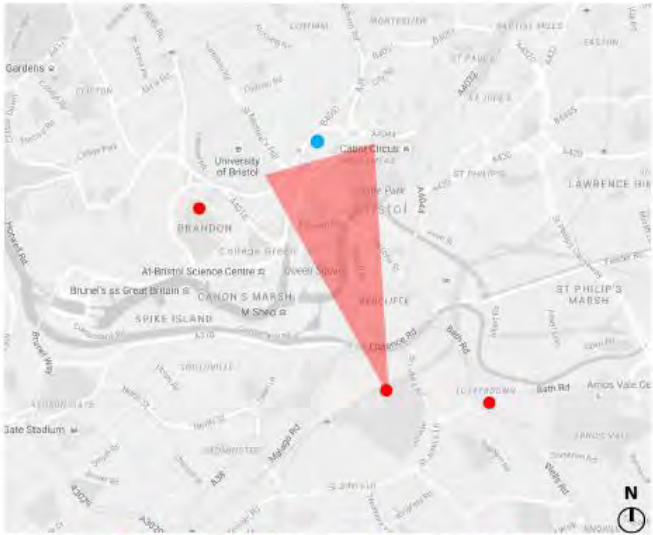
verified view 19  
view from Cabot Tower





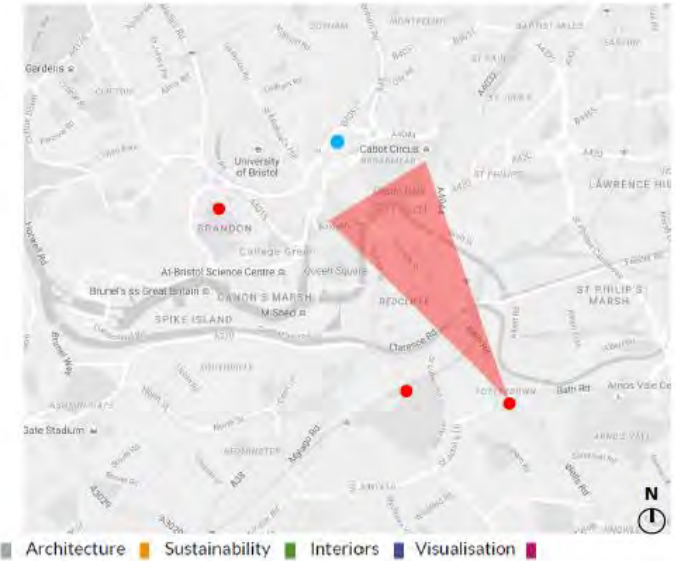
verified view 20

view from Windmill Hill





verified view 21  
view from Totterdown



## sketch views

### Cameo Studies

The following sequence of sketch studies look at the relationship between the form of the development and its engagement with its context.

Views 01 and 02 looking down and up Lower Maudlin Street illustrates how the building form responds strongly to the natural topography of the site and sets up architectural hierarchy along the streetscape. In addition the vertical and horizontal articulation of the elevations affords a cohesive relationship between the building forms and a legible dialogue with the street.



View 01 – looking down Lower Maudlin Street



View 02 – looking up Lower Maudlin Street





## sketch views

View 03 & 04 looking down and up Whitson Street considers the relationship between the Old BRI Building, Fripps Chapel and the proposed new Building.

View 04 illustrates the conscious decision to realign the new build student accommodation to reveal the transept window of Fripps Chapel and to ease the tension between the existing Chapel and the new buildings. The realignment of the student accommodation adjacent to the Chapel also provides more depth to the defensible space between the building and the public realm.



View 03 – looking down Whitson Street ▼



View 04 – looking up Whitson Street ▼



## sketch views

View 05- looking into upper courtyard ▼



View 06 Best describes the relationship between the Old BRI Building and the scale of the new building to the south. Although there is a distinct ascent and descent in scale along Lower Maudlin Street, there is a balance in form and articulation which arguably reinforces the Gravitas of the Historic asset. The 20 storey tower is elegant in proportion and is offset from the BRI by a subservient linking element. This integrated legibility contributes to the cityscape and helps to define a sense of place.



View 06 - looking from Upper Maudlin Street ▼





## sketch views

View 07- looking into lower Courtyard ▼



View 07 illustrates the concept of dominant and subservient architecture. There is sufficient definition between the forms to allow the tower prominent hierarchy and distinct dominance in the relationship between forms.

View 08 describes a more intimate language of architecture appropriate to the nature of Whitson street and in particular its sensitive relationship with St James' Priory. There has been a conscious effort to set back the new build from the current alignment of the existing site enclosure to provide more usable public realm and a less claustrophobic relationship with The Conservation Area.



View 08 - looking down Whitson Street ▼



View 08 - existing ▼

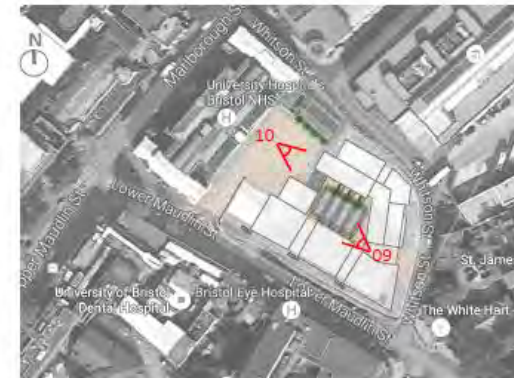


## sketch views

View 09— looking into lower courtyard



View 10— looking from Upper courtyard



View 09 & 10 examine and illustrate the connectivity between the upper and lower courtyard spaces and how the scale of buildings inform the sense of enclosure.

The introduction of a block into the courtyard serves to define the junction between the courtyards and also contains the seating/stepped area which connects the spaces. Glimpses via framed views of events in the distance contribute to the sense of intrigue and of journey between the spaces.



## sketch views

View 11- looking into lower courtyard from Site Entrance ▼



View 11 describes the sense of arrival and gateway to the development. Consciously, a relatively restricted aperture provides a glimpse into the larger courtyard and also hints at a further journey via the steps to the Old BRI Building. Consequently, the internal environment of the courtyards are revealed in a series of varied experiences.

## visual impact





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No.	Description	Date



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Client:

**Unite Students**

Project :

**BRI**

Drawing Status :

**PLANNING**

Scale @ A1:	<b>1 : 100</b>	Scale @ A3:	
Drawn By :	<b>EL</b>	Checked By:	<b>RR</b>
Date :	<b>16/08/2016</b>	Date :	<b>16/08/2016</b>

Drawing:

**EB Proposed Floor Plan 0 (-1)**

Job No:	Drawing No:	Rev:
<b>Rio 0282</b>	<b>A-04-50.</b>	<b>F</b>





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Client:  
**Unite Students**

Project :

**BRI**

Drawing Status :

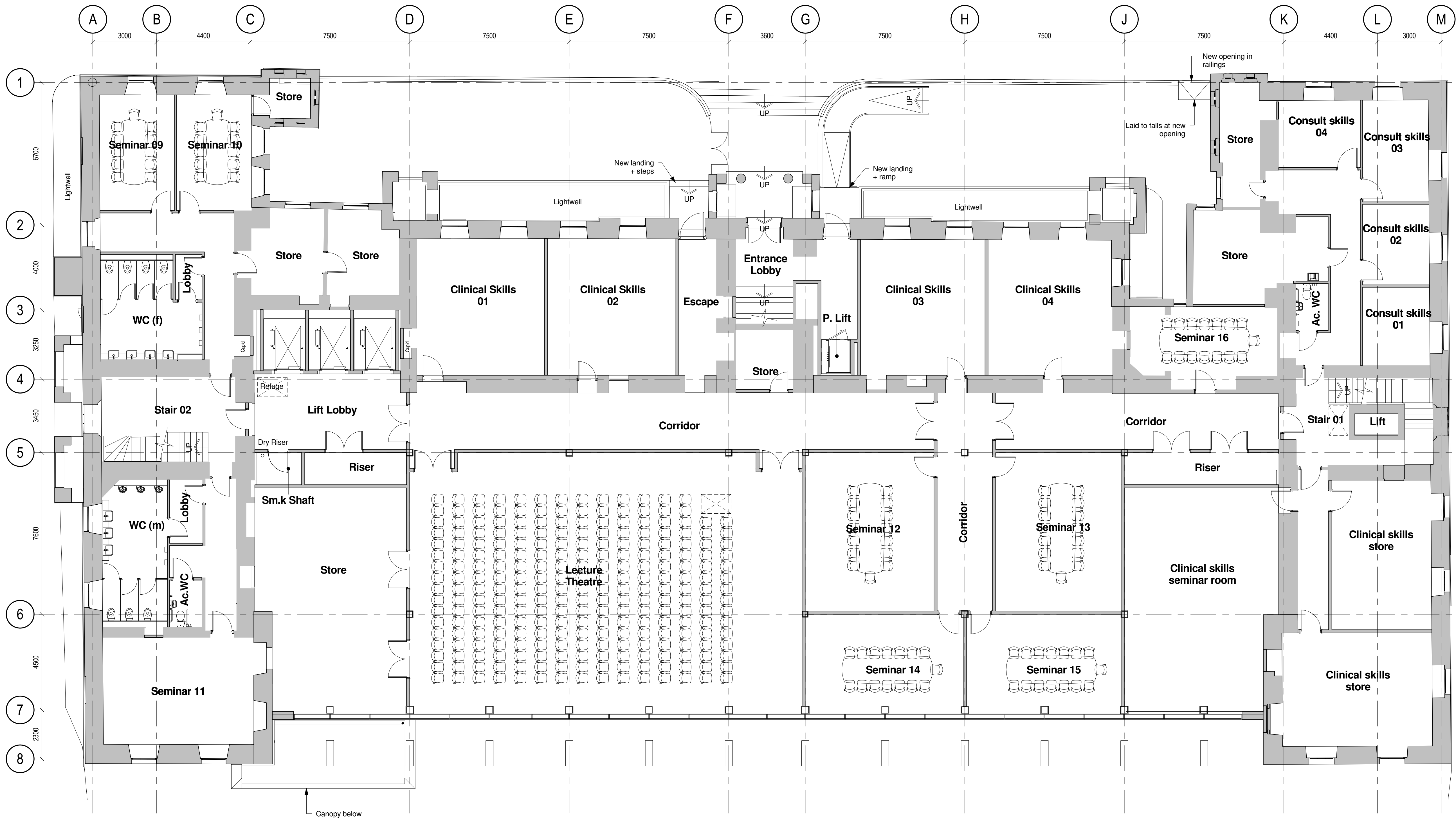
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Drawn By :	<b>EL</b>	Checked By:	<b>RR</b>
Date :	<b>16/08/2016</b>	Date :	<b>16/08/2016</b>

Drawing:

**EB Proposed Floor Plan 1 (-1)**

Job No:	Drawing No:	Rev:
<b>Rio 0282</b>	<b>A-04-51.</b>	<b>E</b>



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Client:  
**Unite Students**

Project :  
**BRI**

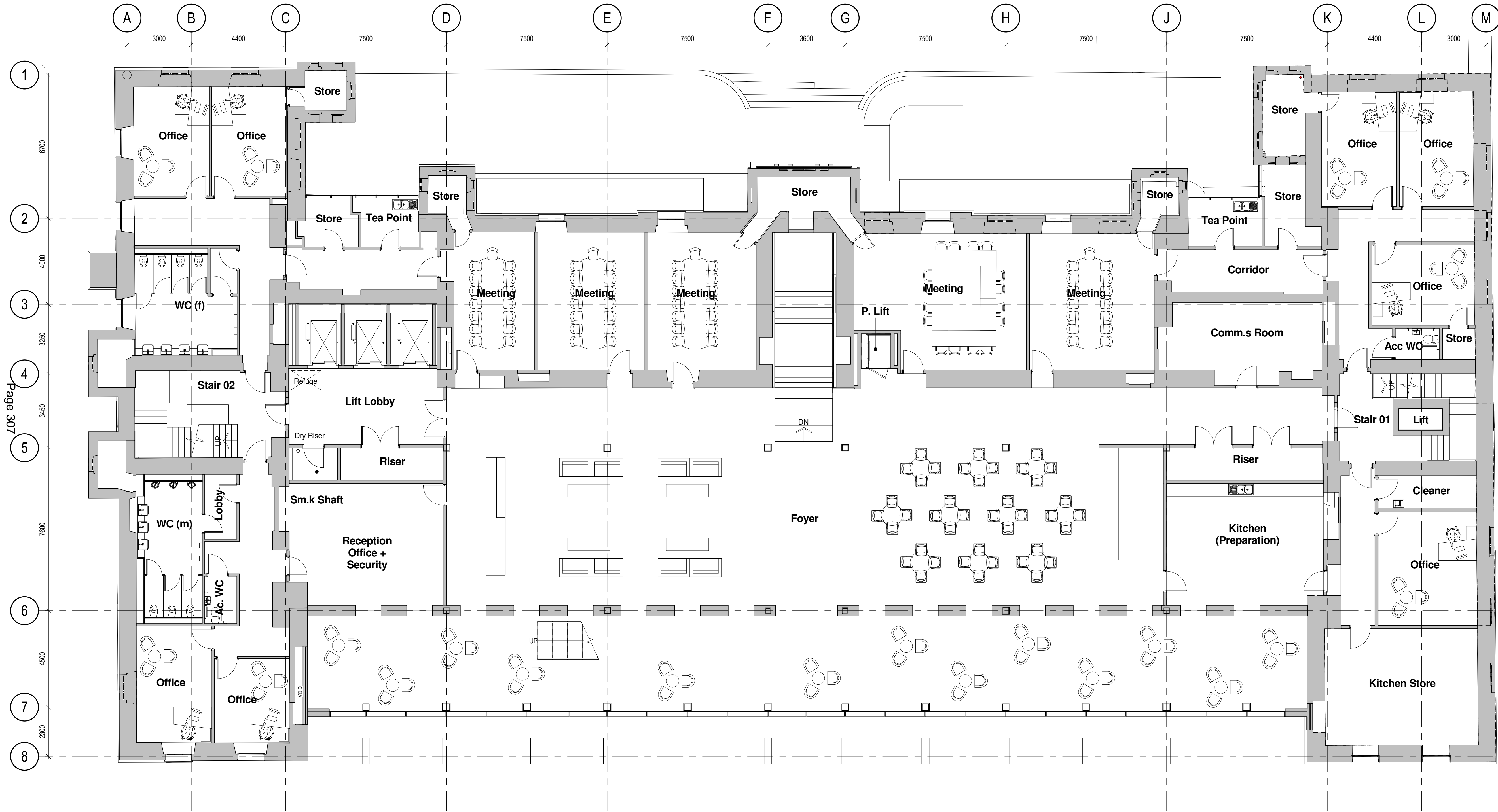
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Date :	16/08/2016	Date :	16/08/2016

Drawing:  
**EB Proposed Floor Plan 2 (00)**

Job No:	Drawing No:	Rev:
<b>Rio 0282</b>	<b>A-04-52.</b>	<b>E</b>





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Client:  
**Unite Students**

Project :  
**BRI**

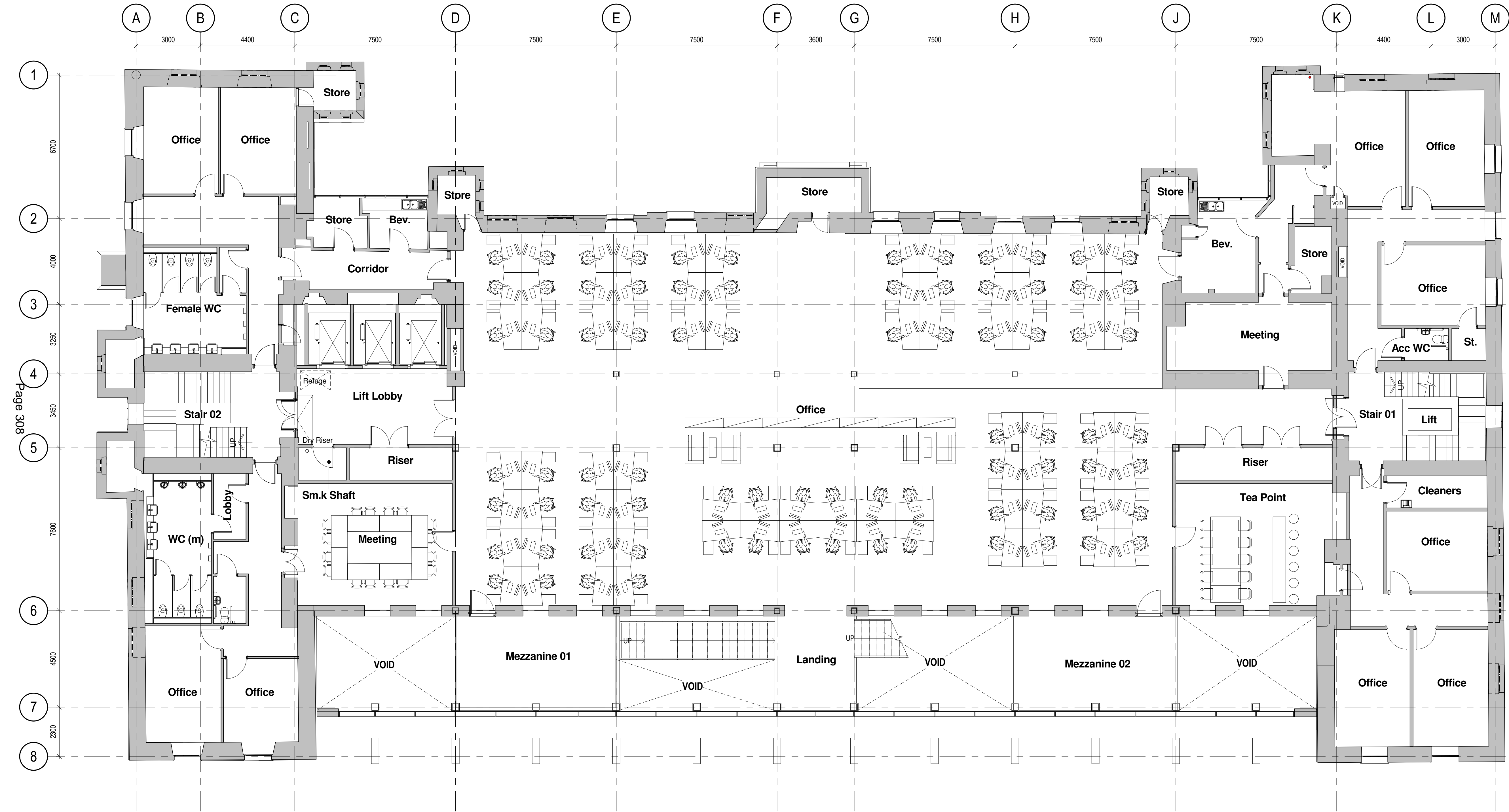
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Drawn By : **Author** Checked By: **Checker**  
Date : **16/08/2016** Date : **16/08/2016**

Drawing:  
**EB Proposed Floor Plan 3 (01)**

Job No: Drawing No: Rev:  
**Rio 0282 A-04-53. D**





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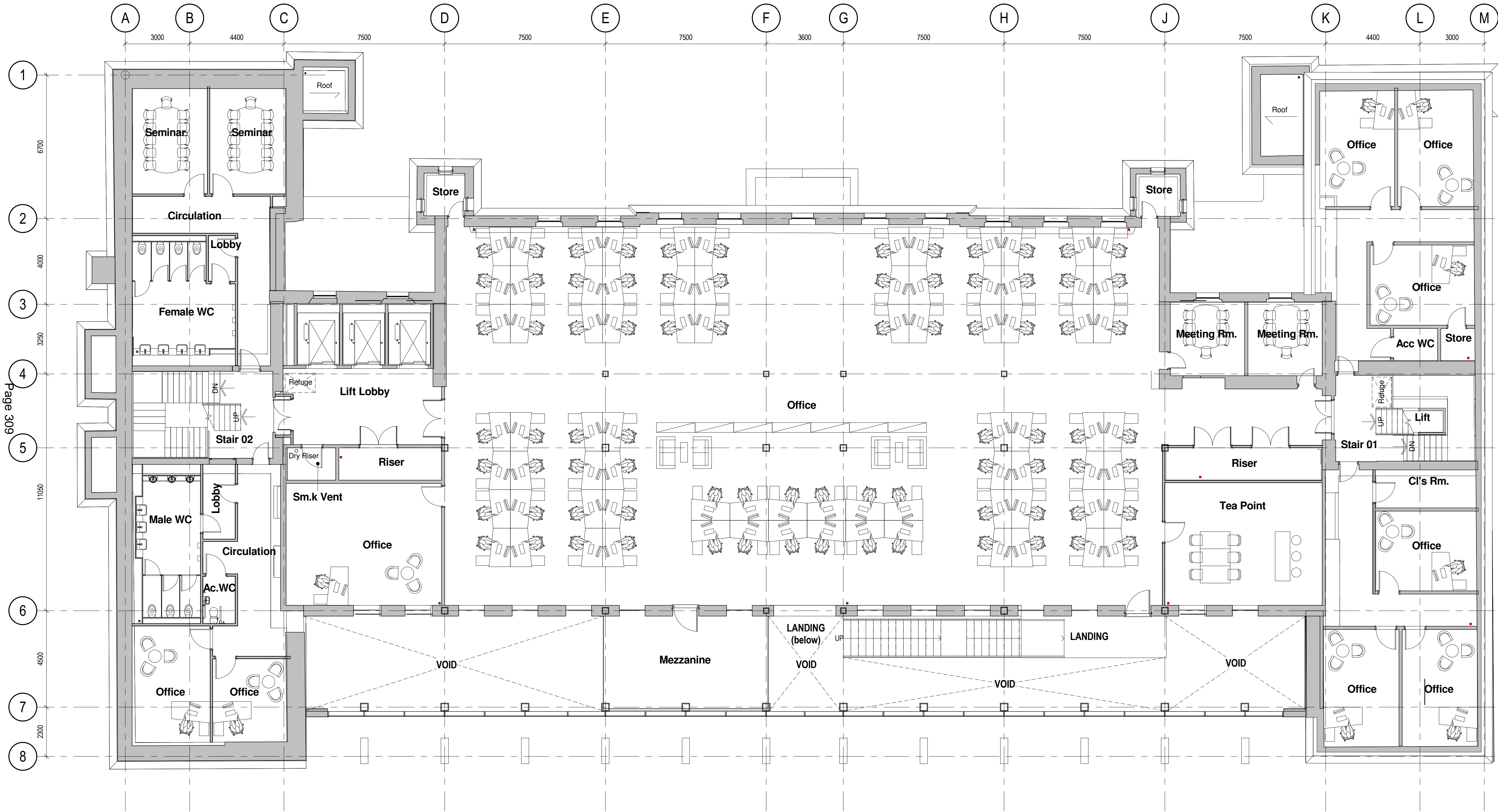
Project :  
**BRI**

Drawing Status :  
**PLANNING**

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Drawn By :	<b>Author</b>	Checked By:	<b>Checker</b>
Date :	<b>16/08/2016</b>	Date :	<b>16/08/2016</b>

Drawing:  
**EB Proposed Floor Plan 4 (02)**

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**Unite Students**

Project :

**BRI**

Drawing Status :

**PLANNING**

Scale @ A1: **1 : 100**

Scale @ A3:

Drawn By : **Author**

Checked By: **Checker**

Date : **16/08/2016**

Date : **16/08/2016**

Drawing:

**EB Proposed Floor Plan 5 (03)**

Job No:

Drawing No:

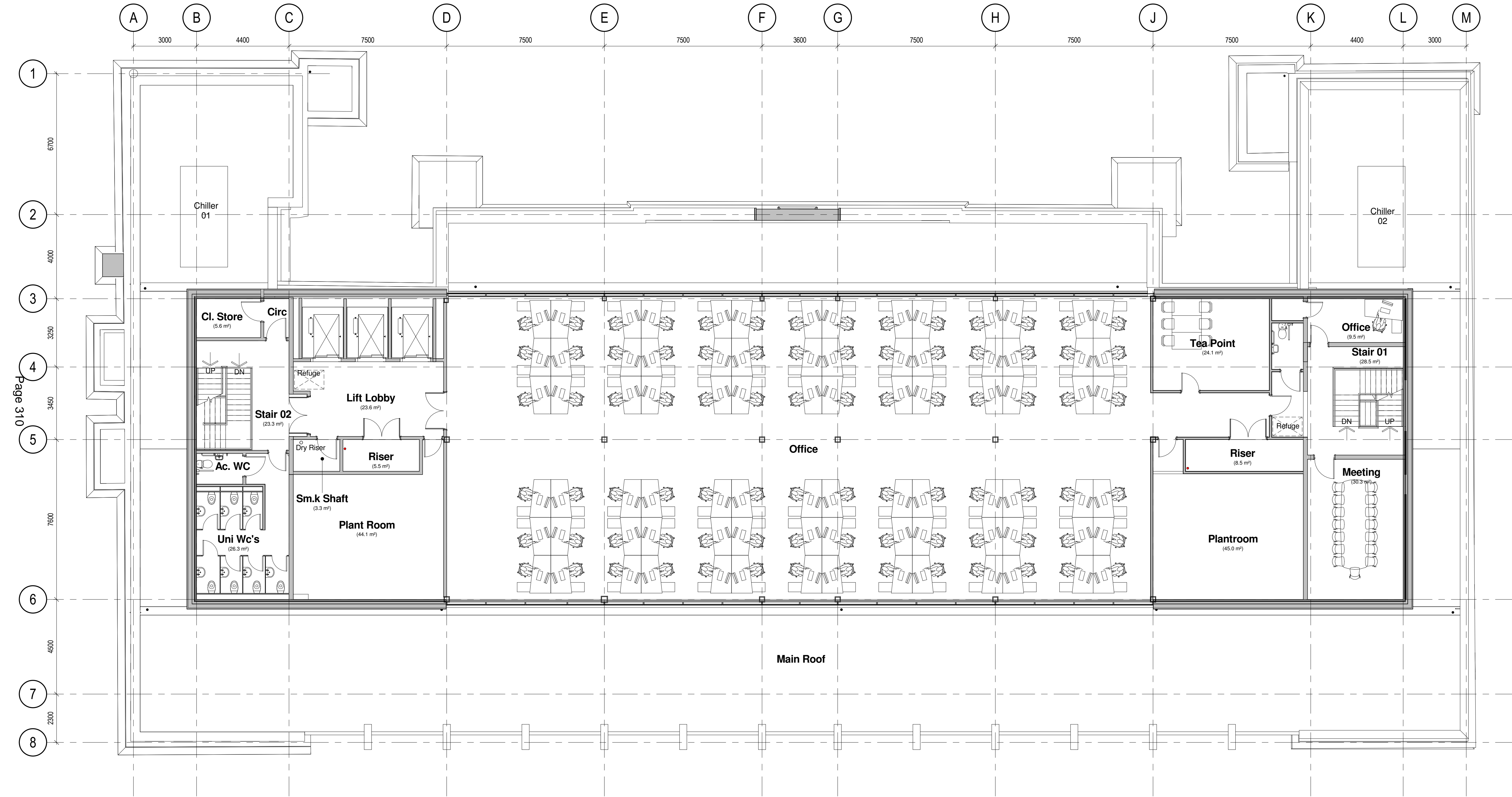
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**D**





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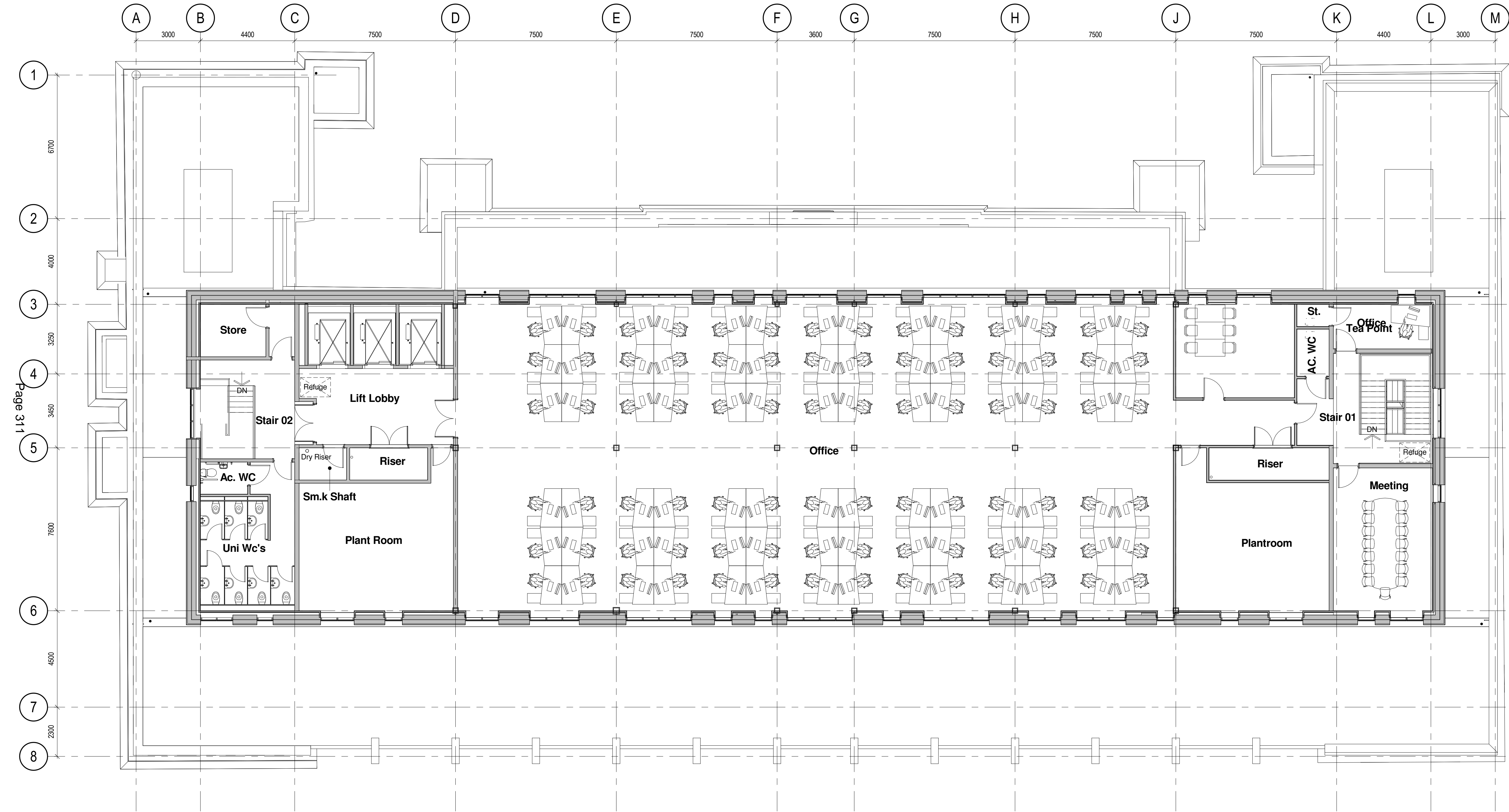
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Drawing Status :  
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Drawn By :	<b>Author</b>	Checked By:	<b>Checker</b>
Date :	<b>16/08/2016</b>	Date :	<b>16/08/2016</b>

Drawing:  
**EB Proposed Floor Plan 6 (04)**

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Project :  
**BRI**

Drawing Status :  
**PLANNING**

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Drawn By :	<b>Author</b>	Checked By:	<b>Checker</b>
Date :	<b>16/08/2016</b>	Date :	<b>16/08/2016</b>

Drawing:  
**EB Proposed Floor Plan 7 (05)**

<b>Job No:</b>	<b>Drawing No:</b>	<b>Rev:</b>
<b>Rio 0282</b>	<b>A-04-57.</b>	<b>E</b>





Page 312

D	Elevation amended	EL	RR	16.08.16
C	Elevation amended	EL	RR	05.04.16
B	Annotation changes	ISI	CT	05.04.16
A	Planning issue	ISI	RR	29.03.16
Rev. Description		Ini.	Ch'k	Date

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Client:  
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Project:  
**BRI**

Drawing status:  
**PLANNING**

Scale @ A1: 1:100  
Drawn: ISI Checked: RR  
Date: 10.03.16 Date: 10.03.16

Drawing:  
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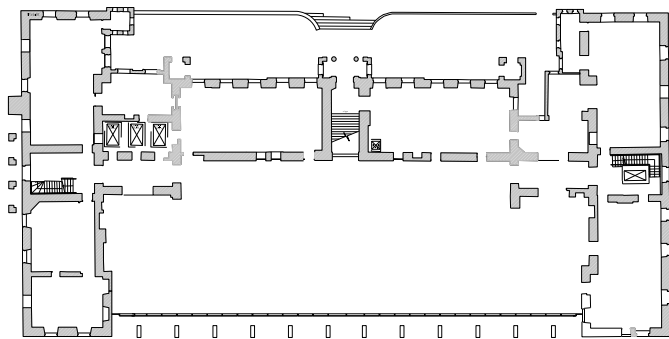
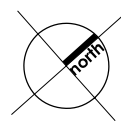
Job No.: Drawing No.: Rev.  
**Rio 0282 A-05 - 52 D**

MATERIALS KEY:

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- Retain existing stone, make good where necessary & clean
- Metal rainscreen cladding. Colour TBC
- Smooth metal rainscreen frame. Colour TBC
- Black engineering brick plinth
- Metal rainscreen cladding. Colour(s) TBC

- Metal cladding panels with louvres to plant areas. TBC
- Structural columns clad in PPC preformed metal. Colour TBC
- Polyester powder-coated double-glazed aluminium curtain walling. Silicone-jointed transoms and mullions. Colour TBC
- Insulated glazed look-a-like panel set within curtain walling frame
- PPC double glazed aluminium window system. Silicone jointed transoms. Colour TBC
- Metal parapet to match rainscreen cladding

- Thermally broken steel doors
- All existing windows to be replaced with new windows
- Existing metal railings retained and repainted
- Make good existing stone coursing and clean
- New windows introduced within existing recess
- Replace existing door with new escape door
- Louvred wall. Colour TBC

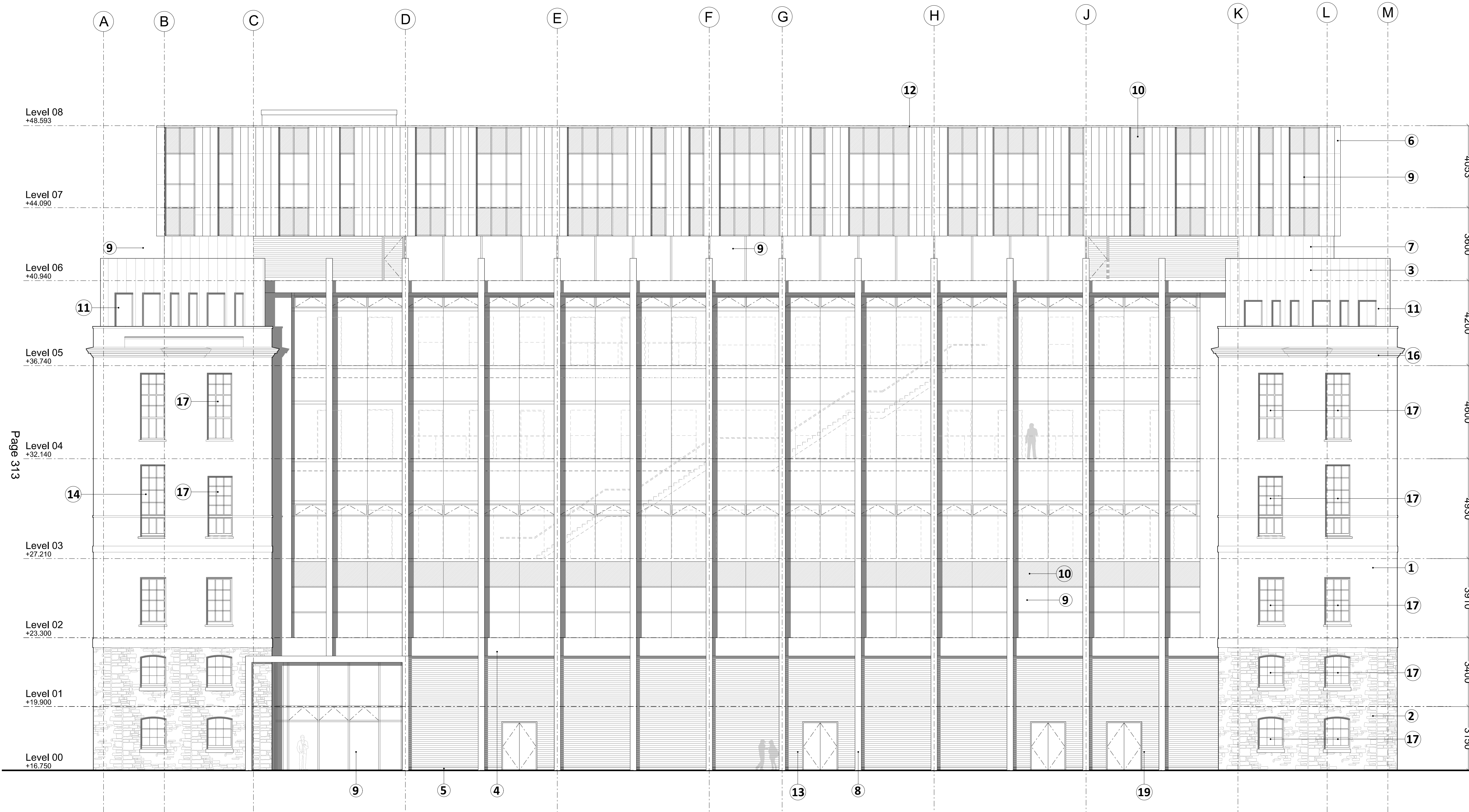


KEY PLAN

NORTH WEST ELEVATION

NORTH WEST ELEVATION

datum 14.00m



Page 313

D	Elevation updated	EL	RR	16.08.16
C	Annotation change	ISJ	CT	05.04.16
B	Door added	ISJ	SH	31.03.16
A	Planning issue	ISJ	RR	29.03.16
Rev.	Description	Ini.	Ch'k	Date

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Client:  
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Project:  
**BRI**

Drawing status:  
**PLANNING**

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Drawn: ISJ Checked: RR  
Date: 10.03.16 Date: 10.03.16

Drawing:  
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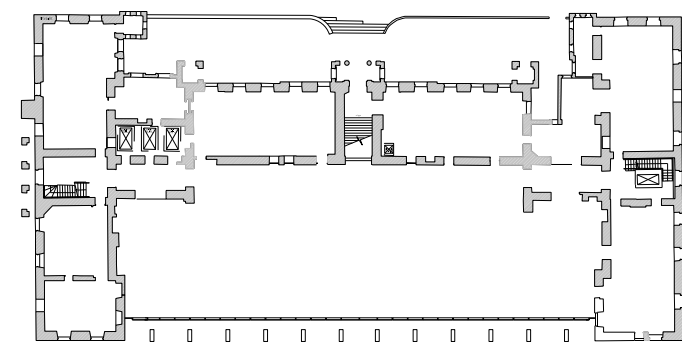
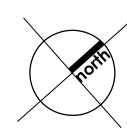
Job No.: Drawing No.: Rev.  
**Rio 0282 A-05 - 50 D**

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- Retain existing stone, make good where necessary & clean
- Metal rainscreen cladding. Colour TBC
- Smooth metal rainscreen frame. Colour TBC
- Black engineering brick plinth
- Metal rainscreen cladding. Colour(s) TBC

- Metal cladding panels with louvres to plant areas. TBC
- Structural columns clad in PPC preformed metal. Colour TBC
- Polyester powder-coated double-glazed aluminium curtain walling. Silicone-jointed transoms and mullions. Colour TBC
- Insulated glazed look-a-like panel set within curtain walling frame
- PPC double glazed aluminium window system. Silicone jointed transoms. Colour TBC
- Metal parapet to match rainscreen cladding

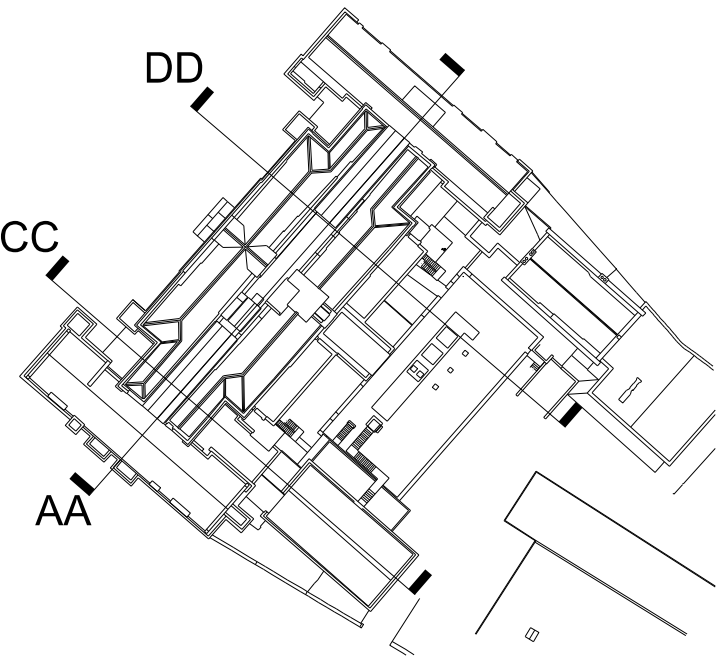
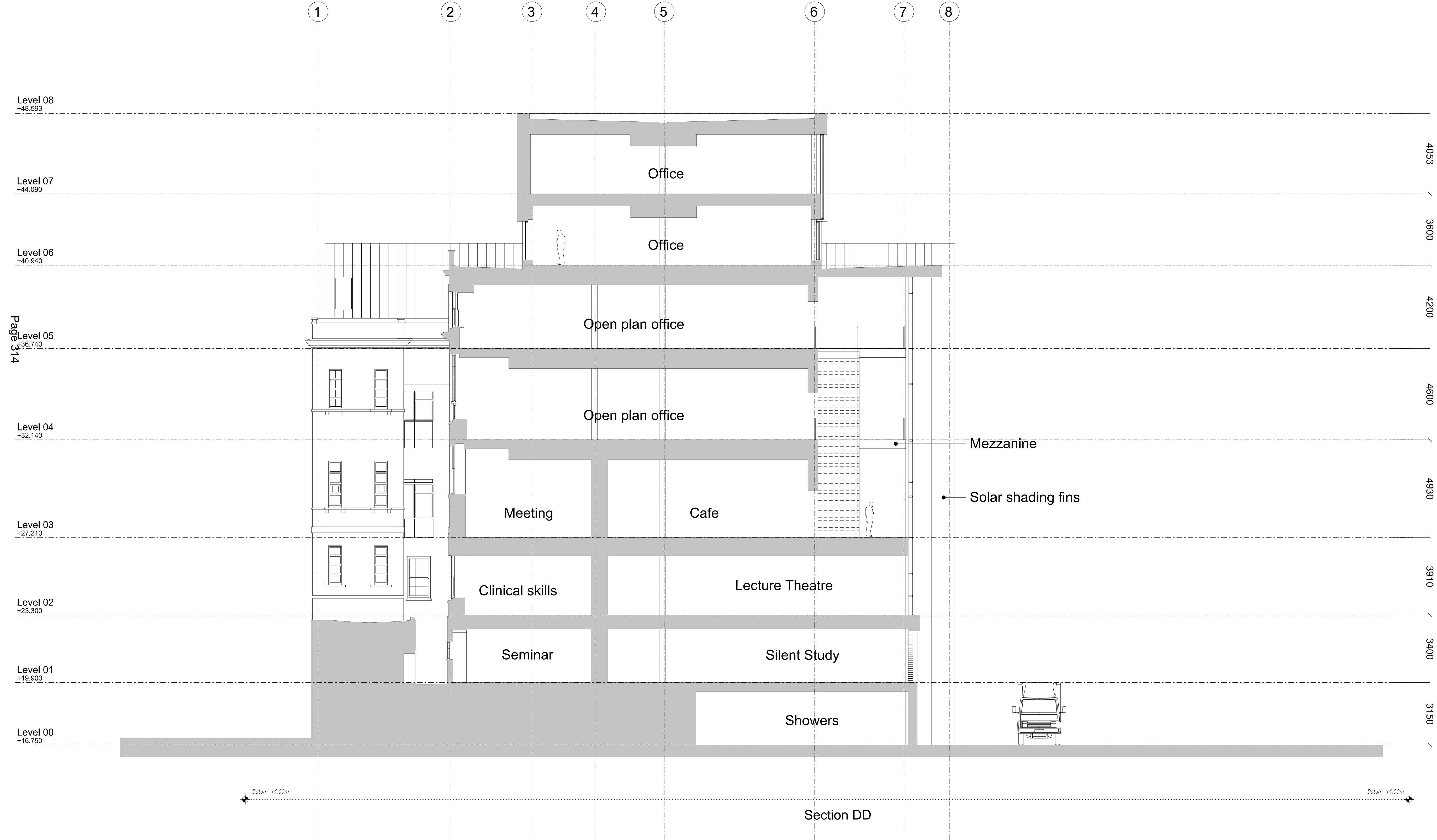
- Thermally broken steel doors
- All existing windows to be replaced with new windows
- Existing metal railings retained and repainted
- Make good existing stone coursing and clean
- New windows introduced within existing recess
- Replace existing door with new escape door
- Louvred wall. Colour TBC



KEY PLAN

SOUTH EAST ELEVATION





Sections Key Plan

Rev.	Description	EL	RR	18.08.16
A	Section updated			

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**Client:**  
**UNITE STUDENTS**

**Project:**  
**BRI**

**Drawing status:**  
**PLANNING**

**Scale @ A1: 1:100**

<b>Drawn:</b>	ISI	<b>Checked:</b>	RR
<b>Date:</b>	30.03.16	<b>Date:</b>	30.03.16

**Drawing:**  
**EB Proposed Section DD**



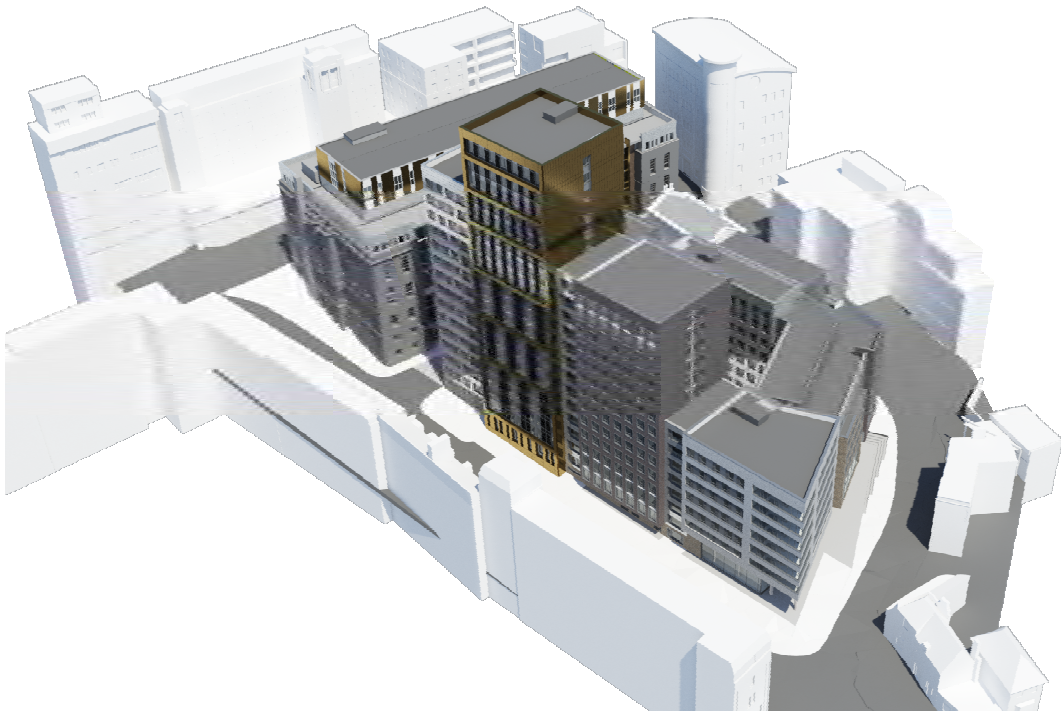
Aerial view from North



Aerial view from West



Aerial view from East



Aerial view from South

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B	Planning	23.08.16
A	Planning Issue	30.03.16
No.	Description	Date



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Client:

Unite Students

Project :

BRI

Drawing Status :

PLANNING

Scale @ A1:

Drawn By : CT

Date : 11/08/16

Scale @ A3:

Checked By: SH

Date : 11/08/16

Drawing:

Proposed Aerial Views

Job No:	Drawing No:	Rev:
Rio 0282	A-IM-01	B



[illegible]

**PROPOSED DEMOLITION SITE PLAN**





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- Pavours
- Anti-walk Pavement
- Concrete Steps
- Tarmac
- As per engineers design

B Planning 23.08.16  
No. Description Date



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Rio London 19 21 Hatton Garden London EC1N 8BA +44 (0)20 2691 7565

Client: Unite Students

Project : BRI

Drawing Status : INFORMATION

Scale @ A1: 1 : 200 Scale @ A3:  
Drawn By : Author Checked By: Checker  
Date : 22/08/2016 Date : 22/08/2016

Drawing: Landscaping Proposal

Job No: Drawing No: Rev:  
Rio 0282 A-09-02 B



FFL 67.780 m  
▼ Level 20  
FFL 65.080 m  
▼ Level 19  
FFL 62.380 m  
▼ Level 18  
FFL 59.680 m  
▼ Level 17  
FFL 56.980 m  
▼ Level 16  
FFL 54.280 m  
▼ Level 15  
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▼ Level 3  
FFL 19.180 m  
▼ Level 2  
FFL 16.480 m  
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▼ Level 0  
FFL 12.755 m  
▼ Plant Level/



Lower Maudlin St. New development Courtyard Chapel Whitson Street

Notes:

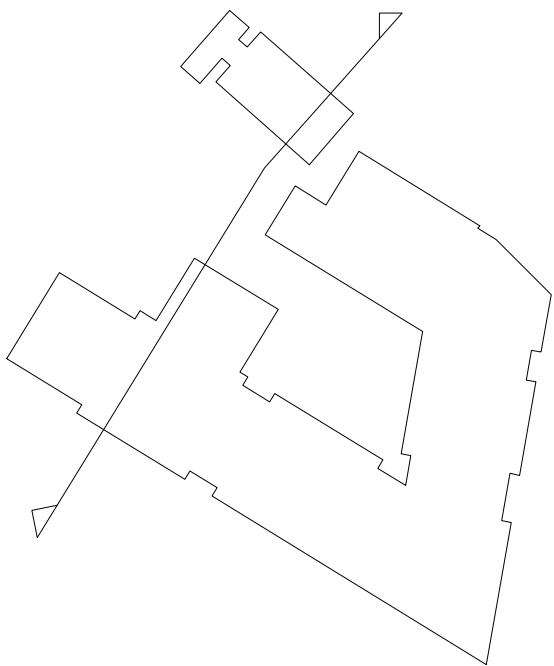
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Client:  
Unite Students

Project :

BRI

Drawing Status :  
INFORMATION

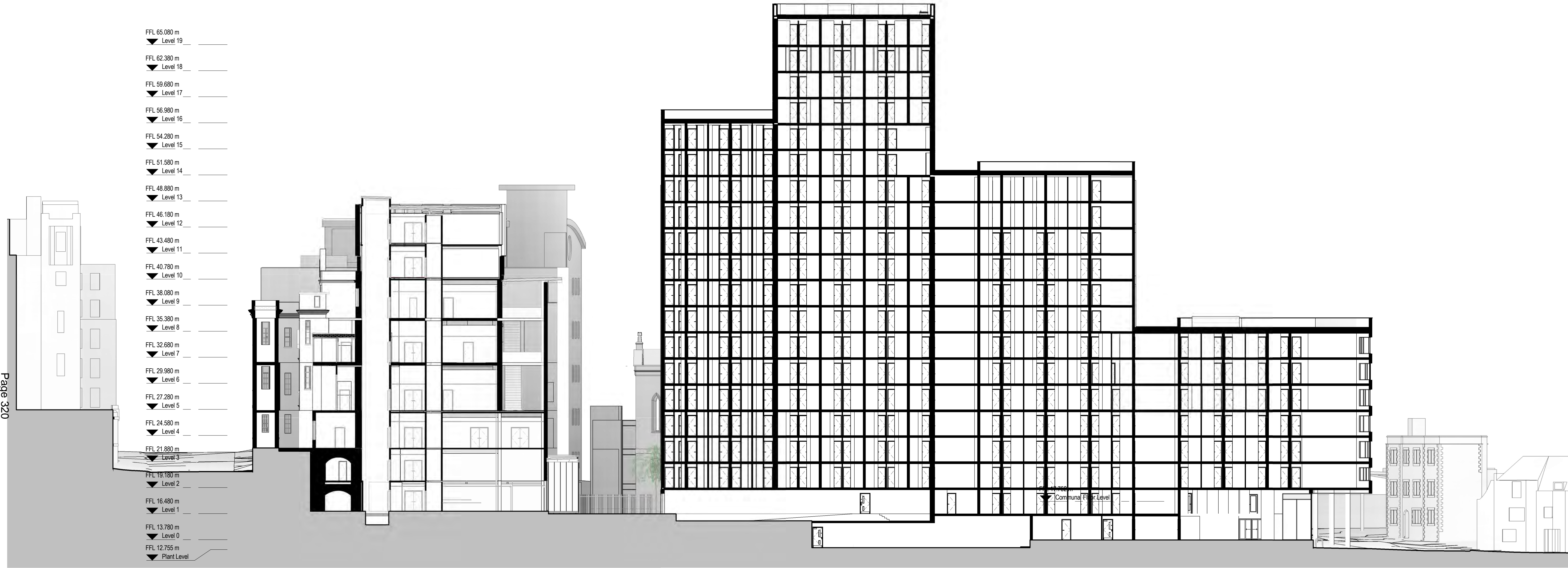
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Drawn By : Author Checked By: Checker  
Date : 11/08/16 Date : 11/08/16

Drawing:  
Proposed Section 04

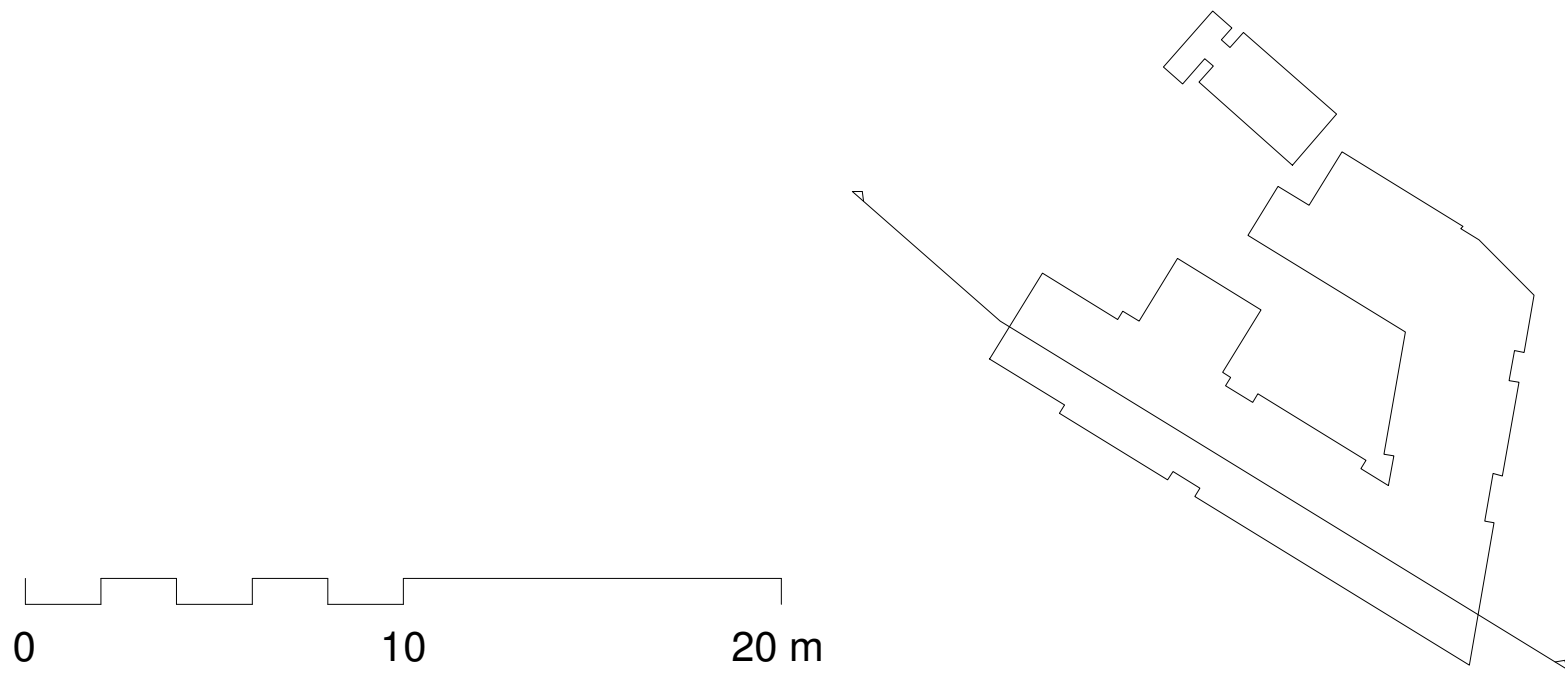
Job No: Drawing No: Rev:  
Rio 0282 A-06-04 A



- FFL 65.080 m  
▼ Level 19
- FFL 62.380 m  
▼ Level 18
- FFL 59.680 m  
▼ Level 17
- FFL 56.980 m  
▼ Level 16
- FFL 54.280 m  
▼ Level 15
- FFL 51.580 m  
▼ Level 14
- FFL 48.880 m  
▼ Level 13
- FFL 46.180 m  
▼ Level 12
- FFL 43.480 m  
▼ Level 11
- FFL 40.780 m  
▼ Level 10
- FFL 38.080 m  
▼ Level 9
- FFL 35.380 m  
▼ Level 8
- FFL 32.680 m  
▼ Level 7
- FFL 29.980 m  
▼ Level 6
- FFL 27.280 m  
▼ Level 5
- FFL 24.580 m  
▼ Level 4
- FFL 21.880 m  
▼ Level 3
- FFL 19.180 m  
▼ Level 2
- FFL 16.480 m  
▼ Level 1
- FFL 13.780 m  
▼ Level 0
- FFL 12.755 m  
▼ Plant Level



King Edward VIII Building    Marlborough St    Old Building - Refer to EB Drawings    Entrance    New development    Whitson Street    St James' Priory



Notes:

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23.08.16  
30.03.16  
Date  
B Planning  
A Planning Issue  
No. Description

Drawn : GJ  
Date : 11/08/16  
Checked By: CT  
Date : 11/08/16

Scale @ A1: 1 : 200  
Scale @ A3:

Drawing Status :  
**INFORMATION**

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Client:  
**Unite Students**

Project :  
**BRI**

Drawing:  
**Proposed Section 02**

Drawing No:  
**A-06-02**

Rev:  
**B**

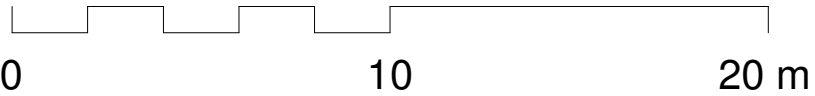




Page 321



Elevation 11 Lower Maudlin St



Notes:

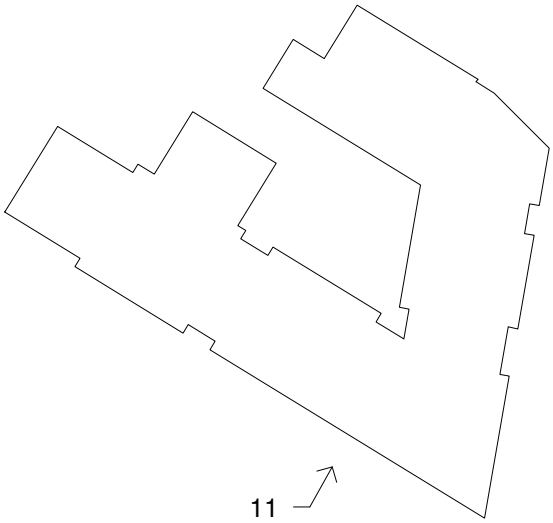
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B	Planning	23.08.16
A	Planning Issue	30.03.16
No.	Description	Date



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Client:

**Unite Students**

Project :

**BRI**

Drawing Status :

**INFORMATION**

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Date :	<b>11/08/16</b>	Date :	<b>11/08/16</b>

Drawing:

**Context Elevations**

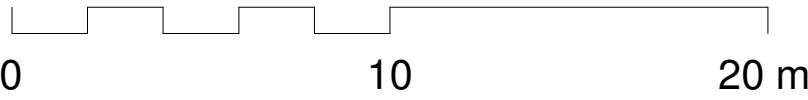
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<b>Rio 0282</b>	<b>A-05-005</b>	<b>B</b>





St James PrioryWhitson StreetNew developmentExisting ChapelNew circulationThe Old Building - refer to A-04-50 series for details elevationsMarlborough StreetKing Edward VII Building

Elevation 13 Whitson St East



Notes:

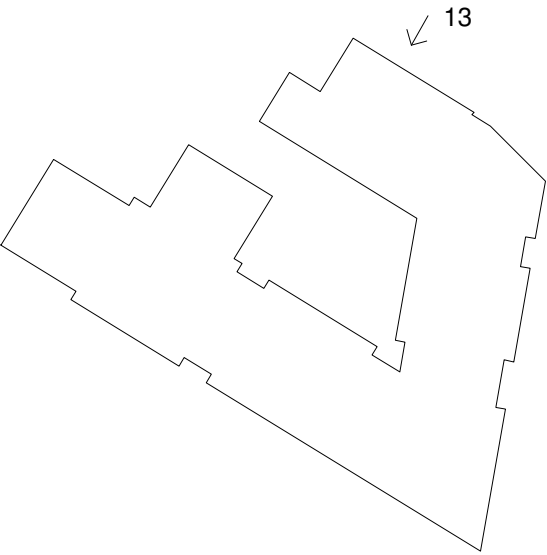
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B	Planning	23.08.16
A	Planning Issue	30.03.16
No.	Description	Date



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Client:  
**Unite Students**

Project :

**BRI**

Drawing Status :  
**INFORMATION**

Scale @ A1:	1:200	
Drawn By :	Author	Checked By: Checker
Date :	11/08/16	Date : 11/08/16

Drawing:  
**Context Elevations**

Job No:	Drawing No:	Rev:
<b>Rio 0282</b>	<b>A-05-007</b>	<b>B</b>





Bristol eye  
Hospital

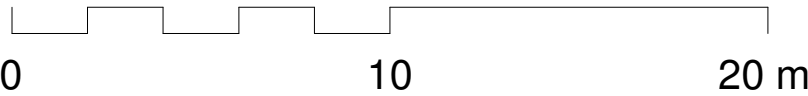
Lower Maudlin Street

New development

Whitson Street

Bristol Magistrates Court

Elevation 12 Whitson St South



Notes:

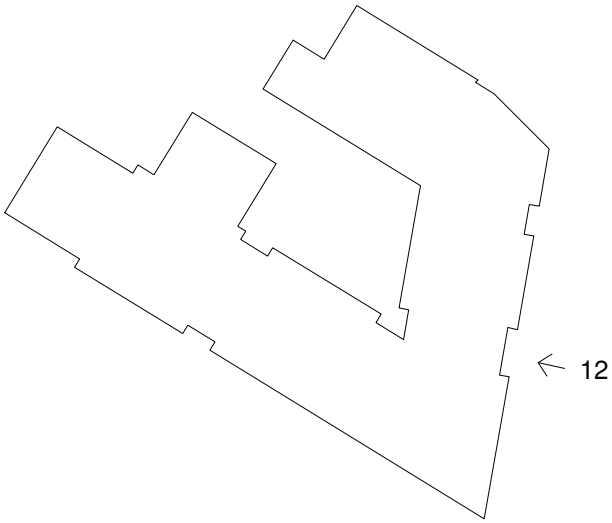
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B Planning	23.08.16
A Planning Issue	30.03.16
No. Description	Date



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Client:  
**Unite Students**

Project :

**BRI**

Drawing Status :

**INFORMATION**

Scale @ A1: 1:200

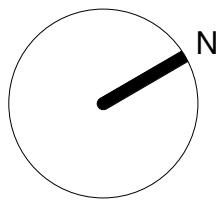
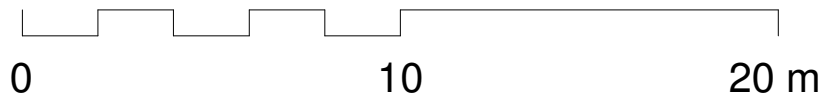
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Date :	<b>11/08/16</b>	Date :	<b>11/08/16</b>

Drawing:

**Context Elevations**

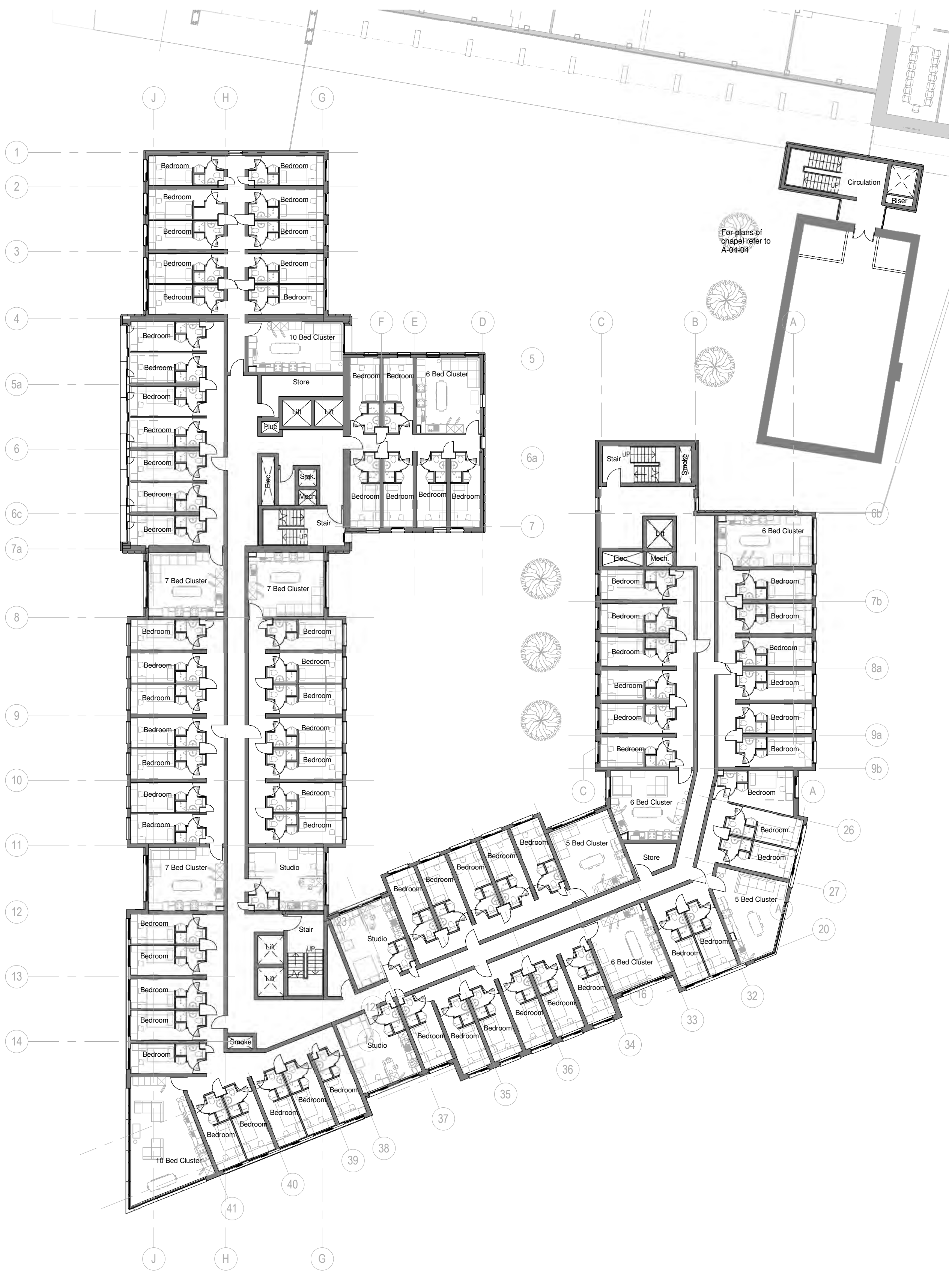
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<b>Rio 0282</b>	<b>A-05-006</b>	<b>B</b>



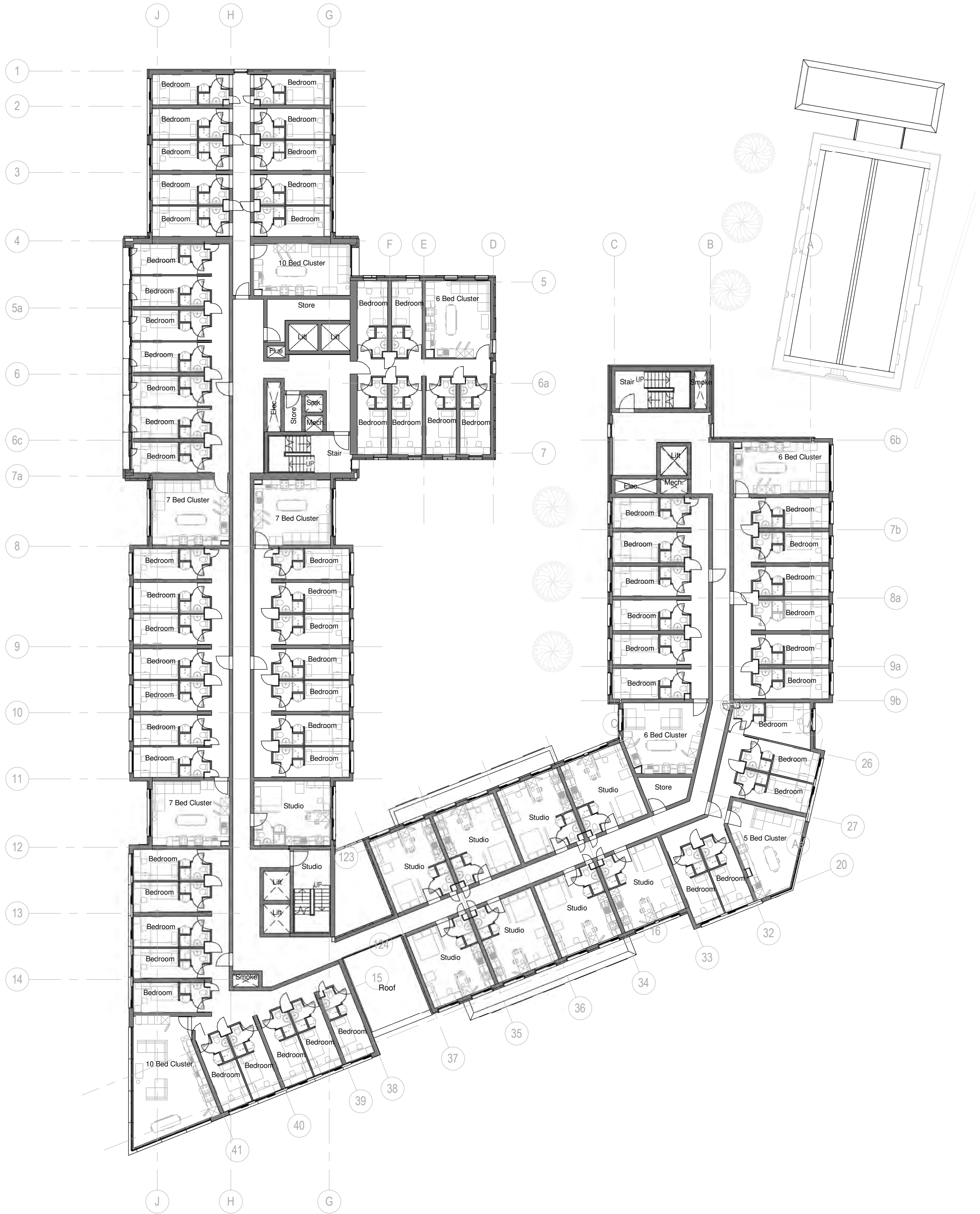


Rio 0282      A-04-01      E





Level 2 - 4



Level 5

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NOTE:  
Roof to be utilised for PV's. Extent of which TBC.

E	Planning	23.08.16
D	Planning Redesign	27.07.16
C	Window positions amended to accomodate columns/kitchen layouts	27.05.16
B	Planning Issue	30.03.16
A	General Amendments	16.03.16
No.	Description	Date

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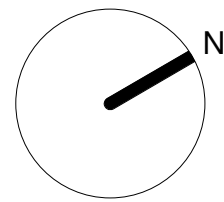
Project :  
**BRI**

Drawing Status :  
**PLANNING**

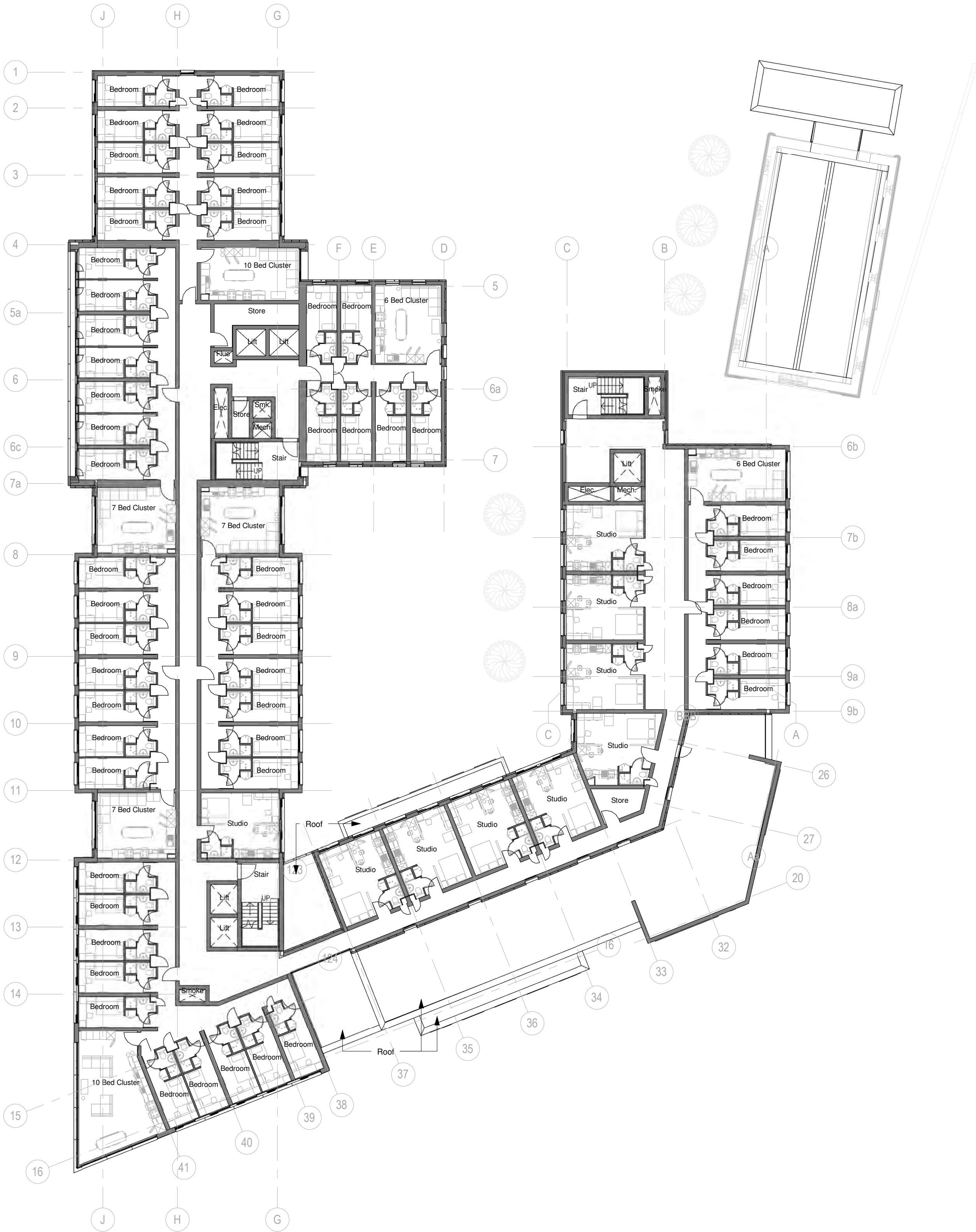
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Drawn By : **GJ** Checked By: **SH**  
Date : **11/08/16** Date : **11/08/16**

Drawing:  
**Level 02 - 05**

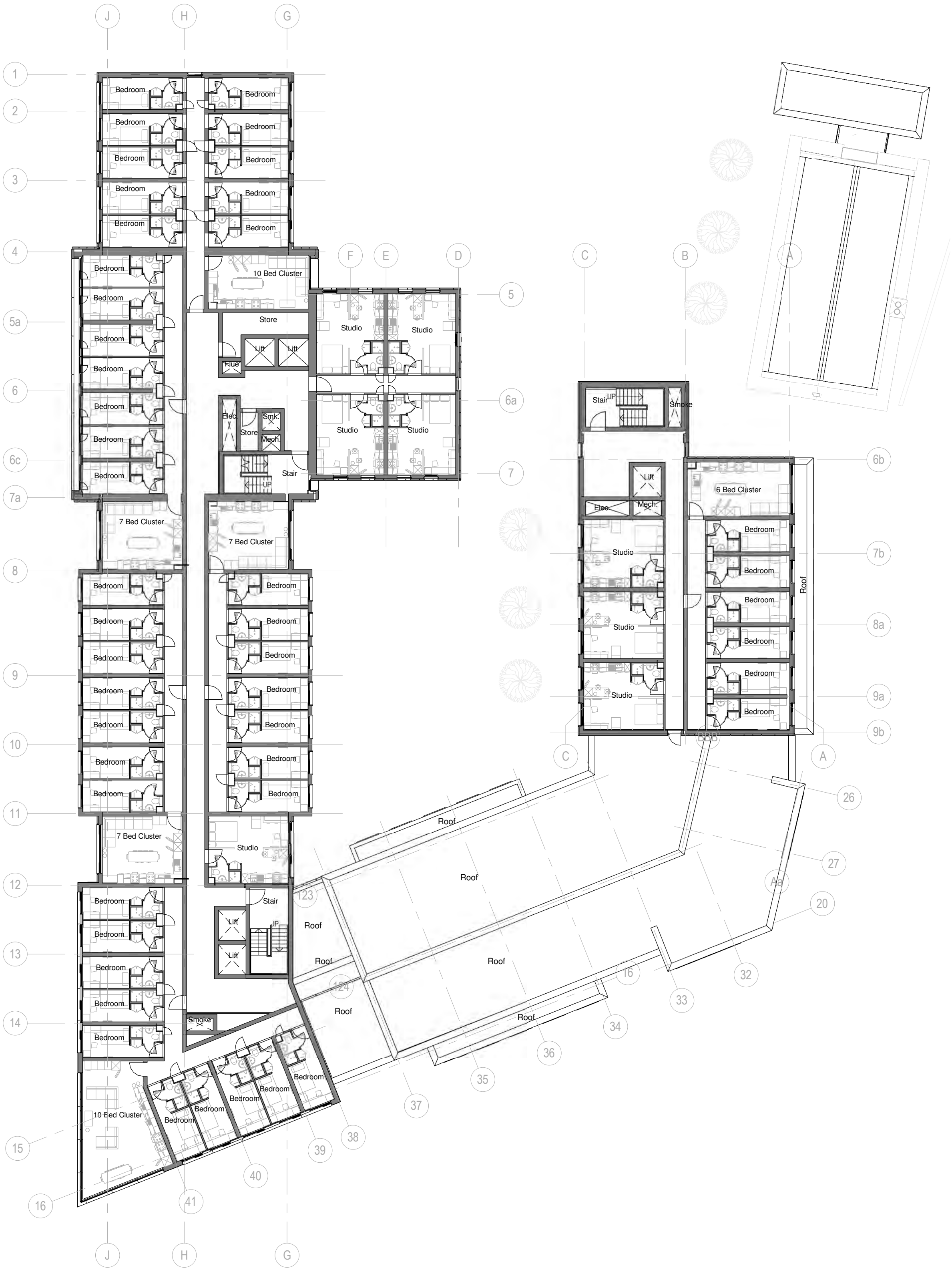
Job No: Drawing No: Rev:  
**Rio 0282 A-04-02 E**







Level 6



Level 7

Notes:

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NOTE:  
Roof to be utilised for PV's. Extent of which TBC.

E	Planning	23.08.16
D	Planning Redesign	27.07.16
C	Kitchen layouts included, riser positions rationalised, gridlines included for clarity.	25.05.16
B	Planning Issue	30.03.16
A	General Amendments	16.03.16
No.	Description	Date



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Client:

Unite Students

Project :

BRI

Drawing Status :

PLANNING

Scale @ A1: 1 : 200

Scale @ A3:

Drawn By : GJ

Checked By: SH

Date : 11/08/16

Date : 11/08/16

Drawing:

Level 06 - 07

Job No:

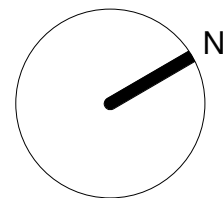
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Rev:

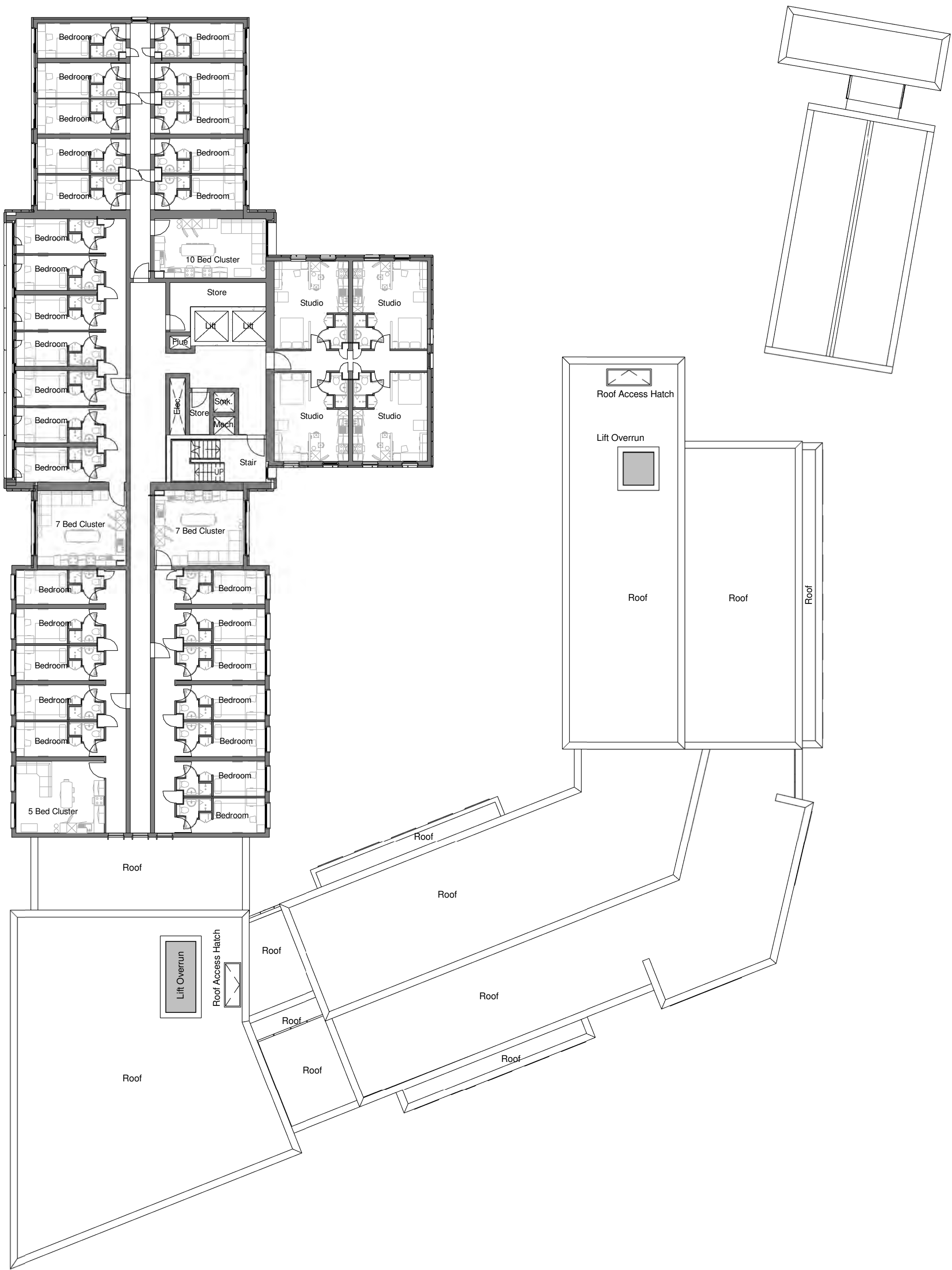
Rio 0282

A-04-03

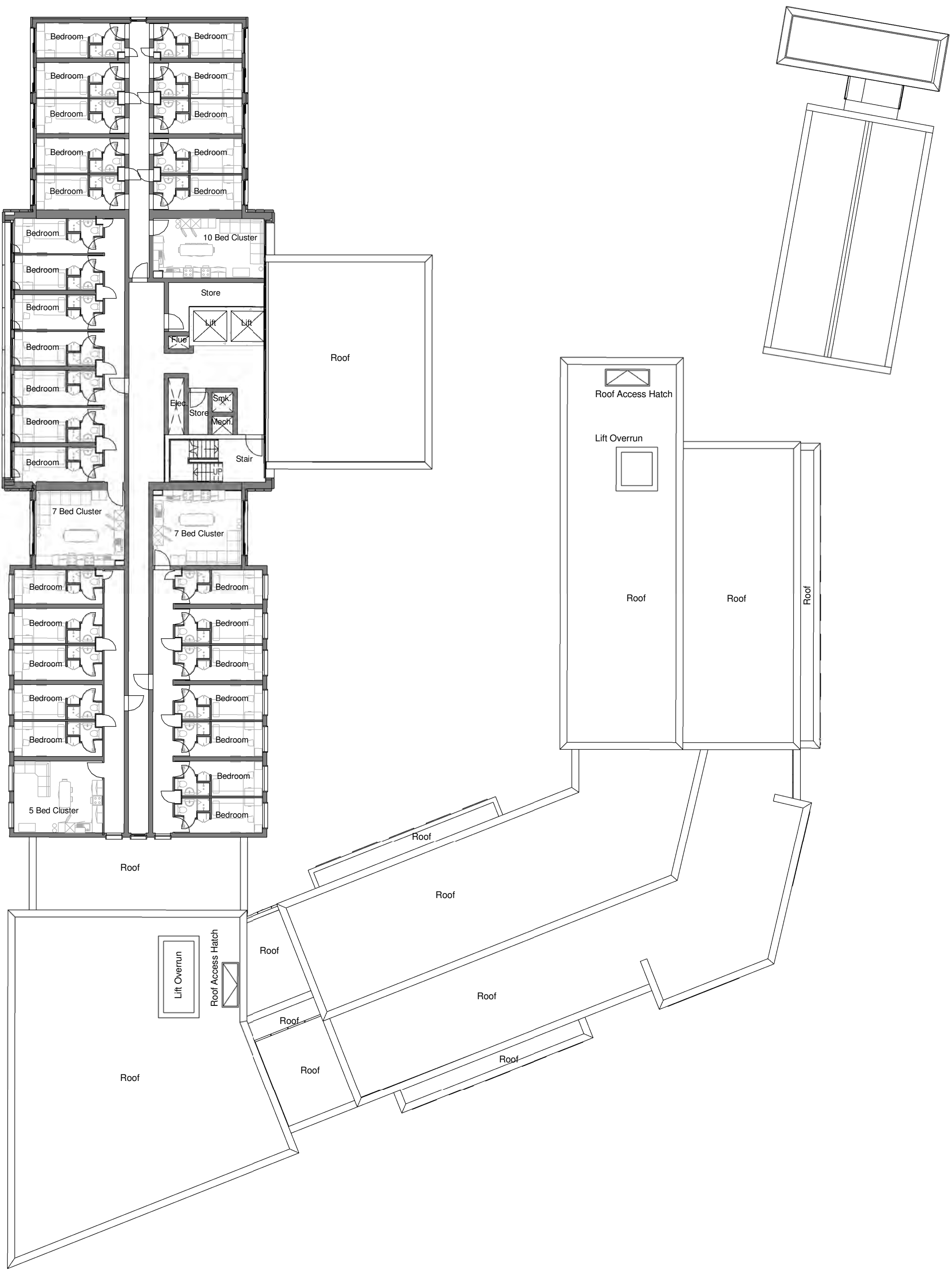
E







Level 8-11



Level 12 - 13

Notes:

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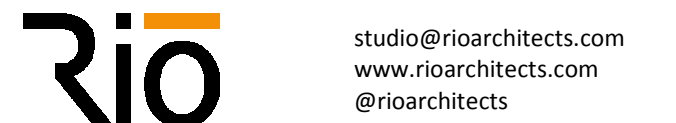
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NOTE:  
Roof to be utilised for PV's. Extent of which TBC.

C Planning	23.08.16
B Planning Redesign	27.07.16
A Planning Issue	30.03.16
No. Description	Date



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Client:  
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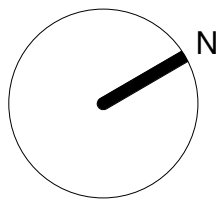
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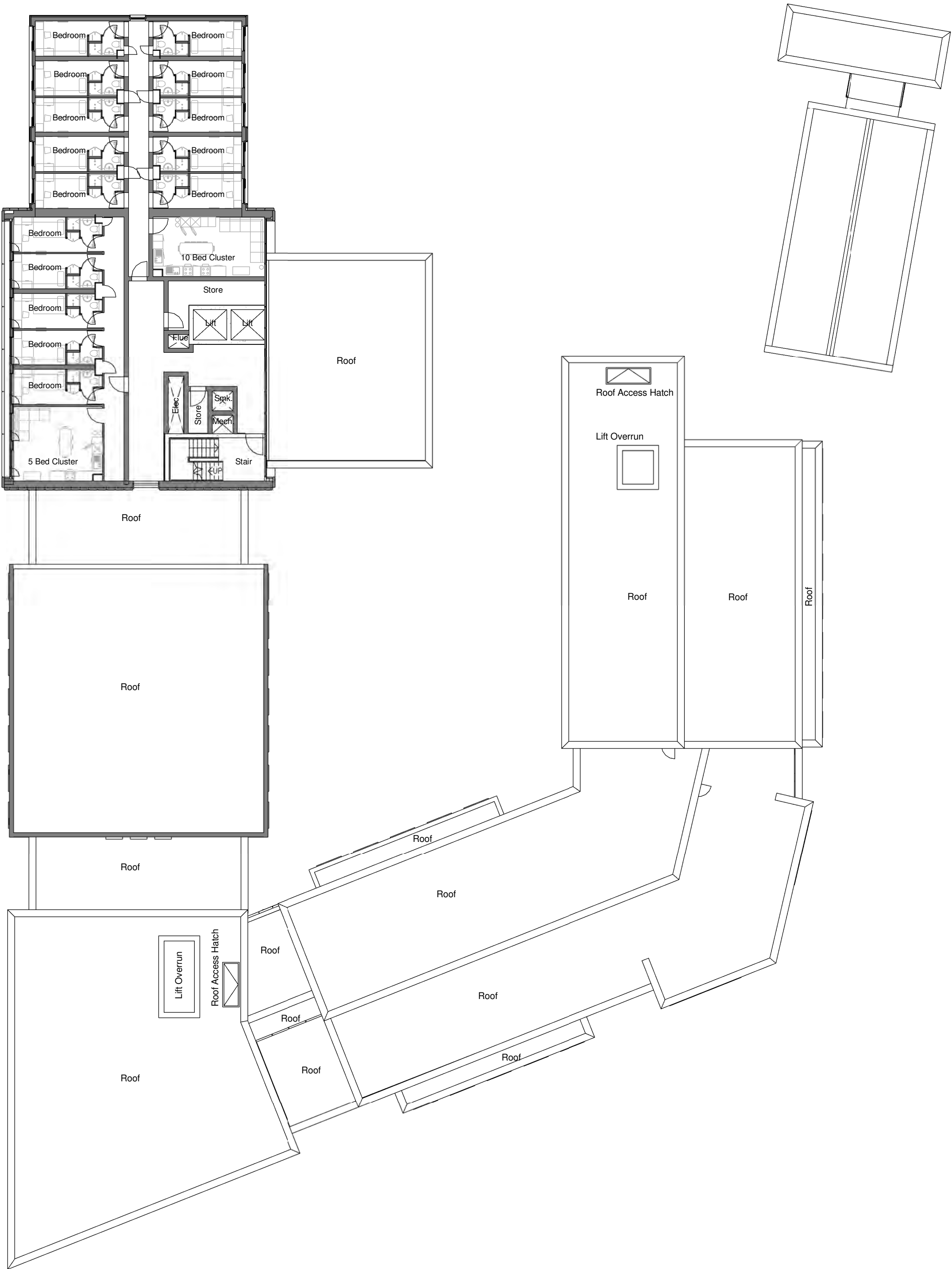
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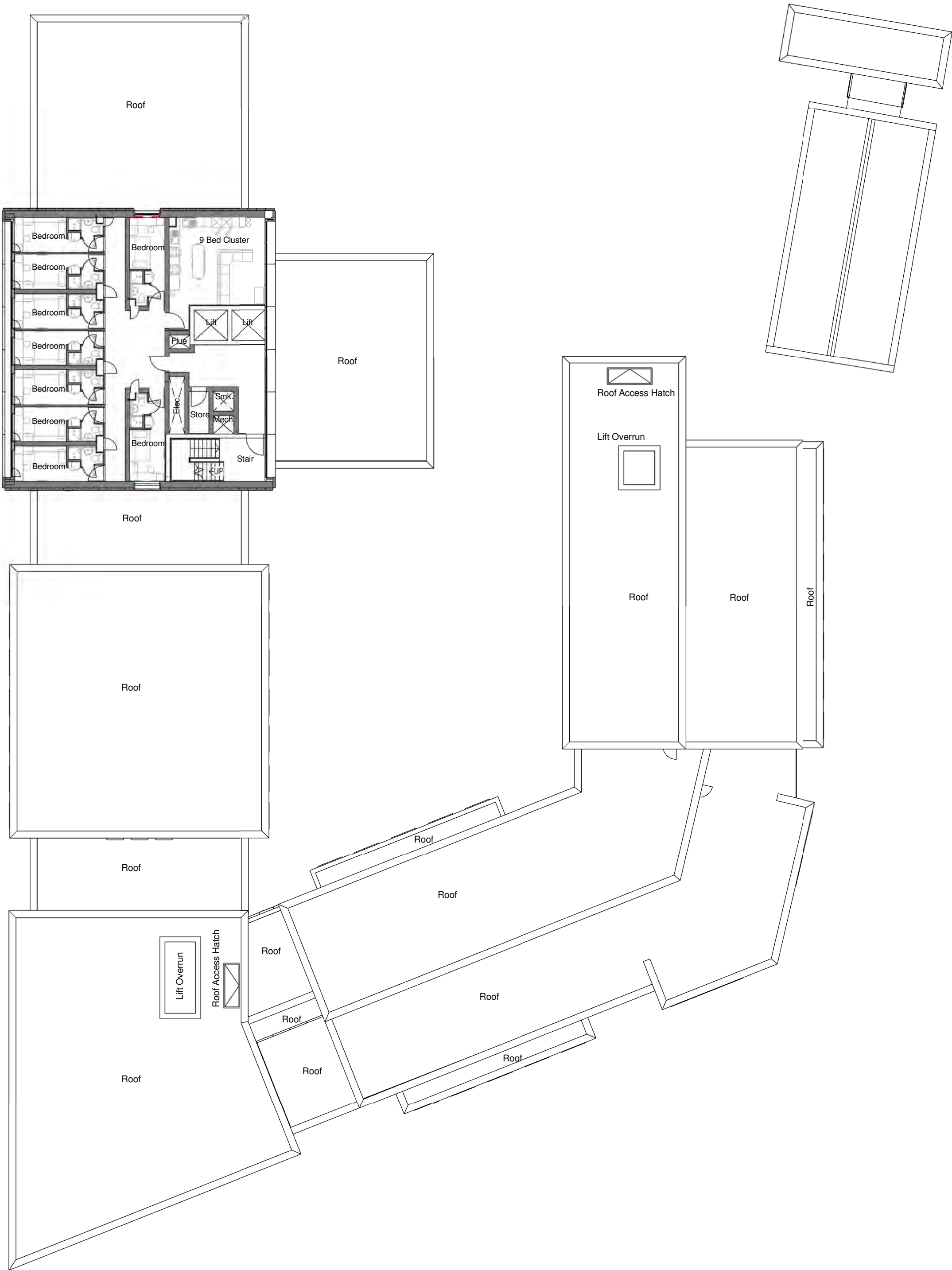
Drawing:  
**Level 08 - 13**

Job No:	Drawing No:	Rev:
<b>Rio 0282</b>	<b>A-04-04</b>	<b>C</b>





Level 14 - 15



Level 16 - 19

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NOTE:  
Roof to be utilised for PV's. Extent of which TBC.

B	Planning	23.08.16
A	Planning Redesign	27.07.16
No.	Description	Date



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Client:

**Unite Students**

Project :

**BRI**

Drawing Status :

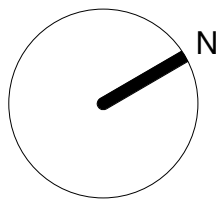
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Date :	<b>11/08/16</b>	Date :	<b>11/08/16</b>

Drawing:

**Level 14 - 19**

Job No:	Drawing No:	Rev:
<b>Rio 0282</b>	<b>A-04-05</b>	<b>B</b>



## **Supporting Documents**

### **3. Land adjacent to 2 Southernhay Avenue**

1. Proposed block plan
2. Plans
3. Historic map
4. Daylight & sunlight report
5. Photographs



existing wall (shown as hatched) to be demolished and reinstated as new party wall



Scale 1:200

Block Plan shows area bounded by: 357668 55, 172594 04, 357705 55, 172630 04 (at a scale of 1:200). The representation of a road, track or path is no evidence of a right of way. The representation of features as lines is no evidence of a property boundary.

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BLOCK PLAN

SH 023 scale 1:200



Scale 1:1250

Site Plan shows area bounded by: 357668 55, 172594 04, 357705 55, 172630 04 (at a scale of 1:1250). The representation of a road, track or path is no evidence of a right of way. The representation of features as lines is no evidence of a property boundary.

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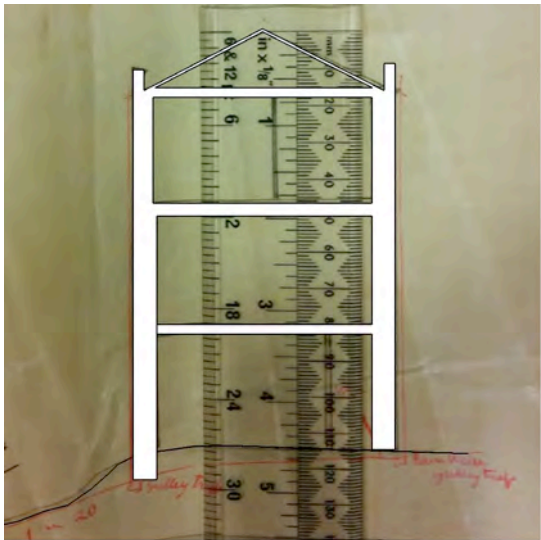
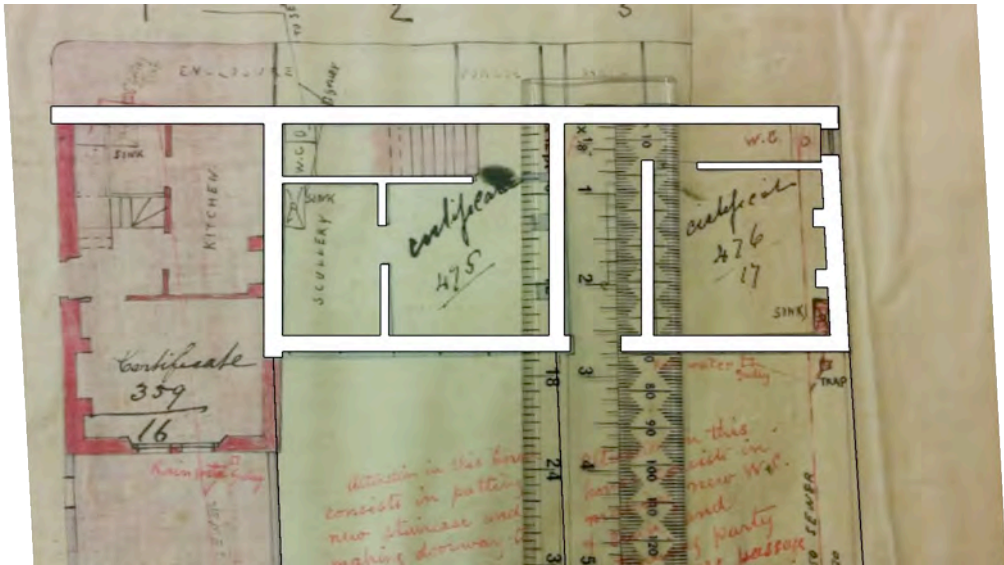
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LOCATION PLAN

SH 024 scale 1:1250

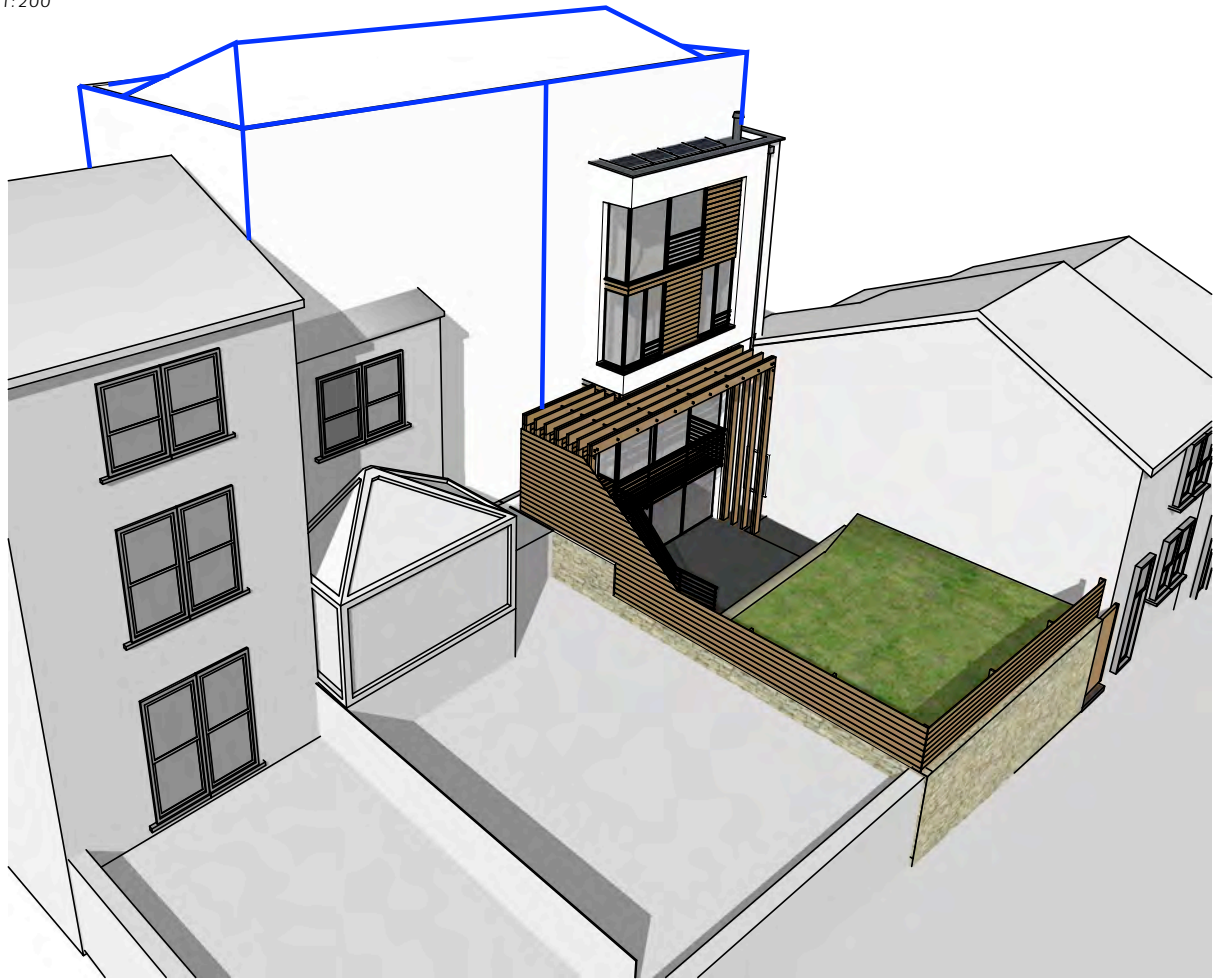
- Footprint of proposed dwelling
- Existing boundary line
- Existing party wall, to remain
- Existing party wall, to be demolished/reinstated





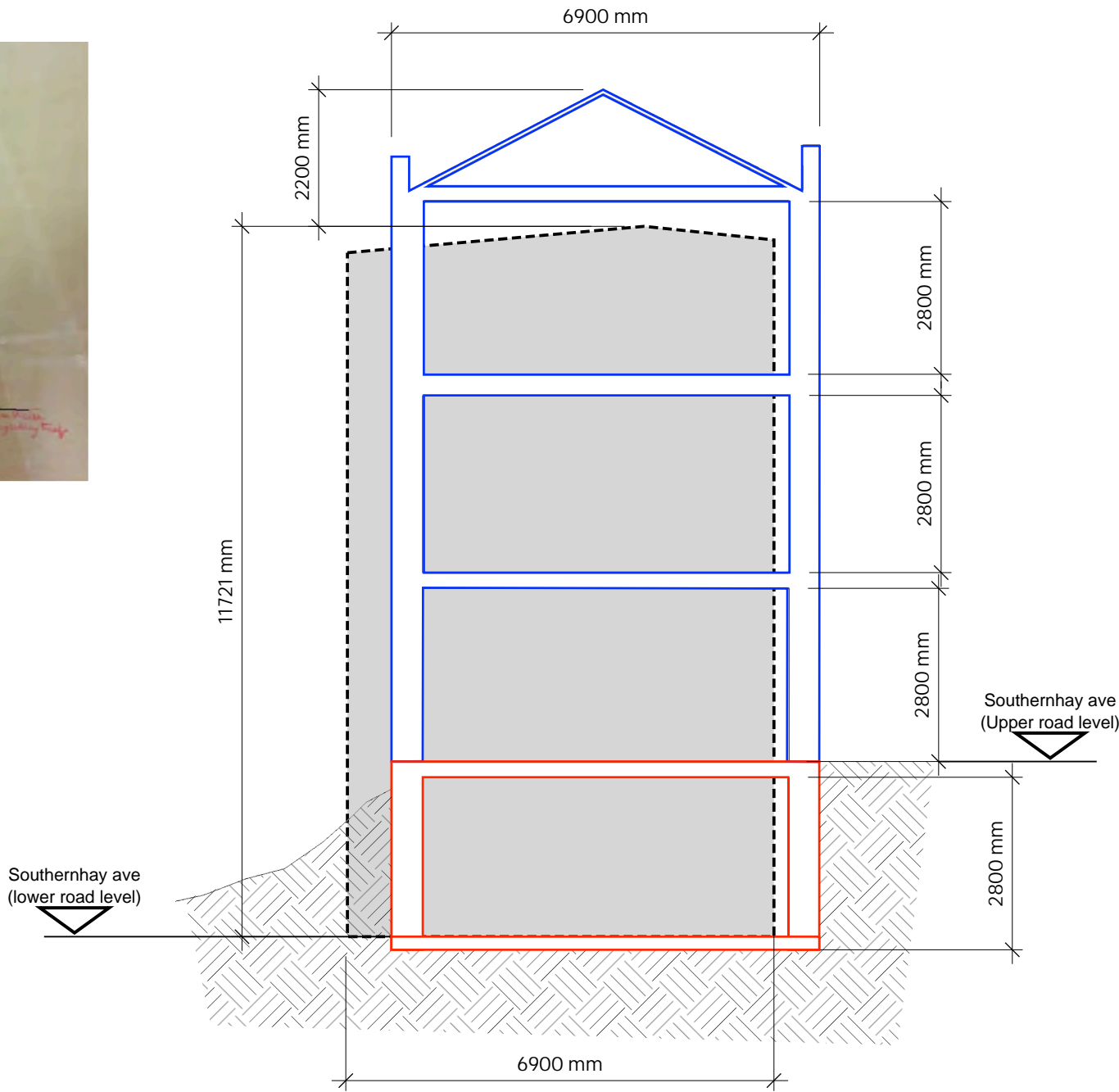
Archive drawings of original building.  
(source- Bristol record office original scale 1/8 inch to 1 foot)

SH 025 scale 1:200



3d view- previous house over proposed

SH 026 scale N/A



- Outline of proposed house- east elevation
- section through previous house (taken from archive drawings above)
- section through existing cellar (surveyed on site by structural engineer)

East elevation- previous and proposed

SH 027 scale 1:100





Existing plot from south- photograph

SH 001 scale N.A



Existing plot from North- Photograph

SH 002 scale N.A





Proposed building- view from south of the river

SH 003 scale N.A

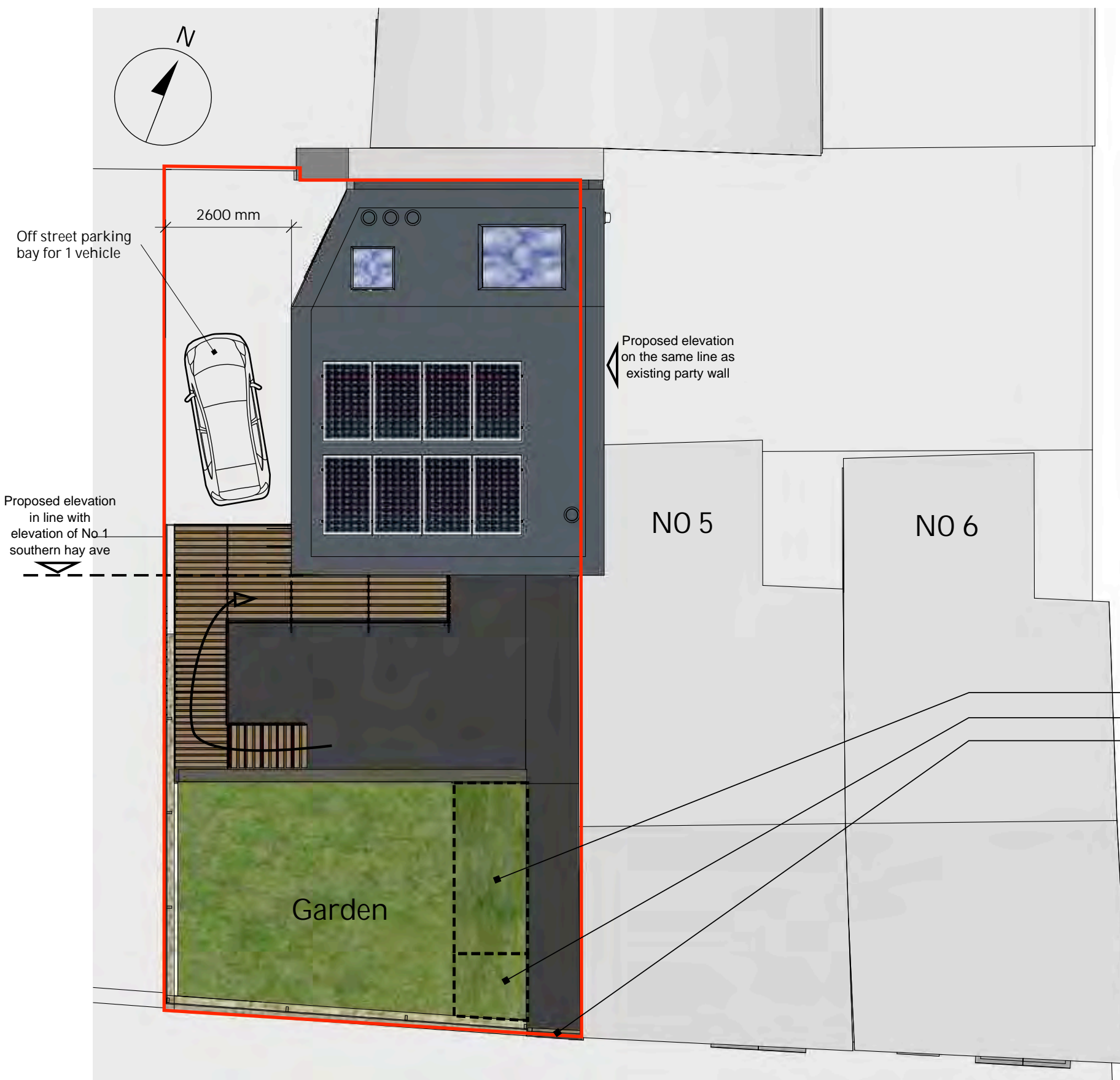




Proposed building from south- 3d visualisation  
SH 004 scale N.A



Proposed building from north- 3d visualisation  
SH 005 scale N.A



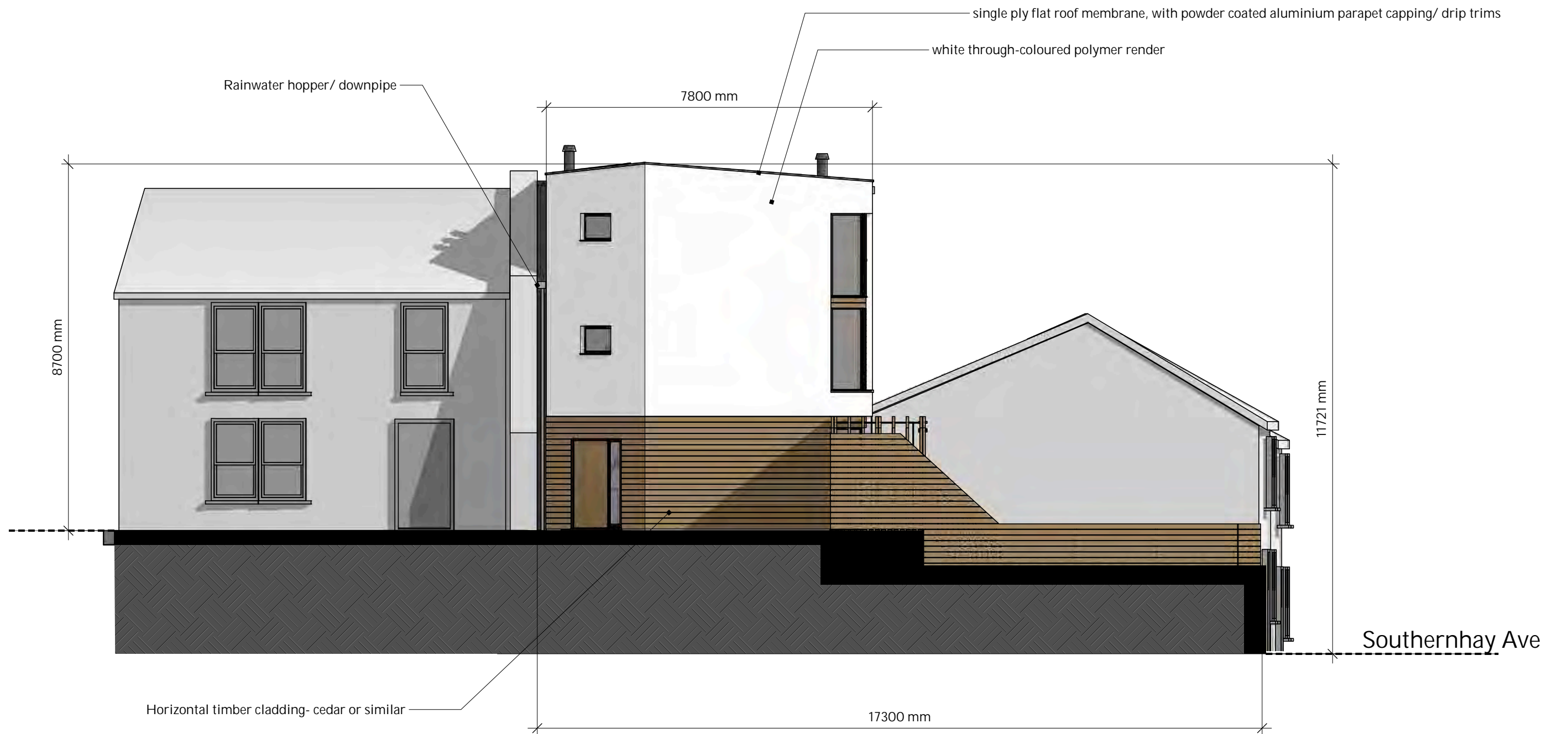
Proposed Site Plan  
SH 006 scale 1:100



3d view- south facing aspect  
SH 007 scale 1:100

- Secure storage for 2 bicycles (turf roof)
- Bin Storage (turf roof)
- Gate Access to Southernhay Ave





West Elevation

SH 008 scale 1:100

0 5 10 m



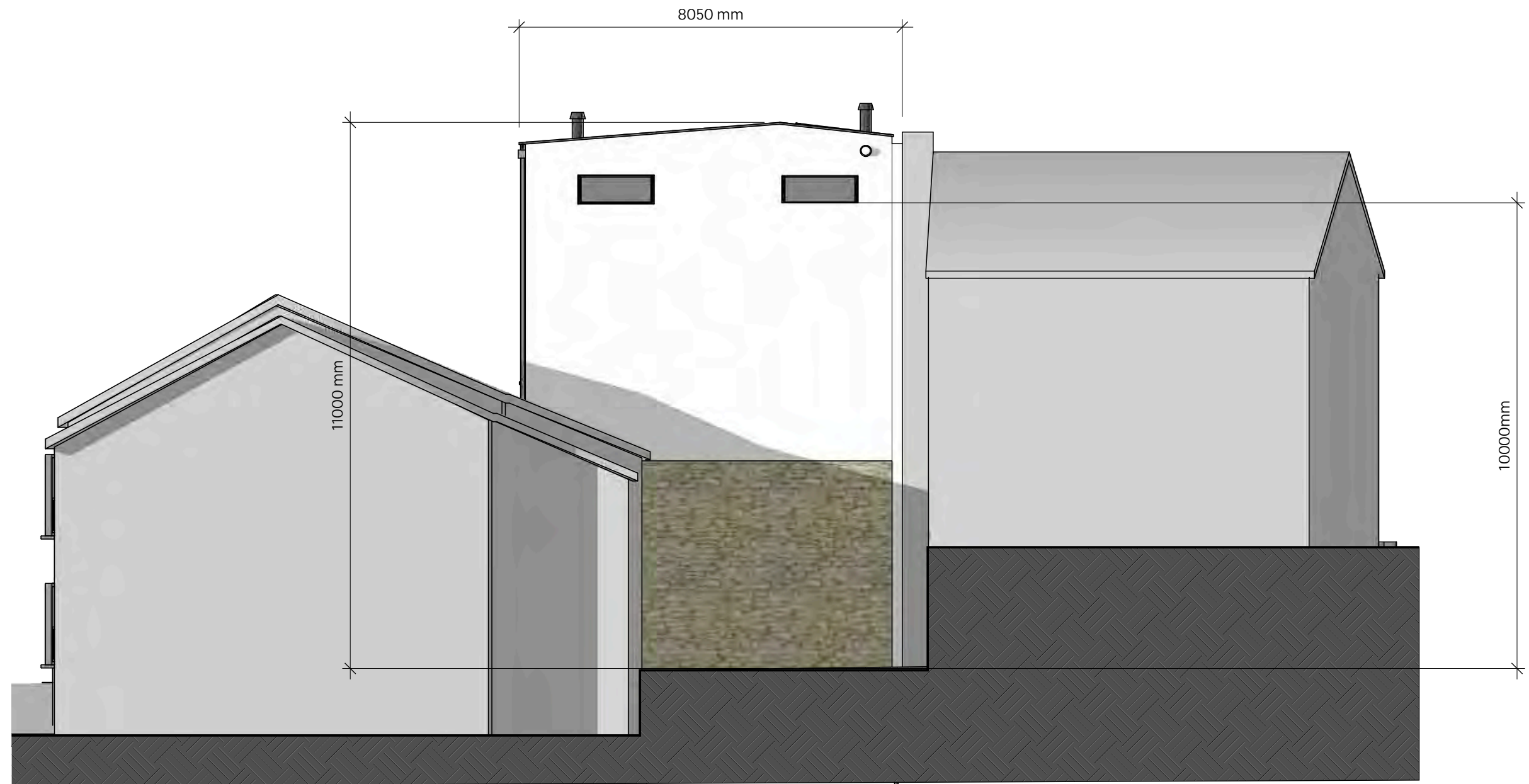
South Elevation

SH 009 scale 1:100

South Elevation (section through courtyard)

SH 010 scale 1:100





East Elevation

SH 011 scale 1:100

0 5 10 m



North Elevation

SH 012 scale 1:100

0 5 10 m





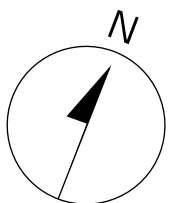
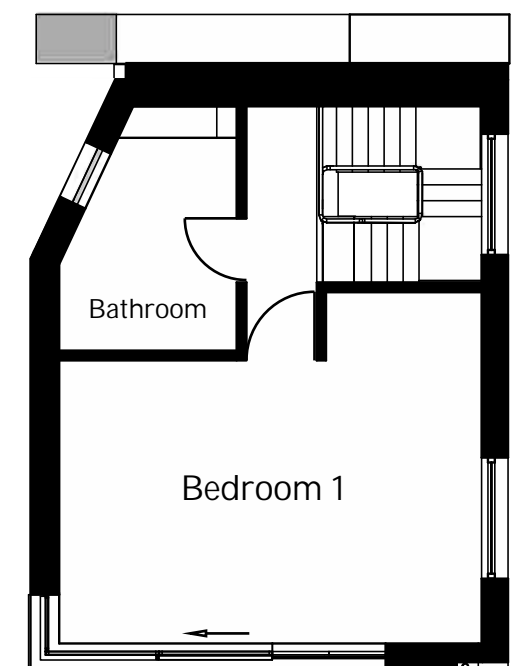
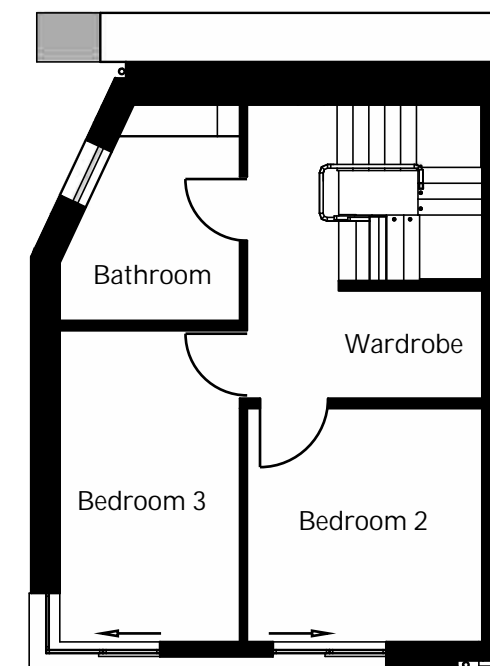
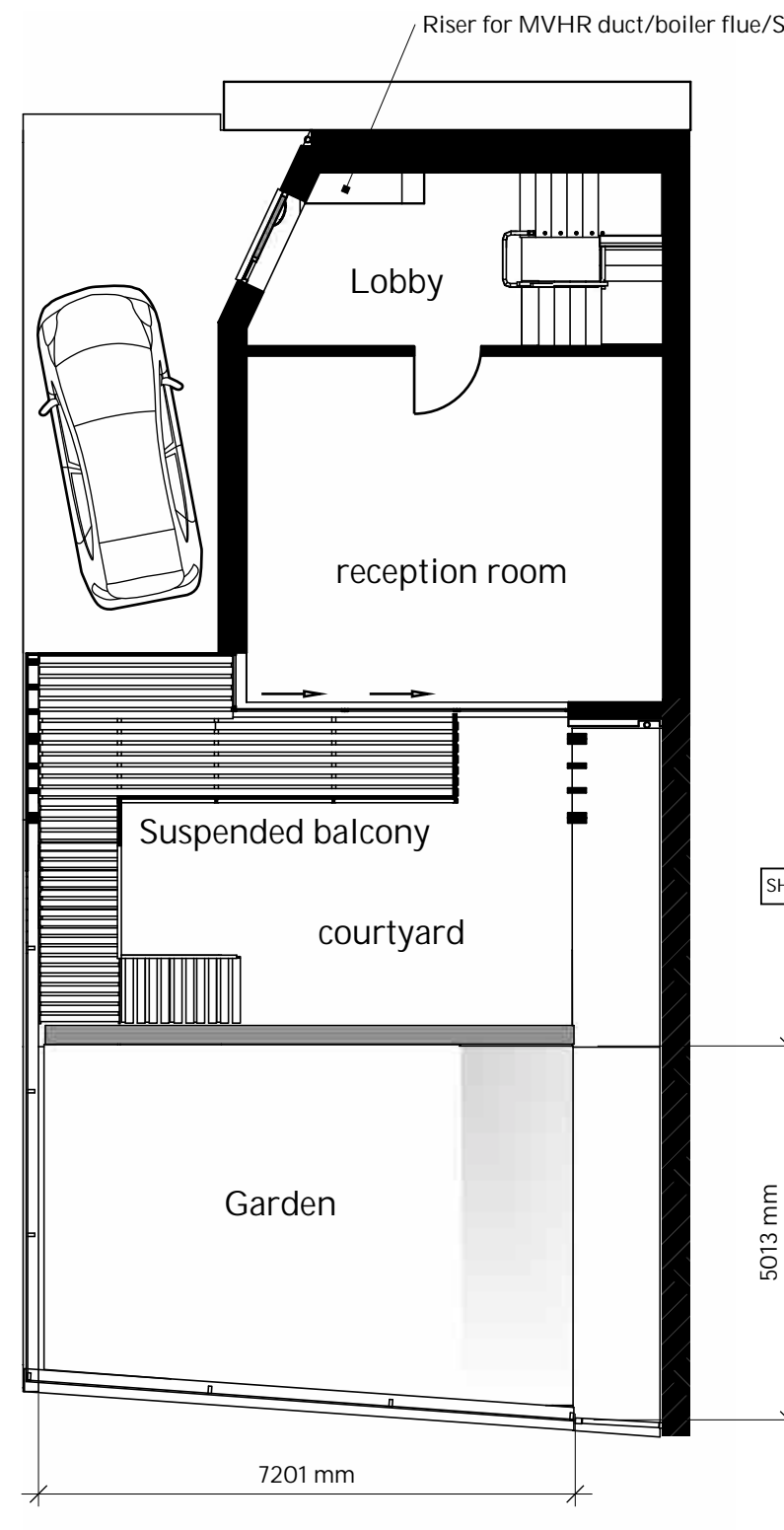
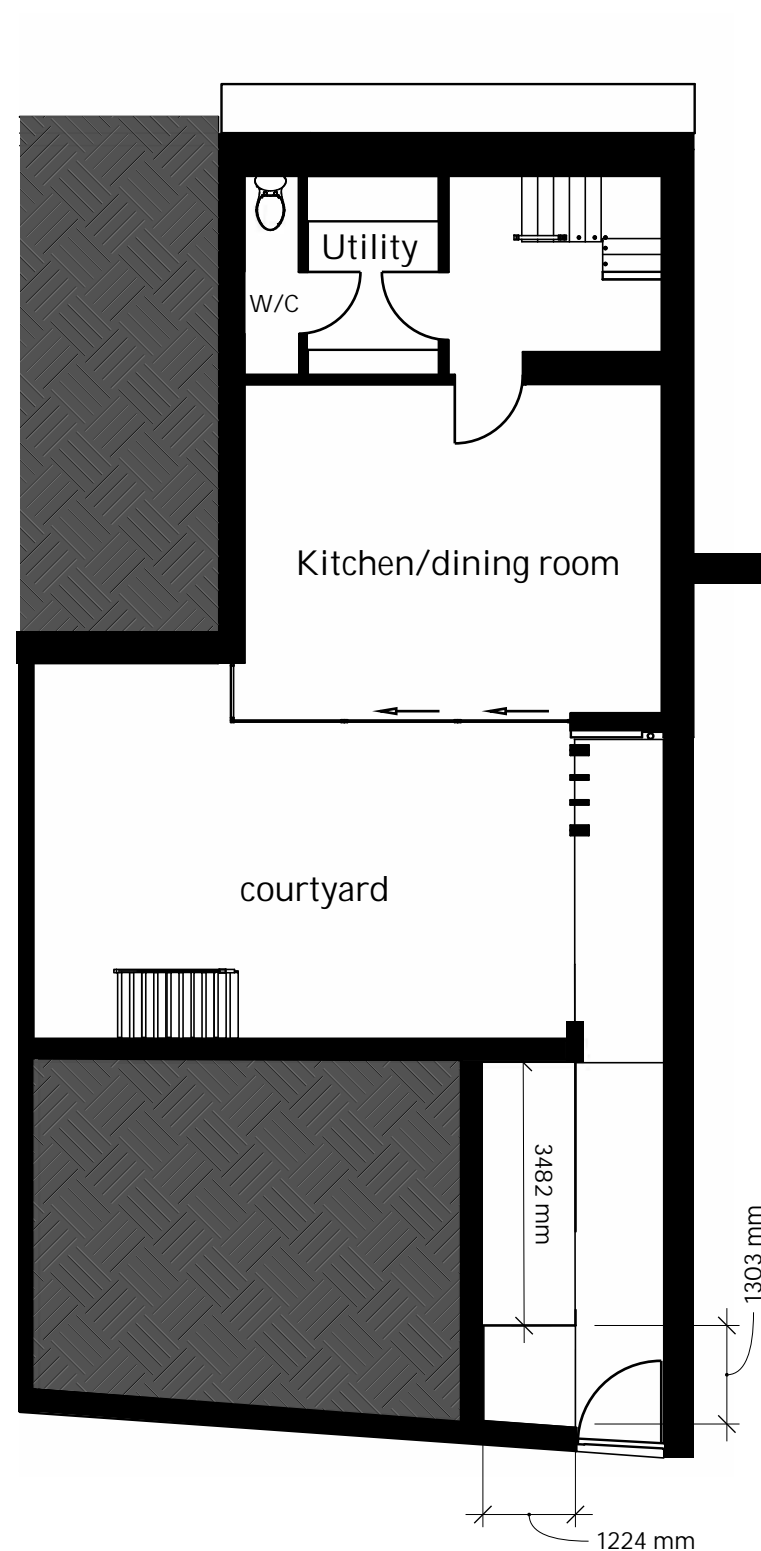
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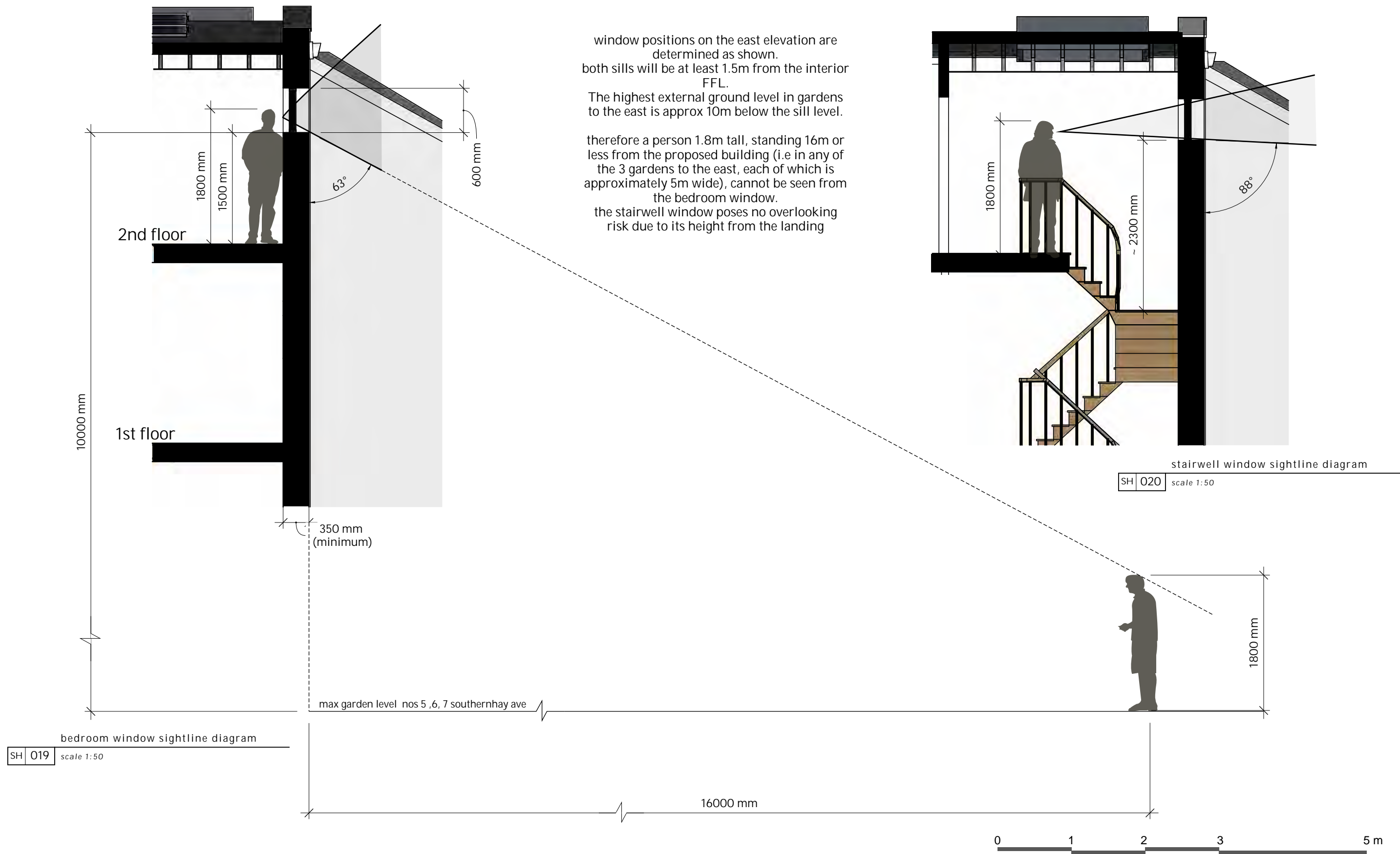
SH 013 scale 1:100



Section South-North

SH 014 scale 1:100





17/04/2016

## **Design, Heritage & Access Statement- Southernhay Ave**

### **Introduction**

We are proposing to build a 3 bedroom, 154m<sup>2</sup> family home over 3 storeys and a basement on a vacant piece of land adjacent to 2 Southernhay Avenue, Cliftonwood, Bristol. We hope this will be a house for our young children to grow up in, close to our family and extended community.

### **Site**

This was the site of a pre-existing terraced house that was demolished following bomb damage in the Second World War (see images below). It has since been partly concreted over and is now used as a private car park, domestic storage and ancillary garden.

The site has access both to the north and south section of the road, Southernhay Avenue forming a U-shape at this point. Due to a steep change in levels, numbers 1, 1a and 2 (the group of houses to which the proposed building would naturally belong) are on higher ground than their neighbours at 5 - 14. The properties are therefore set further back from the road and up the hill, with elevations fronting onto the upper part of Southernhay Avenue.

### **Location & wider context / heritage**

Cliftonwood is a historical, residential part of Bristol, dramatically raising over the hills above the harbour. The colourful and quirky houses are a local landmark. It is a designated conservation area, with a characterful mixture of modest terraced houses and brightly coloured contemporary and postwar architecture.

Many of the adjacent buildings, (in particular no 1 southern hay ave), have been altered significantly over the years and their original character has substantially diminished. Others, e.g. the 1960s buildings at the top of Southernhay Crescent are of poor quality construction. Despite the age of many of the surrounding properties, There is no clear common style or firm context in the area which ought to be adhered to, but a mix of styles to which the only appropriate addition would be something contemporary. an honest reflection of current design ethos, and very much a part of the mix.





Map with examples of contemporary new builds in the area (marked in yellow), and the Southernhay plot (marked in pink). The street names of these sites, from left to right, are : Cliftonwood Terrace, Old School Lane, Bellevue Crescent.



1900 street plan showing position/footprint of the previous house



1946 ariel photo showing bomb damaged buildings on the proposed plot



## **Design**

Our design reflects our commitment to sustainable architecture and our wish for the house to be an energy efficient eco home. The house has a simple, compact envelope to enhance its energy performance and large windows on the south elevation to maximise the solar gain and reduce heat loss.

The proposed house will cover part of the footprint of the previous terraced house. The garden is raised in relation to the basement courtyard, but would in fact be at a similar level to the existing, and accessed from a path leading onto the southern part of Southernhay Avenue. The garden contains secure storage for 3 bicycles and ample bin/recycling storage built discretely into the hill.

from ground level to the north, the building is 3 storeys high and is of similar scale to surrounding houses and the previous house, (In as far as it is possible to determine from the remaining party wall). We consider the height of the building to be close to the minimum needed to accommodate the necessary rooms. Especially given the modest footprint.

## **Layout**

The layout follows that of the typical houses built on the Cliftonwood slopes, lower ground floor kitchen and courtyard, ground floor sitting room and bedrooms above. A staircase is joining the floors at the north-east corner. There are separate bathrooms servicing each of the bedroom floors and a toilet on the lower ground.

All main windows are facing south looking over the garden, and there are 2 east facing smaller windows to let in light to stairs and top bedroom respectively. They are both placed high, above sightline of any neighbouring gardens as illustrated in drawing SH020 in the plans.

## **Scale**

Pre-application concerns of scale have been addressed by lowering the overall height and by pitching the roof in both directions, and reducing the overall width to be in line with the extent of the remaining party wall. The design aims to minimise the impact on views from surrounding housing, retaining a substantial gap between the proposed house and its neighbour. Unlike the previous building which covered the full width of the plot.

## **Materials**

The main materials are white render and full height glazing with timber cladding details.

The existing rubble stone wall along the southern part of Southernhay Ave will be retained at its existing height and with existing materials, in order to retain the character. A simple wooden door will provide access to the alley leading to the courtyard.

## **Landscaping**

The current garden area will be retained on two levels, courtyard and raised garden. The western boundary will have a wooden fence to separate it from the adjoining garden and the south side will have hedges and trees to soften the impact and obscure views of the houses opposite.

## **Sustainability**

Our wish to minimise our ecological footprint manifests itself both through the choices of materials, construction methods and contractors. With consideration for the complete life cycle of the house and Sustainability in the broadest sense.

The building will include a super-insulated timber frame (above ground level), an airtight envelope and largely thermal bridge free construction aimed at achieving, or approaching passivehaus standards and measures to Optimise natural lighting, passive solar heat gains and shading. Other sustainability features of the proposal are:

High performance, triple glazed windows and doors.

FSC certified timber cladding.

Mechanical ventilation with Heat recovery system, ensuring a high level of indoor air quality and thermal comfort while minimising ventilation heat losses.

Renewable energy through PV solar panels.

Use of low embodied energy, and recyclable materials such as timber, cellulose fibre insulation and wood fibre render panels (warmcell and Pavatex/difutherm respectively), and reuse of existing material on site e.g the stonework from the existing remaining walls.

## **Biodiversity and green infrastructure**

Pond and wildlife garden : The garden is planned to provide ample habitats to insects, birds and invertebrates and encourage biodiversity through the inclusion of a small pond, bird boxes, log pile, a couple of fruit trees for example bird cherry and aromatic bee-friendly bushes such as lavender & rosemary. The roof area of the bikeshed will be covered in long grasses and wildflowers, and next to it there will be a composting area.

A small vertical kitchen garden in the courtyard with herbs and some smaller fruits plants. The courtyard is will also be the base for a honeysuckle climbing over the sun shades, going up two floors.

## **Community considerations**

The immediate neighbours have been consulted and their views have been taken into consideration as part of the design process. Particular attention has been given to avoiding any direct overlooking issues and selecting construction techniques that cause minimal disruption. Concerns have been raised relating to the build process which we have begun to address, bringing the contractor into the conversation early in order to instigate a positive and candid forum for discussion. Communication will continue to be a priority throughout the project. We are satisfied that despite peoples concerns, our proposal will provide a considerable net benefit for the local area and its community.

### **Vehicular and transport links**

The site is close to local shops and amenities that can be easily reached on foot or bike. There is a shed at the south-side entrance providing secure storage for at least 3 bikes. Local buses are close by on Hotwells Road.

The design incorporates one car parking space adjacent to the property, to the west side of the house and accessed from the northern branch of Southernhay Avenue, requiring no amendment to existing rights of way.

### **Inclusive access**

Level access will be provided on the southern boundary, Southernhay Avenue, to the lower ground floor where all necessary services will be accessible, bathroom, kitchen and living area. The external door threshold on first floor will also provide level access. Efforts will be taken to ensure reasonable levels of accessibility throughout including internal doorways of at least 850mm clearance on ground and lower ground floors.





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# DAYLIGHT & SUNLIGHT REPORT

**Southernhay**

1 Cliftonwood Road, Clifton, Bristol

**July 2016**

A photograph of a modern building facade with a glass and metal structure, featuring a prominent diagonal line and a large, dark, angular shape in the foreground. The building has a curved, metallic frame with glass panels and horizontal slats. The sky is blue with white clouds.

## Contents

1. Introduction
2. Guidance
3. Assumptions
4. Sources of Information
5. The Site and proposal
6. Assessment Criteria
7. Results
8. Conclusions

# 1. Introduction

- 1.1. This practice has been instructed to provide an assessment of the daylight & sunlight implications of the proposed new development at Southernhay, Cliftonwood Road, Clifton, Bristol.
- 1.2. The methodology and criteria used for these assessments is provided by the Building Research Establishments guidance 'Site layout planning for daylight and sunlight: a guide to good practice' (BRE, 2011) and the British Standard document BS8206 Pt2.

## 2. Guidance

### **Daylight & sunlight for planning**

Site layout planning for daylight and sunlight: a guide to good practice, BRE 2011

- 2.1. This document follows from previous guidance produced by Her Majesty's Stationary Office (HMSO) on daylight and sunlight in the built environment and is now the accepted methodology used by local authorities for assessing daylight and sunlight in relation to new developments. It provides methods for calculating the impact to daylight and sunlight within existing neighbouring buildings and for assessing the provision of amenity provided within new buildings.
- 2.2. The guidance details three methods for calculating daylight; the Vertical Sky Component (VSC), the No-Sky Line Contour (NSC) and the Average Daylight Factor (ADF). The first two assessments are primarily used for the assessment of existing buildings, whilst the ADF test is used for the assessment of new buildings. The assessment of sunlight within both existing and new buildings is undertaken using the Annual Probable Sunlight Hours (APSH) test.

#### *Daylight to existing buildings*

- 2.3. The Vertical Sky Component (VSC) test measures the amount of sky that is visible to a specific point on the outside of a property, usually a window, which is directly related to the amount of daylight that can be received. It is measured on the outside face of the external walls, again usually at the centre point of a window.
- 2.4. The No Sky-Line Contour (NSC) test calculates the distribution of daylight within rooms by determining the area of the 'working plane' which can and cannot receive a direct view of the sky and hence 'sky light'. The working plane height is set at 850mm above floor level within a residential property and 700mm for non-residential.
- 2.5. For buildings that neighbour a new development, the guidance suggests that daylight will be adversely affected by the development, if either; its windows achieve a VSC below 27% and have their levels reduced to less than 0.8 times their former value, or the levels of NSC within rooms are reduced to less than 0.8 times their former values.

#### *Daylight to new buildings*

- 2.6. The ADF test calculates the average illuminance within a room as a proportion of the illuminance available to an unobstructed point outdoors, under a sky of known luminance and luminance distribution. This is the most detailed of the daylight calculations and considers the physical nature of the rooms and windows, including; window transmittance, window size, room size, angle of external obstruction and room surface reflectivity. Some of the inputs can be accurately quantified (room size, angle of obstruction, window size), but some need to be based upon assumptions. These are as follows:-



Internal reflectance of rooms	Existing buildings = 0.5
	Newly built & proposed dwellings = 0.6

Window transmittance	Double Glazed = 0.68
	Single glazed = 0.8

- 2.7. The guidance suggests that, for new dwellings provided with electric lighting, kitchens should attain at least 2% ADF, living and dining rooms at least 1.5% ADF and bedrooms at least 1% ADF.

### *Sunlight*

- 2.8. For sunlight the APSH test calculates the percentage of statistically probable hours of sunlight received by each window in both the summer and winter months. March 21<sup>st</sup> through to September 21<sup>st</sup> is considered to be the summer period while September 21<sup>st</sup> to March 21<sup>st</sup> is considered the winter period. For properties surrounding a new development only those windows orientated within 90° of due south and which overlook the site of the proposal are relevant for assessment.
- 2.9. The BRE guidelines suggest that the main living rooms within new buildings should achieve at least 25% of annual sunlight hours, with 5% during the winter period. For neighbouring buildings the guide suggests that occupiers will notice the loss of sunlight if the APSH to main living rooms is both less than 25% annually (with 5% during winter) and that the amount of sunlight, following the proposed development, is reduced to less than 0.8 times its former value.

### *Sunlight to gardens and outdoor spaces*

- 2.10. The impact to overshadowing and the provision of well sunlit open spaces is assessed using the Sunlight Amenity test. This looks at the proportion of an amenity area that receives at least 2 hours of sun on the 21<sup>st</sup> of March in the present condition and compares this with the proportion of the area that receives at least 2 hours of sun on the 21<sup>st</sup> of March with the proposal in place.

### **BS 8206 Lighting for buildings - Part 2: Code of Practice for daylighting, BSI 2008**

- 2.11. This document gives guidance upon the design and provision of good daylight and sunlight within new developments. It suggests that the ADF test should be used to assess daylight and APSH to assess internal sunlight. The methodologies for these assessments are the same as those discussed in the BRE guidance above.

### 3. Methodology and application

#### Scope of the assessments

- 3.1. The BRE guidelines state that when assessing any potential effects on surrounding sensitive receptors, only those windows and rooms that have a 'reasonable expectation' of daylight and sunlight need to be considered. Paragraph 2.2.2 of the guidelines clarifies what are considered sensitive receptors with a 'reasonable expectation' of daylight and sunlight as follows:-

*"The guidelines given here are intended for use for rooms in adjoining dwellings where daylight is required, including living rooms, kitchens and bedrooms. Windows to bathrooms, toilets, storerooms, circulation areas and garages need not be analysed. The guidelines may also be applied to any existing non-domestic building where the occupants have a reasonable expectation of daylight; this would normally include schools, hospitals, hotels and hostels, small workshops and some offices."*

- 3.2. Commercial properties are not treated as having a reasonable expectation of daylight or sunlight. This is because they are generally designed to rely on electric lighting to provide sufficient light by which to work, rather than natural daylight or sunlight. No further assessment has therefore been carried out in relation to commercial properties in the vicinity of the proposed development.

#### Application of the guidance & criteria

- 3.3. The opening paragraphs of the BRE guidelines state: -

*"The guide is intended for building designers and their clients, consultants and planning officials. The advice given here is not mandatory and the document should not be seen as an instrument of planning policy. Its aim is to help rather than constrain the designer. Although it gives numerical guidelines, these should be interpreted flexibly because natural lighting is only one of many factors in site layout design. In special circumstances the developer or planning authority may wish to use different target values. For example, in a historic city centre a higher degree of obstruction may be unavoidable if new developments are to match the height and proportions of existing buildings".*

- 3.4. It is therefore important to understand that the BRE guidance needs to be applied sensibly and flexibly, after taking account of site context. It is considered important to note that in high density areas, achieving good levels of daylight and sunlight in accordance with the BRE guidelines, can conflict with other beneficial design factors.

## 4. Sources of Information

- 4.1. A measured survey, architects drawings, site photographs and Ordnance Survey information have been used to create a 3D computer model of the proposed development in the context of the existing site and surrounding buildings.
- 4.2. It is important to note that where survey information has not been supplied, the precise position of the neighbouring property elevations has been estimated based upon brick counts from site photographs.
- 4.3. It has not been possible to gain access to any of the surrounding properties, therefore details of the internal layouts and floor level heights have been estimated from the external appearance of the building and the locations of windows. Unless known or otherwise appropriate the depths of rooms have been assumed at 4.27m or half the building depth if this is more appropriate.

### **Clifton Surveys Ltd**

Topographical Survey

3198-1 Cliftonwood Road.dwg

Received 14/07/2016

### **Greenhart Construction**

3D model of the proposed development

southernhay-PlanningV1.skp

Received 14/07/2016

## 5. Daylight and Sunlight Results

- 5.1. Full results of the daylight and sunlight assessments are attached within appendix 2. Drawings to show the existing and proposed buildings in the context of the neighbouring properties are attached within appendix 1.
- 5.2. The following properties have been considered within our assessments:-
- 2 Southernhay
  - 1a Southernhay
  - 5 Southernhay Avenue
  - 6 Southernhay Avenue

### 2 Southernhay



- 5.3. This is a two-storey house situated directly to the west of the Site. It has three windows at ground floor and two at first floor level that face east overlooking the proposed house. These can be seen on drawing WM01, attached within the appendix.
- 5.4. We understand that the small window at ground floor level (W10) serves a toilet and that the two windows at first floor level (W1 & W2) serve a hallway. These rooms are non-habitable and are therefore not relevant for assessment following the BRE methodology. The only rooms relevant for consideration are, therefore, the ground floor kitchen and conservatory to the rear of the property.



### Daylight

- 5.5. The results of the VSC assessment have shown that two of the facing kitchen windows (W8 & W9) and one of the conservatory windows (W6) will receive reductions in VSC leaving them below 0.8 times their former value.
- 5.6. Both the kitchen and conservatory are served by multiple windows and, therefore, have other windows that provide daylight into the rooms. The further NSC assessment considers the contribution made by all windows together, by calculating the distribution of direct skylight (daylight) throughout both rooms. The results of the NSC assessment have shown that the daylight within both rooms will remain unchanged by the proposed development. Furthermore, each room will continue to receive direct skylight to at least 98% of the room area.

### Sunlight

- 5.7. The BRE guidance suggests that sunlight is most important in main living rooms and that kitchens and bedrooms are less important. Furthermore, only windows which face within 90 degrees of due south are relevant for consideration as part of an APSH assessment.
- 5.8. As such only the windows within the southern elevation of the house (W1 – W7) have been included. The results of this assessment have shown that both the kitchen and the conservatory will retain very good levels of sunlight, well in excess of the 25% annual and 5% winter targets suggested by the BRE guide.
- 5.9. The impact to both daylight and sunlight within this property is therefore considered acceptable and consistent with the BRE guidance.

## 1a Southernhay



### Daylight

- 5.10. The results of our VSC, NSC and ADF assessments show that the rooms and windows within this property will retain good levels of daylight well in excess of the BRE target criteria.

## Sunlight

- 5.11. The BRE guidance suggests that sunlight is most important in main living rooms and that kitchens and bedrooms are less important. Furthermore, only windows which face within 90 degrees of due south are relevant for consideration as part of an APSH assessment.
- 5.12. Only room R1 at ground floor (served by windows W1 & W2) within the front elevation of the property appears to be a living room. The results of this assessment have shown that this room will retain very good levels of sunlight following the development, well in excess of the 25% annual and 5% winter targets suggested by the BRE guide.
- 5.13. The impact to both daylight and sunlight within this property is well within the criteria of the BRE guidance.

## 5 Southernhay Avenue



- 5.14. This two-storey house is located to the east of the Site and directly abuts the eastern boundary. Most of its windows face south across Southernhay Avenue or north onto the rear garden, but there are three windows in the western elevation that will overlook the proposed development. Each of these windows is secondary or ancillary in nature, either serving a non-habitable space, or serving as a smaller secondary window.
- 5.15. Window W2 at ground serves a kitchen that is also lit by a patio door in the rear elevation. Window W3 at ground serves a hallway and window W2 at second floor appears to serve an attic room, also served by a rooflight. Only the kitchen and attic room are considered to be habitable rooms relevant for assessment.

### Daylight

- 5.16. The results of our VSC assessment have shown that the main patio window serving the kitchen, and the two windows serving the attic room, will each retain at least 0.8 times their former values, whilst the smaller secondary window serving the kitchen retains 0.5 times its former value.
- 5.17. The further NSC assessment, which considers the amount of daylight within each room and accounts for light from all windows together, shows that both of these rooms will continue to receive near 100% of the light they currently receive, and that there will be very little impact to daylight within these rooms.

### Sunlight

- 5.18. The BRE guidance suggests that sunlight is most important in main living rooms and that kitchens and bedrooms are less important. Furthermore, only windows which face within 90 degrees of due south are relevant for consideration as part of an APSH assessment.
- 5.19. The south facing living room windows within this property overlook Southernhay Avenue and will receive no impact from the proposed development.

## 6 Southernhay Avenue



- 5.20. This is a two-storey mid-terrace house, which adjoins No.5 Southernhay Avenue and is located to the east of the Site. Most of the windows within this property face either north or south and do not overlook the proposed development. We understand, however, that there is a conservatory to the rear of the property that will have some view of the Site and has therefore been considered within our assessment.

### Daylight

- 5.21. The windows in the roof of the conservatory are horizontal and face directly upwards. As such they are not relevant for VSC (Vertical Sky Component). The results of our NSC analysis have shown that this room will continue to receive skylight to 100% of its area and is therefore unaffected by the proposed development.

### Sunlight

- 5.22. The BRE guidance suggests that sunlight is most important in main living rooms and that kitchens and bedrooms are less important. Furthermore, only windows which face within 90 degrees of due south are relevant for consideration as part of an APSH assessment.
- 5.23. The south facing living room windows within this property overlook Southernhay Avenue and will receive no impact from the proposed development.



## 6. Sunlight Amenity Results

- 6.1. The BRE guidance suggests that the impact of new development upon neighbouring gardens should be assessed using the sunlight amenity test (as described in the guidance section above). This assessment determines the proportion of a garden that receives two or more hours of sunlight, throughout the whole day. This assessment has been undertaken both on 21<sup>st</sup> March (equinox) and 21<sup>st</sup> June (summer solstice) in order to demonstrate the sunlighting conditions with the Sun at it's mid-point and high-point. The results of this assessment are shown within appendix 3.

### March 21<sup>st</sup>

- 6.2. The results on March 21<sup>st</sup> show that, in the existing situation, the rear garden of 5 Southernhay Avenue does not see two or more hours of sun across any of its area. With the proposal in place this, clearly, would not be reduced any further. There will be no impact to this garden.
- 6.3. The assessment within the rear garden of 6 Southernhay shows that, currently, 0.7sq.m (3%) of the garden receives 2 or more hours of sunlight on 21<sup>st</sup> March. With the proposed development in place this area of sunlight is reduced to 0sq.m. Clearly this garden is very poorly sunlit on March 21<sup>st</sup> and is therefore unlikely to receive any direct sunlight through the winter, in either the current or proposed conditions.

### June 21<sup>st</sup>

- 6.4. A further assessment of sunlight conditions undertaken on the summer solstice (June 21<sup>st</sup>) has shown that both of these gardens will receive very good level of sunlight, above 50%, in both the current and proposed conditions, thereby complying with the BRE criteria.
- 6.5. The proposal therefore easily complies with the BRE criteria and as such can be considered compliant with Local Planning Policy.

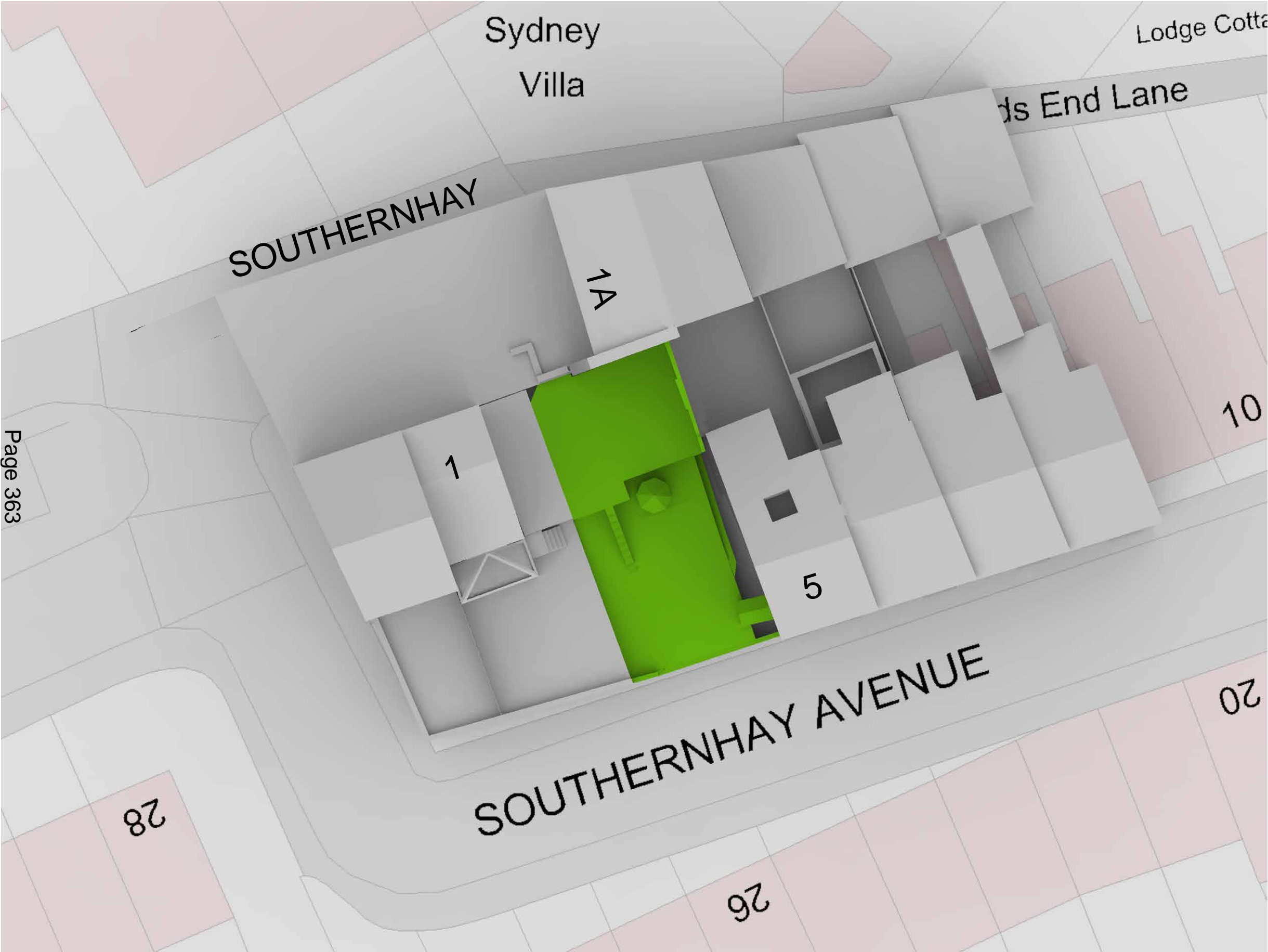
## 7. Conclusions

- 7.1. This report considers the impact caused, by the proposed new development at Southernhay, Clifton upon the daylight and sunlight currently received by the closest neighbouring properties. The assessment has been undertaken using the VSC, NSC and APSH tests set out within the BRE guidance 'Site layout planning for daylight and sunlight: a guide to good practice' (BRE, 2011) and the British Standard document BS8206 pt2.
- 7.2. The results of these tests have shown that, whilst there will be some reductions in daylight to individual windows, the amount of direct skylight received within each of the neighbouring habitable rooms will remain very high and in excess of the BRE criteria. The assessment of sunlight to neighbouring windows has also shown full compliance with the BRE criteria.
- 7.3. The assessment of sunlight amenity (overshadowing) within the rear gardens of 5 and 6 Southernhay Avenue has shown that both gardens currently receive very little sunlight on March 21<sup>st</sup>, with only a very small area (0.7sq.m) of the rear garden to 6 Southernhay Avenue receiving 2 hours of sunlight. The impact of the proposed development is therefore negligible.
- 7.4. A further assessment of sunlight on 21<sup>st</sup> June (Summer Solstice) shows that both gardens will receive 2 or more hours of sunlight, to more than 50% of their area, in both the current condition and with the proposed development in place.
- 7.5. The developments impact upon the neighbouring properties is therefore considered to be entirely consistent with the BRE guidance and relevant planning policy in terms of daylight and sunlight.



## Appendix 1

### **Drawings of the existing, proposed and surrounding buildings**



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Sources of information

CLIFTON SURVEYS Ltd  
3198-1 Cliftonwood Road.dwg  
Received 14/07/2016

LIGHTING TD  
southernhay-PlanningV3.skp  
Received 26/07/2016

EB7 Ltd  
Site Photographs  
Ordnance Survey

Project Southernhay, Clifton  
Bristol

Title Existing Condition  
Plan View

Drawn YH Checked IT

Date 27/07/2016 Rel no. 02

Drawing no. 2282-01



Sources of information

CLIFTON SURVEYS Ltd  
3198-1 Cliftonwood Road.dwg  
Received 14/07/2016

LIGHTING TD  
southernhay-PlanningV3.skp  
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EB7 Ltd  
Site Photographs  
Ordnance Survey

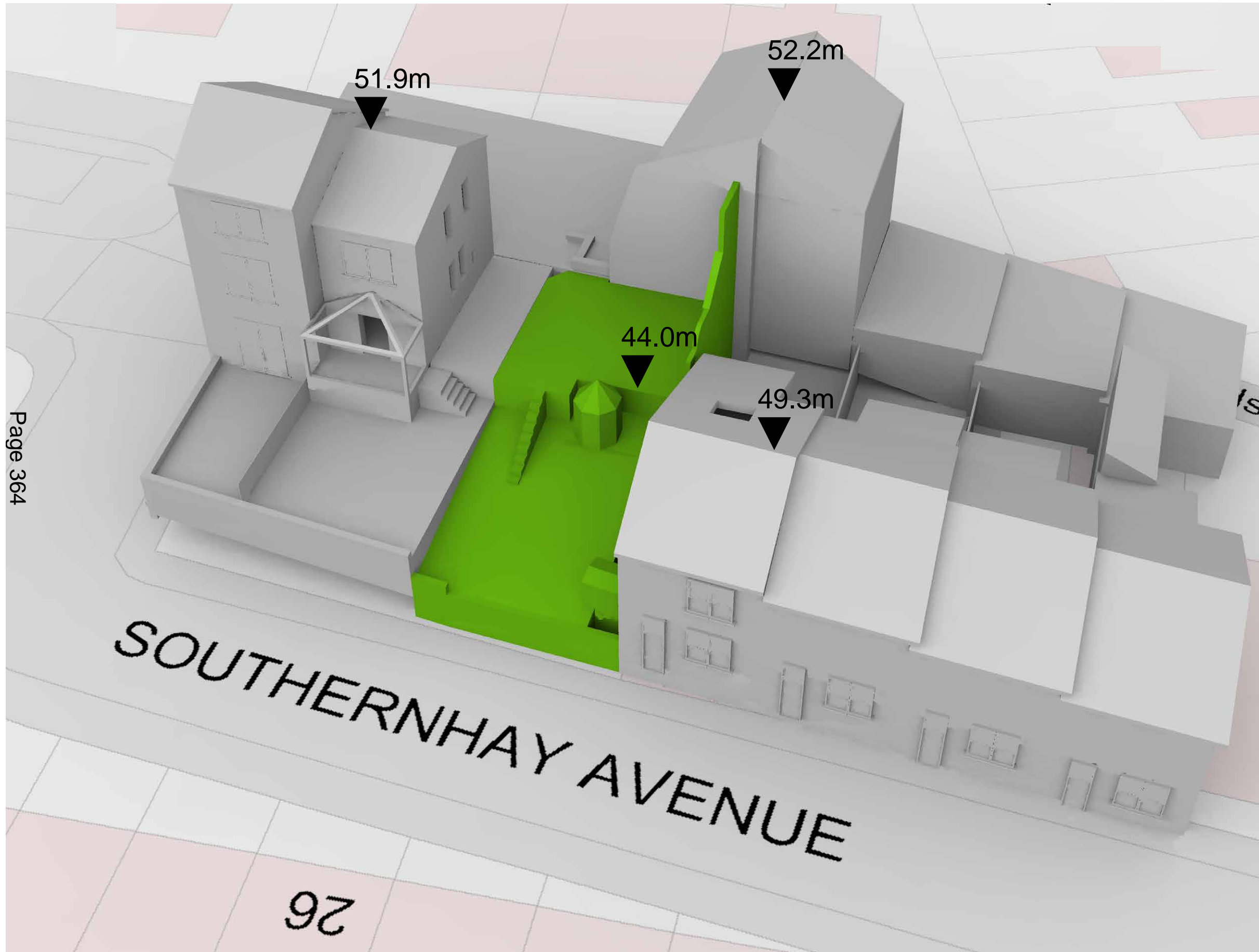
Project Southernhay, Clifton  
Bristol

Title Existing Condition  
3D View

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Date	27/07/2016	Rel no.	02
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Sources of information

CLIFTON SURVEYS Ltd  
3198-1 Cliftonwood Road.dwg  
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LIGHTING TD  
southernhay-PlanningV3.skp  
Received 26/07/2016

EB7 Ltd  
Site Photographs  
Ordnance Survey

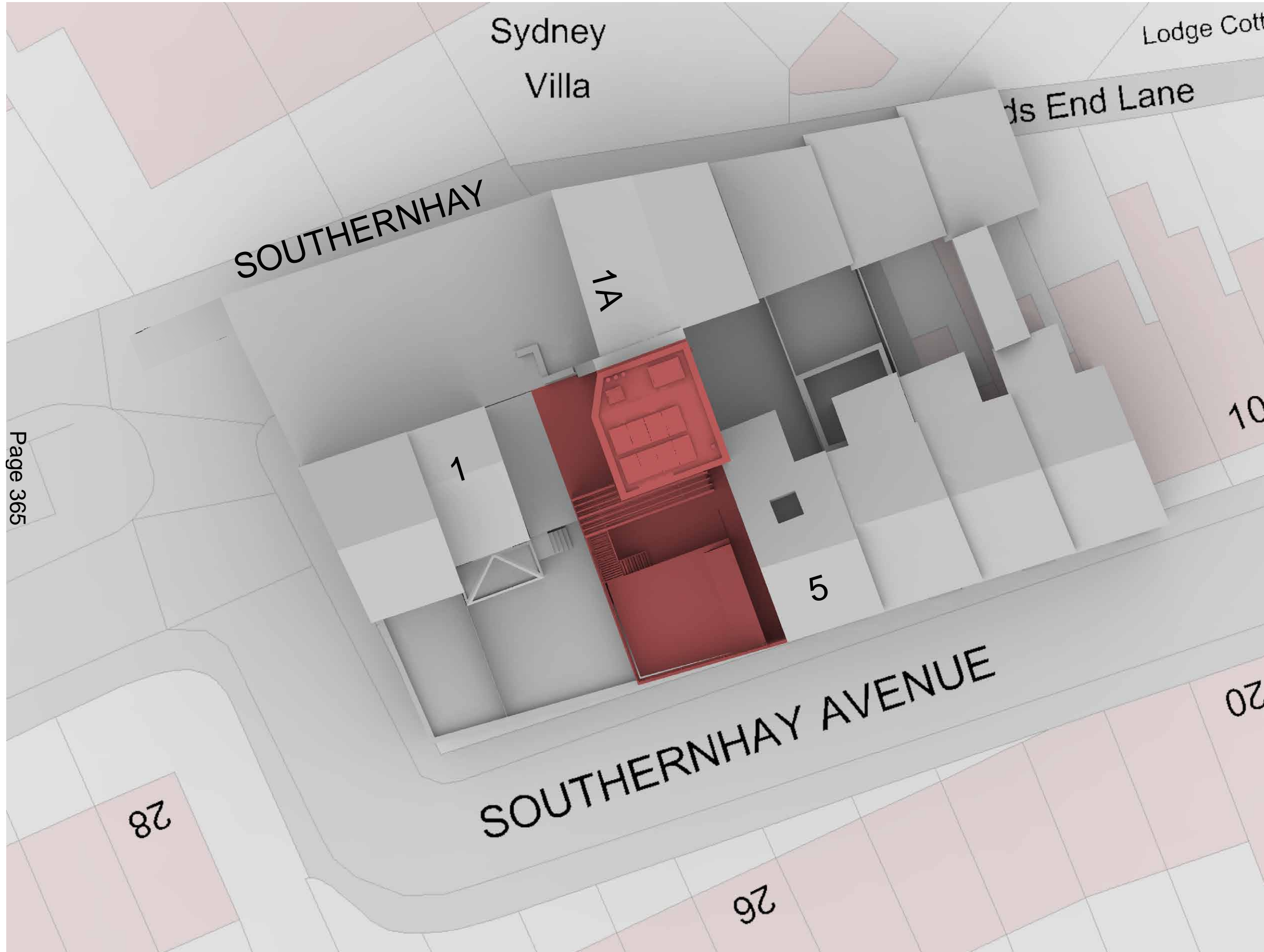
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Bristol

Title Proposed View  
Plan View

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Drawing no.	2282-03
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Sources of information

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EB7 Ltd  
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Ordnance Survey

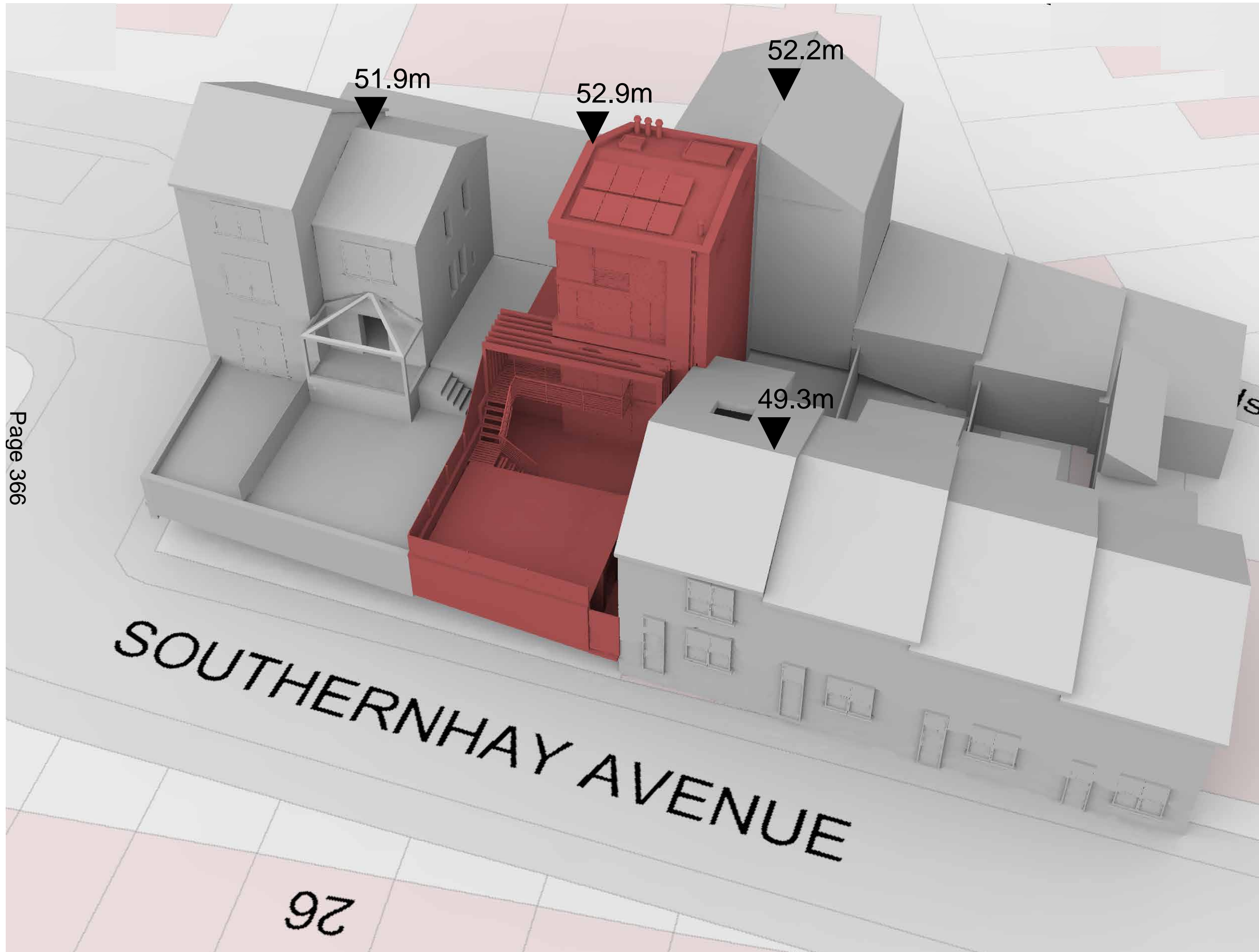
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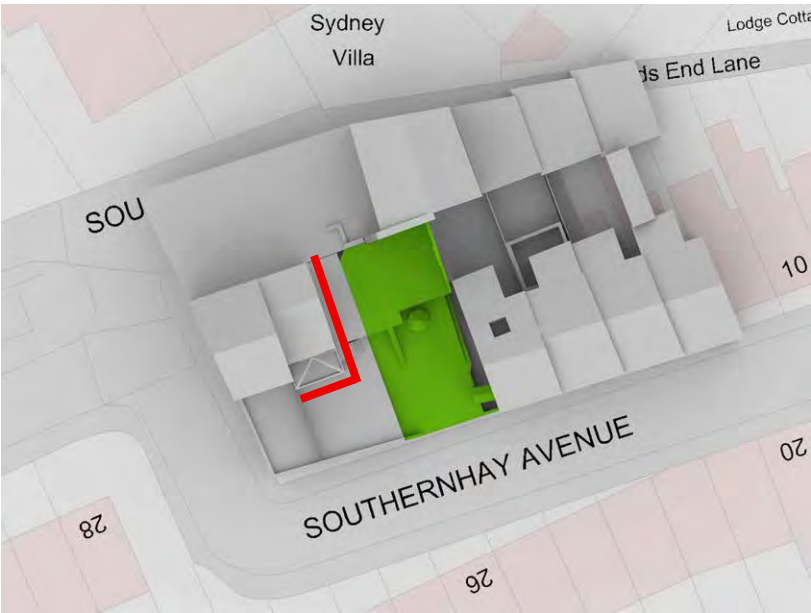
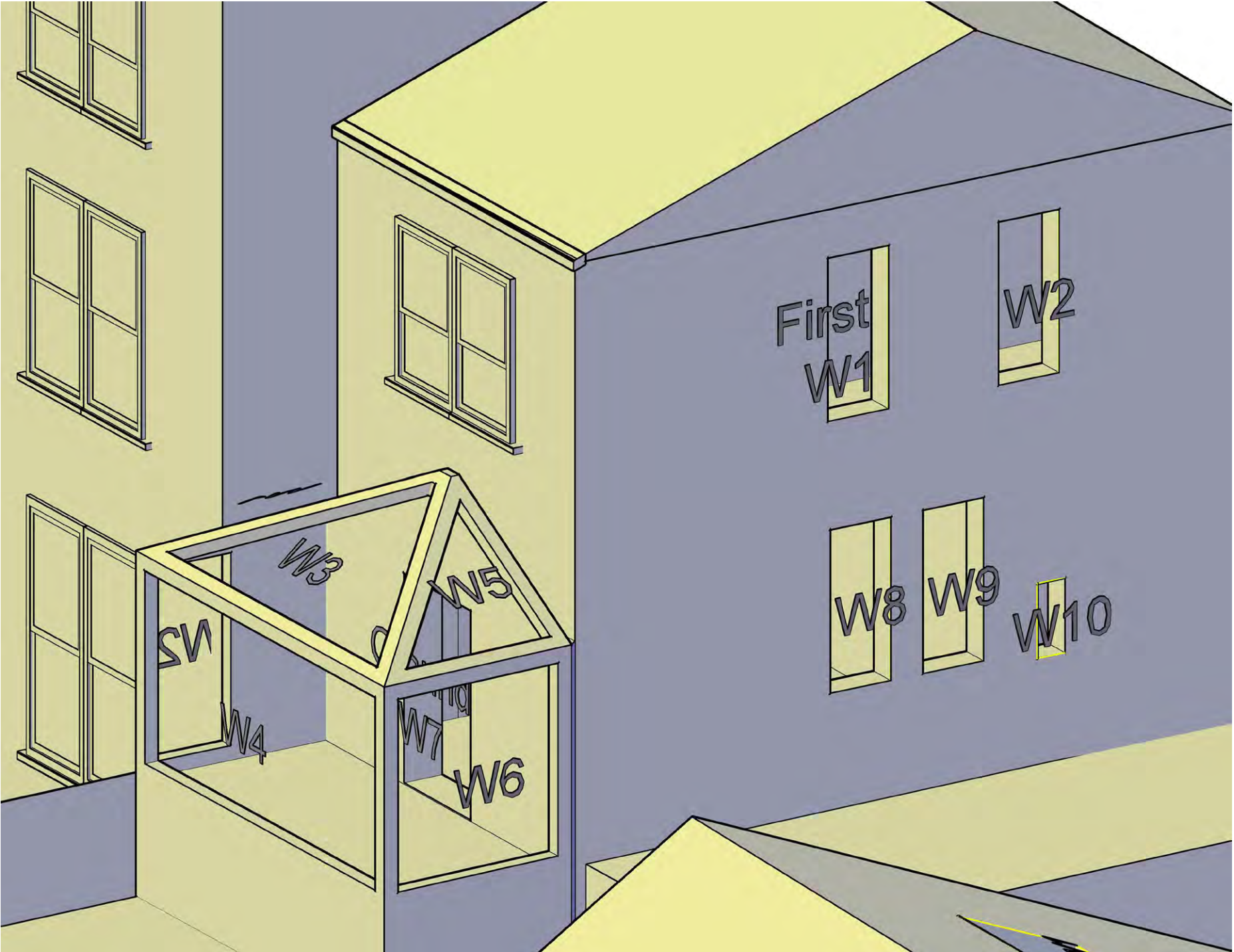
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Drawing no.	2282-04
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Sources of information

CLIFTON SURVEYS Ltd  
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Received 14/07/2016

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Bristol

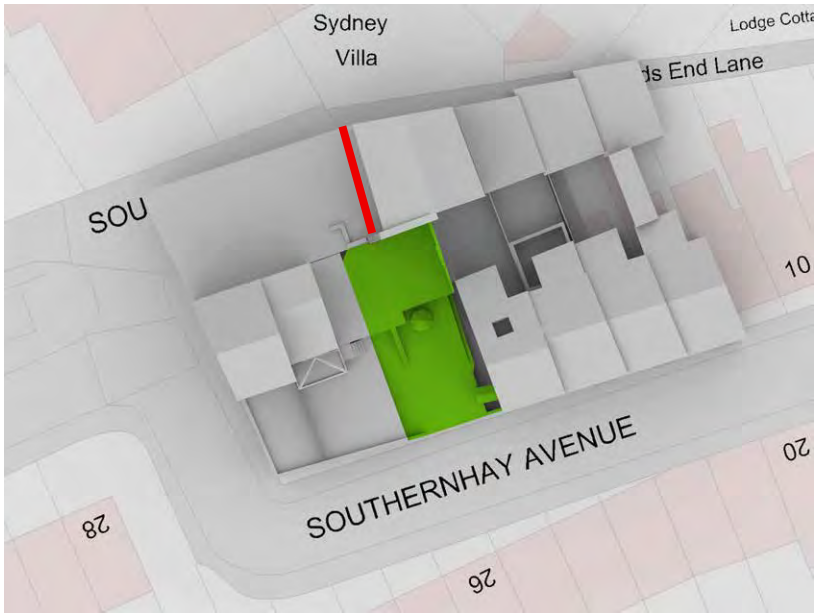
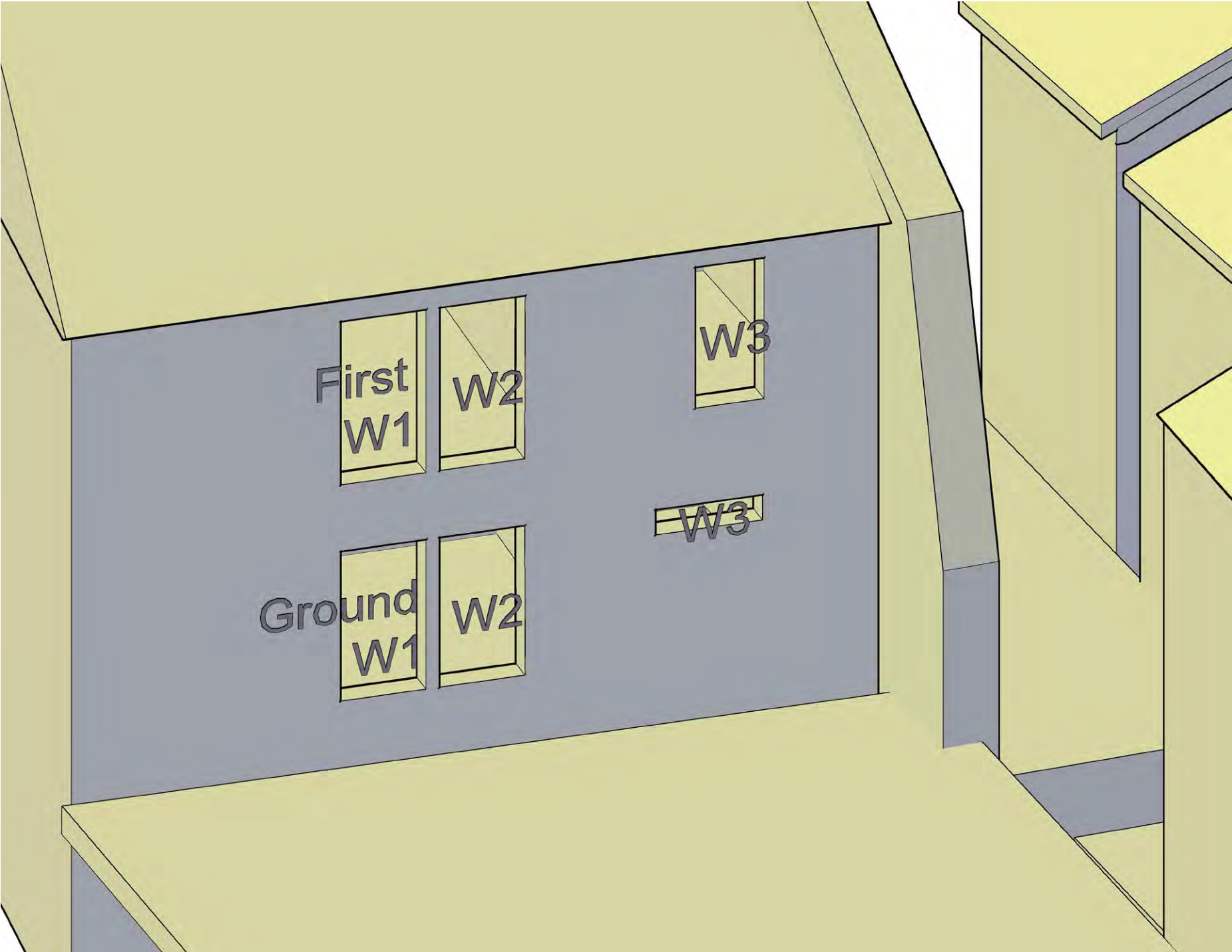
Title 1 Southernhay  
Window Map

Drawn YH Checked IT

Date 27/07/2016 Rel no. 02

Drawing no. 2282-WM01





Sources of information

CLIFTON SURVEYS Ltd  
3198-1 Cliftonwood Road.dwg  
Received 14/07/2016

LIGHTING TD  
southernhay-PlanningV3.skp  
Received 26/07/2016

EB7 Ltd  
Site Photographs  
Ordnance Survey

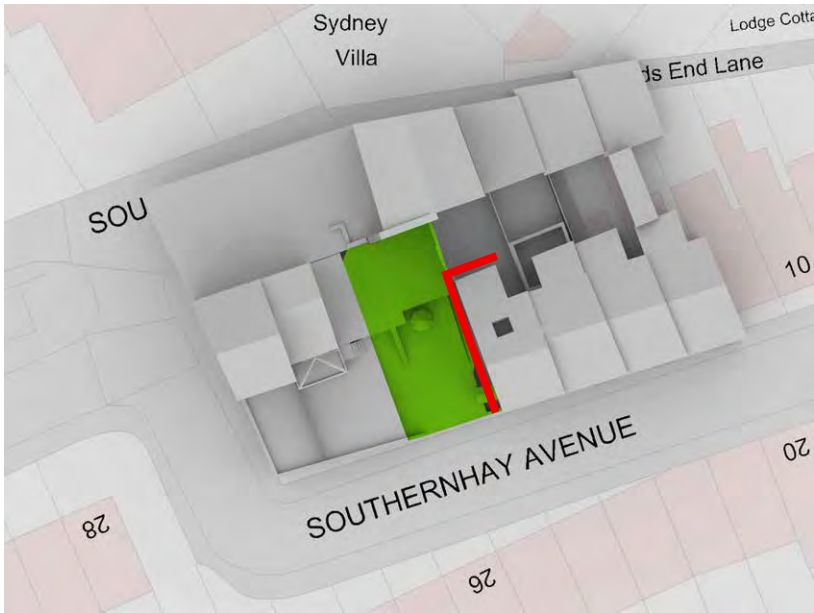
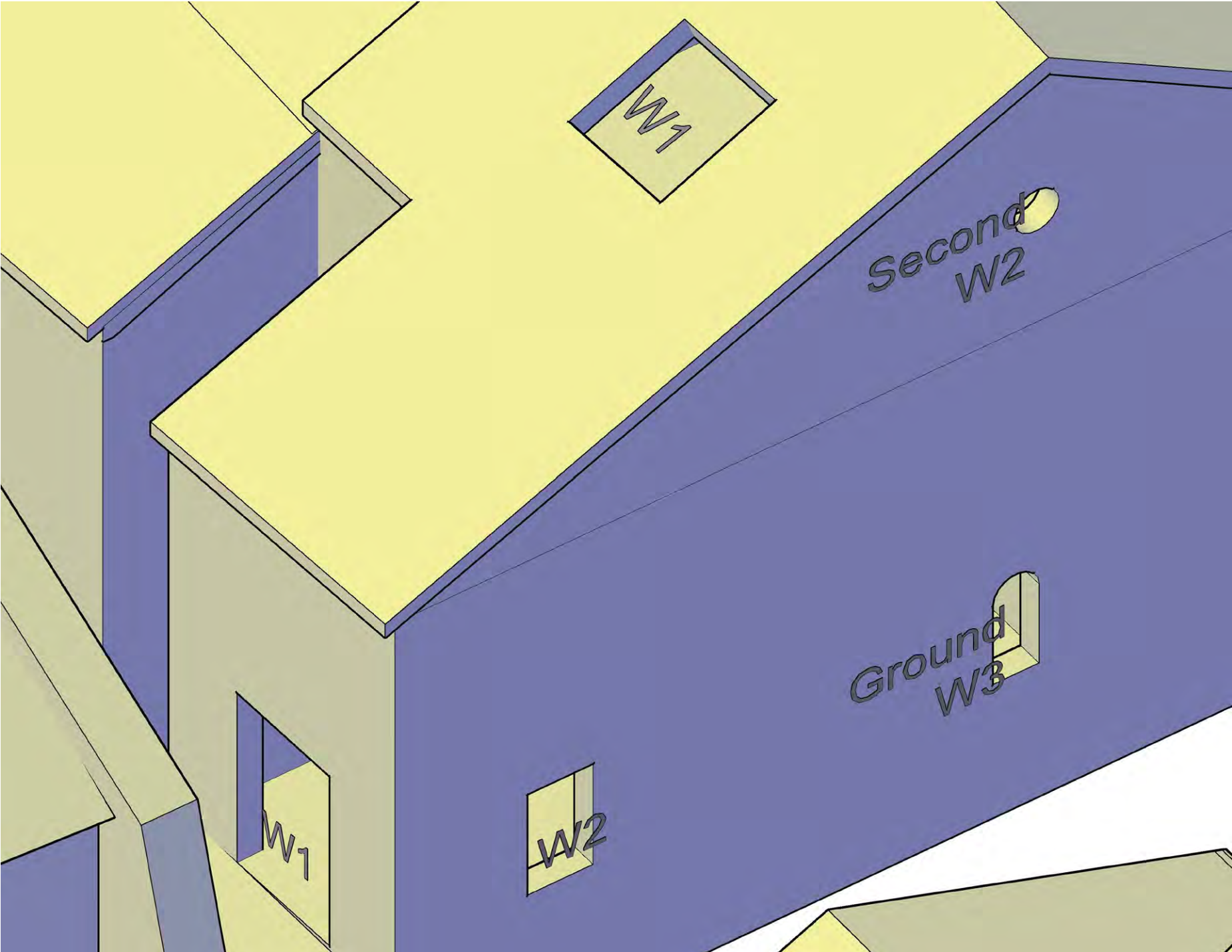
Project Southernhay, Clifton  
Bristol

Title 1A Southernhay  
Window Map

Drawn YH Checked IT

Date 27/07/2016 Rel no. 02

Drawing no. 2282-WM02



Sources of information

CLIFTON SURVEYS Ltd  
3198-1 Cliftonwood Road.dwg  
Received 14/07/2016

LIGHTING TD  
southernhay-PlanningV3.skp  
Received 26/07/2016

EB7 Ltd  
Site Photographs  
Ordnance Survey

Project Southernhay, Clifton  
Bristol

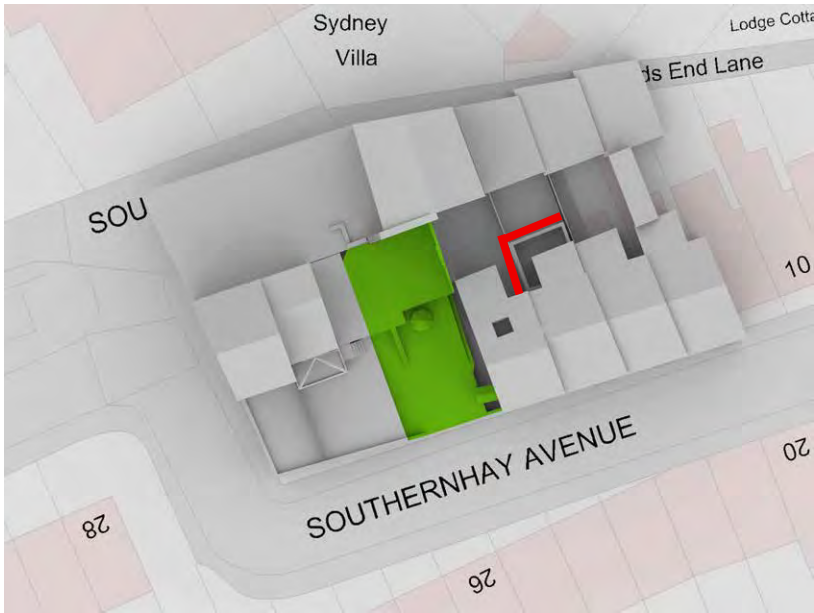
Title 5 Southernhay Ave  
Window Map

Drawn YH Checked IT

Date 27/07/2016 Rel no. 02

Drawing no. 2282-WM03





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Sources of information

CLIFTON SURVEYS Ltd  
3198-1 Cliftonwood Road.dwg  
Received 14/07/2016  
  
LIGHTING TD  
southernhay-PlanningV3.skp  
Received 26/07/2016

EB7 Ltd  
Site Photographs  
Ordnance Survey

Project Southernhay, Clifton  
Bristol

Title 6 Southernhay Ave  
Window Map

Drawn YH Checked IT

Date 27/07/2016 Rel no. 02

Drawing no. 2282-WM04



## Appendix 2

### Results of the daylight & sunlight assessments

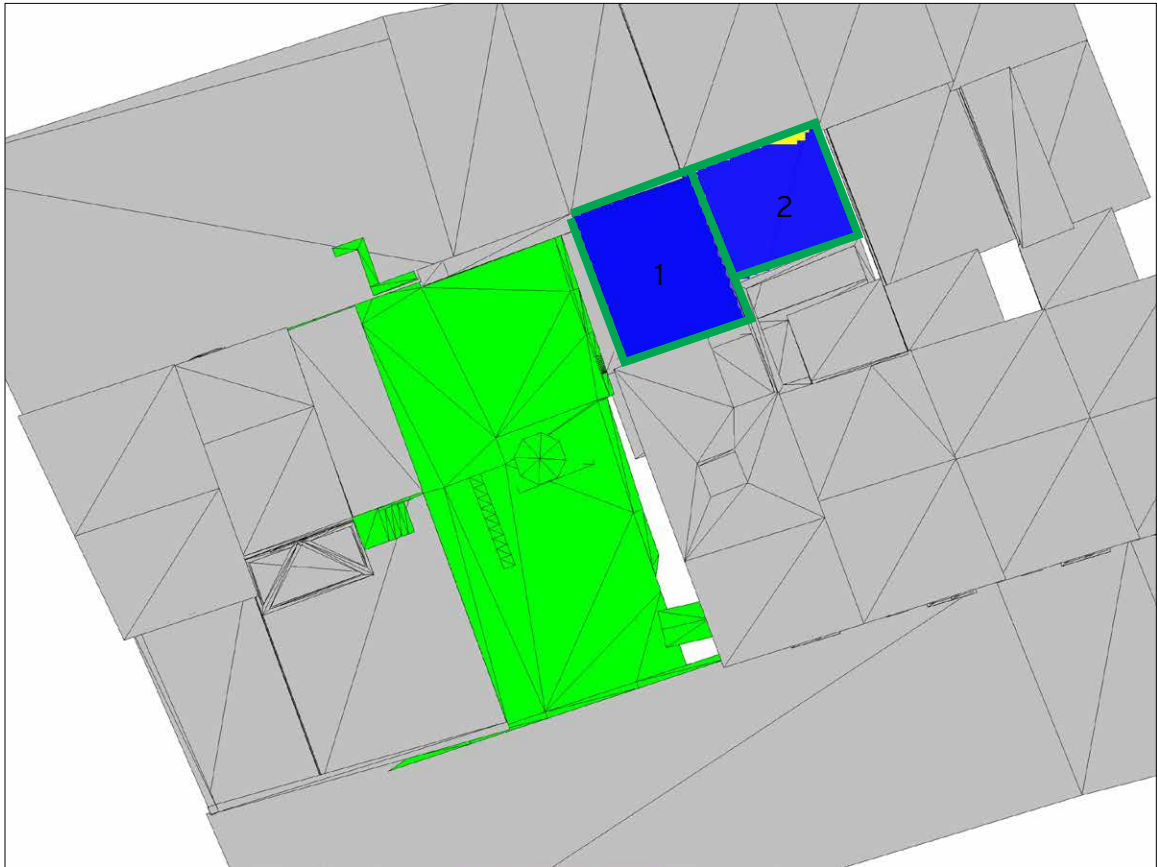


Address	Room	Window	Room Use	Existing VSC	Proposed VSC	Proportion Retained	Room Area	Existing NSC	Proposed NSC	Proportion Retained	Existing APSH		Proposed APSH		Total Retained	Winter Retained
											Total	Winter	Total	Winter		
2 Southernhay																
Ground	R1	W1	Conservatory	11.9	11.9	1.0	85.0	85.0	85.0	1.0	90	30	89	30	1.0	1.0
		W2-L		21.3	21.3	1.0										
		W2-U														
		W3		39.4	39.4	1.0										
		W4-L		39.2	39.2	1.0										
		W4-U														
		W5		31.4	25.1	0.8										
		W6-L		33.0	25.1	0.8										
W6-U																
Ground	R2	W7-L	Kitchen	29.3	29.3	1.0	195.5	191.4	191.4	1.0	66	20	64	20	1.0	1.0
		W7-U														
		W8		33.1	21.1	0.6										
		W9		32.4	20.4	0.6										
5 Southernhay Avenue																
Ground	R1	W1-L	Kitchen	11.8	10.7	0.9	131.8	89.0	89.0	1.0	41	17	37	16	0.9	0.9
		W1-U														
		W2-L		20.0	9.5	0.5										
		W2-U														
Second	R1	W1	Attic room	35.4	28.6	0.8	334.7	329.2	316.7	1.0	57	20	53	20	0.9	1.0
		W2		36.3	33.4	0.9										
6 Southernhay Avenue																
Ground	R1	W1	Conservatory	n/a	n/a	n/a	106.5	106.5	106.5	1.0	N/A	N/A	N/A	N/A	N/A	N/A
		W2		n/a	n/a	n/a										
1A Southernhay																
Ground	R1	W1-L	Living room	35.5	35.4	1.0	265.8	241.1	241.1	1.0	50	13	47	11	0.9	0.8
		W1-U														
		W2-L		34.7	34.6	1.0										
		W2-U														
First	R1	W1-L	Bedroom	37.0	36.9	1.0	238.2	225.3	225.3	1.0	51	16	51	16	1.0	1.0
		W1-U														
		W2-L		36.7	36.6	1.0										
		W2-U														

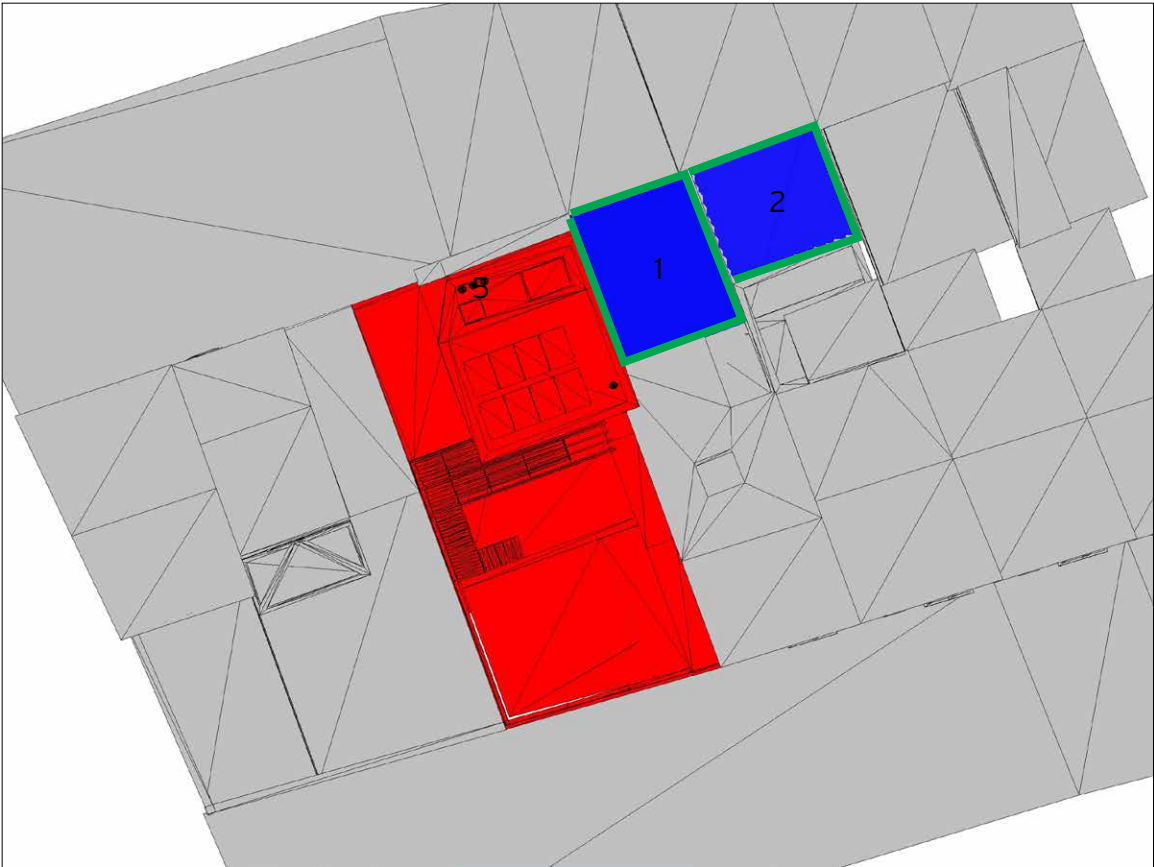


## Appendix 3

### Results of the sunlight amenity assessment



March 21st Sunlight Amenity study - E X I S T I N G



March 21st Sunlight Amenity study - P R O P O S E D

Page 374

Assessment Area	TotalArea (sq.m)	EXISTING		PROPOSED		RETAINED
		Area 2Hrs (sq.m)	Area 2Hrs (%)	Area 2Hrs (sq.m)	Area 2Hrs (%)	
1	29.8	0.0	0.1	0.0	0.0	1.0
2	23.4	0.7	3.0	0.0	0.0	0.0

Sources of information

CLIFTON SURVEYS Ltd  
3198-1 Cliftonwood Road.dwg  
Received 14/07/2016

LIGHTING TD  
southernhay-PlanningV1.skp  
Received 14/07/2016

EB7 Ltd

Site Photographs  
Ordnance Survey

Key:

Hours of sunlight on 21st March

Area of assessment

More than 2 hours of sunlight

Less than 2 hours of sunlight

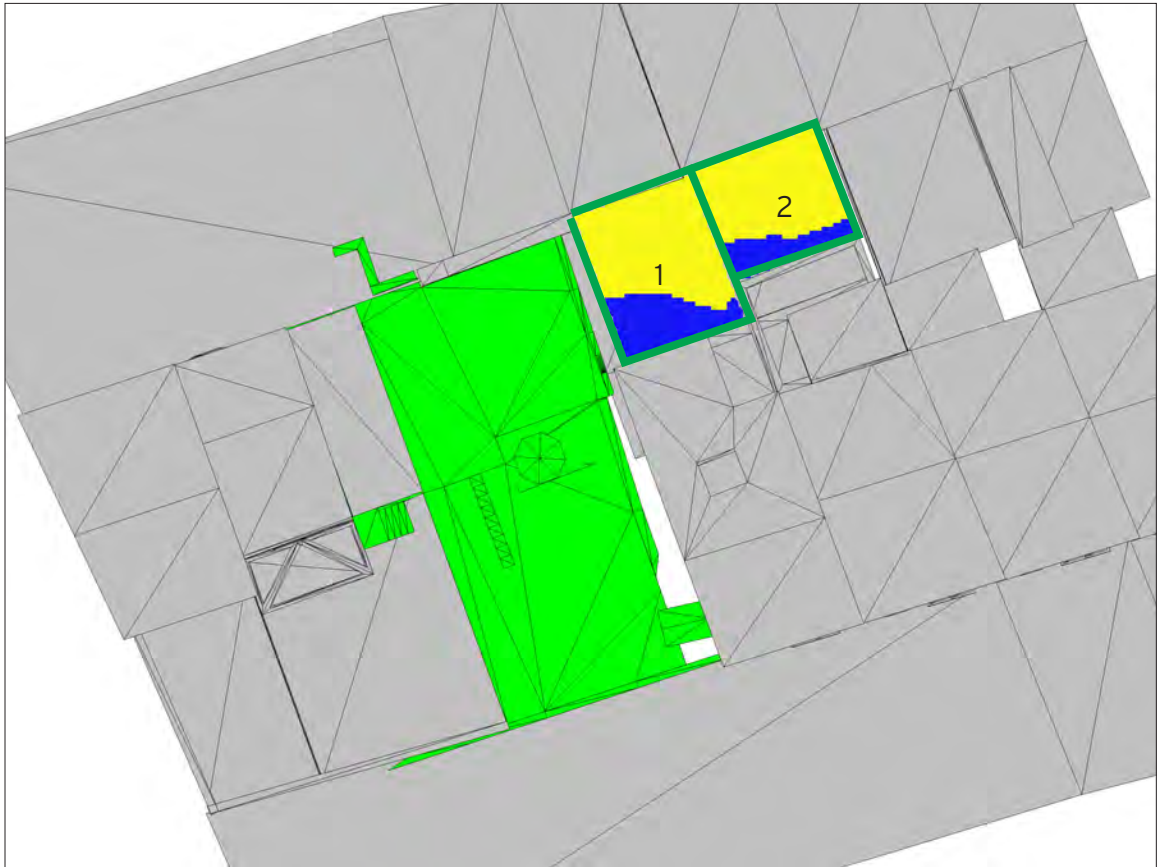
Project Southernhay, Clifton  
Bristol

Title March 21st Sunlight Amenity  
study

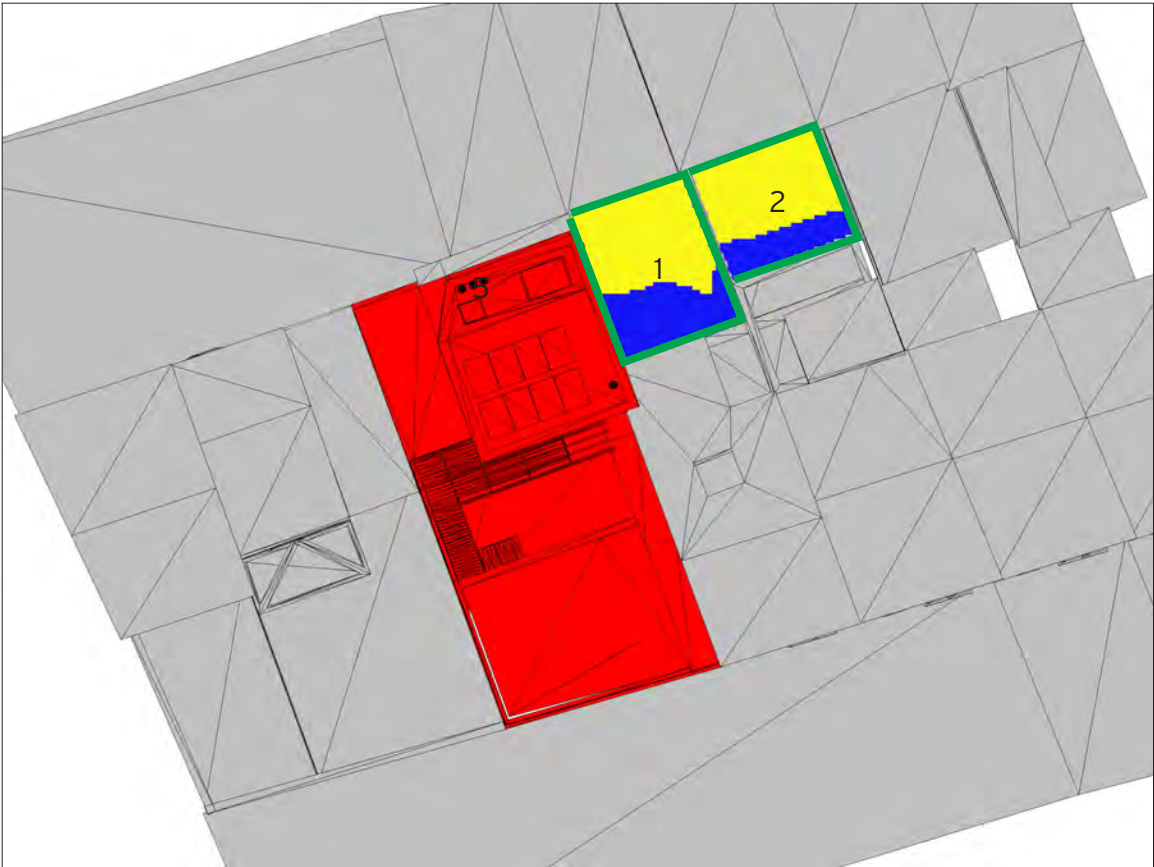
Drawn DB Checked IT

Date 29/07/2016 Rel no. SA02

Drawing no. 2282-SA01



June 21st Sunlight Amenity study - E X I S T I N G



June 21st Sunlight Amenity study - P R O P O S E D

Page 375

Assessment Area	TotalArea (sq.m)	EXISTING			PROPOSED		RETAINED
		Area 2Hrs (sq.m)	Area 2Hrs (%)		Area 2Hrs (sq.m)	Area 2Hrs (%)	
1	29.8	20.9	70.2		17.9	60.3	0.9
2	23.4	18.1	77.3		16.7	71.4	0.9

Sources of information

CLIFTON SURVEYS Ltd  
3198-1 Cliftonwood Road.dwg  
Received 14/07/2016

LIGHTING TD  
southernhay-PlanningV1.skp  
Received 14/07/2016

EB7 Ltd

Site Photographs  
Ordnance Survey

Key:

Hours of sunlight on 21st June

Area of assessment

More than 2 hours of sunlight

Less than 2 hours of sunlight

Project Southernhay, Clifton  
Bristol

Title June 21st Sunlight Amenity  
study

Drawn DB Checked IT

Date 29/07/2016 Rel no. SA03

Drawing no. 2282-SA02





Page 377































Page 387

























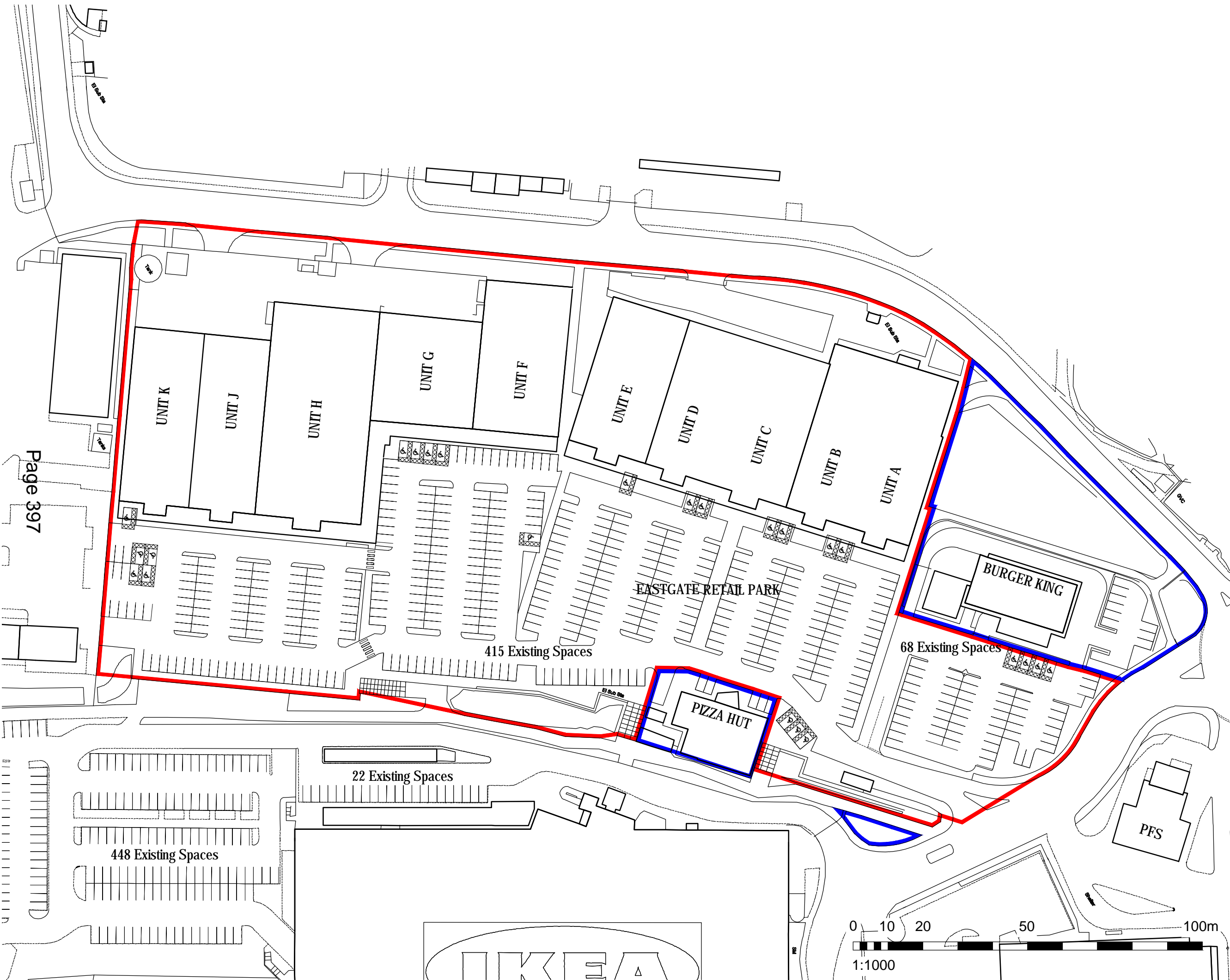




## **Supporting Documents**

### **4. Unit 4 Eastgate Centre, Eastgate Road**

1. Location plan
2. Applicant covering letter
3. Applicant latest comments
4. Retail advice to council
5. 2013 appeal decision



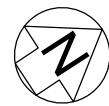
© WCEC ARCHITECTS - DISCLAIMER:

This drawing is copyright and shall not be reproduced nor used for any other purpose without the written permission of the Architects. This drawing must be read in conjunction with all other related drawings and documentation. It is the contractors responsibility to ensure full compliance with the Building Regulations. Do not scale from this drawing, use figured dimensions only. It is the contractors responsibility to check and verify all dimensions on site. Any discrepancies to be reported immediately.

IF IN DOUBT ASK.

Materials not in conformity with relevant British or European Standards/Codes of practice or materials known to be deleterious to health & safety must not be used or specified on this project.

XREF'S IN THIS DRAWING



Site Area  
8.19 Acres  
3.314 Ha

Site Area  
1.30 Acres  
0.527 Ha

A	23/02/15	Red line boundary and unit annotation amended.	DG/DC
No.	Date	Description	Drwn/Chkd By
CLIENT			

Consolidated  
Property  
Group

PROJECT

Bristol Eastgate  
Retail Park

TITLE

Site Location Plan

DRAWING STATUS			
For Comment			
DRAWN	AP	CHECKED	DG
SCALE	1:1000 @ A3		
DATE	January 2015		

**WCEC** architects

Chesterfield 01246 260261 London 020 3388 0019 Livingston 08700 555915  
email@wcec.co.uk www.wcec.co.uk

JOB NO.	DRAWING NO.	REV
14-114	SK_07	A

23 February 2016  
L160223 S73 Application Covering letter



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Manchester M2 4AW  
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**Submitted via Planning Portal Reference PP-04858375**

Dear Sir or Madam

**The Town and Country Planning Act 1990 (as amended)**  
**Units A/B, C/D, E, F, G, H, J and K, Eastgate Retail Park, Eastgate Centre, Eastgate Road, Bristol, BS5 6XX**  
**Planning Application for a Variation of Condition 6 of Planning Permission Reference 15/00907/X**  
**Application by CPG South East Ltd**

## **Introduction**

We write on behalf of CPG South East Limited to apply for planning permission for the above.

This application is submitted under Regulation 9 of The Town and Country Planning (Fees for Applications, Deemed Applications, Requests and Site Visits) (England) Regulations 2012 following the refusal of Planning Application Reference 15/04749/X for an identical proposal.

This application addresses is submitted with the intention of avoiding the requirement to appeal the earlier refusal.

## **Application Documents**

In accordance with the Town and Country Planning (Development Management Procedure) Order 2010 (as amended), the application comprises the following documents:

- This covering letter
- The completed application forms
- Plan Reference 14-114 SK\_07 Revision A – 'Site Location Plan'
- A Retail Planning Statement prepared by Savills

As the application has been submitted under Regulation 9 of The Town and Country Planning (Fees for Applications, Deemed Applications, Requests and Site Visits) (England) Regulations 2012, it is exempt from the requirement to provide a fee.

## **The Proposal**

The application proposes to vary Condition 6 of Planning Permission Reference 15/00907/X. Condition 6 is one of two conditions that controls the retail use of Units A/B, C/D, E, F, G, H, J and K at the retail park. Condition 5 permits the sale of food from Unit J and restricts it from any other unit unless the sale of food is ancillary. This planning application intends to leave that condition in place.

The existing Condition 5 states:

*'Unless otherwise agreed in writing by the Local Planning Authority the amount of floor space to be used for the retail sale of clothing, fashion accessories, sporting goods, books or stationery or any of them, shall not exceed 1,858 sqm in Units C/D and 3,473 sqm in the total combined floorspace of Units A, B, E, F, G, H, J and K.'*

The application seeks permission to remove the above condition. As can be seen from the condition, the majority of the floorspace at the Retail Park can already be used for the sale of all non-food retail goods, with the remainder, minor element of the floorspace, able to sell a significant number of non-food products. The restriction on the minor element of the floorspace only relates to five product categories.

Accordingly, the proposal will not alter the role and function of the Eastgate Centre. The Centre will remain an important retail destination in Bristol providing a full range of large format floorspace for national multiple retailers of food and non-food retail goods. The proposal represents a modest change to the planning controls to the Retail Park as a whole. In terms of its effect on land use considerations, the proposal is small-scale, and would have an almost discernible impact on the character of the retail park, its role and function and on overall shopping patterns.

In addition, and to ensure that the Local Planning Authority has complete control over the type of retail operation at the Retail Park, we suggest a new minimum unit size condition that will ensure that the minimum unit size of the Retail Park will be no less than 929 sq. m.

## **The Case for the Proposal**

### **Context**

Planning Application Reference 15/04749/X was refused under the following reason:

*'The submitted retail assessment fails to satisfy the requirements of the sequential test as set out in the National Planning Policy Framework (NPPF) and DM7 of the Bristol Local Plan, as there are sequentially preferable, suitable and available alternatives within Bristol City Centre. These existing sites could accommodate retail development that might otherwise locate within Eastgate retail park. In so doing, this proposal would lead to the loss of existing and potential retail investment, undermining the growth of the city centre contrary to the objectives of the National Planning Policy Framework, Bristol Core Strategy 2011 (Spatial visions and objectives) and the Bristol Central Area Plan 2015.'*

The Local Planning Authority has been unable to confirm what the sequential sites are. Accordingly, in the absence of this information, no evidence has been provided to support the reason for refusal. The applicant has worked proactively with the Local Planning Authority to ensure that sustainable development is delivered including requests for meeting to avoid the appeal. This application forms part of our continued efforts to meet and avoid an appeal which is unnecessary and avoidable in the light of the minor nature of the proposal. We suggest dates below for a meeting.

In the meantime, the enclosed documents and the information in this letter provide the evidence to address the reason for refusal, namely satisfying the sequential test.

In terms of the impact assessment, it has been confirmed by officers that the proposal will not have a significant adverse impact on Bristol City Centre.



## Satisfying the Sequential Test

Under the terms of the National Planning Policy Framework ('The Framework') and the National Planning Practice Guidance ('The Guidance') and confirmed by the Secretary of State and Supreme Court in appeal and Court decisions<sup>1</sup>, the assessment of alternative sites as part of the sequential test relates to whether:

1. An alternative site is suitable for the proposal?
2. The whole proposal and not an altered, disaggregated or reduced version of the proposal can be accommodated on an alternative site?
3. A suitable site is available now?

The term proposal can only refer to what is proposed. In summary this is:

1. An application to vary a retail condition that relates to all of the retail units at the Retail Park.
2. The application seeks permission to vary the condition and replace it with a new condition that will control all of the retail units.
3. For any permission granted to take effect from the day that it is granted, not at some point in time in the future.
4. The proposal relates to a retail park where eight conjoined retail units measuring a total of approximately 15,216 sq. m over ground and first floor level (configured as 9,914 sq. m at ground floor and 5,302 sq. m at mezzanine level).
5. Accordingly, the proposal delivers the above configured retail floorspace to be used for any non-food retail purpose in Use Class A1<sup>2</sup>. There is no other form of development that the proposal would deliver.

## Consideration of Alternative Sites

The alternative sites in Bristol City Centre can be categorised as:

- a. Vacant units
- b. Development Plan Sites

We take each in turn below:

### a. Vacant Units

The largest vacant units in Bristol City Centre are the former PC World unit at 26 Cabot Circus that provides 1,180 sq. m of floorspace and the former Peacocks unit at 60 The Horsefair. The unit measures approximately 630 sq. m at ground floor level and 590 sq. m at first floor level. The units are not suitable for the proposal as it would have to be:

- i. Altered and reduced to a form that no longer represents what it is that has been applied for; or
- ii. A disaggregated version of the proposal where individual retail units were disaggregated and analysis of their suitability to be accommodated at the site undertaken.

Accordingly, there are no available vacant units that are suitable for the proposal under the terms of The Framework and The Guidance.

<sup>1</sup> Further details provided at Paragraphs 1.18, 3.9 – 3.10 and Table 3.1 of the Retail Planning Statement, dated September 2015.

<sup>2</sup> With Unit J also permitted to be used for the sale of food.

## **b. Development Plan Sites**

There are two development plan sites in the City Centre that were identified as part of the previous appeal as being potentially capable of accommodating retail development. These are sites KS02 and KS03 identified in the Bristol Central Area Action Plan (AAP). The outlines of both sites are shown on the Goad plans included at Appendix 7 of the Retail Planning Statement.

The conclusions set out at Paragraphs 4.14 – 4.19 of the Retail Planning Statement apply to these sites, namely:

1. The sites are in existing retail use.
2. Any vacant units in the sites are small and not suitable for the proposal.
3. There are no development proposals for either site.
4. The sites are not available for the proposal now. Any development at KS02 or KS03 would not be delivered beyond the medium to long-term.

Accordingly, the sites cannot be considered to be available sites that are suitable for the proposal under the terms of The Framework and The Guidance as confirmed by the Secretary of State. The Secretary of State has confirmed as part of the Rushden Lakes decision that for the purpose of The Framework an available site must be available now and not at some point in time over a plan period (see cross reference to Paragraph 17 of the Secretary of State's decision and Paragraph 8.55 of the Inspector's Report above). Sites KS02 and KS03 are not available now and so are not suitable sites that are available for the proposal. There is no planning application for the redevelopment of either site, let alone an implementable planning permission. Both sites contain a number of existing operational uses. The sites are not available.

## **Overall Case for the Proposal**

The overall case for the proposal is:

1. It complies with relevant local and national policies assessing retail development.
2. The application is supported by evidence addressing the sequential test and impact assessment. Both tests are passed.
3. The proposal is a positive economic investment in Bristol that will contribute towards the Government's agenda to promote sustainable economic growth.
4. The proposal does not represent a material change to the permitted retail use of the Retail Park or the role and function of the wider Eastgate Centre.
5. The proposal is acceptable in all other regards. It accords with Policies DM1 and DM7 of the SADMP.

The proposal accords with the development plan and The Framework. Therefore, the application should be approved in accordance with Section 38(6) of the Planning and Compulsory Purchase Act 2004.

## Conclusion

Given the proposal accords with the relevant policies in the development plan, The Framework, The Guidance and the Secretary of State and Supreme Court's authority on the application of policies relating to retail proposals, the application should be approved.

We welcome the opportunity to discuss the application at a meeting to ascertain whether the application will be recommended for approval in the light of the above. The meeting will be beneficial as it will help all parties understand whether there is any common ground on the application proposal and if not, what areas need to be considered and the policy basis for this. With that in mind, we suggest the 15<sup>th</sup> or 17<sup>th</sup> March as suitable dates to meet and would be grateful if you could confirm whether you would be available to meet on these dates.

If you have any questions, please contact either Matthew Sobic or Lewis Wright.

Yours faithfully

A handwritten signature in dark ink, appearing to read "Savills", written in a cursive style.

**Savills (UK) Limited**  
Retail Planning

Enc.

cc. Sally Dawson – CPG South East Limited  
Stuart Dawson – CPG South East Limited

Angelo

Planning Application for the Variation of Condition No 6 for Planning Permission 15/00907/X

Application at Eastgate Retail Park, Eastgate Centre, Bristol

Application by CPG South East Limited

Application Reference 16/01193/X

## **Introduction**

Thank you for taking the time to run through the above with me yesterday. I found the discussions positive and very helpful and thought best to set out the key points discussed.

In particular, we discussed an alternative solution to the application whereby the two bulky goods retail units at the Eastgate Centre (Pets at Home and Halfords) were restricted and the restriction was removed from the remaining floorspace. This would reflect the current operator retail use line-up at the Eastgate Centre and I set out further details of this below, including the material considerations that weigh in favour of permission being granted. It follows that the alternative solution proposed would not result in an amendment to the shopping patterns at the Centre, or result in any demonstrable impacts on land use planning considerations.

Our view is that the current terms of the application (i.e. the removal of the existing retail use restriction) should be supported, but we consider that the alternative solution proposed is the best way forwards to address the issues that affect the operation of the Eastgate Centre. I'd therefore be hopeful that we'd be able to agree a way forwards on the basis of the alternative solution given the positive nature of our earlier discussions.

## **Consideration**

The Eastgate Centre is an important retail destination in Bristol. Although it's not a designated centre in the development plan, it plays an important role in the retail hierarchy providing floorspace that meets local food and non-food retail shopping needs. It is in a very accessible and sustainable location that is well-related to surrounding residential and commercial development in Bristol's urban area. The Eastgate Centre cannot be described as being in an isolated retail location within the City.



The retail characteristics of the Eastgate Centre is therefore one of a modern retail centre that meets the needs of existing residents in the City. The proposal represents on a modest change to the planning controls at the Eastgate Centre that would not alter its role or function given the retail offer of existing tenants (i.e. large format national multiple retailers selling largely unrestricted non-food retail goods, a large format food superstore and a furniture and furnishings warehouse).

Condition 6 of Planning Permission Reference 15/00907/X that provides retail use controls over the application site causes significant management and operational difficulties that aren't of any real benefit and perversely cause potential harm to the Eastgate Centre. The condition limits the overall amount of floorspace that can be used for the sale of certain goods. This means that individual retailers may inadvertently breach the planning condition without knowing, because of activities in units not in their control.

In terms of the existing retail operations and restrictions, we comment:

1. Units A/B, C/D, E, J and K provide floorspace for open A1 non-food retail operators (e.g. Mothercare, Asda Living, Boots, Next and Laura Ashley).
2. There are only two bulky goods retailers at the Retail Park – Pets at Home and Halford (Units F and G).
3. Units A/B, E, F, G, J and K are all subject to the same floorspace restriction (Unit C/D (Asda Living) is subject to a separate control).
4. That control permits 3,473 sq. m of floorspace to be used for the retail sale of clothing, fashion accessories, sporting goods, books or stationary.
5. If we take Pets at Home and Halfords (Unit F and G) out of the equation (as we are suggesting a bulky goods restriction for these retail units set out below), the total retail sales floorspace of Units A/B, E, J and K is 5,467 sq. m. These retail units are all occupied by 'open A1' non-food retailers.

6. Therefore, the question is what happens if the range of goods permitted under Condition 6 is sold from all of the sales area in Units A/B, E, J and K? The permission permits those goods to be sold and the retailers in those units are open A1 non-food retailers.

7. How, in those circumstances, will the retailers know if they are operating within the terms of the Condition 6, or who would be responsible for any breach of condition? The issue can easily arise during seasonal sales or even if a retailer re-balances their display stock. The answer is not helped by trying to identify the last retailer that may have caused the breach as the condition applies to all retailers.

8. The Landlord can't control that position as every individual tenant can lay claim to operating under the terms of its lease. Who would the Council therefore enforce against? Would it enforce against the Landlord who can't control the position or the tenants who all lay claim to operating under the terms of their leases?

9. Would the Council in these circumstance require the national multiple retailers of Units A/B, E, J and K to all cease trading as that would be the only way a continued breach could be prevented? In that circumstance the tenants would all be able to vacate their premises citing breach of lease by the Landlord (even though the Landlord had no control over the operation of the existing permission). This would result in loss of employment, wages and retail facilities and critically undermine the viability of the Eastgate Centre as a retail destination that meets retail needs in the City. How would the Landlord ever be able to attract new tenants to occupy the floorspace that had been vacated? No national multiple retailers' legal teams would ever endorse another their clients taking space at the Eastgate Centre in that scenario.

10. The above seems an unmanageable and undesirable position for all parties concerned, particularly where the retailers of those units are open A1 non-food retailers and the amendment sought by the application wouldn't alter the role or function of the existing Eastgate Centre.

We agreed that the operation of the Centre does not pose a harm to designated centres in the City including the City Centre. Bristol City Centre is the principal Centre in the South West and one of eight core cities in Bristol (further details of the strength of Bristol City Centre are provided in my letter of 14 July 2016). It follows that the application proposal is not of a scale that could have a material impact on the vitality and viability of Bristol City Centre or any potential planned investment within it given its strength as a vital and viable regional centre.

We have a differing view on the application of the sequential test and I understand that your advisor GVA has referenced the Exeter Secretary of State appeal decision that it has recently been involved in (Appeal Reference APP/Y1110/W/15/3005333). We also referenced this appeal in our letter of 14 July 2016 and I comment here that the two cases are not comparable. The Exeter appeal was dismissed on the basis that the bus and coach station site on the edge of Exeter City Centre was a sequentially preferable available and suitable site. The bus and coach station site is subject to an application for retail uses. The application case and the Exeter case aren't comparable. A bus and coach station site that can be readily developed is different to the Broadmead site which contains existing retail uses and is not yet subject to a planning application. To deliver the Broadmead scheme, existing agreements with operators will need amending, agreements to close shops (permanently or temporarily) will be required, floorspace will need to be reconfigured. The best guess estimate is that the scheme could be open by 2022, some six years from now. The Broadmead site cannot be considered to be an available site for the proposal.

That said, the key and important land use point we're agreed on is that given the strength of Bristol City Centre, the calibre of tenants it attracts, the large-scale potential plans of Hammerson for Broadmead and the small-scale nature of the application proposal it cannot harm any potential planned investment in the City. It follows that the proposal doesn't harm the operation of defined centre locations.

This position is further supported by the alternative proposal discussed and set out above where Units F and G would be restricted to the sale of bulky goods and Units A/B, C/D, E, J and K would be permitted to be operated by open A1 non-food retailers. A condition worded in this way, would reflect the current retail operation that occur at the Eastgate Centre. Accordingly, we propose the following condition that would reflect this operation and remove the unmanageable position that arises as a result of the current restrictions:

'The retail floorspace can be used for the sale of non-food retail goods within Use Class A1 of the Town and Country Planning (Use Classes) Order 1987 (as amended).

Unless sold ancillary or related to pets, bicycles and motor vehicles the retail sale of clothing, fashion accessories, sporting goods, books or stationary or any part of them is not permitted from Units F and G'

The National Planning Policy Framework outlines that planning should be a creative exercise that should seek solutions to approving applications. The above proposal would accord fully with that requirement. When considered in the round, the planning balance is that there are a number of positive material considerations for the proposal, namely:

1. The proposal will amend an existing restriction that is unmanageable and undesirable for all parties concerned and potentially causes harm to employment and economic growth in the City.
2. The proposed alternative solution restriction reflects the retail operators that operate from the Eastgate Centre.
3. The proposal is modest and will not alter the role and function of the Eastgate Centre.
4. The proposal will not harm the vitality and viability of existing centres or any existing or planned investment within centres.
5. The proposal will safeguard the Eastgate Centre as a destination that plays an important role in the retail hierarchy providing floorspace that meets local food and non-food retail shopping needs at an accessible and sustainable location. This accords with Paragraph 70 of the National Planning Policy Framework that require planning decisions to 'ensure established shops, facilities and services are able to develop and modernise in a way that is sustainable, and retained for the benefit of the community'.

The material considerations all weigh in favour of permission being granted. This is the fourth application made for this identical proposal in addition to two appeals. The risk of the existing restriction to our client is real and considerable, which provides the background to our continued pursuance of the proposal.

The alternative solution set out above presents a positive and constructive way forwards that doesn't raise any planning conflict with land use considerations as it would not alter the existing land use operation of the Eastgate Centre. I'd be hopeful we could agree a way forwards on this basis given our discussions yesterday. I would be grateful if you are able to contact me by return to confirm that you are able to agree to the alternative solution on the basis of the information included within this e-mail and our earlier discussions.

Many thanks

Matt



Our ref:

26<sup>th</sup> May 2016

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**BY E-MAIL**

Dear Angelo

## Variation of Condition 6, Planning Permission 15/00907/X, Eastgate Retail Park, Bristol

### Introduction

Further to your recent instructions, we have now completed our review of planning application 16/01193/X which proposes the variation of condition No.6 on planning permission 15/00907/X to allow the sale of an unrestricted range of comparison goods from Units A-K at Eastgate Retail Park.

This application is the latest in a line of identical proposals by CPG South East Ltd at Eastgate Retail Park, which have included two appeal dismissals (in 2013) and refusal of permission in 2015. GVA has advised Bristol City Council ('BCC') on all of these applications and our most recent advice on the proposed variations to condition No.6 are contained a letter dated 27<sup>th</sup> November 2015 (which is attached for ease of reference).

Apart from the plans and covering letter, the only piece of supporting material is a Retail Planning Statement, dated September 2015. This is the same document as submitted with the most recent application (15/04749/X) and our review of that document is contained in our 27<sup>th</sup> November 2015 advice letter.

Given that the application site lies in an out-of-centre location and is not allocated in the development plan, there is a need for BCC to consider whether the proposal complies with the salient national and local policy tests of 'impact' and 'the sequential test'. The applicant's covering letter concentrates upon the sequential test and brushes over the issues associated with the impact of the proposed development despite the observations and conclusions of the Inspector in relation to the second appeal in 2013.

This advice letter deals with both the sequential and impact tests in turn below.

## The Sequential Test

The covering letter with the latest application makes reference to reasons for refusing application 15/04749/X and notes that:

*"The Local Planning Authority has been unable to confirm what the sequential sites are"*

The covering letter goes on to suitability and availability of vacant premises in Bristol city centre and development plan allocations in the adopted Bristol Central Area Action Plan. However, it does so, the letter discusses how the sequential test should be approached and (A) repeats the contents of paragraph 4.5 of the September 2015 Retail Planning Statement and (B) outlines, in the applicant's view, what is being proposed.

In its attempt to define 'the proposal', the applicant places particular emphasis on condition No.6 relating to all of the units at the retail park, allowing for the sale of any non-food goods and, if granted, the permission applying the day it is granted and not at some point in time in the future. The effect of this definition is to suggest that the proposal, in the context of the sequential test, can only be considered as relating to the whole of the proposal floorspace in one single block. In addition, the covering letter also suggests that to consider the proposal in any other way would be to suggest disaggregation which is not part of the National Planning Practice Guidance.

However, this is, in our opinion, a repeat of the applicant's arguments used at the appeals in 2013 and also within the 2015 application. Our November 2015 advice letter (attached) outlines the approach which was taken by the Inspector in 2013/14 and confirms that the correct approach is to recognise that 'the proposal' will allow different retail units to become available to retailers selling the wider range of goods sought over a period of time. In this regard, it is different from a proposal for a new retail park or store.

As a consequence, we can see no reason for the Council to depart from its previous position which it adopted for the appeals in 2013 and in its reason for refusal for the previous application in 2015.

In relation to the sequentially preferable alternative sites within Bristol city centre, the applicant complains that the Council has not been clear over the identity of these sites. The applicant has therefore examined vacant units in the city centre and also the two allocations in the city centre AAP. Before we go on to consider the specific details of these sites, it should be noted from the outset that the applicant's assessment proceeds on the basis that the alternative sites must be able to accommodate the whole of the retail park. As outlined above, this approach is not, in our opinion, the correct one and therefore the applicant's latest analysis should not be given any weight.

In relation to the specifics of the alternative sites, page 3 of the covering letter refers to two large vacant units: the former PC World unit in Cabot Circus of 1,180sq m and the former Peacocks store on the Horsefair of circa 1,200sq m. Both of these units are larger than the smallest units at Eastgate Retail Park and the availability of such units was sufficient for the previous Inspector to conclude that the sequential test had not been passed.

In relation to the potential redevelopment sites / AAP allocations, apart from the assumption that they must be able to accommodate the whole of the retail park, the applicant has suggested that they can (A) only be delivered in the medium to longer term and (B) they are not available now so cannot be considered to be genuinely 'available' and (C) there must be planning permission(s) in place in order to classify them as being 'available'.

In relation to the applicant's analysis, we do not consider that the existence of a planning permission is a pre-requisite of availability. In addition, the suggestion that these sites, particularly the Horsefair/Callowhill Court allocation, are medium to long term opportunities only appears to be based on the conclusions of the Inspector in 2013/14. Since that time, the city centre AAP has been adopted and it is clear that matters regarding the redevelopment of the Horsefair/Callowhill Court area are advancing. In their representations to the current application to extend The Mall at Cribbs Causeway, The Bristol Alliance (who own Cabot Circus and are promoting the redevelopment of the

Horsefair/Callowhill Court area) make it clear that they are now in pre-application discussions with BCC regarding the redevelopment for new retail floorspace and set out a timetable for bringing this development forward.

It is this information which we consider BCC should place weight upon as it shows how Bristol Alliance is making the Horsefair/Callowhill Court area available for retail development and how a key investment project in Bristol city centre is progressing. This supersedes part of the information that was available to the Inspector at the second appeal in 2013/14 and reinforces the Horsefair/Callowhill Court area as a suitable and available sequentially preferable site for comparison goods retailers who could be attracted to Eastgate Retail Park should this application succeed.

## Impact

Whilst the applicant's covering letter is correct to note that the Inspector at the second appeal in 2013 did not conclude that the previous (identical) proposal would have a significant adverse impact upon the vitality and viability of Bristol city centre, we nevertheless indicated that there would be "*adverse effects*". Whilst such a conclusion does not suggest that the provisions of paragraph 27 of the NPPF apply, this is still a negative impact of the proposal to be weighed in the overall planning balance when BCC reaches its final view on this application.

However, given that the Horsefair/Callowhill Court proposals are now progressing, and given that the effect of the proposed variation of condition would allow high street style retailers to occupy Eastgate Retail Park rather than the city centre site, we consider that there is now more of a concern over the scale of impact on city centre investment. This should be taken into account by BCC when it reaches a conclusion the effects of the proposed development.

In addition, it should be noted that the current proposal to extend The Mall at Cribbs Causeway has the potential to have a further cumulative impact on the health of the city centre. Whilst this remains an undetermined application at this stage, an approval for The Mall extension, when combined with the Eastgate Retail Park proposal, would increase the cumulative impact on the health of, and investment within, Bristol city centre.

## Conclusions

Overall, and having considered the latest information submitted in support of this proposal, we see no reason for BCC to change its position in relation to the sequential test. In particular, we consider that the applicant's approach to the sequential test is incorrect and, when properly considered, there are suitable and available sites within Bristol city centre to accommodate what is actually being proposed in this application. In addition, there remains a likelihood of a clear adverse impact upon the health of, and investment within, the city centre which could now be larger due to the progress being made on the Horsefair/Callowhill Court redevelopment area.

I trust that the contents of this letter are sufficient for your current requirements. However, if you have any queries, or require additional information, then please do not hesitate to contact me.

Yours sincerely



**M S Morris BSc(Hons) DipTP MRTPI**  
**Director – Planning, Development & Regeneration**  
**For and on behalf of GVA Grimley Ltd**

enc

Our ref:



27<sup>th</sup> November 2015

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BY E-MAIL

Dear Angelo

## Variation of Condition 6, Planning Permission 15/00907/X, Eastgate Retail Park, Bristol

Further to your recent instructions, I have now completed my review of the information that has been submitted in support of the above planning application at Eastgate Retail Park in Bristol.

As you know, this current application proposed to vary the terms of Condition No.6 of planning permission 15/00907/X. This condition restricts the sale of clothing, fashion accessories, sporting goods, books or stationery to 1,858sq m within Units C & D and to 3,473sq m in the combined floorspace of Units A, B, E, F, G, H, J and K. The applicant proposes that this condition is replaced with a control which allows all types of non-food goods to be sold from the entirety of the retail park<sup>1</sup>.

This application takes the same form as two previous applications<sup>2</sup> which were both subject to appeals and heard at the same public inquiry in October 2013. The appeals were dismissed primarily on the basis of a conflict with the sequential test although the Inspector also noted that the appeal proposals would have adverse effects on Bristol city centre.

In support of the current application, the applicant claims that "since the appeal was determined, there have been material changes in circumstance that supports approving a planning application for the proposal". These changes are given as:

- o The decision of the Secretary of State for Communities and Local Government ('SSCLG') in relation to the Rushden Lakes planning application; and
- o The removal of the 2009 Practice Guidance, published by DCLG, on need, impact and the sequential test.

The applicant suggests that the effect of the Rushden Lakes decision and the removal of the Practice Guidance is:

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<sup>1</sup> i.e. Units A, B, C, D, E, F, G, H, J and K – excluding the existing Burger King and Pizza Hut units.  
<sup>2</sup> 12/00254/X and 12/05316/X



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- That the sequential test relates entirely to what is proposed by the application;
- The question is whether an alternative site is suitable for the proposed development, not whether the proposed development could be altered or reduced to make it fit on an alternative site.

The applicant also makes reference to the Dundee Supreme Court decision, including the meaning of the term 'suitable' in the context of the sequential test. However, this is not a new material consideration as it was available at the time of the previous appeals at Eastgate Retail Park.

The applicant then goes to claim that these material changes in circumstance address in full the reasons for dismissing the previous appeals because:

- The sites in the development plan for the city centre are not available now, which the applicant considers relevant in light of the Rushden Lakes decision;
- In any event, the city centre sites are not suitable as they cannot accommodate the whole of Eastgate Retail Park; and
- There is now no requirement for disaggregation following the cancellation of the Practice Guidance.

Based upon the information and arguments I turn to consider whether there has in fact been any material changes in circumstances in relation to the sequential test and other material matters since the previous public inquiry in October 2013 and the Inspector's decision letter dated January 2014.

### **Sequential Test**

In short, the applicant's case in relation to the alleged changes in circumstances are the effect of the Rushden Lakes decision and the cancellation of the 2009 Practice Guidance, the latter of which was in force at the time of the previous inquiry.

The applicant claims that Rushden Lakes is important because of the comments of the Inspector in relation to the 'availability' of alternative sites and also references to disaggregation. In relation to 'availability' it appears to be suggested by the applicant that the decision changes or clarifies national policy as to what this term can mean. However, a Secretary of State decision cannot change policy in the NPPF and in any event this is not the only post-NPPF decision from the Secretary of State which deals with the issue of 'availability'. One other relevant decision is Bath Press, in Bath, which was published in December 2013. This decision indicates that a site which could become available by 2020 (i.e. 7 years after the Bath Press inquiry/decision) could be classified as an available site. It will be noted that the Bath Press decision was released at a time when the 2009 Practice Guidance was still in force, although the change from the Practice Guidance to the NPPG cannot change NPPF policy on the sequential test.

Therefore, I cannot see how there has been a material change in how the decision-maker should approach the issue of the 'availability' of alternative sites. There has been no change in national policy on this issue since October 2013 and the publication of the NPPG has not sought to change guidance on this issue. Therefore, I consider that it is still appropriate to consider sites and premises which are either available now or within a reasonable period of time in the future.

On these issues, it will be noted that:

- There are current vacant retail units in the city centre which are of a similar size to some the existing size of units at Eastgate Retail Park. Given that, as will be outlined below, the relevant exercise in this instance is to find sites and premises which can accommodate individual retailers as and when units become available at the application site, there are suitable alternative vacant premises in the city centre.

- o It is reasonable to examine sites which could come forward in the future and this includes allocations in the Bristol Central Area Plan. This plan shows areas which are allocated for retail development and, given their location and role, it is likely that they will be available to accommodate the sorts of retailers who could also occupy unrestricted retail units at the application site. At the time of making this decision, the Inspector placed reduced weight on the contents of the Central Area Plan, due to the stage of preparation. However, the plan has now been adopted and thus carries considerably more weight. Indeed, the adopted plan continues to include the proposed allocations which were before the Inspector in October 2013 and I would highlight his comments at the end of paragraph 47 of the decision letter which noted that leases at the Retail Park would not be renewed until after 5 years which could make the city centre allocations sequentially preferable.

Turning to the issue of disaggregation, the applicant suggests that the comments of the Rushden Lakes Inspector make a turning point for this issue and confirm that it is now not a requirement of the sequential test. Whether or not this is the case, and there has certainly not been a change in the NPPF in this regard, I don't consider it a particularly salient issue for the current application at Eastgate Retail Park. Indeed, it is also related to the applicant's keenness to highlight the Dundee judgement and the meaning of 'suitability'. In particular, the applicant suggests that, in light of the Rushden Lakes decision, that a different approach must now be taken to the relaxation of controls at Eastgate Retail Park. However, the Inspector didn't mention disaggregation and instead approached the sequential test in the same way as the City Council which was to acknowledge that individual units at the retail park would become available separately and over time. Thus, the proposal was to allow the opportunity for numerous separate changes in the future and therefore it was correct to consider the availability of sites and premises on that basis. The conclusions and recommendations of the Rushden Lakes Inspector do not effect this valid approach as the Rushden Lakes development was for a new retail park and was not to introduce changes to an existing retail park.

As a consequence of the above, I do not consider that there have been any material changes in circumstance in relation to the proposals at Eastgate Retail Park and their relationship with national or local planning policy. As a consequence, I would recommend to the Council that it continues to conclude that the proposal is contrary to paragraph 24 of the NPPF.

### **Other Matters**

I has also considered whether there are any other material considerations which are relevant to this application:

- o Impact on the city centre. The applicant has not provided any additional information on this issue and I consider that the conclusions of the Inspector remain relevant on this issue, namely that there will be an adverse effect of the proposal on the health of the city centre. This impact may not be significantly adverse in its own right, but is nevertheless a material factor to be considered in the overall planning balance.
- o The applicant has also repeated its view that the existing condition is not practical. This issue was debated at length at the inquiry in October 2013 and was ultimately not given any particular weight by the Inspector. No new information has been provided and I therefore I recommend that the Council continues with its position that the conditions meets the tests in Circular 11/95.
- o The applicant considers that the removal of the condition will secure the long-term viability of the retail park and raises concerns over the impact of other new retail developments such as the impact of the extension of The Mall at Cribbs Causeway. In my view, this is not relevant consideration as the retail park is not afforded any planning policy protection in the development plan. In any event, if the wider trading impacts of proposals at The Mall are relevant it is to increase the adverse impact upon Bristol city centre and which could thus become more of a concern for the Council.

## Conclusions

Overall, and having considered the information and arguments put forward by the applicant, I do not agree that there has been a material change in circumstances in relation to Eastgate Retail Park and national planning policy which should prompt the City Council to change its view on the relationship of the relaxation of planning controls at the retail park with the sequential test. In particular, I would recommend that the Council continues to conclude that there are suitable and available sites and premises in the city centre which can accommodate the proposal and therefore it is contrary to paragraph 24 of the NPPF.

I trust that the contents of this letter are sufficient for your current purposes. However, if you have any queries, or require additional information, then please do not hesitate to contact me.

Yours sincerely



**M S Morris BSc(Hons) DipTP MRTPI**  
**Director – Planning, Development & Regeneration**  
**For and on behalf of GVA Grimley Ltd**

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## Appeal Decisions

Inquiry held on 16 and 17 October 2013

Site visits made on 15 and 18 October 2013

**by M Middleton BA(Econ) Dip TP Dip Mgmt MRTPI**

**an Inspector appointed by the Secretary of State for Communities and Local Government**

**Decision date: 17 January 2014**

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### **Appeal Ref: APP/Z0116/A/12/2184068**

#### **Eastgate Retail Park, Eastgate Road, Bristol, BS5 6XX**

- The appeal is made under section 78 of the Town and Country Planning Act 1990 against a failure to give notice within the prescribed period of a decision on an application for planning permission under section 73 of the Town and Country Planning Act 1990 for the development of land without complying with a condition subject to which a previous planning permission was granted.
  - The appeal is made by CPG South East Limited against the decision of Bristol City Council.
  - The application Ref 121/00254/X is dated 24 January 2012.
  - The application sought planning permission for the insertion of additional mezzanine floorspace into combined Units C/D and alterations to the front of Units C/D without complying with a condition attached to planning permission Ref 08/01342/F, dated 14 May 2008.
  - The condition in dispute is No. 4 which states that: *Unless otherwise agreed in writing by the Local Planning Authority the amount of floor space to be used for the sale of clothing, fashion accessories, sporting goods, books or stationery or any of them, shall not exceed 1,858 sqm. in Units C/D and 3,473 sqm. in Units A, B, E, F, G, H, J and K.*
  - The reason given for the condition is: *To minimise any adverse impact upon the existing shopping hierarchy occasioned by the development above permitted.*
  - This decision supersedes that issued on 14 February 2013. That decision on the appeal was quashed by order of the High Court.
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### **Appeal Ref: APP/Z0116/A/13/2197824**

#### **Units A/B, C/D, E to H, J & K, Eastgate Centre, Eastgate Road, Bristol, BS5 6XX**

- The appeal is made under section 78 of the Town and Country Planning Act 1990 against a refusal to grant planning permission under section 73A of the Town and Country Planning Act 1990 for the development of land carried out without complying with a condition subject to which a previous planning permission was granted.
- The appeal is made by CPG South East Limited against the decision of Bristol City Council.
- The application Ref 12/05316/X, dated 29 November 2012, was refused by notice dated 25 January 2013.
- The application sought planning permission for the insertion of additional mezzanine floorspace into combined Units C/D and alterations to the front of Units C/D without complying with a condition attached to planning permission Ref 08/01342/F, dated 14 May 2008.
- The condition in dispute is No. 4 which states that: *Unless otherwise agreed in writing by the Local Planning Authority the amount of floor space to be used for the sale of clothing, fashion accessories, sporting goods, books or stationary or any of them, shall not exceed 1858sqm. in Units C/D and 3,473 sqm. in Units A, B, E, F, G, H, J and K.*
- The reason given for the condition is: *To minimise any adverse impact upon the existing shopping hierarchy occasioned by the development above permitted.*



## Decisions

### **Appeal ref: APP/Z0116/A/12/2184068**

1. The appeal is dismissed.

### **Appeal ref: APP/Z0116/A/13/2197824**

2. The appeal is dismissed.

## Procedural Matters

3. In August 2013 the Appellant applied for a Lawful Development Certificate for Use Class A1 at all of the units that now comprise Eastgate Retail Park (ERP). This application was refused shortly before the opening of this Inquiry. The Appellant and Council agreed that it would not be appropriate to discuss this decision at this Inquiry or for me to comment on it in my decision. I have not therefore considered the lawfulness of the appealed condition in my assessment of these appeals.
4. Both of these appeals concern the removal of the same condition (condition No.4 attached to planning permission Ref 08/01342/F, dated 14 May 2008) and give rise to the same issues. I therefore propose to deal with them together, using the same reasoning to justify the decision in each case. Draft issues were circulated before the Inquiry and were discussed and amended at its beginning.

## Main Issues

5. The main issues are:
  - a) whether the condition is necessary, relevant and reasonable in order to
    - i) protect the vitality and viability of Bristol City Centre  
and
    - ii) enable the development to accord with the requirements of paragraph 24 of the National Planning Policy Framework (the sequential test);  
and
  - b) whether the condition is enforceable and precise and thereby meets the other tests set out in Circular 11/95: *The Use of Conditions in Planning Permissions*.

## Background

6. Planning permission for non-food retail warehousing at ERP was granted in 1987. Condition 7 prevented the retail sale of clothing, fashion accessories, sporting goods, books or stationary (the restricted goods) from being predominant in all of the retail warehouses permitted. In 2005 and in order to enable Unit K to be able to retail restricted goods from a majority of its floorspace, planning permission was given to enable that unit and three other units together, to sell restricted goods from up to 5331 sqm. of floorspace. Further variations were subsequently approved. These changed

and clarified the terms of trade across the whole park, whilst retaining the 5331 sqm. limit, until in 2008, and at the then owner's request, the appealed condition was established.

7. The Appellant's floorspace analysis was accepted by the Council for the purposes of the appeals. It suggests that only about 4,200 sqm. of the 5,331 sqm. of unrestricted floorspace is currently used for that purpose. Consequently, whilst 57% of the retail floorspace could be used to sell restricted goods, the Appellant's survey suggests that only about 45% is actually being used for that purpose at the present time. There are currently eight retail warehouses at the appeal site. At the time of my site visit, five were selling restricted goods to a significant extent<sup>1</sup>. The three others had little floorspace devoted to these types of retailing.
8. As well as the eight retail warehouse units, there is also a large Ikea and a Tesco Extra on adjacent land. Together these units comprise the Eastgate Centre which, having a total floorspace equivalent to about 30% of that found in Broadmead/Cabot Circus (Bristol City Centre's prime retail area), must be a significant destination for retail expenditure in the Bristol area.
9. The reason for the condition was to protect the existing shopping hierarchy from any adverse impact. National policy now suggests that I should add to this 'to facilitate the growth of town centres by requiring proposals for main town centre uses to be located there'.

## Reasons

10. The Development Plan includes the *Bristol Core Strategy* (BCS) 2011 and saved policies of the *Bristol Local Plan* (LP) 1997. Policy BCS7 says that retail development will be primarily located within or, where appropriate, adjoining the centres in the identified network and hierarchy serving Bristol. Despite its size and turnover, the Eastgate Centre is not listed in the Hierarchy of Centres. The scale of the proposal (about an additional 4,000 sqm. of floorspace that could sell the restricted goods) would not affect the primacy of the defined shopping hierarchy and in particular Bristol City Centre (BCC)<sup>2</sup>, which is the only centre of concern to the Council. The proposal is not in conflict with Policy BCS7.
11. Saved LP Policy S10 says that non-food retail warehouses will be permitted on four sites as defined on the Proposals Map. Eastgate Centre, Eastville is one of these. However, given the age of this policy and the absence of a replacement in the adopted BCS and the draft *Site Allocations and Development Management Policies* document, it can not be considered to be up to date. The supporting text to LP Policy S10 says that proposals for additional floorspace will be assessed against the criteria in Policy S9. However, Policy S9 similarly referred to new retail stores and in any event has not been saved.

<sup>1</sup> At the times of my site visit about 30% of the net floorspace in unit J, which is occupied by Mamas and Papas, was selling restricted goods. This is appreciably higher than the estimate put forward by the Appellant (<3%).

<sup>2</sup> For the purposes of this decision, references to Bristol City Centre (BCC) refer to the Broadmead/Cabot Circus shopping area as defined in the Bristol City Centre Retail Study (BCCRS).

12. The BCS was prepared at a time when it was not considered appropriate to repeat national policy in Development Plans. The supporting text to retail policy therefore says that PPS4: *Planning for Sustainable Economic Growth* contains national policies towards development in town centres and that these will inform decisions on specific proposals falling outside the network and hierarchy of centres. PPS4 has now been revoked and replaced by the National Planning Policy Framework (Framework). Consequently, as well as LP Policy S10, the background to Policy BCS7 is not completely up to date. Because of the considerations discussed in paragraphs 10 and 11, I conclude that the proposal does not conflict with the Development Plan retail Policies as currently constituted.
13. At paragraph 14 the Framework says that where relevant Development Plan policies are out-of-date, permission should be granted unless specific policies in the Framework indicate development should be restricted.
14. The Framework in Section 2 incorporates the thrust of the policies in PPS4 that in particular sought to concentrate retail development in a network and hierarchy of defined centres. It also says at paragraph 24 that a sequential test should be applied to planning applications for main town centre uses that are not in an existing centre and are not in accordance with an up-to-date Local Plan. In these circumstances paragraph 26 requires an impact assessment if the development is over 2,500 sqm. The floorspace affected by the condition is significantly larger than this threshold and so the impact of the proposal on existing and committed investment in a centre or centres in the catchment area of the proposal should be assessed. The impact of the proposal on town centre vitality and viability, including local consumer choice and trade in the town centre and wider area should also be considered. It was agreed that BCC was the only centre upon which the proposal could have an adverse effect.

### ***Vitality and viability***

15. The removal of the restriction from the restricted floorspace would allow it to be used by retailers for whom the principal location of available floorspace in Bristol is BCC. Analysis undertaken for the Bristol City Centre Retail Study (BCCRS) 2013<sup>3</sup> suggests that about 80% of the BCC's turnover is derived from the restricted goods. Retailers, mainly specialising in the sale of the restricted items and investing in Bristol, could choose ERP in preference to BCC if there were vacant units and an ability to sell the restricted items to the extent required from them. That would reduce BCC's ability to recover from the recession, which has manifested itself in a large number of vacant units. It could also affect consumer choice and future investment there, leading to declines in its vitality and viability.
16. River Island was highlighted at the Inquiry as a retailer that could potentially locate at ERP if the condition were to be removed. It has stores at other retail parks and it is therefore appropriate to include it in the basket of retailers used to derive an average sales density. Using this, the Council's worst case analysis suggests that the impact on BCC from a change in the use of the existing restricted floorspace, to non-restricted

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<sup>3</sup> Bristol City Centre Retail Study, DTZ, June 2013.

retail uses, would be about 2%. In terms of loss of turnover this is not significant.

17. Furthermore, I am not persuaded that 60% of the trade would be drawn from BCC. Only 24% of clothing and footwear and 16% of other comparison goods, which includes personal luxury and recreational goods, expenditure generated in Bristol's catchment area is actually spent in BCC<sup>4</sup>. The size of the Eastgate Centre and its proximity to BCC do not justify such a leap, especially when ERP is competing against other similar retail warehouse destinations within the City and the Cribbs Causeway shopping centre, all of which offer a retail experience similar to the Eastgate Centre but different to BCC. I am therefore not convinced that the impact would be as large as 2%.
18. Be that as it may, the Framework refers to existing, committed and planned investment. The combination of the opening of Cabot Circus followed by the national economic recession, which has seen the demise of a number of formerly prominent national multiple retailers, has resulted in profound changes in the occupancy of retail floorspace within BCC. In April 2013 over 20% of the units within BCC were vacant and over 13% of the floorspace. Both of these statistics are noticeably above the national averages. The removal of the condition would potentially increase the competition for tenants to occupy the larger vacant units.
19. Nevertheless, the BCCRS<sup>5</sup> points to latent retailer demand within BCC. It suggests that a number of national and international retail chains will have requirements within Broadmead/Cabot Circus in the 12 to 24 months after June 2013 and lists ten key fashion/toy retailers that can be expected to locate there. BCCRS also notes that there are forty-three specific requirements of national multiple retailers for representation in BCC. Whilst the Council's survey suggests that about 80 units are vacant at the present time, this is a reduction from the 90 identified for BCCRS in April 2012. The Council's survey was carried out in early September 2013. By the time of my site visit there had been occupation of other previously vacant units pointing further to the existence of latent retailer demand in BCC. If the identified retailer demand was to be converted into representation, then the vacancy rate would be noticeably reduced and possibly to a level below the national average.
20. Additionally, in February 2012 the Council granted planning permission for the extension and refurbishment of Units Nos. 2-9 New Broadmead, Union Street, vacant units that are at the western end of the prime shopping area. The above considerations do not suggest to me that there is limited retailer demand or that investor confidence in BCC is low.
21. The results of an analysis undertaken for BCCRS<sup>6</sup> suggest that there is sufficient population and expenditure growth to support additional comparison goods floorspace within BCC, including a major retail-led development, in the medium to long term. It also identifies a need to

<sup>4</sup> Table 9, Appendix C. BCCRS

<sup>5</sup> Paras 2.9 and 7.4-7.8, BCCRS

<sup>6</sup> Section 11, Conclusions and Implications for Strategy, BCCRS



provide larger and more flexible retail floorspace, possibly through the amalgamation of smaller units. It recognises the Broadmead/Horsefair area as the most prominent development opportunity and recommends its active promotion as a location to make a substantial contribution towards accommodating forecast capacity. Whilst not actual investment, this analysis suggests that there is a firm basis upon which to justify future investment in BCC, irrespective of any changes to the format at ERP. Nevertheless, the removal of the condition would increase the competition for clothing and fashion retailers who, given the nature of retail expenditure within BCC, are likely to be the bedrock of redevelopment for retail purposes within BCC.

22. Representations were handed into the Inquiry from Destination Bristol, which represents almost 1,000 businesses in the Bristol area and on behalf of Bristol Alliance who developed and own Cabot Circus and have a major ownership interest in the Broadmead/Horsefair area. Despite a process that began in January 2012 and involved the consultation and publicity surrounding two planning applications and two appeals, this was the first time either of these bodies had made any representations about the proposal. In cross examination the Council accepted that these representations followed direct or indirect discussions with its officers. Whilst accepting their central role in retail investment within BCC and noting their opposition to the scheme, as they were not present at the Inquiry and their evidence was unable to be cross-examined, the weight that I can attach to it must be limited.
23. The Appellant has offered to replace the appealed condition with one that would limit the ability to subdivide the approved retail floorspace into small units, thereby removing the potential to attract any but large space format retailers and thus preserving the warehouse characteristics of the park. The absence of such a restriction at the present time was raised in the representation from Bristol Alliance. Its substitution for the appealed condition could restrict the ability of many retailers to choose ERP in preference to BCC. Any effect the appealed condition could have on consumer choice would thereby be reduced.
24. Details of lease expiry dates were submitted to the Inquiry. These reveal that the leases on the five units that devote significant amounts of their floorspace to the restricted items all expire between 2017 and 2023. Their departure from ERP is unlikely to be imminent. Indeed there was agreement that these tenants and the others were at the top of their respective retail categories and would be an asset to any retail development.
25. The leases of two of the units that do not devote significant areas to the sale of the restricted goods have already expired and the third, occupied by Boots expires in May 2014. The parties accepted that Boots were a prestigious tenant and that the Appellant would be unlikely to wish to see them depart. It was also agreed that the rents paid by different types of retailers were unlikely to vary significantly so there is no financial advantage in changing tenants. The Appellant advanced the argument that retail developments require a mix of tenant types to maximise their

attractiveness. My experience does not lead me to dispute this. The tenants of the remaining two units, Halfords and Pets at Home are still in occupation so also presumably do not wish to leave at this point in time.

26. Consequently, there is unlikely to be an overnight transformation in the occupation of the retail park. Whilst there could be a gradual change that resulted in a higher proportion of units selling mainly restricted items and the introduction of retailers that only sold these items, the nature of the current tenants and their leases suggests that this would only fully manifest itself over the next decade and beyond if at all. At any one point in time only one or possibly two units would be likely to be competing for tenants with BCC.
27. However, even this finding should be cautioned by the fact that three of the existing tenants are also represented in BCC in similar, albeit larger formats. Consequently it does not automatically follow that the establishment at ERP of a retailer currently located in BCC would automatically lead to the closure of the City Centre store or that all medium or large format retailers wishing to establish in Bristol would locate at ERP in preference to BCC.
28. I note that the Inspector considering the 2000 appeal<sup>7</sup> found a lower estimated impact to be significantly harmful. However, that appeal was determined in a different retail market climate in the Bristol area, following extensive new retail developments at Cribbs Causeway and before the development at Broadmead/Cabot Circus had begun to redress the balance. It was also determined under a different Development Plan regime and before the Council decided that the retailing of the restricted goods from a significant proportion of the floorspace within individual units at Eastgate Retail Park was acceptable. I therefore attach little weight to it.
29. When considered in the round, the above considerations suggest to me that although the proposal could have an adverse effect on BCC, it would not have a significantly adverse impact on the factors discussed in paragraph 26 of the Framework. I conclude that the condition is not necessary in order to protect the vitality and viability of BCC and in this context it is also not relevant or reasonable.

### ***Sequential Test***

30. Paragraph 24 of the Framework says that Local Planning Authorities should require applications for main town centre uses to be located in town centres and only if suitable sites are not available should out of centre sites be considered. The sale of the restricted goods is a main town centre use and the appeal site is in an out of centre location. It is therefore necessary to establish whether or not there are any sequentially preferable sites within BCC that are available to accommodate the development that would arise out of the proposal. The sites should also be suitable and viable for the development proposed.

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<sup>7</sup> Appeals ref: T/APP/Z0116/A/00/1040142/P7 & 1040145/P7, Unit 3, Eastgate Centre, Eastville, Bristol.

31. The Appellant suggests that the development that should be tested is all of the floorspace that currently exists at ERP. It argued that the condition does not directly control the amount of floorspace that could sell the restricted goods in each individual unit. Instead, the nature of the condition makes them all interdependent. Additionally, because there is no control over unit size, there are an infinite number of permutations.
32. Neither of these is strictly correct. Firstly, it would not be in the landlord's financial interest to amalgamate all of the space into one unit because the undivided floorspace would attract a lower overall rent than if it was divided. Secondly, because of the shape and configuration of the buildings this option would be difficult for any tenant to optimise its trading potential. Thirdly, for operational reasons, there is likely to be a maximum limit to unit size and fourthly, the number of small units that it could be subdivided into is also limited because of the configuration of the units and circulation space. However, more fundamentally, the sequential test should be applied to the situation that would result if the condition were to be removed, not the situation that currently exists and which would continue to exist if it were not removed.
33. The removal of the condition would remove the interdependency of the units in the context of the amount of floorspace that could be used to sell restricted goods. The maximum effect would occur if all of the units sold nothing other than the restricted goods. At most this could only result in an additional 4,026 sqm. of additional retail floorspace selling the restricted goods and this totality would be unlikely to come into effect other than over a period in excess of ten years and in subdivisions of this total amount.
34. None of the units currently devoting significant amounts of floorspace to restricted goods do so completely. About 20% of the currently available floorspace is not used for this purpose. This suggests that the condition is not the cause of these retailers not using more floorspace to sell restricted goods but that they are doing so because of operational reasons. Two of these retailers, Laura Ashley and Next, have City Centre stores where the proportion of floorspace selling goods that are restricted at ERP is noticeably below 100%. The nature of the business at Mamas and Papas and Mothercare suggests that they too would also be unlikely to use 100% of their floorspace to sell restricted goods.
35. The evidence suggests that in the cases of five of the units, the removal of the condition would not make any significant difference to the amount of floorspace used to sell restricted goods unless the tenant changed. The leases on these units do not expire until after 2016 and as noted above, the evidence suggests that there is no expectation that they will do other than renew their leases. Consequently, sequentially preferable sites would be unlikely to be required for these units until after that date if at all.
36. Planning for Town Centres<sup>8</sup> at para. 6.35 specifically says, in the context of retail parks, that it will be relevant to consider whether any of the proposed units could be accommodated on more centrally located sites. This does

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<sup>8</sup> Planning for Town Centres, Practice guidance on need, impact and the sequential approach, Department of Communities and Local Government, December 2009

not mean that all of the units have to be capable of relocation together on more centrally located sites. In the context of suitability it says that it is necessary to have a proper understanding of the scale and form of development needed but it goes on to say that it is not necessary to demonstrate that a town centre site can accommodate precisely the scale and form of development being proposed, rather to consider what contribution more central sites are able to make either individually or collectively, to meeting the same requirement.

37. The Dundee judgement<sup>9</sup> at paragraphs 24 and 27 says that suitable in the context of the sequential test means suitable to meet the requirements of the developer and/or retailer and that the focus should be on the availability of sites, which might accommodate the proposed development. However in paragraph 28 it goes on to point out that the application of the sequential approach requires flexibility and realism from developers and retailers as well as planning authorities. It also says that the applicant is expected to have given consideration to the scope for accommodating the development in a different form, having had regard to the circumstances of the particular town centre. The advice in the Practice Guide is consistent with this judgement.
38. The Council identified all the vacant floorspace within BCC in September 2013. There are about 80 units ranging in size from 30 to 690 sqm. but only about 10 with a ground floor area above 300 sqm. and only 4 with a ground floor area above 400 sqm. Consequently, whilst there are probably sequentially preferable opportunities to accommodate all of the retail park's floorspace in small units, a more realistic assessment that is based on sequentially testing the likely reality at ERP and looks at comparative suitability has a limited number of opportunities.
39. The Appellant has offered to accept a replacement condition that would prevent any of the development being subdivided into units of less than 697 sqm. The developer or retailer would not therefore require a unit smaller than this. The floorspace occupied by Halfords and Pets at Home could become available in the short term and reused by a retailer using 100% of the floorspace to sell restricted goods, as could the Boots unit, although both parties considered this to be unlikely. These units occupy gross floorspaces between 885 and 1,000 sqm on a single floor. In these circumstances I consider that the sequential test should be based on the availability of units in a similar floorspace range to the above i.e. between 700 and 1,000 sqm. As four of the units have sales areas that extend up to mezzanine floors, units with retail floorspace on an upper floor as well as a ground floor would be suitable, providing the ground floor floorspace was above the minimum threshold.
40. In a number of instances, within BCC, there are comparatively large vacant units adjacent to each other. The Appellant pointed out that the Council had provided no evidence to demonstrate that the owners were prepared to amalgamate the units. By the same token the Appellant did not provide any information to demonstrate that they were not. Its eagerness to

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<sup>9</sup> Judgement given on Tesco Stores Ltd v Dundee City Council, United Kingdom Supreme Court Judgement 13 [2012]



provide information during the course of the Inquiry in an attempt to demonstrate that the vacant floorspace at Units 2-9 Broadmead (Union Gate) had already been let, suggests that if there was such evidence then it would have been provided. There are numerous examples within the various shopping developments, within BCC, of individual retailers occupying more than one adjacent unit. The PG clearly states that it is for the Applicant to demonstrate compliance with the sequential approach and clearly justify its position.

41. The assessment of floorspace within adjacent vacant units within the same development/building as sequentially preferable to floorspace at the appeal site is therefore appropriate. The floorspace referred to by the Council has recently been used by retailers and adjacent floorspace still is. There is no substantiated evidence to suggest that it would not be suitable or viable.
42. The Council submitted three plans of BCC showing vacant floorspace at different levels, together with a schedule of vacant units and specifically referred to 5 sites. The unit at Brigstowe Street as identified on the plans appears to have 1,020 sqm. of floorspace but at the time of my site visit it was being fitted out and had clearly been let.
43. The former Peacocks unit on Horsefair should be considered as available within the timescales that are relevant to this appeal, despite the Appellant's point that the company is in receivership. Once removed from receivership, the owner would no doubt be keen to secure a new tenant. It has ground level floorspace of 630sqm. and 590 sqm. on the first floor. The adjacent former New Look unit that the Council referred to was also vacant at the time of my site visit. Together these units would provide ground floor retail floorspace similar to that available at Eastgate Retail Park, with the added option of first floor retailing, a trading format used by four of the retailers at Eastgate Retail Park. Being in a prominent location within BCC and having recently been occupied by two well known national retailers, there is no reason to suggest that this floorspace is not viable. Given some flexibility on the part of developers / retailers then this unit could be as suitable as one at ERP.
44. There are a number of vacant units in the Galleries shopping centre. Whilst for the most part they are individually of a size that is less than 400 sqm, such is the level of vacancies that there are a number of vacant units adjacent to one another, which could be combined to provide suitably sized retail space. Units 20, 21 and 22, for example, have a combined floorspace of 820 sqm. The notices suggesting that the floorspace is to let confirm that it is available and it was used by viable retail businesses, some of whom have moved to other parts of the City Centre, following the opening of the new Cabot Circus/Broadmead shopping area.
45. Planning permission has recently been granted for the extension and amalgamation of floorspace on Union Street to provide a 955 sqm. unit on the ground floor and with a similar amount above. This would be a suitable alternative to a unit at ERP. Whilst the Appellant claimed that this had already been offered to prospective tenants, it accepted that it was unable to verify this with direct evidence from the developers or their agents and

that its information suggested that there was no legal contract. The quoted floorspace also differs from that which received planning permission. Consequently, on balance I consider that it is reasonable to assume that at the present time this unit is available.

46. The Council also referred to the identification of a large site at Broadmead / The Horsefair, which is owned by the City Council and leased to Bristol Alliance. BCCRS considered the site (BMS10) to be the best opportunity in strategic terms for the delivery of a next phase of major retail development within BCC and with a capability of delivering some larger modern stores. The Preferred Options Consultation of the Bristol Central Area Plan<sup>10</sup> takes this site forward in Policy BCAP36, which proposes redevelopment at Horsefair/Callowhill Court (site KS02) and also at Union Street (site KS03). Part of the latter has already received planning permission<sup>11</sup>. Although this plan is in its early stages and can not be given significant weight, it indicates the direction of travel. The City Council has clearly taken on board the findings of the BCCRS and intends to pursue this aspect of its recommendations for retail development / redevelopment within BCC.
47. Whilst the KS02 site is unlikely to come to fruition until beyond 5 years, the potential timescale for replacing retailers at the Eastgate Retail Park with ones selling a higher proportion of restricted goods extends until at least 2024. The PG, at paragraph 6.39, discusses the timescales for availability and suggests that periods beyond five years may be appropriate according to local circumstances. At 6.41 it also points out that when promoting a proposal on a less sequentially preferable site, it will not be appropriate for a developer or retailer to dismiss a more central location on the basis that it is not available to the developer or retailer in question. In this context and although of only limited weight, as some of the leases at Eastgate Retail Park will not be renewed until beyond 5 years, the emerging redevelopment proposals could quite easily be sequentially preferable.
48. I conclude that there are sequentially available sites within BCC, a location that is prioritised by paragraph 24 of the Framework. In consequence, the proposal does not meet the requirements of the sequential test and is contrary to this aspect of the Framework. The condition is therefore necessary, relevant and reasonable.

### ***Other tests set out in Circular 11/95***

49. The Appellant says that the condition creates uncertainty and a logistical headache for the landlord. The latter may be so but although the referencing of the restricted goods allowance to all the units was introduced at the request of the owners, the removal of the restriction is not the answer to that problem. In retrospect it may be difficult for the landlord to control the amount of floorspace each individual tenant is using to sell restricted goods so as to ensure that the condition is not breached. However, if the condition has proved to be unduly onerous to administer, the restricted floorspace could be divided between the units through a

<sup>10</sup> Bristol Central Area Plan, Preferred Options Consultation, Bristol City Council, September 2013.

<sup>11</sup> This is the same site as is referred to in paragraph 45.

revised condition, if it has not already been done via the leases. No such suggested revised condition is before me.

50. The Appellant also considers that the Council in reality would be unable to enforce the condition. However, it is clear from the Appellant's table of floorspaces that it is possible to define what floorspace is used to sell restricted goods and what is not. There are widely accepted conventions as to where and when not to include circulation space, which one assumes were used by the Appellant when calculating its figures. I have no doubt that the Council could similarly calculate the overall floorspace selling the restricted goods in order to monitor the situation and to establish whether or not there has been a breach of the condition.
51. If a breach of condition is alleged and enforcement action is to be pursued, then Paragraph 172 (2) of the Town and Country Planning act 1990 specifically says that a copy of an enforcement notice shall be served on the owner and on the occupier of the land to which it relates. There is therefore no ambiguity as to whom to serve the notice on. It would then be a matter for the Appellant and its tenants to resolve the matter to the satisfaction of the Local Planning Authority. I therefore consider the condition to be enforceable.
52. The condition specifically refers to the maximum amounts of floorspace that can be used for the sale of the restricted goods. It does not therefore create uncertainty for the Appellant. In this respect it is clear and precise. I conclude that the condition meets the other tests in Circular 11/95.

### ***Other considerations***

53. ERP is located within the Bristol urban area and there are residential areas close by to which there are footpath connections. The site is served by four bus routes and frequent bus services pass the site. In this context it is a comparatively accessible and sustainable location. However, BCC is the focus of public transport routes for the whole urban area and from beyond and is consequently a much more sustainable location. In this context I can only attach minimal weight to the site's sustainability credentials.
54. There are also opportunities for linked trips, not only between the retail units within the retail park but also with the nearby Tesco and Ikea stores. However, BCC has a much larger number of retail outlets and far wider customer choice. If the removal of the condition were to lead to a greater concentration of retailers predominantly selling restricted goods at the expense of those who currently do not, then this would weaken consumer choice in the context of holistic shopping trips to the Eastgate Centre and is a disadvantage of the proposal.
55. The Appellant suggests that the removal of the condition would reduce its management costs and free up finance for capital investment, which would contribute to the Framework's objective of building a strong responsive and competitive economy. Whilst this may be so, I am not persuaded that it would free up significant amounts of capital for reinvestment. This consideration therefore attracts limited weight. I am also not persuaded

that the changes that could be brought about by the removal of the condition would necessarily result in an increase in jobs in the locality.

56. Whilst a replacement condition that set a minimum unit size would prevent significant sub-division of the retail park and could be to the benefit of BCC, I am not persuaded that this and the other considerations when taken together outweigh the harm to national policy that I have identified.

## **Conclusions**

57. Although I have concluded that the proposal would not have a significantly adverse impact on BCC's vitality and viability, I have found that it could have adverse effects on BCC and concluded that the proposal does not meet the sequential test. The Framework seeks to promote competitive town centre environments and encourages their growth over time in order to provide improved customer choice and a diverse retail offer. The emerging Development Plan is seeking to achieve this by identifying suitable sites for major redevelopment and town centre retail expansion within BCC. Although these are unlikely to become available until the medium and long term, allowing the appeal proposal, which would widen the opportunities for retailers selling comparison goods such as clothing and fashion accessories and compete for these retailers with new city centre developments, would clearly conflict with these objectives.
58. There are currently suitable, viable and available premises within BCC to accommodate these uses. Allowing the appeals could prolong their vacancy longer than would otherwise be necessary and to this extent there would be an adverse impact on BCC's vitality and viability in the short term. When considered along with the above there would clearly be some overall harm.
59. The Framework says at paragraph 27 that where an application fails to satisfy the sequential test it should be refused. In the context of this proposal, the adopted Development Plan is out of date. However, the benefits of the proposal that I have been referred to do not outweigh the harm to national policy that seeks to facilitate the growth of town centres by requiring proposals for main town centre uses to be located there unless suitable and viable town centre sites are not available. The condition, which meets the tests in Circular 11/95, is therefore necessary. I find for the reasons discussed above and having taken account of all of the other matters raised that the appeal should be dismissed.

*M Middleton*

INSPECTOR



## **APPEARANCES**

### **FOR THE LOCAL PLANNING AUTHORITY:**

Richard Ground of Counsel	Instructed by Director of Legal Services, Bristol City Council
He called	Angelo Calabrese, Bristol City Council Matthew Morris, GVA, Bristol

### **FOR THE APPELLANT:**

Paul G Tucker Queens Counsel	Instructed by Matthew Sobic of Savills, Manchester
He called	Jeremy Hinds, Savills

## **ADDITIONAL DOCUMENTS PRESENTED TO THE INQUIRY**

- 1 Representation from Destination Bristol, dated 15 October 2013
- 2 Representation from Turley Associates on behalf of Bristol Alliance, dated 15 October 2013
- 3 Copy of letter from RPS that accompanied planning application ref: 07/02550/F, dated 8 June 2007, submitted by the Council
- 4 Appellant's written response to Inspector's pre Inquiry questions on, impact, floorspace, sustainability, replacement condition, leases, Policy S10 sites and vacancies
- 5 Details of other S10 retail warehouse sites, submitted by the Council
- 6 River Island, retail warehouse locations, submitted by the Council
- 7 Agreed vacant units in UK regional shopping centres, October 2013
- 8 Vacant floorspace in UK Regional shopping centres, October 2013, submitted by the Council
- 9 Comparison of potential trade diversion estimates from and impact on Bristol City Centre
- 10 Lease expiry dates for current occupiers at Eastgate Retail Park, submitted by the Council
- 11 Application No. 11/04183/F, Units 2-9 New Broadmead, Union Street, Bristol, notice of decision, submitted by the Council
- 12 Email from Luke Sowerby of Curson Sowerby Partners LLP to Sally Dawson of Savills about Union Gate, dated 15 October 2013, submitted by the Appellant
- 13 Land at Barnfield Drive, Chichester, Sequential Assessment Statement, submitted by the Appellant
- 14 First bus services, Bristol Network Diagram, submitted by the Council
- 15 Bus stops and bus services serving Eastgate, Retail Park, submitted by the Appellant

## **PLANS**

- |   |   |
|---|---|
| A | Plan ref: CPG/ERP/SLP, 1/1250 Site Location Plan (Application Plan)                               |
| B | Plan ref: CPG/2013/RP, 1/7500 plan showing residential uses surrounding the Eastgate Centre       |
| C | Plan ref: CPG/ERP/USP, 1/1250 Unit Size Plan, showing unit subdivision at the time of the Inquiry |
| D | 1/1250 Site Location Plan, Union Gate, Bristol  |
| E | 1/500 Existing ground floor plan, Union Gate, Bristol   |
| F | 1/200 Proposed ground floor plan, Union Gate, Bristol   |