



## Energy and Sustainability Statement

Integra 61,  
Bowburn, DC3



Document Reference: 3537-27-220201  
Integra 61 DC3 Energy and Sustainability  
Statement.docx

Sunley House • 4 Bedford Park  
Croydon • CR0 2AP  
020 8662 2288 • [www.espltd.co.uk](http://www.espltd.co.uk)

**Revision Schedule**

<b>Revision</b>	<b>Description</b>	<b>Purpose of Issue</b>	<b>Document Reference</b>	<b>Date of Issue</b>
-	First Draft	Planning	3537-27-220201 Integra 61 DC3 Energy and Sustainability Statement.docx	02/02/22

ESP QMS DOC622 V11 AUG20

## TABLE OF CONTENTS

LIST OF FIGURES .....	3
LIST OF TABLES .....	3
LIST OF ABBREVIATIONS .....	4
EXECUTIVE SUMMARY .....	5
1 INTRODUCTION .....	6
2 PLANNING POLICY CONTEXT.....	7
3 ENERGY ASSESSMENT .....	8
4 SUSTAINABILITY STATEMENT .....	13
5 CONCLUSIONS.....	15
APPENDIX A – AJA ARCHITECTS PLANNING DRAWINGS .....	16
UNIT 3a PLANNING DRAWINGS .....	17
UNIT 3b PLANNING DRAWINGS .....	21
UNIT 3c PLANNING DRAWINGS .....	25
UNIT 3d PLANNING DRAWINGS .....	29
APPENDIX B – BRUKL REPORTS .....	33
UNIT 3a BRUKL REPORT .....	34
UNIT 3b BRUKL REPORT .....	40
UNIT 3c BRUKL REPORT .....	45
UNIT 3d BRUKL REPORT .....	50

**LIST OF FIGURES**

Figure 1 Site Location ..... 6  
Figure 2 Example of the 3D model in IES VE (Unit 3a) ..... 8  
Figure 3 Example of the 3D model in IES VE (Unit 3b, 3c, 3d.)..... 8  
Figure 5 7049-026 Unit 3a - Building Plans ..... 17  
Figure 6 7049-027 Unit 3a – Roof Plan ..... 18  
Figure 7 7049-028 Unit 3a – Building Elevations..... 19  
Figure 8 7049-029 Unit 3a - Building Sections..... 20  
Figure 9 7049-030 Unit 3b - Building Plans ..... 21  
Figure 10 7049-031 Unit 3b – Roof Plan ..... 22  
Figure 11 7049-032 Unit 3b – Building Elevations..... 23  
Figure 12 7049-033 Unit 3b - Building Sections..... 24  
Figure 13 7049-034 Unit 3c - Building Plans ..... 25  
Figure 14 7049-035 Unit 3c – Roof Plan ..... 26  
Figure 15 7049-036 Unit 3c – Building Elevations ..... 27  
Figure 16 7049-037 Unit 3c - Building Sections ..... 28  
Figure 17 7049-038 Unit 3d - Building Plans ..... 29  
Figure 18 7049-039 Unit 3d – Roof Plan ..... 30  
Figure 19 7049-040 Unit 3d – Building Elevations..... 31  
Figure 20 7049-041 Unit 3d - Building Sections..... 32

**LIST OF TABLES**

Table 1 AJA Architects planning drawings ..... 9  
Table 2 Warehouses: Controlled Fittings Transmittances (U values, g-values, LT) ..... 10  
Table 3 Amenity/Office Blocks: Thermal Elements Transmittances (U values)..... 11  
Table 4 Amenity/Office: Controlled Fittings Transmittances (U values, g-values, LT) ..... 11  
Table 5 Target Air infiltration ..... 12  
Table 6 AJA Architects planning drawings ..... 16

## LIST OF ABBREVIATIONS

Abbreviation	Description
<b>ASHP</b>	Air Source Heat Pump
<b>BER</b>	Building Emissions Rate
<b>BREEAM</b>	Building Research Establishment Environmental Assessment Method
<b>CO<sub>2</sub></b>	Carbon Dioxide
<b>DHW</b>	Domestic Hot Water
<b>LED</b>	Light Emitting Diode
<b>NCM</b>	National Calculation Methodology
<b>NPPF</b>	National Planning Policy Framework
<b>PIR</b>	Passive Infra-Red
<b>SCOP</b>	Seasonal Coefficient Of Performance
<b>SEER</b>	Seasonal Energy Efficiency Rating
<b>TER</b>	Target Emissions Rate
<b>WHB</b>	Wash Hand Basin

## EXECUTIVE SUMMARY

Engineering Services Partnership Ltd has prepared this energy and sustainability statement to support the planning application {Application Number} on behalf of Integra 61 (Durham) Ltd. The document demonstrates how the proposed Integra DC3 development will meet the planning requirements for energy and sustainability set by Durham County Council.

### ENERGY STATEMENT

To demonstrate compliance with the County Durham Plan (Adopted 2020), ESP have modelled each Integra 61, Bowburn, DC3 development to assess the energy demand and the regulated carbon emissions following the NCM.

The design of the development will include the following energy efficiency measures.

- Reducing the energy demand via a fabric first approach. Thermal elements and controlled fittings will have a suitable thermal, light and solar properties transmittance.
- Fixed building services will exceed the minimum requirements on efficiency stipulated by the Building Regulations.
- Low carbon technologies such as VRF will be deployed to provide low carbon heating to the occupied spaces.
- High efficiency LED luminaires will be employed throughout the site with appropriate photoelectric, occupancy and time controls.
- Measures to reduce the performance gap at construction such as commissioning, metering and high-level workmanship.

Overall, the energy demand is reduced by 9% below the Part L compliant development (gross energy demand) is considered to make a favourable and significant contribution to reducing energy demand in line with Policy 33 Renewable and Low Carbon Energy.

Additionally, the development has the potential to offset grid electricity via the installation of roof-mounted PV panels. In the first instance, the electricity produced by the PV power plant will be used on site. The feasibility of exporting electricity back to the network will be investigated as the design progresses.

The inclusion of PV panels in the proposed design further reduces the required energy demand of the development.

The combined net energy demand for all four developments is reduced by 9% below the Part L compliant development. Therefore, the development will make a favourable and significant contribution to energy production in line with Policy 33 Renewable and Low Carbon Energy.

### SUSTAINABILITY STATEMENT

This document details methods of achieving sustainable development that is in line with the Policy 33 Renewable and Low Carbon Energy:

- Construction Pollution/Site Waste Management
- Storing and recycling of waste
- Environmentally friendly specification and materials

The relevant documentation will provide further information on resource efficiency.

## 1 INTRODUCTION

1.1.1 This energy and sustainability report has been prepared by Engineering Services Partnership Ltd on behalf of Integra 61 (Durham) Ltd. The document has been produced to accompany the planning application {APPLICATION NUMBER} for the development at Integra DC3, Bowburn, Durham.

1.2 The document aims to outline how the proposed development will meet the relevant planning policies for the scheme. The key outcomes of these policies are:

- To integrate sustainable design and construction in the development.
- To reduce the energy demand and the carbon dioxide emissions associated with the development.
- To contribute to energy production.

As the design progresses, the strategy outlined in this report will be further developed and subjected to financial feasibility studies. The strategy outlined in this report are based on the current information available and are likely to evolve with the design.

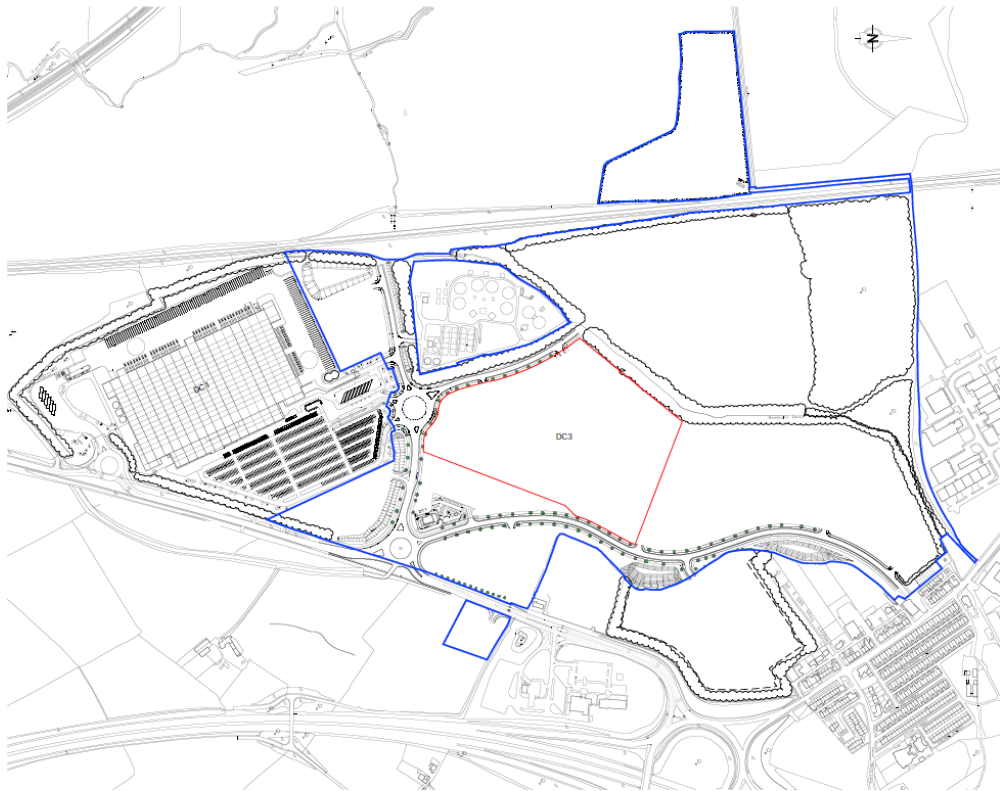


Figure 1 Site Location

**2 PLANNING POLICY CONTEXT**

2.1 This section provides an overview of the relevant planning policies for the proposed development.

2.2 NATIONAL POLICY

2.2.1 The National Planning Policy Framework (NPPF) was introduced in March 2012. It replaced the majority of the Planning Policy Guidance Notes and Statements, with the notable exception of PPS 10: Planning and Sustainable Waste Management (subsequently superseded by the National Planning Policy for Waste in October 2014). A further revision was issued in February 2019 to include amendments on housing and habitats, and biodiversity.

2.2.2 The NPPF promotes the Government’s zero carbon policy that endorses the energy hierarchy approach of firstly improving energy efficiency and then considering the use of renewables.

2.2.3 The NPPF does not include detailed measures on sustainable design codes and standards to apply. These are addressed at the regional and local level within the framework provided by the NPPF.

2.3 EXISTING PLANNING POLICY

2.3.1 The local planning authority for the proposed development is the Durham County Council.

2.3.2 The Council will consider more favourably scheme that make a positive and significant contribution towards one or more of the below principles:

<b>Low Carbon energy Principles</b>	<b>Description</b>
<b>Reducing demand</b>	development should enable occupants to minimise their energy and water consumption, minimise their need to travel and, where travel is necessary, to maximise opportunities for sustainable modes of travel.
<b>Resource Efficiency</b>	development could take opportunities to use sustainable materials in the construction process, avoiding products with a high embodied energy content; and minimise construction waste.
<b>Energy Production</b>	development could provide site based decentralised or renewable energy infrastructure.



### 3 ENERGY ASSESSMENT

3.1 This section provides an overview of the methodology used to prepare the energy assessment, the details of the approach to sustainable energy and demonstrates compliance with the relevant planning policies for climate change mitigation.

#### 3.2 DEVELOPMENT ENERGY TARGET

3.2.1 The proposed development will have to:

- a) demonstrate that principles of sustainable design and construction have been adhered to.
- b) demonstrate that the development will make a significant contribution to energy reduction and energy production.
- c) demonstrate that the development will make a favourable contribution to resource efficiency. For further details, on resource efficiency please refer to the additional supporting reports.

#### 3.3 METHODOLOGY

3.3.1 Each unit has been modelled in IES VE (2021.0.2.0). Compliance against Part L of the Building Regulation has been assessed using VE compliance (7.0.13.0) with the SBEM methodology.



Figure 2 Example of the 3D model in IES VE (Unit 3a)

3.3.2 The combined areas of all units noted in Table 1 as modelled with the NCM conventions, is approximately 30480.51 m<sup>2</sup>. The units are modelled as B8 Use Class (Storage and Distribution).

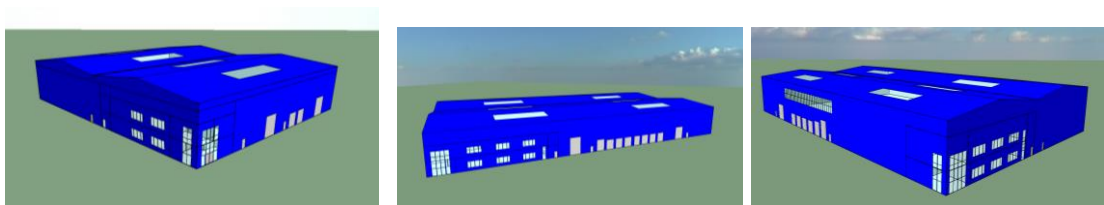


Figure 3 Example of the 3D model in IES VE (Unit 3b, 3c, 3d.)

3.3.3 The energy assessment has been based upon the drawings prepared by AJA Architects in Table 1. A copy of these drawings can be found in Appendix A for reference.

Table 1 AJA Architects planning drawings

Drawing Description	Drawing Reference
<b>UNIT 3a - Building Plans</b>	7049-026
<b>UNIT 3a - Roof Plan</b>	7049-027
<b>UNIT 3a - Building Elevations</b>	7049-028
<b>UNIT 3a - Building Sections</b>	7049-029
<b>UNIT 3b - Building Plans</b>	7049-030
<b>UNIT 3b - Roof Plan</b>	7049-031
<b>UNIT 3b - Building Elevations</b>	7049-032
<b>UNIT 3b - Building Sections</b>	7049-033
<b>UNIT 3c - Building Plans</b>	7049-034
<b>UNIT 3c - Roof Plan</b>	7049-035
<b>UNIT 3c - Building Elevations</b>	7049-036
<b>UNIT 3c - Building Sections</b>	7049-037
<b>UNIT 3d - Building Plans</b>	7049-038
<b>UNIT 3d - Roof Plan</b>	7049-039
<b>UNIT 3d - Building Elevations</b>	7049-040
<b>UNIT 3d - Building Sections</b>	7049-041

### 3.4 DEMAND REDUCTION

3.4.1 The sustainable design and construction principles prioritise demand reduction measures through passive and active measures (e.g. suitable insulated envelope, use of solar gains and daylight) and energy efficiency measures.

3.4.2 The energy efficiency measures included in the works for the proposed development are summarised below:

- The thermal transmittances of the thermal elements and controlled fittings do not exceed those stipulated in **Error! Reference source not found.** - Table 4.
- Roof lights will be provided to take advantage of natural daylight. Solar gains through transparent surfaces will be reduced via an appropriate ratio of roof lights to the roof area and with the selection of suitable g-values.

3.4.3 Fixed building services for space conditioning shall comprise:

- Electric panel heaters with thermostatic control and time clocks.
- VRF to provide heating and cooling to areas such as offices and receptions.

3.4.4 Fixed building services for ventilation shall comprise:

- Supply and extract ventilation with heat recovery and summer by-pass to occupied areas as required by Building Regulations.
- Extract ventilation as required by Building Regulations.
- PIR sensors will control fans where appropriate.
- The efficiency of the fans shall at least meet the minimum requirements of the non-domestic building services compliance guide.

3.4.5 Fixed building services for lighting shall be as follows:

- Lighting to be LED luminaires, controlled by presence detection where appropriate. A target average luminaire efficacy of 100 lm/W per circuit has been assumed in line with technology standards.
- Areas where energy savings can be made by the use of daylight will have photoelectric control to take advantage of natural light from roof lights. Warehouses will be provided with controls to switch on/off luminaires (in response to variations of lux levels over the working hours).
- Controls for lighting will include occupancy detection throughout the amenity blocks.

3.4.6 Fixed building services for Domestic Hot Water (DHW) production shall comprise of a combination of electric point of use water heaters and electric cylinders as appropriate.

3.4.7 It should be noted that the warehouses are intended to be offered to the market as a shell. There are reasonable expectations for the warehouses to be unheated and to have an energy-efficient lighting system with photoelectric controls to take advantage of the daylight entering the space via the roof lights. Therefore, suitable allowances have been made in the calculation of energy demand and carbon emissions.

Thermal Elements	U value (W/m <sup>2</sup> ·K)	Limiting U values AD L2A (W/m <sup>2</sup> ·K)	Notes
Ground/Exposed Floor	0.25	0.25	
External Wall	0.35	0.35	It excludes the external wall of the undercroft warehouse.
Roof	0.25	0.25	
Insulated ceiling/floor	0.25	0.25	Floor/Ceiling separating the warehouse and unconditioned areas from conditioned spaces.
Insulated wall	0.35	0.35	Wall separating the warehouse and unconditioned areas from conditioned spaces.

Table 2 Warehouses: Controlled Fittings Transmittances (U values, g-values, LT)

Controlled Fittings	U value (W/m <sup>2</sup> ·K)	Limiting fabric parameters (W/m <sup>2</sup> ·K) AD L2A	Notes
Vehicle Unloading Door	1.50	1.50	
Pedestrian Door	2.20	2.20	External doors and doors on party walls with the amenity block
External Windows (inc. frame)	1.6	2.20	To better notional building. g-value = 0.34 LT = 0.6
Roof-lights	2.20 (Quoted on the horizontal plane)	2.20	g-value = 0.55 LT = 0.6

Table 3 Amenity/Office Blocks: Thermal Elements Transmittances (U values)

Thermal Elements	U value (W/m <sup>2</sup> ·K)	Limiting fabric parameters (W/m <sup>2</sup> ·K) AD L2A	Notes
Ground/Exposed Floor	0.25	0.25	To match the notional building.
External wall	0.22	0.35	With metal cladding. To better notional building. <i>It includes the external wall of the undercroft warehouse.</i>
Insulated wall	0.35	0.35	Wall separating the conditioned spaces from the warehouse and unconditioned spaces
Insulated ceiling/floor	0.25	0.25	Ceiling or floor separating the amenity block from the warehouse and unconditioned spaces

Table 4 Amenity/Office: Controlled Fittings Transmittances (U values, g-values, LT)

Controlled Fittings	U value (W/m <sup>2</sup> ·K)	Limiting fabric parameters (W/m <sup>2</sup> ·K) AD L2A	Notes
Doors	2.20	2.20	External doors and doors on party walls with the warehouse
External Windows (inc. frame)	1.6	2.20	To better notional building. g-value = 0.34 LT = 0.6
External glazed door (inc. frame)	1.6	2.20	

3.4.8 The air permeability of all units will target the air permeability of 50% below the acceptable standard.

Table 5 Target Air infiltration

Units	Air permeability (m <sup>3</sup> /m <sup>2</sup> /h @ 50 Pa)	Notes
A B C D	5	Acceptable Standard 10

3.4.9 The proposed development will take advantage of the opportunities to use LZC technologies as appropriate. The design includes VRF to provide heating and cooling to a selection of spaces in the amenity blocks (e.g. offices) of each unit and electric panel radiators in the circulation and wc areas.

3.4.10 The concept design currently includes provision for a maximum of 10% of the overall roof area PV power plant. The final percentage will be subject to detailed design and will ensure full compliance with Part L and EPC A rating.

3.5 REDUCING PERFORMANCE GAP

3.5.1 A variation between the compliance calculation and the energy consumption in the operation of the building is generally to be expected. Occupancy patterns, occupants’ behaviour, weather, small power usage, workmanship are some of the factors that may affect the gap between expected energy consumption and actual operational consumption. Details of the strategy to mitigate the performance gap are provided in this section.

3.5.2 Workmanship: The Contractor, when appointed, will ensure that the insulation is reasonably continuous over the insulated envelope. A qualified and competent person will calculate the U values and the psi values of the selected thermal elements to verify that they do not exceed the design values. Windows, roof lights and other glazed surfaces will be selected and installed so that the thermal, solar and light transmittance is compatible with the design values.

3.5.3 Commissioning: To reduce wasteful use of energy, the installed building services and their controls will be commissioned by a person registered with a competent person scheme.

3.5.4 Metering: Each unit will be afforded automatic meter reading and data collection facilities. Metering of the energy will be devised so that at least 90% of the energy consumption is accounted for and separated by energy uses. Renewable energy generation will be separately monitored. The metering system will be connected to the unit BMS.

## **4 SUSTAINABILITY STATEMENT**

4.1 The NPPF and the County Durham Plan identify the key sustainability issues that shall be addressed in the new development. These are:

- Efficient use of water
- Construction Pollution/Site Waste Management;
- Storing and recycling of waste;
- Environmentally friendly specification and materials;

### **4.2 CONSTRUCTION POLLUTION / SITE WASTE MANAGEMENT**

4.2.1 The following sections describe a selection of the procedures and processes that will positively contribute towards resource efficiency (County Durham Plan Policy 33).

4.2.2 The applicant recognises that the construction phase of the development can have an impact on the quality of the site and its surroundings, including the local environment, neighbouring residents and employees and the public. In the case of the proposed development, it is not considered that the construction phase will yield an adverse level of disturbance.

4.2.3 The Contractor, when appointed, will be required to deliver high standards of sustainable construction and have due regard for neighbouring properties and environmental issues.

4.2.4 The Principal Contractor shall be required to consider the following:

- Register the site against the Considerate Constructors Scheme and achieve certification.
- Manage a number of environmental impacts, including the control of dust.
- Deliver the measures by ensuring that appropriate procedures are in place for on-site storage and segregation.

#### 4.2.5 STORING AND RECYCLING WASTE

4.2.5.1 The Government's Waste Strategy 2007 sets targets to reduce the amount of waste going to landfill sites. This is implemented through a Framework, which adopts a hierarchical approach to waste management, which promotes the reduction of waste before considering disposal.

4.2.5.2 Waste will be kept to a minimum throughout the construction phase by the use of economical design and construction processes combined with good management practice.

4.2.5.3 This hierarchy will be further managed in a number of ways:

- Economical design;
- Employ off-site manufacture wherever possible;
- Ensure correct management procedures are employed when measuring and procuring materials to ensure correct quantity and specification;
- Clean, tidy and safe storage of materials on-site;
- Timely delivery of materials;
- Manage client expectations to minimise design changes;
- Control of quality to minimise defective work;
- Reuse of materials on-site wherever possible; and,
- Segregation of waste for recycling.

#### 4.2.6 ENVIRONMENTALLY FRIENDLY SPECIFICATION AND MATERIALS

4.2.6.1 As the production, use and disposal of building materials account for significant quantities of energy and resources, opportunities to reduce the use of finite, primary minerals and aggregates and maximise the use of reused or recycled materials are encouraged by local policy. Achieving this will reduce the embodied energy within the building's construction.

4.2.6.2 The most sustainable use of materials is to restrict the use of new materials altogether and reuse what is available on site. The Building Research Establishment's (BRE) Green Guide rates materials based on their environmental impact. Materials reused in situ are given an A+ sustainability rating.

#### 4.2.7 SPECIFICATION OF NEW MATERIALS

4.2.7.1 Where new materials are specified, care will be taken to select environmentally sound materials. Where possible, the BRE Green Guide will be used for material specification, and materials will have an A+ sustainability rating.

4.2.7.2 Throughout further stages of design, consideration will be given to the responsible sourcing of materials. Material suppliers shall preferably hold an Environmental Management System (EMS) accredited to ISO 14001.

## **5 CONCLUSIONS**

- 5.1 This document has demonstrated how sustainability has been considered and shall be integrated into the proposed development. Sustainability will also be delivered during the detailed design stage and implemented throughout construction and operation.
- 5.2 It has been shown that the design of the Integra DC3 site in Bowburn includes the necessary energy efficiency measures to meet the targets set by the County Durham Plan (Adopted 2020).



## APPENDIX A – AJA ARCHITECTS PLANNING DRAWINGS

This section contains the drawings used to produce this energy assessment.

Table 6 AJA Architects planning drawings

<b>Drawing Description</b>	<b>Drawing Reference</b>
<b>UNIT 3a - Building Plans</b>	7049-026
<b>UNIT 3a - Roof Plan</b>	7049-027
<b>UNIT 3a - Building Elevations</b>	7049-028
<b>UNIT 3a - Building Sections</b>	7049-029
<b>UNIT 3b - Building Plans</b>	7049-030
<b>UNIT 3b - Roof Plan</b>	7049-031
<b>UNIT 3b - Building Elevations</b>	7049-032
<b>UNIT 3b - Building Sections</b>	7049-033
<b>UNIT 3c - Building Plans</b>	7049-034
<b>UNIT 3c - Roof Plan</b>	7049-035
<b>UNIT 3c - Building Elevations</b>	7049-036
<b>UNIT 3c - Building Sections</b>	7049-037
<b>UNIT 3d - Building Plans</b>	7049-038
<b>UNIT 3d - Roof Plan</b>	7049-039
<b>UNIT 3d - Building Elevations</b>	7049-040
<b>UNIT 3d - Building Sections</b>	7049-041

**UNIT 3a PLANNING DRAWINGS**

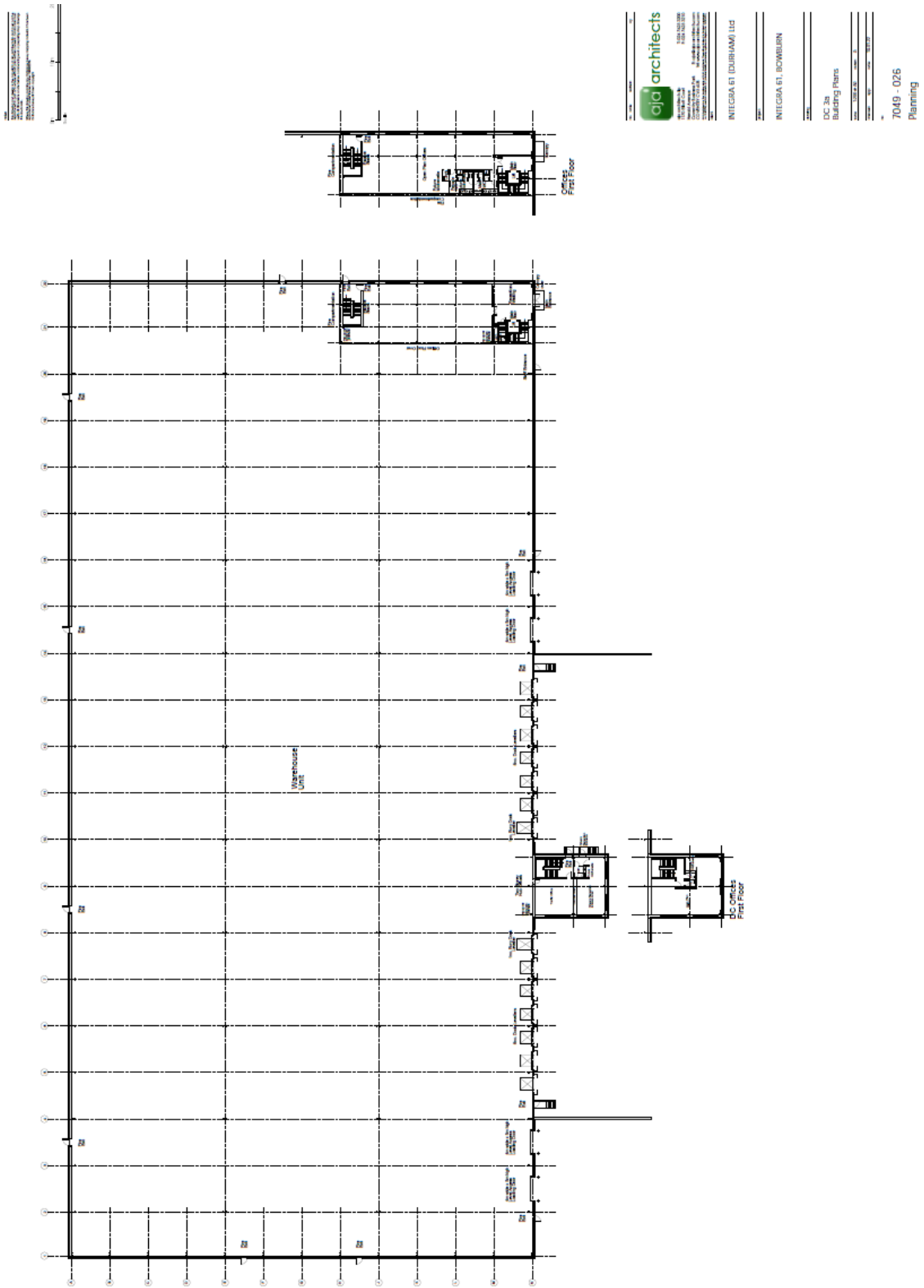
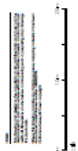


Figure 4 7049-026 Unit 3a - Building Plans



**ojo architects**  
 11000 1000 0000  
 11000 1000 0000  
 11000 1000 0000  
 11000 1000 0000

---

INTEGRA 61 (DURHAM) LTD

---

INTEGRA 61, BOWBURN

---

DC 3a  
 Roof Plan

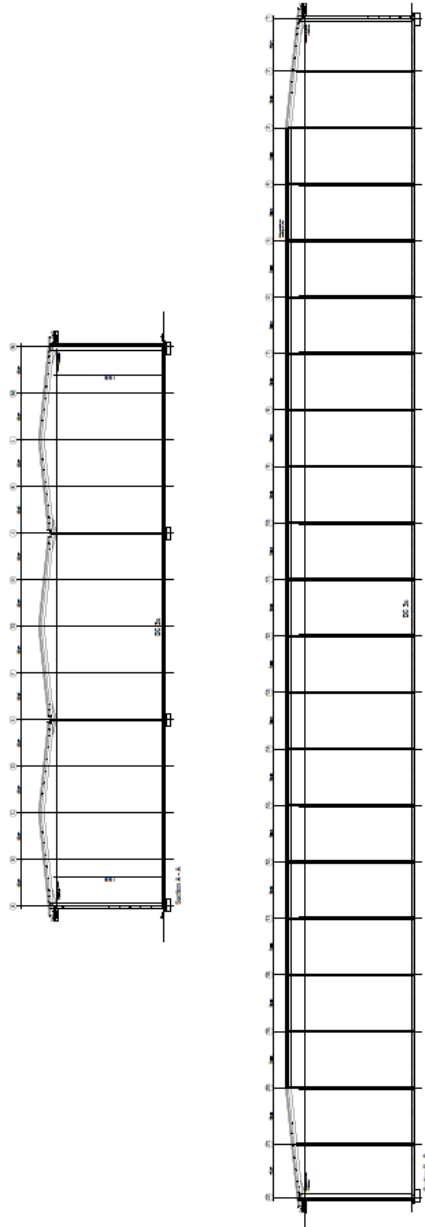
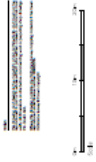
---

7049 - 027  
 Planning



Figure 5 7049-027 Unit 3a – Roof Plan



The logo for oja architects, featuring a green square with a white 'o' and the word 'architects' in a sans-serif font.

oja architects  
11-13 THE ARCADE  
DURHAM, DURHAM, DURHAM  
DURHAM, DURHAM, DURHAM  
DURHAM, DURHAM, DURHAM

---

INTEGRA 61 (DURHAM) LTD

---

INTEGRA 61, BOWBURN

---

DC 3a  
Building Sections

---

7049 - 029  
Planning

Figure 7 7049-029 Unit 3a - Building Sections

**UNIT 3b PLANNING DRAWINGS**

The drawings have been prepared by the architects on behalf of the client. They are to be used for the purpose stated only and not for any other purpose. The client is responsible for ensuring that the drawings are used for the purpose stated and for any other purpose. The client is responsible for ensuring that the drawings are used for the purpose stated and for any other purpose.

	oja architects 1, 208 202 200 110, Biscuit Court Conville Park, Durham County of Durham, UK Tel: 0191 385 9999 Email: info@ojaarchitects.com www.ojaarchitects.com	No. Date Title	INTEGRA 61 (DURHAM) Ltd  INTEGRA 61, BOWBURN  DC 3b Building Plans Scale: 1:200 @ A1 Date: 21.02.20 Drawn: [Blank]
---	---	----------------------	--

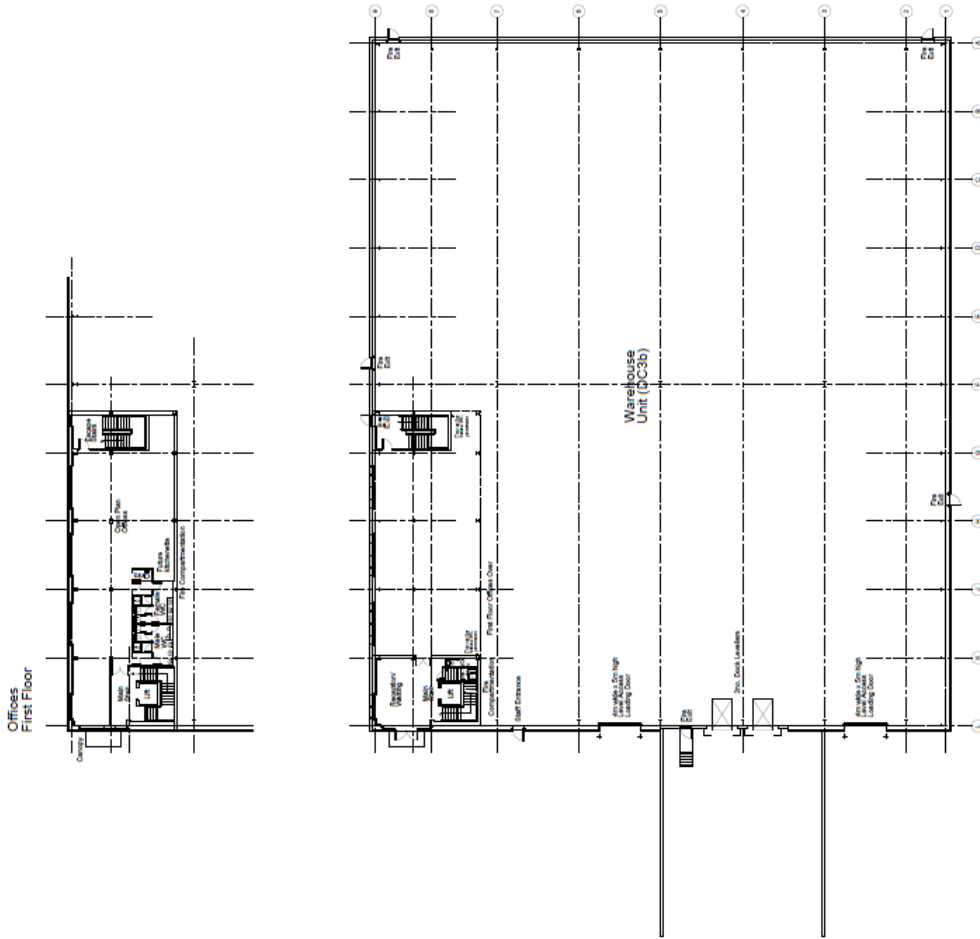


Figure 8 7049-030 Unit 3b - Building Plans



	0191 262 5000 115, Blenheim Court County Durham, UK E: oja@oja-architects.com T: +44 (0)191 262 5000 F: +44 (0)191 262 5001
<b>INTEGRA 61 (DURHAM) Ltd</b>	
<b>INTEGRA 61, BOWBURN</b>	
DC 3b Roof Plan	
Date: 12.08.2021 Drawing No: 7049-031	
<b>7049 - 031</b> Planning	

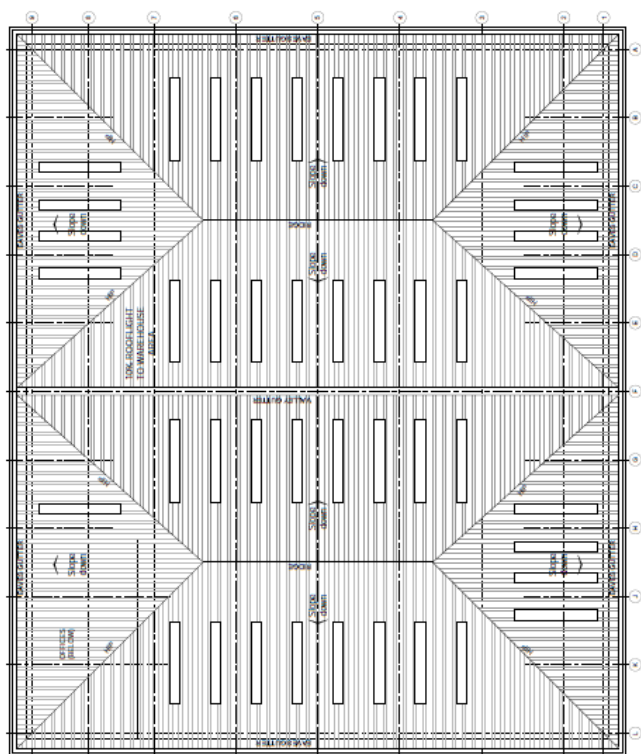


Figure 9 7049-031 Unit 3b – Roof Plan

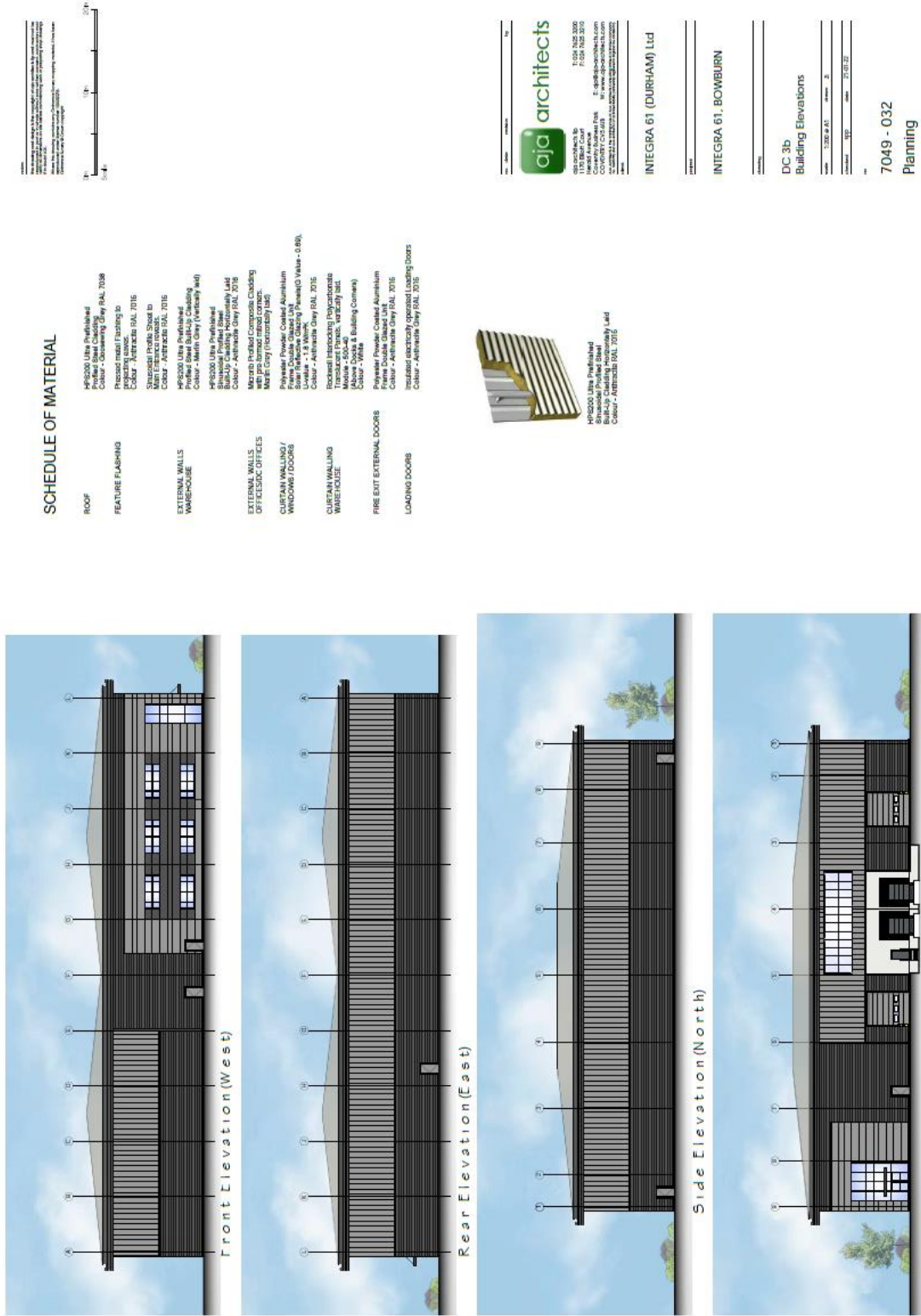
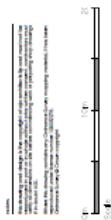


Figure 10 7049-032 Unit 3b – Building Elevations





**aia architects**  
 0525 204113  
 114 Westgate Road  
 Newcastle NE1 3AF  
 T: 0161 742 2000  
 F: 0161 742 2025  
 E: info@aiadurham.com  
 www.aiadurham.com

**INTEGRA 61 (DURHAM) Ltd**

**INTEGRA 61, BOWBURN**

**DC 3b  
 Building Sections**

7049 - 033  
 Planning

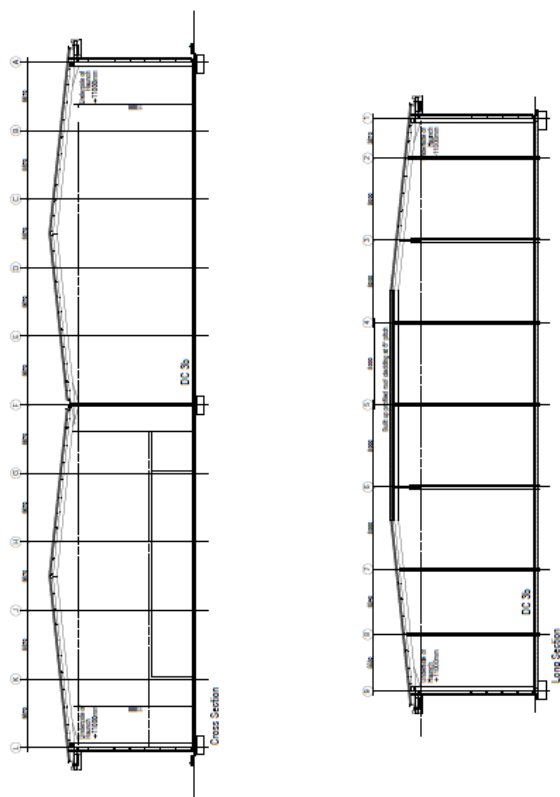


Figure 11 7049-033 Unit 3b - Building Sections

**UNIT 3c PLANNING DRAWINGS**

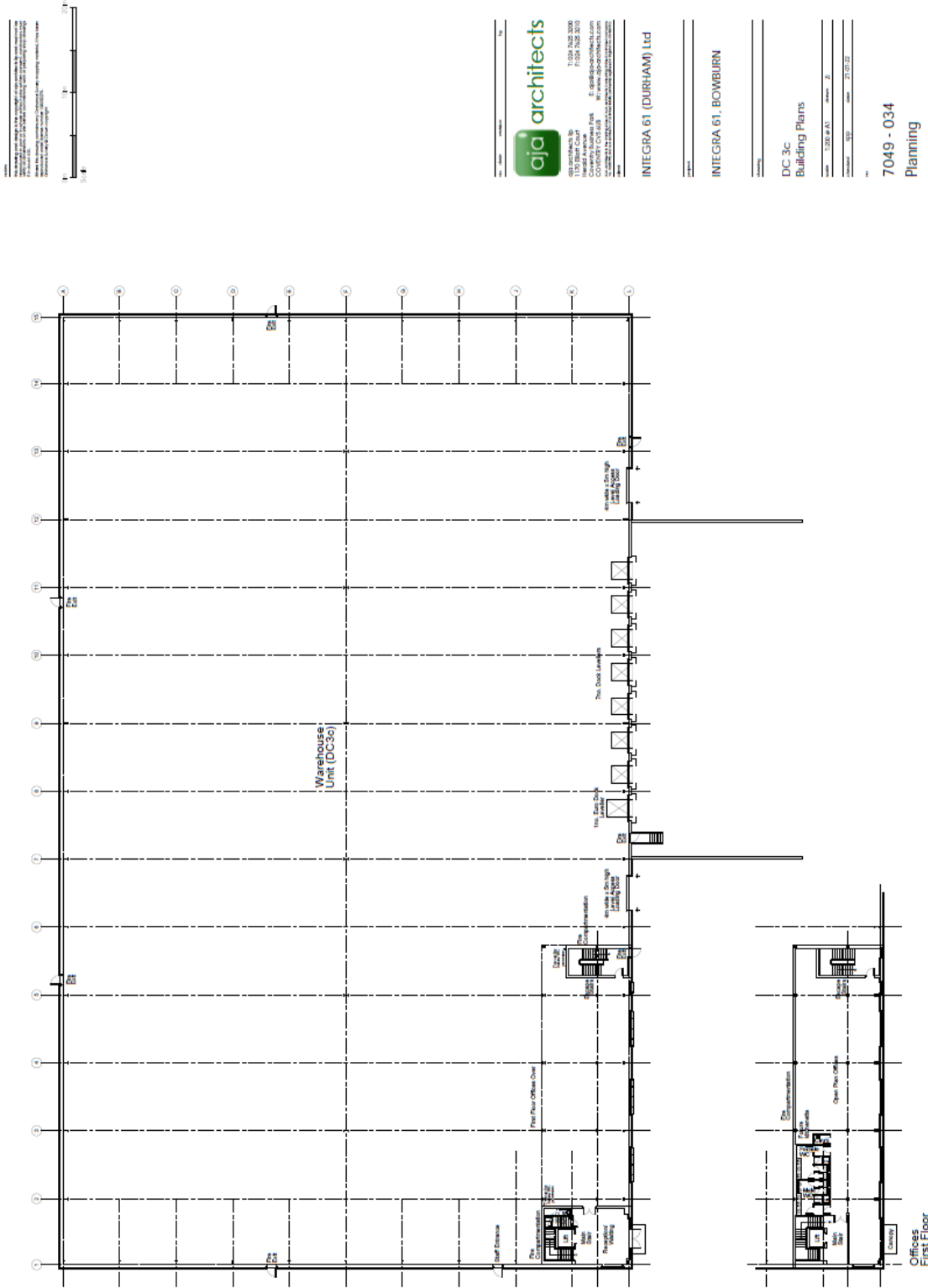
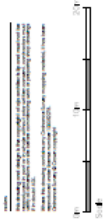


Figure 12 7049-034 Unit 3c - Building Plans



**aja architects**  
 150, NINE BROS  
 115, BRISTOL COURT  
 CENTRAL BUSINESS PARK  
 COVENTRY CV3 4JH  
 TEL: 02476 343434  
 FAX: 02476 343435  
 E: aja@aja-architects.com  
 W: www.aja-architects.com

INTEGRA 61 (DURHAM) Ltd

INTEGRA 61, BOWBURN

DC 3c  
 Roof Plan  
 Scale: 1:200 @ A1  
 Date: 27.01.12

7049 - 035  
 Planning

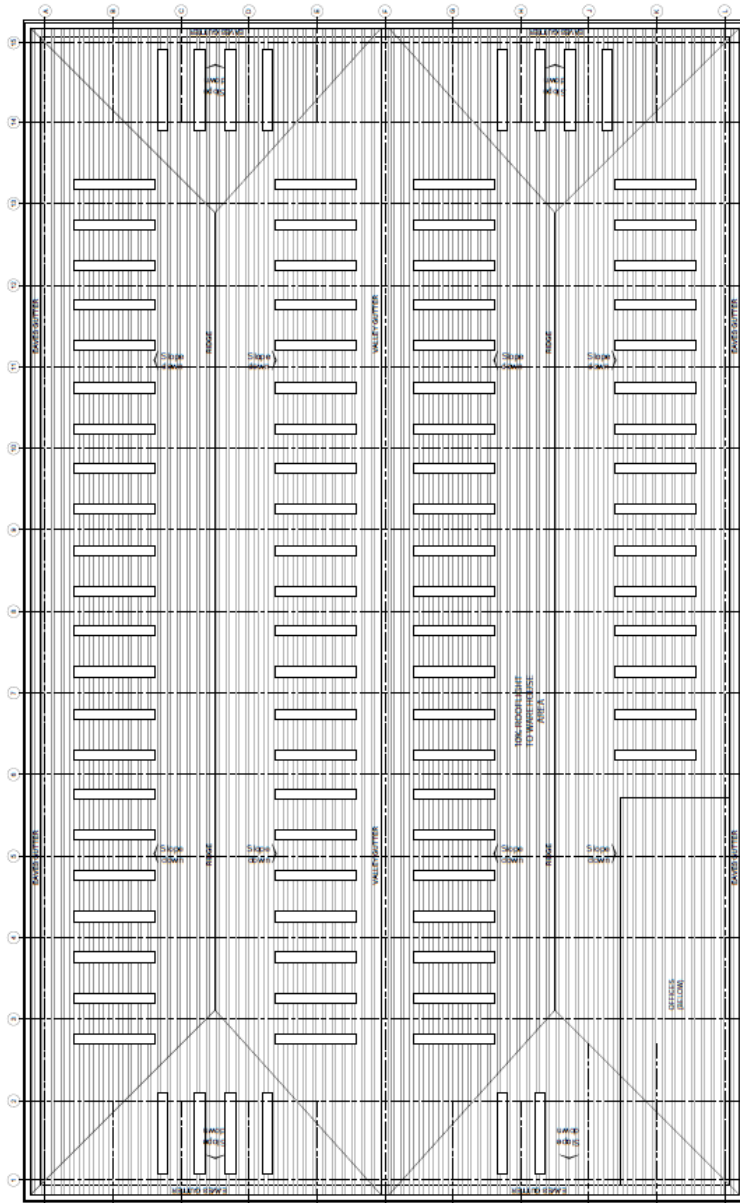
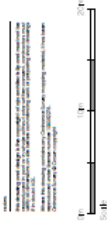


Figure 13 7049-035 Unit 3c – Roof Plan



Figure 14 7049-036 Unit 3c – Building Elevations

Integra 61 (Durham) Ltd/ Integra 61, Bowburn DC3  
 Energy and Sustainability Statement



**gja architects**  
 115a Bowburn Road  
 Bowburn Durham  
 CO1 1JH  
 Tel: 0191 275 1000  
 Email: info@gja-architects.com  
 Website: www.gja-architects.com

**INTEGRA 61 (DURHAM) Ltd**

INTEGRA 61, BOWBURN

DC 3c  
 Building Sections

7049 - 037  
 Planning

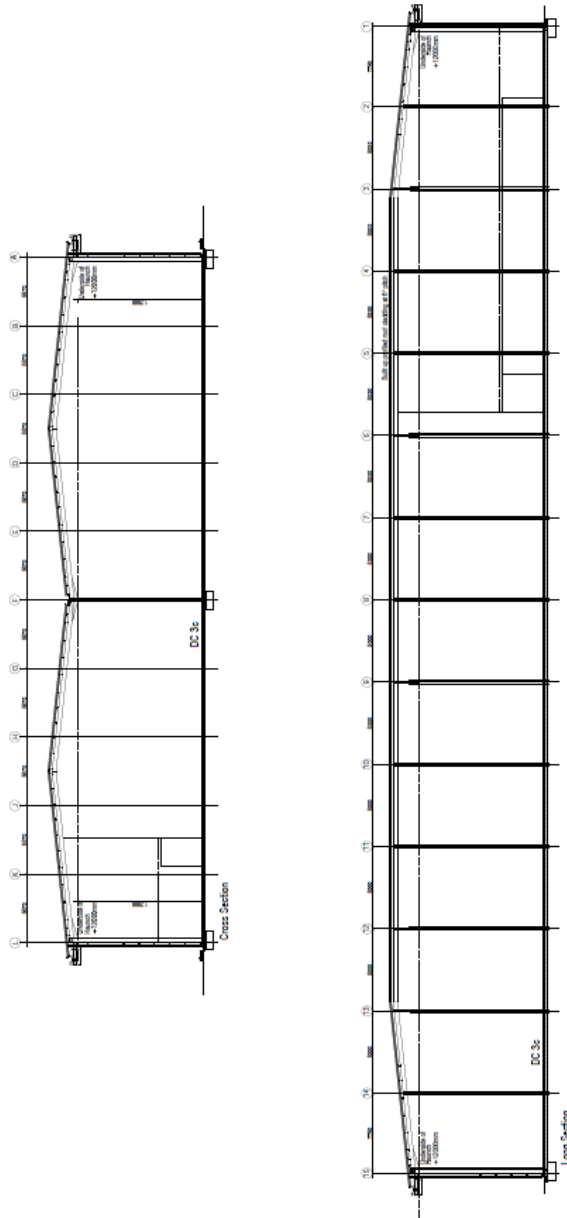
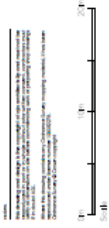


Figure 15 7049-037 Unit 3c - Building Sections

**UNIT 3d PLANNING DRAWINGS**



 <p>                 7049 038 038                  110 BURN COURT                  CENTRAL BUSINESS PARK                  COVENTRY CV3 5JH                  TEL: 02476 222222                  FAX: 02476 222222                  E: info@oja-architects.com                  W: www.oja-architects.com             </p>	<p><b>INTEGRA 61 (DURHAM) Ltd</b></p> <hr/> <p><b>INTEGRA 61, BOWBURN</b></p> <hr/> <p>DC 3d                  Building Plans</p> <hr/> <p>Scale: 1:200 @ A1                  Date: 21/01/22</p> <hr/> <p><b>7049 - 038</b>                  Planning</p>
---	--

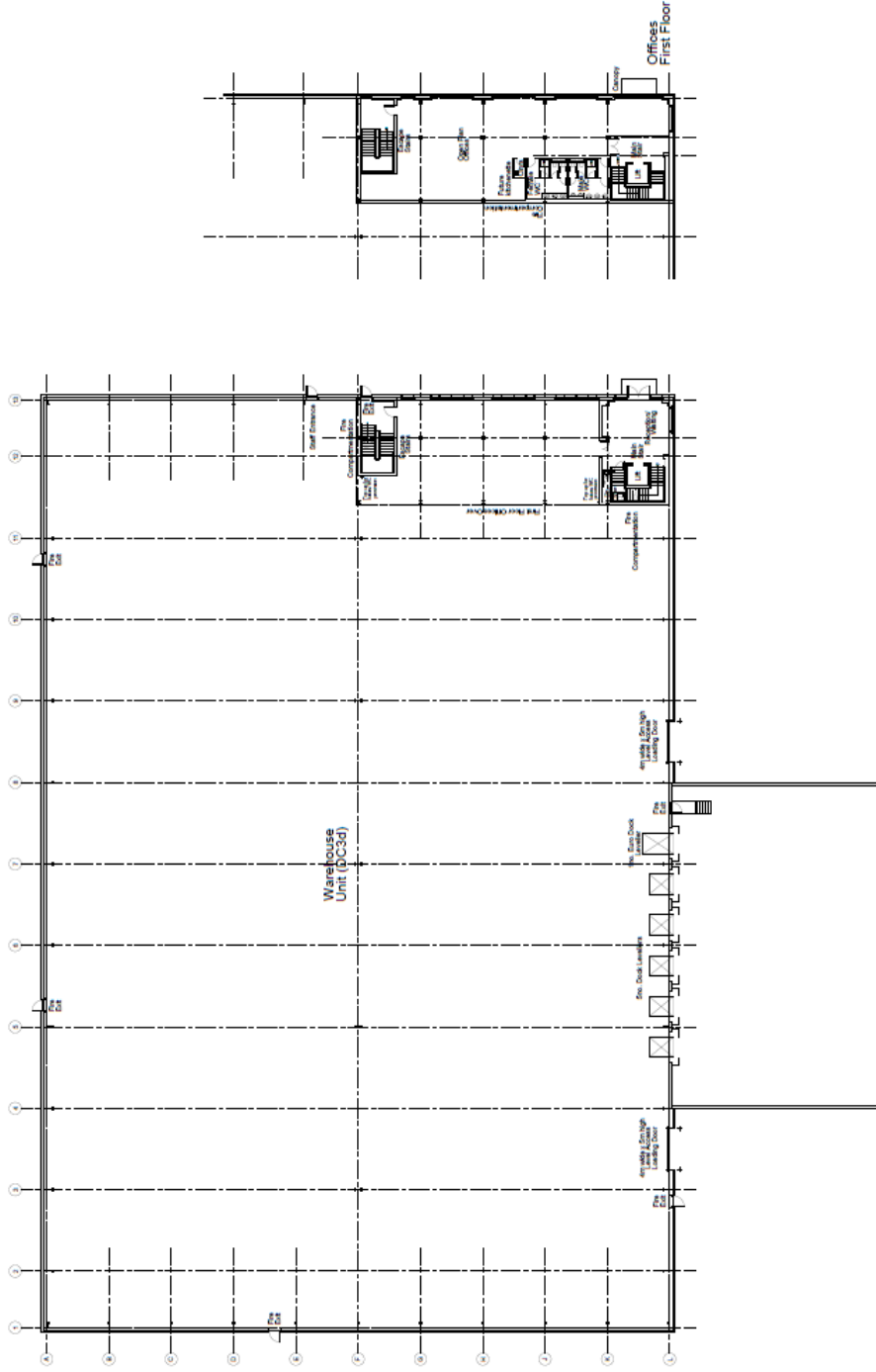
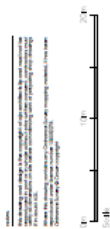


Figure 16 7049-038 Unit 3d - Building Plans



**oja architects**  
 0191 262626  
 1000 North Road  
 Leazes Road  
 Newcastle Upon Tyne  
 NE4 4BE  
 www.oja-architects.com

INTEGRA 61 (DURHAM) Ltd

INTEGRA 61, BOWBURN

DC 3d  
 Roof plan

Scale: 1:200  
 Date: 21/02/22

7049 - 039  
 Planning

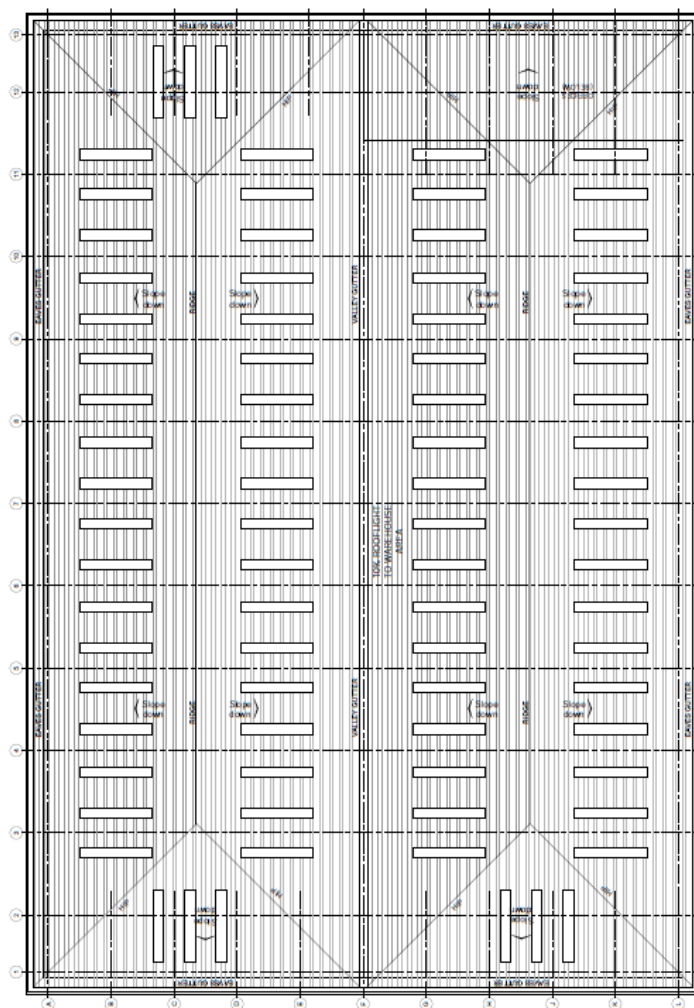


Figure 17 7049-039 Unit 3d – Roof Plan

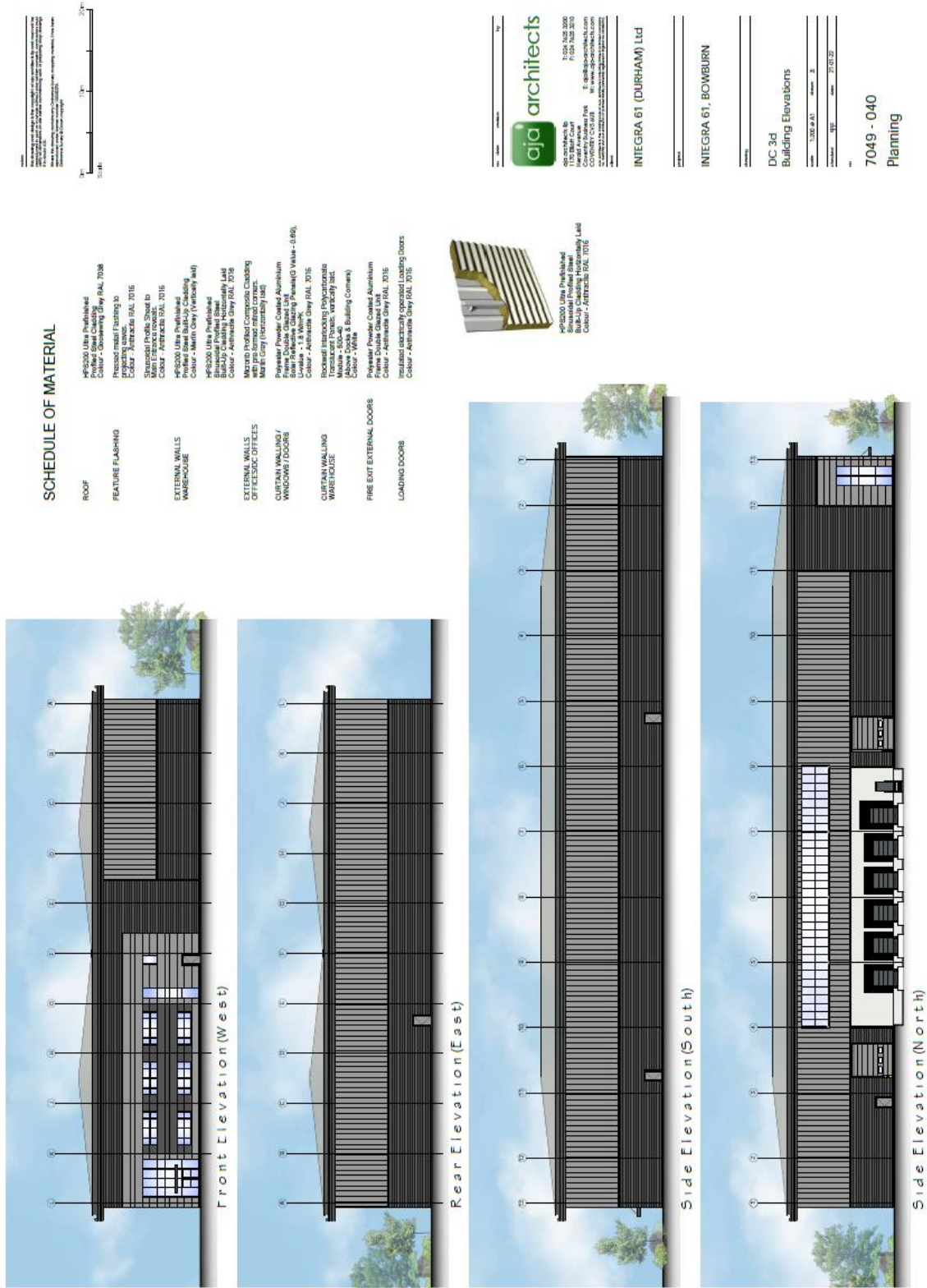
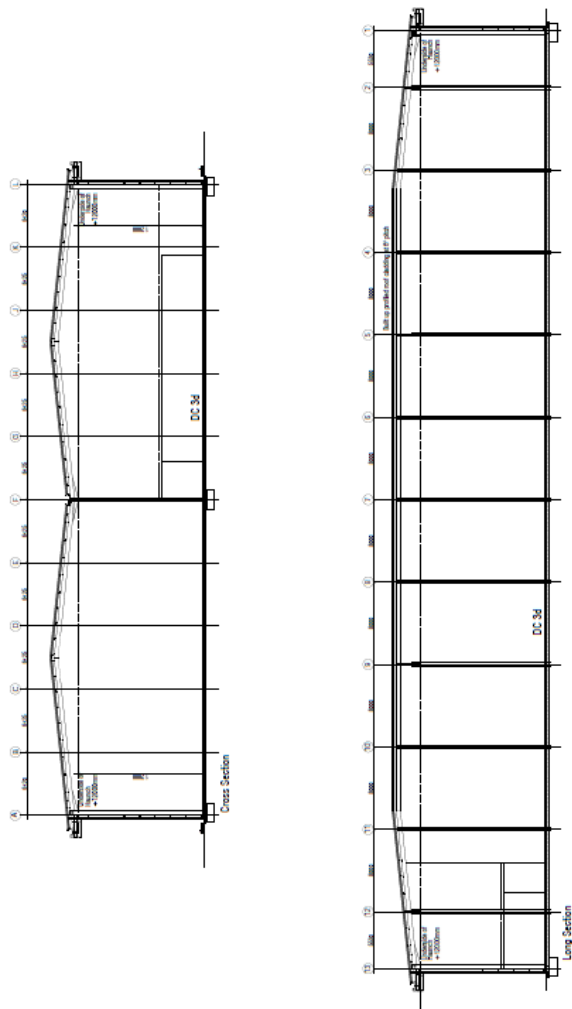
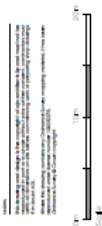


Figure 18 7049-040 Unit 3d – Building Elevations



Integra 61 (Durham) Ltd/ Integra 61, Bowburn DC3  
 Energy and Sustainability Statement



INTEGRA 61 (DURHAM) Ltd

INTEGRA 61, BOWBURN

DC 3d  
 Building Sections

Scale: 1:200 A1  
 Date: 27.03.23

7049 - 041  
 Planning

Figure 19 7049-041 Unit 3d - Building Sections

## **APPENDIX B – BRUKL REPORTS**

This section contains a copy of the BRUKL reports of the assumed first fit-out for each unit.

**UNIT 3a BRUKL REPORT**

**BRUKL Output Document**  HM Government  
 Compliance with England Building Regulations Part L 2013

Project name	<b>Integra DC3 Block A</b>	As designed
Date:	Fri Feb 04 16:04:55 2022	

**Administrative information**

**Building Details**

Address: Bowburn, Durham, City, Postcode

**Certification tool**

Calculation engine: SBEM  
 Calculation engine version: v5.8.b.0  
 Interface to calculation engine: Virtual Environment  
 Interface to calculation engine version: v7.0.13  
 BRUKL compliance check version: v5.8.b.0

**Certifier details**

Name: ESP LTD  
 Telephone number: 0208 822 2281  
 Address: Sunley House, 4 Bedford Park, Croydon, City, CR0 2AP

**Criterion 1: The calculated CO<sub>2</sub> emission rate for the building must not exceed the target**

CO <sub>2</sub> emission rate from the notional building, kgCO <sub>2</sub> /m <sup>2</sup> .annum	12.3
Target CO <sub>2</sub> emission rate (TER), kgCO <sub>2</sub> /m <sup>2</sup> .annum	12.3
Building CO <sub>2</sub> emission rate (BER), kgCO <sub>2</sub> /m <sup>2</sup> .annum	9.8
Are emissions from the building less than or equal to the target?	BER =< TER
Are as built details the same as used in the BER calculations?	Separate submission

**Criterion 2: The performance of the building fabric and fixed building services should achieve reasonable overall standards of energy efficiency**

Values which do not achieve the standards in the Non-Domestic Building Services Compliance Guide and Part L are displayed in red.

**Building fabric**

Element	U <sub>o-limit</sub>	U <sub>o-calc</sub>	U <sub>i-calc</sub>	Surface where the maximum value occurs*
Wall**	0.35	0.22	0.22	"L0000004_W0"
Floor	0.25	0.22	0.22	"L0000004_F"
Roof	0.25	0.25	0.25	"L2000008_C"
Windows***, roof windows, and rooflights	2.2	1.8	1.8	"L0000008_W-1_O0"
Personnel doors	2.2	1.41	1.41	"L0000004_WO_O0"
Vehicle access & similar large doors	1.5	-	-	"No external vehicle access doors"
High usage entrance doors	3.5	-	-	"No external high usage entrance doors"
U <sub>o-limit</sub> = Limiting area-weighted average U-values [W/(m <sup>2</sup> K)] U <sub>o-calc</sub> = Calculated area-weighted average U-values [W/(m <sup>2</sup> K)] U <sub>i-calc</sub> = Calculated maximum individual element U-values [W/(m <sup>2</sup> K)] * There might be more than one surface where the maximum U-value occurs. ** Automatic U-value check by the tool does not apply to curtain walls whose limiting standard is similar to that for windows. *** Display windows and similar glazing are excluded from the U-value check. N.B.: Neither roof ventilators (inc. smoke vents) nor swimming pool basins are modelled or checked against the limiting standards by the tool.				

Air Permeability	Worst acceptable standard	This building
m <sup>3</sup> /(h.m <sup>2</sup> ) at 50 Pa	10	5

**Building services**

The standard values listed below are minimum values for efficiencies and maximum values for SFPs. Refer to the Non-Domestic Building Services Compliance Guide for details.

Whole building lighting automatic monitoring & targeting with alarms for out-of-range values	YES
Whole building electric power factor achieved by power factor correction	<0.9

1- Electric Panel Radiators

	Heating efficiency	Cooling efficiency	Radiant efficiency	SFP [W/(l/s)]	HR efficiency
<b>This system</b>	1	-	-	-	-
<b>Standard value</b>	N/A	N/A	N/A	N/A	N/A
<b>Automatic monitoring &amp; targeting with alarms for out-of-range values for this HVAC system</b>					YES

2- VRF

	Heating efficiency	Cooling efficiency	Radiant efficiency	SFP [W/(l/s)]	HR efficiency
<b>This system</b>	3.38	8.67	-	-	-
<b>Standard value</b>	2.5*	2.6	N/A	N/A	N/A
<b>Automatic monitoring &amp; targeting with alarms for out-of-range values for this HVAC system</b>					YES
* Standard shown is for all types >12 kW output, except absorption and gas engine heat pumps. For types <=12 kW output, refer to EN 14825 for limiting standards.					

3- VRF Hub

	Heating efficiency	Cooling efficiency	Radiant efficiency	SFP [W/(l/s)]	HR efficiency
<b>This system</b>	7.5	8.93	-	-	-
<b>Standard value</b>	2.5*	2.6	N/A	N/A	N/A
<b>Automatic monitoring &amp; targeting with alarms for out-of-range values for this HVAC system</b>					YES
* Standard shown is for all types >12 kW output, except absorption and gas engine heat pumps. For types <=12 kW output, refer to EN 14825 for limiting standards.					

1- SYST0001-DHW

	Water heating efficiency	Storage loss factor [kWh/litre per day]
<b>This building</b>	1	0.021
<b>Standard value</b>	1	N/A

Local mechanical ventilation, exhaust, and terminal units

ID	System type in Non-domestic Building Services Compliance Guide
A	Local supply or extract ventilation units serving a single area
B	Zonal supply system where the fan is remote from the zone
C	Zonal extract system where the fan is remote from the zone
D	Zonal supply and extract ventilation units serving a single room or zone with heating and heat recovery
E	Local supply and extract ventilation system serving a single area with heating and heat recovery
F	Other local ventilation units
G	Fan-assisted terminal VAV unit
H	Fan coil units
I	Zonal extract system where the fan is remote from the zone with grease filter

Zone name	ID of system type	SFP [W/(l/s)]									HR efficiency	
		A	B	C	D	E	F	G	H	I	Zone	Standard
	<b>Standard value</b>	0.3	1.1	0.5	1.9	1.6	0.5	1.1	0.5	1	-	-
L1 - WC		-	-	0.3	-	-	-	-	-	-	-	N/A
L2 - Cleaners Cupboard		0.3	-	-	-	-	-	-	-	-	-	N/A

Zone name	SFP [W/(l/s)]										HR efficiency	
	ID of system type										Zone	Standard
Standard value	A	B	C	D	E	F	G	H	I			
L0 - Disabled WC - Shower	-	-	0.3	-	-	-	-	-	-	-	-	N/A
L1 - Drivers Hub WC	-	-	0.3	-	-	-	-	-	-	-	-	N/A
L0 - Drivers Hub WC	-	-	0.3	-	-	-	-	-	-	-	-	N/A
L1 - Office	-	-	-	1.5	-	-	-	-	-	-	0.8	0.5
L2 - Office	-	-	-	1.5	-	-	-	-	-	-	0.8	0.5
L2 - Office	-	-	-	1.5	-	-	-	-	-	-	0.8	0.5
L0 - Reception	-	-	-	1.5	-	-	-	-	-	-	0.8	0.5
L1 - Drivers Hub	-	-	-	1.5	-	-	-	-	-	-	0.8	0.5
L0 - Drivers Hub	-	-	-	1.5	-	-	-	-	-	-	0.8	0.5

Zone name	Luminous efficacy [lm/W]			General lighting [W]
	Luminaire	Lamp	Display lamp	
Standard value	60	60	22	
L1 - WC	-	100	-	132
L2 - Cleaners Cupboard	100	-	-	41
L0 - Core 2	-	100	-	45
L1 - Core 2	-	100	-	45
L2 - Core 2	-	100	-	46
L2 - Core 1	-	100	-	77
L2 - WC	-	100	-	141
L0 - Disabled WC - Shower	-	100	-	50
L1 - Drivers Hub Core Stairs	-	100	-	55
L0 - Drivers Hub Core Stairs	-	100	-	55
L1 - Drivers Hub WC	-	100	-	61
L1 - Core 1	-	100	-	73
L0 - Drivers Hub WC	100	-	-	120
L1 - Office	100	-	-	1495
L2 - Office	100	-	-	1523
L2 - Office	100	-	-	43
L0 - Reception	-	100	100	226
L1 - Drivers Hub	100	-	-	645
L0 - Drivers Hub	100	-	-	641
L0 - Ware House Area	100	-	-	59987

**Criterion 3: The spaces in the building should have appropriate passive control measures to limit solar gains**

Zone	Solar gain limit exceeded? (%)	Internal blinds used?
L2 - Cleaners Cupboard	N/A	N/A
L0 - Drivers Hub WC	N/A	N/A
L1 - Office	NO (-22.9%)	NO
L2 - Office	NO (-40%)	NO
L2 - Office	N/A	N/A
L0 - Reception	NO (-7.4%)	NO

Zone	Solar gain limit exceeded? (%)	Internal blinds used?
L1 - Drivers Hub	NO (-33.4%)	NO
L0 - Drivers Hub	NO (-40.6%)	NO
L0 - Ware House Area	NO (-36.9%)	NO

**Criterion 4: The performance of the building, as built, should be consistent with the calculated BER**

Separate submission

**Criterion 5: The necessary provisions for enabling energy-efficient operation of the building should be in place**

Separate submission

**EPBD (Recast): Consideration of alternative energy systems**

Were alternative energy systems considered and analysed as part of the design process?	YES
Is evidence of such assessment available as a separate submission?	YES
Are any such measures included in the proposed design?	YES

## Technical Data Sheet (Actual vs. Notional Building)

Building Global Parameters			Building Use	
	Actual	Notional	% Area	Building Type
Area [m <sup>2</sup> ]	14698.2	14698.2		A1/A2 Retail/Financial and Professional services
External area [m <sup>2</sup> ]	35391.5	35391.5		A3/A4/A5 Restaurants and Cafes/Drinking Est./Takeaways
Weather	NEW	NEW		B1 Offices and Workshop businesses
Infiltration [m <sup>3</sup> /hm <sup>2</sup> @ 50Pa]	5	3		B2 to B7 General Industrial and Special Industrial Groups
Average conductance [W/K]	12462.1	12377.2	100	<b>B8 Storage or Distribution</b>
Average U-value [W/m <sup>2</sup> K]	0.35	0.35		C1 Hotels
Alpha value* [%]	4.15	15.82		C2 Residential Institutions: Hospitals and Care Homes
* Percentage of the building's average heat transfer coefficient which is due to thermal bridging				
				C2 Residential Institutions: Residential schools
				C2 Residential Institutions: Universities and colleges
				C2A Secure Residential Institutions
				Residential spaces
				D1 Non-residential Institutions: Community/Day Centre
				D1 Non-residential Institutions: Libraries, Museums, and Galleries
				D1 Non-residential Institutions: Education
				D1 Non-residential Institutions: Primary Health Care Building
				D1 Non-residential Institutions: Crown and County Courts
				D2 General Assembly and Leisure, Night Clubs, and Theatres
				Others: Passenger terminals
				Others: Emergency services
				Others: Miscellaneous 24hr activities
				Others: Car Parks 24 hrs
				Others: Stand alone utility block

### Energy Consumption by End Use [kWh/m<sup>2</sup>]

	Actual	Notional
Heating	0.99	0.94
Cooling	0.33	0.63
Auxiliary	0.36	0.27
Lighting	13.23	19.36
Hot water	4.34	4.82
Equipment*	30.21	30.21
<b>TOTAL**</b>	<b>19.25</b>	<b>26.02</b>

\* Energy used by equipment does not count towards the total for consumption or calculating emissions.  
 \*\* Total is net of any electrical energy displaced by CHP generators, if applicable.

### Energy Production by Technology [kWh/m<sup>2</sup>]

	Actual	Notional
Photovoltaic systems	0.3	0
Wind turbines	0	0
CHP generators	0	0
Solar thermal systems	0	0

### Energy & CO<sub>2</sub> Emissions Summary

	Actual	Notional
Heating + cooling demand [MJ/m <sup>2</sup> ]	231.56	291.3
Primary energy* [kWh/m <sup>2</sup> ]	59.09	68.77
Total emissions [kg/m <sup>2</sup> ]	9.8	12.3

\* Primary energy is net of any electrical energy displaced by CHP generators, if applicable.

HVAC Systems Performance										
System Type	Heat dem MJ/m2	Cool dem MJ/m2	Heat con kWh/m2	Cool con kWh/m2	Aux con kWh/m2	Heat SSEFF	Cool SSEER	Heat gen SEFF	Cool gen SEER	Electricity
[ST] Other local room heater - unfanned, [HS] Heat pump (electric): ground or water source, [HFT] Electricity, [CFT] Electricity										
Actual	121.7	44	40.2	0	1.8	0.84	0	1	0	
Notional	186.6	64.4	21.3	0	3.6	2.43	0	---	---	
[ST] Split or multi-split system, [HS] Heat pump (electric): air source, [HFT] Electricity, [CFT] Electricity										
Actual	22.9	168.4	1.9	6.7	6.4	3.32	6.94	3.38	9.28	
Notional	47.7	151.4	5.4	11.7	3.8	2.43	3.6	---	---	
[ST] Split or multi-split system, [HS] Heat pump (electric): air source, [HFT] Electricity, [CFT] Electricity										
Actual	79.5	155.3	3	6	6.3	7.36	7.2	7.5	9.63	
Notional	181.9	190.5	20.8	14.7	3.8	2.43	3.6	---	---	
[ST] No Heating or Cooling										
Actual	156.3	78.3	0	0	0	0	0	0	0	
Notional	159.8	135	0	0	0	0	0	---	---	

**Key to terms**

- Heat dem [MJ/m2] - Heating energy demand
- Cool dem [MJ/m2] - Cooling energy demand
- Heat con [kWh/m2] - Heating energy consumption
- Cool con [kWh/m2] - Cooling energy consumption
- Aux con [kWh/m2] - Auxiliary energy consumption
- Heat SSEFF - Heating system seasonal efficiency (for notional building, value depends on activity glazing class)
- Cool SSEER - Cooling system seasonal energy efficiency ratio
- Heat gen SSEFF - Heating generator seasonal efficiency
- Cool gen SSEER - Cooling generator seasonal energy efficiency ratio
- ST - System type
- HS - Heat source
- HFT - Heating fuel type
- CFT - Cooling fuel type

**Key Features**

The Building Control Body is advised to give particular attention to items whose specifications are better than typically expected.

**Building fabric**

Element	U <sub>typ</sub>	U <sub>min</sub>	Surface where the minimum value occurs*
Wall	0.23	0.22	"L0000004_W0"
Floor	0.2	0.22	"L0000004_F"
Roof	0.15	0.25	"L2000008_C"
Windows, roof windows, and rooflights	1.5	1.6	"L0000008_W-1_O0"
Personnel doors	1.5	1.41	"L0000004_W0_O0"
Vehicle access & similar large doors	1.5	-	"No external vehicle access doors"
High usage entrance doors	1.5	-	"No external high usage entrance doors"
U <sub>typ</sub> - Typical Individual element U-values [W/(m <sup>2</sup> K)]		U <sub>min</sub> - Minimum Individual element U-values [W/(m <sup>2</sup> K)]	

\* There might be more than one surface where the minimum U-value occurs.

Air Permeability	Typical value	This building
m <sup>3</sup> /(h.m <sup>2</sup> ) at 50 Pa	5	5



**UNIT 3b BRUKL REPORT**

**BRUKL Output Document**  HM Government  
 Compliance with England Building Regulations Part L 2013

Project name	
<b>Integra DC3 Block B</b>	As designed
Date: Fri Feb 04 15:07:54 2022	

**Administrative information**

**Building Details**

Address: Bowburn, Durham, DH6

**Certification tool**

Calculation engine: SBEM  
 Calculation engine version: v5.6.b.0  
 Interface to calculation engine: Virtual Environment  
 Interface to calculation engine version: v7.0.13  
 BRUKL compliance check version: v5.6.b.0

**Certifier details**

Name: ESP Ltd  
 Telephone number: 0208 662 2281  
 Address: Sunley House, 4 Bedford Park., Croydon, CR0 2AP

**Criterion 1: The calculated CO<sub>2</sub> emission rate for the building must not exceed the target**

CO <sub>2</sub> emission rate from the notional building, kgCO <sub>2</sub> /m <sup>2</sup> .annum	13.7
Target CO <sub>2</sub> emission rate (TER), kgCO <sub>2</sub> /m <sup>2</sup> .annum	13.7
Building CO <sub>2</sub> emission rate (BER), kgCO <sub>2</sub> /m <sup>2</sup> .annum	8.5
Are emissions from the building less than or equal to the target?	BER =< TER
Are as built details the same as used in the BER calculations?	Separate submission

**Criterion 2: The performance of the building fabric and fixed building services should achieve reasonable overall standards of energy efficiency**

Values which do not achieve the standards in the Non-Domestic Building Services Compliance Guide and Part L are displayed in red.

**Building fabric**

Element	U <sub>a-Limit</sub>	U <sub>a-Calc</sub>	U <sub>i-Calc</sub>	Surface where the maximum value occurs*
Wall**	0.35	0.33	1.79	"L1000004_W10_A0"
Floor	0.25	0.25	0.25	"L0000004_F"
Roof	0.25	0.25	0.25	"L0000005_C_A2"
Windows***, roof windows, and rooflights	2.2	1.6	1.6	"L0000004_W0_O0"
Personnel doors	2.2	1.6	1.6	"L0000001_W1_O6"
Vehicle access & similar large doors	1.5	-	-	"No external vehicle access doors"
High usage entrance doors	3.5	-	-	"No external high usage entrance doors"
U <sub>a-Limit</sub> = Limiting area-weighted average U-values [W/(m <sup>2</sup> K)] U <sub>a-Calc</sub> = Calculated area-weighted average U-values [W/(m <sup>2</sup> K)] U <sub>i-Calc</sub> = Calculated maximum individual element U-values [W/(m <sup>2</sup> K)] * There might be more than one surface where the maximum U-value occurs. ** Automatic U-value check by the tool does not apply to curtain walls whose limiting standard is similar to that for windows. *** Display windows and similar glazing are excluded from the U-value check. N.B.: Neither roof ventilators (inc. smoke vents) nor swimming pool basins are modelled or checked against the limiting standards by the tool.				

Air Permeability	Worst acceptable standard	This building
m <sup>3</sup> /(h.m <sup>2</sup> ) at 50 Pa	10	5

**Building services**

The standard values listed below are minimum values for efficiencies and maximum values for SFPs. Refer to the Non-Domestic Building Services Compliance Guide for details.

Whole building lighting automatic monitoring & targeting with alarms for out-of-range values	YES
Whole building electric power factor achieved by power factor correction	<0.9

1- Panel Radiators

	Heating efficiency	Cooling efficiency	Radiant efficiency	SFP [W/(l/s)]	HR efficiency
This system	1	-	-	-	-
Standard value	N/A	N/A	N/A	N/A	N/A
Automatic monitoring & targeting with alarms for out-of-range values for this HVAC system					NO

2- VRF

	Heating efficiency	Cooling efficiency	Radiant efficiency	SFP [W/(l/s)]	HR efficiency
This system	8	9	-	-	-
Standard value	2.5*	2.6	N/A	N/A	N/A
Automatic monitoring & targeting with alarms for out-of-range values for this HVAC system					NO

\* Standard shown is for all types >12 kW output, except absorption and gas engine heat pumps. For types <=12 kW output, refer to EN 14825 for limiting standards.

1- SYST0000-DHW

	Water heating efficiency	Storage loss factor [kWh/litre per day]
This building	1	0.021
Standard value	1	N/A

Local mechanical ventilation, exhaust, and terminal units

ID	System type in Non-domestic Building Services Compliance Guide
A	Local supply or extract ventilation units serving a single area
B	Zonal supply system where the fan is remote from the zone
C	Zonal extract system where the fan is remote from the zone
D	Zonal supply and extract ventilation units serving a single room or zone with heating and heat recovery
E	Local supply and extract ventilation system serving a single area with heating and heat recovery
F	Other local ventilation units
G	Fan-assisted terminal VAV unit
H	Fan coil units
I	Zonal extract system where the fan is remote from the zone with grease filter

Zone name	ID of system type	SFP [W/(l/s)]									HR efficiency	
		A	B	C	D	E	F	G	H	I	Zone	Standard
	Standard value	0.3	1.1	0.5	1.9	1.6	0.5	1.1	0.5	1		
L1 - WC		-	-	0.3	-	-	-	-	-	-	-	N/A
L0 - Office Area		-	-	-	1.5	-	-	-	-	-	0.8	0.5
L1 - Office Area		-	-	-	1.5	-	-	-	-	-	0.8	0.5
L1 - Office Area		-	-	-	1.5	-	-	-	-	-	0.8	0.5
L1 - Office Area		-	-	-	1.5	-	-	-	-	-	0.8	0.5
L0 - Disabled WC		-	-	0.3	-	-	-	-	-	-	-	N/A
L0 - Reception		-	-	-	1.5	-	-	-	-	-	0.8	0.5
L1 - Cleaners Cupboard		-	-	0.3	-	-	-	-	-	-	-	N/A

General lighting and display lighting	Luminous efficacy [lm/W]			General lighting [W]
	Zone name	Luminaire	Lamp	
Standard value	60	60	22	
L0 - Core 2	-	100	-	58
L1 - Core 2	-	100	-	58
L1 - WC	-	100	-	64
L0 - Office Area	100	-	-	1365
L1 - Office Area	100	-	-	238
L1 - Office Area	-	100	-	69
L1 - Office Area	100	-	-	1212
L0 - Disabled WC	100	-	-	100
L0 - Reception	100	-	-	452
L1 - Cleaners Cupboard	-	100	-	11
L1 Warehouse Area	100	-	-	17098

**Criterion 3: The spaces in the building should have appropriate passive control measures to limit solar gains**

Zone	Solar gain limit exceeded? (%)	Internal blinds used?
L0 - Office Area	NO (-67.5%)	NO
L1 - Office Area	NO (-28.4%)	NO
L1 - Office Area	NO (-65.3%)	NO
L1 - Office Area	NO (-67%)	NO
L0 - Disabled WC	N/A	N/A
L0 - Reception	NO (-28.8%)	NO
L1 Warehouse Area	NO (-40%)	NO

**Criterion 4: The performance of the building, as built, should be consistent with the calculated BER**

Separate submission

**Criterion 5: The necessary provisions for enabling energy-efficient operation of the building should be in place**

Separate submission

**EPBD (Recast): Consideration of alternative energy systems**

Were alternative energy systems considered and analysed as part of the design process?	YES
Is evidence of such assessment available as a separate submission?	YES
Are any such measures included in the proposed design?	YES

## Technical Data Sheet (Actual vs. Notional Building)

Building Global Parameters			Building Use	
	Actual	Notional	% Area	Building Type
Area [m <sup>2</sup> ]	4495	4495		A1/A2 Retail/Financial and Professional services
External area [m <sup>2</sup> ]	10886.6	10886.6		A3/A4/A5 Restaurants and Cafes/Drinking Est./Takeaways
Weather	NEW	NEW		B1 Offices and Workshop businesses
Infiltration [m <sup>3</sup> /hm <sup>2</sup> @ 50Pa]	5	5		B2 to B7 General Industrial and Special Industrial Groups
			100	<b>B8 Storage or Distribution</b>
Average conductance [W/K]	3810.36	3867.07		C1 Hotels
Average U-value [W/m <sup>2</sup> K]	0.35	0.36		C2 Residential Institutions: Hospitals and Care Homes
Alpha value* [%]	4.55	22.3		C2 Residential Institutions: Residential schools
				C2 Residential Institutions: Universities and colleges
				C2A Secure Residential Institutions
				Residential spaces
				D1 Non-residential Institutions: Community/Day Centre
				D1 Non-residential Institutions: Libraries, Museums, and Galleries
				D1 Non-residential Institutions: Education
				D1 Non-residential Institutions: Primary Health Care Building
				D1 Non-residential Institutions: Crown and County Courts
				D2 General Assembly and Leisure, Night Clubs, and Theatres
				Others: Passenger terminals
				Others: Emergency services
				Others: Miscellaneous 24hr activities
				Others: Car Parks 24 hrs
				Others: Stand alone utility block

\* Percentage of the building's average heat transfer coefficient which is due to thermal bridging

### Energy Consumption by End Use [kWh/m<sup>2</sup>]

	Actual	Notional
Heating	1.02	2.25
Cooling	0.7	1.24
Auxiliary	0.85	0.63
Lighting	14.02	20.32
Hot water	4.54	4.81
Equipment*	31.19	31.19
<b>TOTAL**</b>	<b>21.13</b>	<b>29.25</b>

\* Energy used by equipment does not count towards the total for consumption or calculating emissions.  
 \*\* Total is net of any electrical energy displaced by CHP generators, if applicable.

### Energy Production by Technology [kWh/m<sup>2</sup>]

	Actual	Notional
Photovoltaic systems	4.69	0
Wind turbines	0	0
CHP generators	0	0
Solar thermal systems	0	0

### Energy & CO<sub>2</sub> Emissions Summary

	Actual	Notional
Heating + cooling demand [MJ/m <sup>2</sup> ]	224.4	305.43
Primary energy* [kWh/m <sup>2</sup> ]	64.88	76.38
Total emissions [kg/m <sup>2</sup> ]	8.5	13.7

\* Primary energy is net of any electrical energy displaced by CHP generators, if applicable.

HVAC Systems Performance									
System Type	Heat dem MJ/m2	Cool dem MJ/m2	Heat con kWh/m2	Cool con kWh/m2	Aux con kWh/m2	Heat SSEFF	Cool SSEER	Heat gen SEFF	Cool gen SEER
[ST] Other local room heater - unfanned, [HS] Direct or storage electric heater, [HFT] Electricity, [CFT] Electricity									
Actual	112.2	24.6	39	0	3.3	0.8	0	1	0
Notional	156.6	41.1	53.1	0	6.6	0.82	0	---	---
[ST] Split or multi-split system, [HS] Heat pump (electric): air source, [HFT] Electricity, [CFT] Electricity									
Actual	34.8	140.7	1.7	5.7	6.3	5.59	6.89	6	9.71
Notional	81.4	129.3	9.3	10	4	2.43	3.6	---	---
[ST] No Heating or Cooling									
Actual	158.9	74.7	0	0	0	0	0	0	0
Notional	201.1	120.7	0	0	0	0	0	---	---

**Key to terms**

- Heat dem [MJ/m2] - Heating energy demand
- Cool dem [MJ/m2] - Cooling energy demand
- Heat con [kWh/m2] - Heating energy consumption
- Cool con [kWh/m2] - Cooling energy consumption
- Aux con [kWh/m2] - Auxiliary energy consumption
- Heat SSEFF - Heating system seasonal efficiency (for notional building, value depends on activity glazing class)
- Cool SSEER - Cooling system seasonal energy efficiency ratio
- Heat gen SSEFF - Heating generator seasonal efficiency
- Cool gen SSEER - Cooling generator seasonal energy efficiency ratio
- ST - System type
- HS - Heat source
- HFT - Heating fuel type
- CFT - Cooling fuel type

**Key Features**

The Building Control Body is advised to give particular attention to items whose specifications are better than typically expected.

**Building fabric**

Element	U <sub>typ</sub>	U <sub>min</sub>	Surface where the minimum value occurs*
Wall	0.23	0.22	"L0000004_W0"
Floor	0.2	0.25	"L0000004_F"
Roof	0.15	0.25	"L0000005_C"
Windows, roof windows, and rooflights	1.5	1.6	"L0000004_W0_O0"
Personnel doors	1.5	1.6	"L0000001_W1_O6"
Vehicle access & similar large doors	1.5	-	"No external vehicle access doors"
High usage entrance doors	1.5	-	"No external high usage entrance doors"
U <sub>typ</sub> - Typical Individual element U-values [W/(m <sup>2</sup> K)]		U <sub>min</sub> - Minimum Individual element U-values [W/(m <sup>2</sup> K)]	
* There might be more than one surface where the minimum U-value occurs.			

Air Permeability	Typical value	This building
m <sup>3</sup> /(h.m <sup>2</sup> ) at 50 Pa	5	5

**UNIT 3c BRUKL REPORT**

**BRUKL Output Document**  HM Government  
 Compliance with England Building Regulations Part L 2013

Project name	<b>INTEGRA DC3 C</b>	As designed
Date: Wed Feb 02 19:56:23 2022		

**Administrative information**

<b>Building Details</b>	
Address: Bowburn, Durham, DH8	
<b>Certification tool</b>	
Calculation engine: SBEM	
Calculation engine version: v5.6.b.0	<b>Certifier details</b>
Interface to calculation engine: Virtual Environment	Name: Jonathan Board
Interface to calculation engine version: v7.0.13	Telephone number: 0208 662 2281
BRUKL compliance check version: v5.6.b.0	Address: Sunley House 4 Bedford Park, Croydon, CR0 2AP

**Criterion 1: The calculated CO<sub>2</sub> emission rate for the building must not exceed the target**

CO <sub>2</sub> emission rate from the notional building, kgCO <sub>2</sub> /m <sup>2</sup> .annum	12.9
Target CO <sub>2</sub> emission rate (TER), kgCO <sub>2</sub> /m <sup>2</sup> .annum	12.9
Building CO <sub>2</sub> emission rate (BER), kgCO <sub>2</sub> /m <sup>2</sup> .annum	6.9
Are emissions from the building less than or equal to the target?	BER =< TER
Are as built details the same as used in the BER calculations?	Separate submission

**Criterion 2: The performance of the building fabric and fixed building services should achieve reasonable overall standards of energy efficiency**

Values which do not achieve the standards in the Non-Domestic Building Services Compliance Guide and Part L are displayed in red.

**Building fabric**

Element	U <sub>a-Limit</sub>	U <sub>a-Calc</sub>	U <sub>i-Calc</sub>	Surface where the maximum value occurs*
Wall**	0.35	0.22	0.22	"FF000001_W-1"
Floor	0.25	0.25	0.25	"GF000002_F"
Roof	0.25	-	-	"No heat loss roofs"
Windows***, roof windows, and rooflights	2.2	1.6	1.6	"GF000000_W-1_O0"
Personnel doors	2.2	1.81	2.24	"GF000002_W-1_O0"
Vehicle access & similar large doors	1.5	-	-	"No external vehicle access doors"
High usage entrance doors	3.5	-	-	"No external high usage entrance doors"
U <sub>a-Limit</sub> = Limiting area-weighted average U-values [W/(m <sup>2</sup> K)] U <sub>a-Calc</sub> = Calculated area-weighted average U-values [W/(m <sup>2</sup> K)] U <sub>i-Calc</sub> = Calculated maximum individual element U-values [W/(m <sup>2</sup> K)] * There might be more than one surface where the maximum U-value occurs. ** Automatic U-value check by the tool does not apply to curtain walls whose limiting standard is similar to that for windows. *** Display windows and similar glazing are excluded from the U-value check. N.B.: Neither roof ventilators (inc. smoke vents) nor swimming pool basins are modelled or checked against the limiting standards by the tool.				

<b>Air Permeability</b>	<b>Worst acceptable standard</b>	<b>This building</b>
m <sup>3</sup> /(h.m <sup>2</sup> ) at 50 Pa	10	5



**Building services**

The standard values listed below are minimum values for efficiencies and maximum values for SFPs. Refer to the Non-Domestic Building Services Compliance Guide for details.

Whole building lighting automatic monitoring & targeting with alarms for out-of-range values	YES
Whole building electric power factor achieved by power factor correction	<0.9

1- Electric Panel Radiators

	Heating efficiency	Cooling efficiency	Radiant efficiency	SFP [W/(l/s)]	HR efficiency
This system	1	-	-	-	-
Standard value	N/A	N/A	N/A	N/A	N/A
Automatic monitoring & targeting with alarms for out-of-range values for this HVAC system					YES

2- VRF

	Heating efficiency	Cooling efficiency	Radiant efficiency	SFP [W/(l/s)]	HR efficiency
This system	7	8.99	-	-	-
Standard value	2.5*	2.6	N/A	N/A	N/A
Automatic monitoring & targeting with alarms for out-of-range values for this HVAC system					YES

\* Standard shown is for all types >12 kW output, except absorption and gas engine heat pumps. For types <=12 kW output, refer to EN 14825 for limiting standards.

1- SYST0001-DHW

	Water heating efficiency	Storage loss factor [kWh/litre per day]
This building	1	0.021
Standard value	1	N/A

Local mechanical ventilation, exhaust, and terminal units

ID	System type in Non-domestic Building Services Compliance Guide
A	Local supply or extract ventilation units serving a single area
B	Zonal supply system where the fan is remote from the zone
C	Zonal extract system where the fan is remote from the zone
D	Zonal supply and extract ventilation units serving a single room or zone with heating and heat recovery
E	Local supply and extract ventilation system serving a single area with heating and heat recovery
F	Other local ventilation units
G	Fan-assisted terminal VAV unit
H	Fan coil units
I	Zonal extract system where the fan is remote from the zone with grease filter

Zone name	SFP [W/(l/s)]										HR efficiency	
	A	B	C	D	E	F	G	H	I	Zone	Standard	
GF Disabled WC - Shower	-	-	0.3	-	-	-	-	-	-	-	N/A	
FF WCs	-	-	0.3	-	-	-	-	-	-	-	N/A	
GF Office Area	-	-	-	1.5	-	-	-	-	-	0.8	0.5	
GF Reception Staircore 1	-	-	-	1.5	-	-	-	-	-	0.8	0.5	
FF Office Area	-	-	-	1.5	-	-	-	-	-	0.8	0.5	

General lighting and display lighting

Zone name	Luminous efficacy [lm/W]			General lighting [W]
	Luminaire	Lamp	Display lamp	
Standard value	60	60	22	
FF Stair Core Two	-	100	-	48

General lighting and display lighting		Luminous efficacy [lm/W]			General lighting [W]
Zone name	Standard value	Luminaire	Lamp	Display lamp	
GF Stairs Core 2	-	100	-	-	48
GF Disabled WC - Shower	-	100	-	-	47
FF Staircore 1	-	100	-	-	64
FF WCs	-	100	100	-	122
FF Cleaners Cupboard	100	-	-	-	4
GF Office Area	100	-	-	-	1578
GF Reception Staircore 1	-	100	100	-	198
FF Office Area	100	-	-	-	1189
Ware House Area	100	-	-	-	29743

**Criterion 3: The spaces in the building should have appropriate passive control measures to limit solar gains**

Zone	Solar gain limit exceeded? (%)	Internal blinds used?
FF WCs	NO (0%)	NO
GF Office Area	NO (-45.5%)	NO
GF Reception Staircore 1	NO (-53.6%)	NO
FF Office Area	NO (-78.3%)	NO
Ware House Area	NO (-40%)	NO

**Criterion 4: The performance of the building, as built, should be consistent with the calculated BER**

Separate submission

**Criterion 5: The necessary provisions for enabling energy-efficient operation of the building should be in place**

Separate submission

**EPBD (Recast): Consideration of alternative energy systems**

Were alternative energy systems considered and analysed as part of the design process?	YES
Is evidence of such assessment available as a separate submission?	YES
Are any such measures included in the proposed design?	YES



## Technical Data Sheet (Actual vs. Notional Building)

Building Global Parameters			Building Use	
	Actual	Notional	% Area	Building Type
Area [m <sup>2</sup> ]	8274.8	8274.8		A1/A2 Retail/Financial and Professional services
External area [m <sup>2</sup> ]	19627.3	19627.3		A3/A4/A5 Restaurants and Cafes/Drinking Est./Takeaways
Weather	NEW	NEW		B1 Offices and Workshop businesses
Infiltration [m <sup>3</sup> /hm <sup>2</sup> @ 50Pa]	5	5		B2 to B7 General Industrial and Special Industrial Groups
Average conductance [W/K]	6998.91	6889.69	100	<b>B8 Storage or Distribution</b>
Average U-value [W/m <sup>2</sup> K]	0.36	0.35		C1 Hotels
Alpha value* [%]	3.24	17.08		C2 Residential Institutions: Hospitals and Care Homes
				C2 Residential Institutions: Residential schools
				C2 Residential Institutions: Universities and colleges
				C2A Secure Residential Institutions
				Residential spaces
				D1 Non-residential Institutions: Community/Day Centre
				D1 Non-residential Institutions: Libraries, Museums, and Galleries
				D1 Non-residential Institutions: Education
				D1 Non-residential Institutions: Primary Health Care Building
				D1 Non-residential Institutions: Crown and County Courts
				D2 General Assembly and Leisure, Night Clubs, and Theatres
				Others: Passenger terminals
				Others: Emergency services
				Others: Miscellaneous 24hr activities
				Others: Car Parks 24 hrs
				Others: Stand alone utility block

### Energy Consumption by End Use [kWh/m<sup>2</sup>]

	Actual	Notional
Heating	0.57	1.14
Cooling	0.39	0.94
Auxiliary	0.55	0.4
Lighting	12.33	20.31
Hot water	4.44	4.84
Equipment*	30.03	30.03
<b>TOTAL**</b>	<b>18.28</b>	<b>27.63</b>

\* Energy used by equipment does not count towards the total for consumption or calculating emissions.  
 \*\* Total is net of any electrical energy displaced by CHP generators, if applicable.

### Energy Production by Technology [kWh/m<sup>2</sup>]

	Actual	Notional
Photovoltaic systems	4.97	0
Wind turbines	0	0
CHP generators	0	0
Solar thermal systems	0	0

### Energy & CO<sub>2</sub> Emissions Summary

	Actual	Notional
Heating + cooling demand [MJ/m <sup>2</sup> ]	224.35	298.96
Primary energy* [kWh/m <sup>2</sup> ]	56.11	72.08
Total emissions [kg/m <sup>2</sup> ]	6.9	12.9

\* Primary energy is net of any electrical energy displaced by CHP generators, if applicable.

HVAC Systems Performance									
System Type	Heat dem MJ/m2	Cool dem MJ/m2	Heat con kWh/m2	Cool con kWh/m2	Aux con kWh/m2	Heat SSEFF	Cool SSEER	Heat gen SEFF	Cool gen SEER
[ST] Other local room heater - unfanned, [HS] Direct or storage electric heater, [HFT] Electricity, [CFT] Electricity									
Actual	92.1	52.3	30.4	0	3	0.84	0	1	0
Notional	134.9	97.5	45.7	0	5.9	0.82	0	----	----
[ST] Split or multi-split system, [HS] Heat pump (electric): air source, [HFT] Electricity, [CFT] Electricity									
Actual	20.1	133.6	0.8	5.1	6.5	6.87	7.23	7	9.67
Notional	42.7	159.5	4.9	12.3	3.9	2.43	3.6	----	----
[ST] No Heating or Cooling									
Actual	156.8	75	0	0	0	0	0	0	0
Notional	186.4	121.9	0	0	0	0	0	----	----

Key to terms	
Heat dem [MJ/m2]	= Heating energy demand
Cool dem [MJ/m2]	= Cooling energy demand
Heat con [kWh/m2]	= Heating energy consumption
Cool con [kWh/m2]	= Cooling energy consumption
Aux con [kWh/m2]	= Auxiliary energy consumption
Heat SSEFF	= Heating system seasonal efficiency (for notional building, value depends on activity glazing class)
Cool SSEER	= Cooling system seasonal energy efficiency ratio
Heat gen SSEFF	= Heating generator seasonal efficiency
Cool gen SSEER	= Cooling generator seasonal energy efficiency ratio
ST	= System type
HS	= Heat source
HFT	= Heating fuel type
CFT	= Cooling fuel type

## Key Features

The Building Control Body is advised to give particular attention to items whose specifications are better than typically expected.

### Building fabric

Element	U <sub>typ</sub>	U <sub>min</sub>	Surface where the minimum value occurs*
Wall	0.23	0.22	"FF000001_W-1"
Floor	0.2	0.25	"GF000002_F"
Roof	0.15	-	"No heat loss roofs"
Windows, roof windows, and rooflights	1.5	1.6	"GF000000_W-1_O0"
Personnel doors	1.5	1.6	"ST000000_W0_O6"
Vehicle access & similar large doors	1.5	-	"No external vehicle access doors"
High usage entrance doors	1.5	-	"No external high usage entrance doors"
U <sub>typ</sub> = Typical Individual element U-values [W/(m²K)]		U <sub>min</sub> = Minimum Individual element U-values [W/(m²K)]	
* There might be more than one surface where the minimum U-value occurs.			

Air Permeability	Typical value	This building
m³/(h.m²) at 50 Pa	5	5

**UNIT 3d BRUKL REPORT**

**BRUKL Output Document**  HM Government  
 Compliance with England Building Regulations Part L 2013

Project name	<b>Integra 61 Block D</b>	As designed
Date:	Tue Feb 01 18:25:34 2022	

**Administrative information**

<b>Building Details</b>	
Address: Bowburn, Durham, Postcode	
<b>Certification tool</b>	
Calculation engine: SBEM	
Calculation engine version: v5.6.b.0	<b>Certifier details</b>
Interface to calculation engine: Virtual Environment	Name: ESP LTD
Interface to calculation engine version: v7.0.13	Telephone number: 0208 862 2281
BRUKL compliance check version: v5.6.b.0	Address: Sunley House, 4 Bedford Park., Croydon, CR0 2AP

**Criterion 1: The calculated CO<sub>2</sub> emission rate for the building must not exceed the target**

CO <sub>2</sub> emission rate from the notional building, kgCO <sub>2</sub> /m <sup>2</sup> .annum	12.7
Target CO <sub>2</sub> emission rate (TER), kgCO <sub>2</sub> /m <sup>2</sup> .annum	12.7
Building CO <sub>2</sub> emission rate (BER), kgCO <sub>2</sub> /m <sup>2</sup> .annum	7.5
Are emissions from the building less than or equal to the target?	BER =< TER
Are as built details the same as used in the BER calculations?	Separate submission

**Criterion 2: The performance of the building fabric and fixed building services should achieve reasonable overall standards of energy efficiency**

Values which do not achieve the standards in the Non-Domestic Building Services Compliance Guide and Part L are displayed in red.

**Building fabric**

Element	U <sub>a-Limit</sub>	U <sub>a-Calc</sub>	U <sub>i-Calc</sub>	Surface where the maximum value occurs*
Wall**	0.35	0.34	1.54	"L1000003_W4_A0"
Floor	0.25	0.16	0.16	"L0000001_F"
Roof	0.25	-	-	"No heat loss roofs"
Windows***, roof windows, and rooflights	2.2	1.6	1.6	"L0000001_W-1_O0"
Personnel doors	2.2	1.54	1.6	"L0000001_W-1_O10"
Vehicle access & similar large doors	1.5	-	-	"No external vehicle access doors"
High usage entrance doors	3.5	-	-	"No external high usage entrance doors"
U <sub>a-Limit</sub> = Limiting area-weighted average U-values [W/(m <sup>2</sup> K)] U <sub>a-Calc</sub> = Calculated area-weighted average U-values [W/(m <sup>2</sup> K)] U <sub>i-Calc</sub> = Calculated maximum individual element U-values [W/(m <sup>2</sup> K)] * There might be more than one surface where the maximum U-value occurs. ** Automatic U-value check by the tool does not apply to curtain walls whose limiting standard is similar to that for windows. *** Display windows and similar glazing are excluded from the U-value check. N.B.: Neither roof ventilators (inc. smoke vents) nor swimming pool basins are modelled or checked against the limiting standards by the tool.				

<b>Air Permeability</b>	<b>Worst acceptable standard</b>	<b>This building</b>
m <sup>3</sup> /(h.m <sup>2</sup> ) at 50 Pa	10	5

**Building services**

The standard values listed below are minimum values for efficiencies and maximum values for SFPs. Refer to the Non-Domestic Building Services Compliance Guide for details.

Whole building lighting automatic monitoring & targeting with alarms for out-of-range values	YES
Whole building electric power factor achieved by power factor correction	<0.9

1- VRF

	Heating efficiency	Cooling efficiency	Radiant efficiency	SFP [W/(l/s)]	HR efficiency
This system	5.45	8.67	-	-	-
Standard value	2.5*	2.6	N/A	N/A	N/A
Automatic monitoring & targeting with alarms for out-of-range values for this HVAC system					YES

\* Standard shown is for all types >12 kW output, except absorption and gas engine heat pumps. For types <=12 kW output, refer to EN 14825 for limiting standards.

1- SYST0000-DHW

	Water heating efficiency	Storage loss factor [kWh/litre per day]
This building	1	0.021
Standard value	1	N/A

Local mechanical ventilation, exhaust, and terminal units

ID	System type in Non-domestic Building Services Compliance Guide
A	Local supply or extract ventilation units serving a single area
B	Zonal supply system where the fan is remote from the zone
C	Zonal extract system where the fan is remote from the zone
D	Zonal supply and extract ventilation units serving a single room or zone with heating and heat recovery
E	Local supply and extract ventilation system serving a single area with heating and heat recovery
F	Other local ventilation units
G	Fan-assisted terminal VAV unit
H	Fan coil units
I	Zonal extract system where the fan is remote from the zone with grease filter

Zone name	SFP [W/(l/s)]									HR efficiency		
	ID of system type	A	B	C	D	E	F	G	H	I	Zone	Standard
Standard value		0.3	1.1	0.5	1.9	1.6	0.5	1.1	0.5	1		
L0 - Reception		-	-	-	1.5	-	-	-	-	-	0.8	0.5
L0 - Disabled WC - Shower		-	-	0.3	-	-	-	-	-	-	-	N/A
L1 - WCs		-	-	0.3	-	-	-	-	-	-	-	N/A
L1 - Office		-	-	-	1.5	-	-	-	-	-	0.8	0.5
L1 - Office (Mech Vent)		-	-	-	1.5	-	-	-	-	-	0.8	0.5

General lighting and display lighting

Zone name	Luminous efficacy [lm/W]			General lighting [W]
	Luminaire	Lamp	Display lamp	
Standard value	60	60	22	
L0 - Reception	-	100	60	213
L0 - Disabled WC - Shower	-	100	-	52
L1 - Core 1	-	100	-	118
L0 - Core 2	-	100	-	125
L1 - WCs	-	100	-	172
L1 - Office	100	-	-	833

General lighting and display lighting Zone name	Luminous efficacy [lm/W]			General lighting [W]
	Luminaire	Lamp	Display lamp	
Standard value	60	60	22	
L1 - Office (Mech Vent)	100	-	-	467
L3 - Ware House Area	100	-	-	25783
L1 - Cleaner	100	-	-	6

**Criterion 3: The spaces in the building should have appropriate passive control measures to limit solar gains**

Zone	Solar gain limit exceeded? (%)	Internal blinds used?
L0 - Reception	NO (-31.1%)	NO
L0 - Disabled WC - Shower	N/A	N/A
L1 - Core 1	NO (-47.6%)	NO
L0 - Core 2	N/A	N/A
L1 - WCs	N/A	N/A
L1 - Office	NO (-49.1%)	NO
L1 - Office (Mech Vent)	N/A	N/A
L3 - Ware House Area	NO (-39.6%)	NO

**Criterion 4: The performance of the building, as built, should be consistent with the calculated BER**

Separate submission

**Criterion 5: The necessary provisions for enabling energy-efficient operation of the building should be in place**

Separate submission

**EPBD (Recast): Consideration of alternative energy systems**

Were alternative energy systems considered and analysed as part of the design process?	YES
Is evidence of such assessment available as a separate submission?	YES
Are any such measures included in the proposed design?	YES

## Technical Data Sheet (Actual vs. Notional Building)

Building Global Parameters			Building Use	
	Actual	Notional	% Area	Building Type
Area [m <sup>2</sup> ]	6209.8	6209.8		A1/A2 Retail/Financial and Professional services
External area [m <sup>2</sup> ]	15422.2	15422.2		A3/A4/A5 Restaurants and Cafes/Drinking Est./Takeaways
Weather	NEW	NEW		B1 Offices and Workshop businesses
Infiltration [m <sup>3</sup> /hm <sup>2</sup> @ 50Pa]	5	5		B2 to B7 General Industrial and Special Industrial Groups
Average conductance [W/K]	4860.49	4815.25	100	<b>B8 Storage or Distribution</b>
Average U-value [W/m <sup>2</sup> K]	0.32	0.31		C1 Hotels
Alpha value* [%]	5.29	20.34		C2 Residential Institutions: Hospitals and Care Homes
* Percentage of the building's average heat transfer coefficient which is due to thermal bridging				
				C2 Residential Institutions: Residential schools
				C2 Residential Institutions: Universities and colleges
				C2A Secure Residential Institutions
				Residential spaces
				D1 Non-residential Institutions: Community/Day Centre
				D1 Non-residential Institutions: Libraries, Museums, and Galleries
				D1 Non-residential Institutions: Education
				D1 Non-residential Institutions: Primary Health Care Building
				D1 Non-residential Institutions: Crown and County Courts
				D2 General Assembly and Leisure, Night Clubs, and Theatres
				Others: Passenger terminals
				Others: Emergency services
				Others: Miscellaneous 24hr activities
				Others: Car Parks 24 hrs
				Others: Stand alone utility block

### Energy Consumption by End Use [kWh/m<sup>2</sup>]

	Actual	Notional
Heating	0.26	1.21
Cooling	0.15	0.57
Auxiliary	0.38	0.34
Lighting	14.18	19.96
Hot water	4.46	4.8
Equipment*	29.84	29.84
<b>TOTAL**</b>	<b>19.4</b>	<b>26.87</b>

\* Energy used by equipment does not count towards the total for consumption or calculating emissions.  
 \*\* Total is net of any electrical energy displaced by CHP generators, if applicable.

### Energy Production by Technology [kWh/m<sup>2</sup>]

	Actual	Notional
Photovoltaic systems	4.95	0
Wind turbines	0	0
CHP generators	0	0
Solar thermal systems	0	0

### Energy & CO<sub>2</sub> Emissions Summary

	Actual	Notional
Heating + cooling demand [MJ/m <sup>2</sup> ]	156.2	270.86
Primary energy* [kWh/m <sup>2</sup> ]	59.56	71.35
Total emissions [kg/m <sup>2</sup> ]	7.5	12.7

\* Primary energy is net of any electrical energy displaced by CHP generators, if applicable.

HVAC Systems Performance									
System Type	Heat dem MJ/m2	Cool dem MJ/m2	Heat con kWh/m2	Cool con kWh/m2	Aux con kWh/m2	Heat SSEFF	Cool SSEER	Heat gen SEFF	Cool gen SEER
[ST] Split or multi-split system, [HS] Heat pump (electric): air source, [HFT] Electricity, [CFT] Electricity									
Actual	80.4	61.8	4.2	2.5	5.8	5.35	6.94	5.45	9.28
Notional	170.6	89.3	19.5	9.2	5.6	2.43	2.7	----	----
[ST] No Heating or Cooling									
Actual	104.7	52.4	0	0	0	0	0	0	0
Notional	151.8	119.8	0	0	0	0	0	----	----

**Key to terms**

- Heat dem [MJ/m2] - Heating energy demand
- Cool dem [MJ/m2] - Cooling energy demand
- Heat con [kWh/m2] - Heating energy consumption
- Cool con [kWh/m2] - Cooling energy consumption
- Aux con [kWh/m2] - Auxiliary energy consumption
- Heat SSEFF - Heating system seasonal efficiency (for notional building, value depends on activity glazing class)
- Cool SSEER - Cooling system seasonal energy efficiency ratio
- Heat gen SSEFF - Heating generator seasonal efficiency
- Cool gen SSEER - Cooling generator seasonal energy efficiency ratio
- ST - System type
- HS - Heat source
- HFT - Heating fuel type
- CFT - Cooling fuel type

**Key Features**

The Building Control Body is advised to give particular attention to items whose specifications are better than typically expected.

**Building fabric**

Element	U <sub>typ</sub>	U <sub>min</sub>	Surface where the minimum value occurs*
Wall	0.23	0.22	"L0000001_W-1"
Floor	0.2	0.16	"L0000001_F"
Roof	0.15	-	"No heat loss roofs"
Windows, roof windows, and rooflights	1.5	1.6	"L0000001_W-1_O0"
Personnel doors	1.5	1.41	"L0000004_W1_O0"
Vehicle access & similar large doors	1.5	-	"No external vehicle access doors"
High usage entrance doors	1.5	-	"No external high usage entrance doors"
U <sub>typ</sub> = Typical Individual element U-values [W/(m <sup>2</sup> K)]		U <sub>min</sub> = Minimum Individual element U-values [W/(m <sup>2</sup> K)]	
* There might be more than one surface where the minimum U-value occurs.			

Air Permeability	Typical value	This building
m <sup>3</sup> /(h.m <sup>2</sup> ) at 50 Pa	5	5