Environmental Services Design

RICHMOND COLLEGE SITE,

EGERTON ROAD, TWICKENHAM

ENERGY STATEMENT

FOR

CLARION HOUSING GROUP

Prepared by:
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Project No: EJ1078
Date: November 2018
Rev: P01

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1.0 EXECUTIVE SUMMARY

This report assesses the predicted energy performance and carbon dioxide emissions for the proposed development by Clarion Housing Group at the Richmond College Site, Egerton Road, Twickenham.

The proposal is for the comprehensive redevelopment of the site to provide within the residential development zone, 45 x 1 bed apartments, 63 x 2 bed apartments, 8 x 3 bed apartments, 2 x 4 bed apartments, 18 x 2 bed maisonettes, 28 x 3 bed terrace houses, 16 x 4 bed terrace houses, together with associated car parking, cycle parking and amenity space.

The report will demonstrate that there is commitment and response to each of the items relating to planning condition U07956 'Climate Change Adaption – 35% CO_2', namely;

- A minimum 35% reduction in regulated carbon emissions when compared to a building regulations 2013 compliant development.
- A minimum 20% contribution to total energy demand through low carbon decentralized heat and energy networks, or renewable energy sources
- All residential units to achieve a minimum 19% reduction in DER/TER as determined by SAP 2012.

This report also responds to planning condition U07958 'Energy Statements' by demonstrating achievement of the provision of condition U07956 in line with the Site-wide 'Outline Energy Statement: Energy Comparison for Outline Planning' (2015) approved under condition U08044 'Site Wide Energy Statement'.

The scheme has considered the issue of carbon emissions management from an early stage. The client and architect have been decisive in their brief and design intentions.

The methodology used to determine the CO_2 emissions is in accordance with the approved Outline Energy Statement.

Be Lean – Energy Efficient Design and Construction

The first step addresses reduction in energy use, through the adoption of sustainable design and construction measures.

In accordance with this strategy, the proposed development will incorporate a range of energy efficient measures including exceeding current Building Regulation Part L1A 2013 requirements for the levels of insulation and air tightness; eliminate thermal bridging; mechanical ventilation with heat recovery; installation of high-performance glazing and energy efficient lighting.

The implementation of these measures will reduce CO_2 emissions by 19.1% compared to a Part L1A 2013 notional development.

Be Clean – Combined Heat & Power (CHP)

As concluded in the approved Outline Energy Statement, CHP has not been considered appropriate for this development.

Be Green – Renewable Energy

The third stage covers renewable technologies.

The site-wide 'Outline Energy Statement: Energy Comparison for Outline Planning' (2015) approved under condition U08044 'Site Wide Energy Statement' recommends air source heat pumps (ASHP), photovoltaic cells (PV) and solar thermal collectors as the most feasible renewable energy sources for the proposed development.

Further analysis considered the effect on the energy strategy, energy demand contribution, aesthetics and available amenity space for each of the sources. PV cells were considered the most suitable renewable energy technology for the proposed residential development.

Details of the analysis undertaken are in section 4.0 of this report.

Total energy demand for the proposed residential development is calculated using the FSAP 2012 methodology. The calculated demand is 753,319 kWh per annum.

20% of the energy demand is to be generated through the PV cells. The implementation of PV cells for the proposed development will generate 152,389 kWh per annum when calculated using the FSAP 2012 methodology.

PV cell electricity generation has been shared between all houses and apartments for the proposed development, with each unit surpassing the 19% minimum requirement in CO_2 emission reductions.

The implementation of the PV cells will reduce the proposed developments total CO_2 emissions by a further 45.5%.

Conclusion

Energy efficient design and the use of PV cells for the proposed residential development zone will reduce CO_2 emissions by a total 55.9% compared to a Part L1A 2013 notional development and surpassing the minimum requirements of planning condition U07956 'Climate Change Adaption – 35% CO_2'.

In addition to the overall reduction on CO_2 emissions, the introduction of PV cells will generate 20.2% of the total energy demand for the proposed development with each unit achieving more than 19% CO_2 emission reductions individually.

The table below demonstrates the carbon emissions at each stage of the energy hierarchy

	Carbon dioxide emissions (kg CO_2 per annum)
Building Regulations 2013 Part L1A compliant development	79375
After Be Lean energy demand reduction	64199
After Be Clean efficient energy supply	64199
After Be Green renewable technologies	34986

The table below provides a summary of the CO_2 savings at each stage of energy hierarchy.

It can be seen in the table that significant savings are made through the provision of efficient building fabric and services systems, with further reductions made through the provision of a renewable energy generating technologies.

	Carbon Dioxide Savings	
	kg CO_2 per annum	Percentage
Savings from energy demand reduction	15176	19.1%
Savings from CHP	0.0	0.0%
Savings from renewable technologies	29214	45.5%
Total Cumulative Savings	44390	55.9%

2.0 INTRODUCTION

The proposal is for the comprehensive redevelopment of the site to provide within the residential development zone, 45 x 1 bed apartments, 63 x 2 bed apartments, 8 x 3 bed apartments, 2 x 4 bed apartments, 18 x 2 bed maisonettes, 28 x 3 bed terrace houses, 16 x 4 bed terrace houses, together with associated car parking, cycle parking and amenity space.

This document demonstrates how the development addresses the relevant planning conditions in accordance with the granted outline planning application.

In particular this report responds to the energy related planning conditions listed in the decision notice (2016), including:

- U07956 Climate Change Adaption – 35% CO_2
    - A minimum 35% reduction in regulated carbon emissions when compared to a building regulations 2013 compliant development.
    - A minimum 20% contribution to total energy demand through low carbon decentralized heat and energy networks, or renewable energy sources
    - All residential units to achieve a minimum 19% reduction in DER/TER as determined by SAP 2012.
- U07958 Energy Statements
- U08044 Site Wide Energy Statement

The methodology employed to determine the potential CO_2 savings for this development is in accordance the Site-wide 'Outline Energy Statement: Energy Comparison for Outline Planning' (2015) approved under condition U08044 'Site Wide Energy Statement':

- Be Lean - Improve the energy efficiency of the scheme
- Be Clean - Supply as much of the remaining energy requirement with low-carbon technologies such as combined heat and power (CHP)
- Be Green – Off-set a proportion of the remaining carbon dioxide emissions by using renewable technologies.

As concluded in the approved Outline Energy Statement, CHP (Be Clean) has not been considered appropriate for this development.

Energy calculations were carried out using the FSAP2012 methodology. This is in line with Building Regulations Part L1A 2013. Outputs from the energy calculations are provided in Appendix B.

3.0 BE LEAN – ENERGY EFFICIENT DESIGN AND CONSTRUCTION

Passive Design Measures

Enhanced Building Fabric

The heat loss of different building elements is dependent upon their U-value. The lower the U-value, the better the level of insulation of a particular element. A building with low U-values has a reduced heating demand during the cooler months.

The proposed development will incorporate high levels of insulation and high-performance glazing on all of the facades to significantly reduce the demand for space heating (table 1 below).

Air Tightness

Heat loss may also occur due to air infiltration. Although this cannot be eliminated altogether, good construction detailing and the use of best practice construction techniques can minimise the amount of air infiltration into a building.

Current Part L Building Regulations (2013) sets a maximum air permeability rate of 10m^3/h.m^2 at 50Pa. The development is likely to improve upon this to achieve at least 3m^3/h.m^2 at 50Pa through the application of best practice construction techniques.

	Limiting Fabric Parameters Part L1A 2013 (2016 Amendments)	Notional Dwelling Specification Part L1A 2013 (2016 Amendments)	Richmond College Site Fabric Specification
Opening Areas	25% max of total floor area	As measured (25% max of total floor area)	As measured
Walls	0.30 W/m²K	0.18 W/m²K	0.15 W/m²K
Party Walls	0.20 W/m²K	0.00 W/m²K	0.00 W/m²K
Floor	0.25 W/m²K	0.13 W/m²K	0.13 W/m²K
Roof	0.20 W/m²K	0.13 W/m²K	0.13 W/m²K
Windows (incl. frame)	2.00 W/m²K	1.4 W/m²K (g-value 0.63)	1.27 W/m²K (g-value 0.63)
Doors (incl. frame)	2.00 W/m²K	Opaque 1.0 W/m²K / Semi-glazed 1.2 W/m²K	1.0 W/m²K
Air Tightness @ 50Pa	10.0 m³/h.m²	5.0 m³/h.m²	3.0 m³/h.m²
Thermal Bridging	y = 0.15 W/m²K	y = 0.05 W/m²K	0.072 W/m²K

Table 1 Fabric Specification

Active Design Measures

High Efficiency Lighting

The development intends to incorporate low energy lighting fittings throughout the buildings. 100% of all light fittings will be specified as low energy lighting, and will accommodate LEDs, compact fluorescent (CFL's) or fluorescent luminaries only.

Internal areas of infrequent use will be fitted with occupant sensors.

Mechanical Ventilation with Heat Recovery

Mechanical ventilation with heat recovery is proposed for all dwellings in order to achieve ventilation in the most energy efficient way.

CO_2 Emissions

The implementation of these passive and active design measures will reduce CO_2 emissions by 19.1% beyond Building Regulations Part L1A (2013) notional building as shown in the table below.

	kg CO_2 per annum
Building Regulations 2013 Part L1A compliant development	79375
After energy demand reduction	64199
Total savings from energy demand reduction	15176
Total percentage improvement over baseline	19.1%

4.0 BE GREEN - RENEWABLE ENERGY

In accordance with the Site Wide Energy Statement, the range of renewable technologies deemed suitable for the proposed development are:

- Air source heat pump
- Photovoltaic panels
- Solar thermal panels

In determining the appropriate renewable technology for the site, the following factors were considered:

- Energy strategy
- Effect on energy demand contribution
- Effect on design

Feasibility

Air Source Heat Pumps

Apartments

Energy strategy	Effect on energy demand contribution	Effect on design
Centralised system for each block. Generates low grade hot water to distribute to each apartment. Each apartment requires a Heat Interface Unit to transfer heat to the apartments heating and domestic hot water system.	Can convert approximately 1 kW of electricity into 3 kW of low grade heat (55 °C).	Difficult to generate instantaneous hot water within the apartments at 50 °C whilst maintaining high efficiency. Requires metering & billing system. Requires plant space in each block. Performs best with UFH but can be used with specialist or oversized radiators.

There are no internal plant spaces within each block for this option. Roof mounted plant is likely to cause issues with acoustics. Difficulty in generating 50 °C domestic hot water from 55 °C heat. Air source heat pumps for the apartments are deemed unsuitable.

Houses

Energy strategy	Effect on energy demand contribution	Effect on design
Individual system for each house. Generates low grade hot water for heating system. Stored hot water generated by immersion heater.	Can convert approximately 1 kW of electricity into 4 kW of low grade heat (45 °C)	Each house will have a condensor mounted externally. Possible problems with noise from the external unit. Requires space for the internal unit (approximate size of a fridge freezer). Performs best with UFH but can be used with specialist or oversized radiators

The external unit is likely to cause acoustic and aesthetic problems. There is no internal space for the internal unit. Air source heat pumps for the houses are deemed unsuitable

Photovoltaics (PV)

Apartments

Energy strategy	Effect on energy demand contribution	Effect on design
PV cells on the roof linked to the landlords supply. Panels need to face south-east to south-west. Apartments would still need a system to generate heat and domestic hot water	Can generate approximately 204 kWh / m^2 of electricity per annum.	Large roof areas available for installation. Requires specialist mounting system for green roof. Space for inverters in each block. Panels can face a south-east to south-west.

There is considerable roof area for a PV array. The roof mounted PV array will be unobtrusive and combined with another system for generating heat and hot water would work well. A PV array for the apartments is deemed suitable.

Houses

Energy strategy	Effect on energy demand contribution	Effect on design
PV cells mounted on each individual house roof. Panels need to face south-east to south-west. Houses would still need a system to generate heat and domestic hot water	Can generate approximately 204 kWh / m^2 of electricity per annum.	Panels can face a south-east to south-west. Space required in each house for inverter.

Each house has enough roof area for a small PV array. The roof mounted PV array will be unobtrusive and combined with another system for generating heat and hot water would work well. A PV array for the houses is deemed suitable.

Solar Thermal Collectors

Apartments

Energy strategy	Effect on energy demand contribution	Effect on design
Panels need to face south-east to south-west. Would require a centralised domestic hot water system distributed to each apartment. Apartments would still need a system to generate heat and to top-up the domestic hot water system.	Can provide approximately 40% of domestic hot water (395 kWh / m^2 / annum)	Large roof areas available for installation. Requires specialist mounting system for green roof. Requires metering & billing system. Requires plant space in each block for storage tanks, boilers and pumps. Panels can face a south-east to south-west.

Each block has enough roof area for a large solar thermal collector array. The roof mounted solar collectors will be unobtrusive however, there are no internal plant spaces within each block for the hot water storage tanks, boilers and pumps required for the system. A solar thermal array for the apartments is deemed unsuitable.

Houses

Energy strategy	Effect on energy demand contribution	Effect on design
Panels need to face south-east to south-west. Each system would be linked to individual flats. Houses would still need a system to generate heat and top-up the domestic hot water system.	Can provide approximately 47% of domestic hot water (323 kWh / m^2 / annum)	Panels can face a south-east to south-west. Requires space for the hot water tank, solar pump and control system.

Each house has enough roof area for a small solar thermal array. The roof mounted panels will be unobtrusive however, there is no internal space for the storage tank, solar pumps and control system. A solar thermal array for the houses is deemed unsuitable.

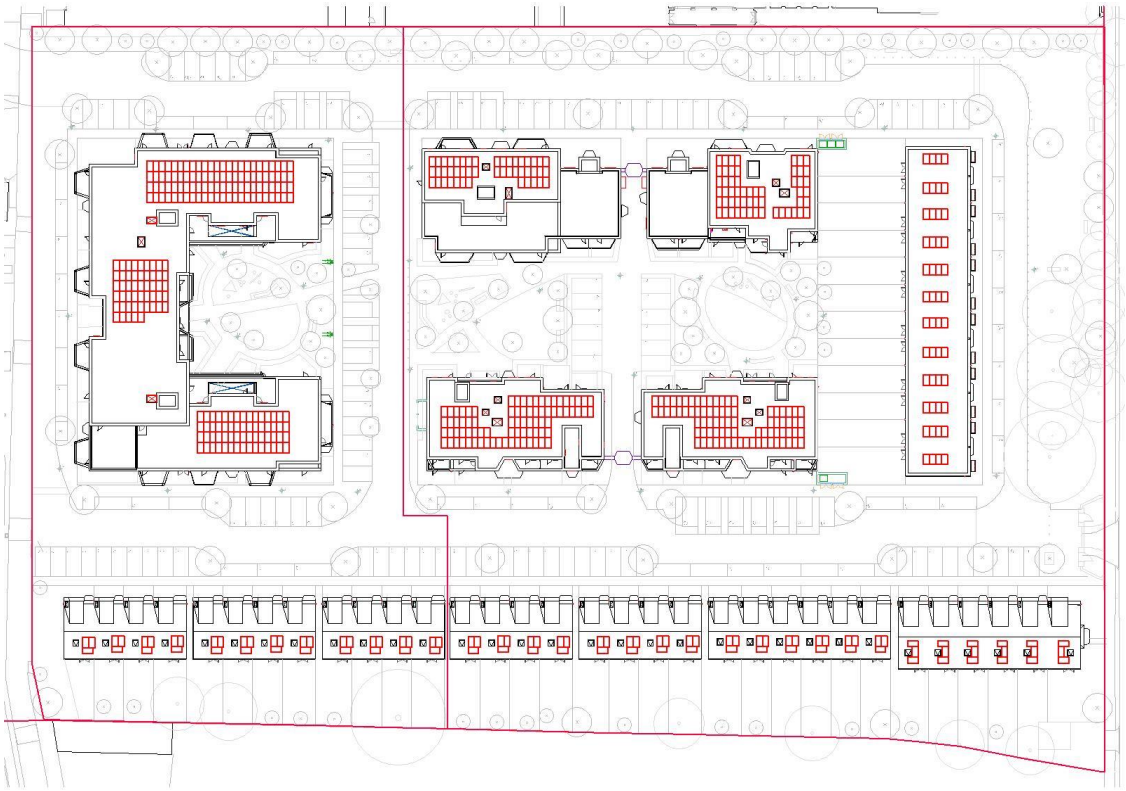
Feasibility conclusion

Air source heat pumps and solar thermal collectors were deemed unsuitable for the development. PV cells were considered the most suitable renewable energy technology as the development has large roof areas to mount the arrays, they generate electricity reducing the impact on the electricity grid and the inverters only require a small amount of space.

In order to maximise CO_2 reductions, it is proposed that PV panels are installed on the roofs of the development. The panels will be installed horizontally on the unshaded areas of the roof to maximise array area.

PV Electricity Generation		
Predicted site solar energy	832.7	kWh/annum
Total estimated system losses	22.6	%
System peak power	183	kWp
Array area	1023	m^2
Primary electricity offset by PV Array	152389	kWh/yr
Total CO_2 savings	79090	kg/annum
Part L 2013 Baseline Regulated CO_2 emissions	79375	kg/annum
Regulated CO2 emissions after energy demand reduction	64199	kg/annum
After renewable technology reduction	34986	kg/annum
Total percentage improvement over energy demand reduction	29214	kg/annum
Percentage improvement over energy demand reduction	45.5%	%

In total, 1,023 m^2 of PV cells, rated at 183 kWp, would produce CO_2 emissions savings of 45.5% for the proposed development after the energy demand reduction. The site-wide PV layout is shown below.



Renewable energy generation

In accordance with the Site Wide Energy Statement, a minimum 20% contribution to total energy demand through low carbon decentralized heat and energy networks, or renewable energy sources.

PV cells were considered the most suitable renewable energy technology to achieve the minimum 20% contribution to total energy demand. The energy demand is calculated using the FSAP 2012 methodology.

It can be seen in the table below that 20.2% of energy demand will be generated by the PV cells for the proposed development.

	Energy demand (kWh)
Building Regulations 2013 Part L1A compliant development	753319
20% contribution through renewable energy	150664
Total contribution from PV cells	152389
Total percentage contribution from PV cells	20.2%

In accordance with the Site Wide Energy Statement, all residential units are to achieve a minimum 19% reduction in DER/TER as determined by SAP 2012. It can be seen in the table below that each different unit type surpasses the minimum 19% reduction.

Dwelling	No Off	DER/TER (%)	Dwelling	No Off	DER/TER (%)	Dwelling	No Off	DER/TER (%)
Plot A0.01	4	47.3%	Plot D4.01	1	39.1%	Plot F1.06	3	58.6%
Plot A0.03	2	47.0%	Plot C3.03	1	39.2%	Plot F1.07	1	57.4%
Plot A0.03	2	51.7%	Plot C3.02	1	41.0%	Plot F1.05	1	50.1%
Plot A0.05	4	44.2%	Plot C4.02	1	44.2%	Plot E1.07	1	50.5%
Plot A0.04	4	53.2%	Plot C4.01	1	35.6%	Plot E1.06	3	59.0%
Plot C0.04	1	48.8%	Plot A2.05	2	37.7%	Plot E2.06	2	60.9%
Plot C0.03	1	56.6%	Plot G.12	1	34.1%	Plot E2.07	2	53.8%
Plot D0.02	1	54.1%	Plot H.06	1	27.3%	Plot F2.06	2	61.4%
Plot A1.03	7	61.2%	Plot I.06	6	34.1%	Plot F2.05	2	50.9%
Plot A1.02	4	55.8%	Plot G.01	1	33.2%	Plot F2.07	2	59.7%
Plot A1.01	7	51.3%	Plot G.07	10	39.0%	Plot E3.01	2	45.9%
Plot D1.02	3	55.8%	Plot H.01	1	27.9%	Plot E3.02	4	48.6%
Plot C1.04	3	56.5%	Plot H.03	4	32.7%	Plot E3.04	1	44.3%
Plot C1.03	2	62.2%	Plot I.01	6	34.1%	Plot E3.05	1	45.7%
Plot C1.02	2	64.6%	Plot I.03	14	38.9%	Plot E4.02	1	48.4%
Plot C1.01	3	57.9%	Plot F0.01	4	77.0%	Plot E4.01	1	41.7%
Plot C2.02	4	53.4%	Plot F0.03	2	52.6%	Plot F4.06	1	47.1%
Plot C2.01	2	46.7%	Plot F0.06	2	50.5%	Plot F4.07	1	45.6%
Plot A3.03	2	46.6%	Plot F0.05	1	52.9%	Plot F4.08	1	44.1%
Plot A3.02	2	42.0%	Plot F0.04	1	49.3%	Plot F4.05	1	33.9%
Plot A3.01	2	38.8%	Plot F1.01	5	61.6%	Plot E0.05	1	46.8%
Plot D4.03	1	42.1%	Plot F1.02	10	60.9%			
Plot D4.02	1	41.9%	Plot F1.04	6	53.8%			

5.0 CONCLUSION

This report demonstrates how the development will addresses the relevant planning conditions in accordance with the granted outline planning application.

In particular, it responds to the energy related planning conditions listed in the decision notice (2016), including:

- U07956 Climate Change Adaption – 35% CO_2
    - A minimum 35% reduction in regulated carbon emissions when compared to a building regulations 2013 compliant development.
    - A minimum 20% contribution to total energy demand through low carbon decentralized heat and energy networks, or renewable energy sources
    - All residential units to achieve a minimum 19% reduction in DER/TER as determined by SAP 2012.
- U07958 Energy Statements
- U08044 Site Wide Energy Statement

Energy efficient design and the use of PV cells for the proposed residential development zone will reduce CO_2 emissions by a total 55.9% compared to a Part L1A 2013 notional development and surpassing the minimum requirements of planning condition U07956 'Climate Change Adaption – 35% CO_2'.

In addition to the overall reduction on CO_2 emissions, the introduction of PV cells will generate 20.2% of the annual energy demand for the proposed development with each unit achieving more than 19% CO_2 emission reductions individually.

The table below demonstrates the carbon emissions at each stage of the energy hierarchy

	Carbon dioxide emissions (kg CO_2 per annum)
Building Regulations 2013 Part L1A compliant development	79375
After Be Lean energy demand reduction	64199
After Be Clean efficient energy supply	64199
After Be Green renewable technologies	34986

The table below provides a summary of the CO_2 savings at each stage of energy hierarchy.

	Carbon Dioxide Savings	
	kg CO_2 per annum	Percentage
Savings from energy demand reduction	15176	19.1%
Savings from CHP	0.0	0.0%
Savings from renewable technologies	29214	45.5%
Total Cumulative Savings	44390	55.9%

APPENDIX A – PRELIMINARY SAP CALCULATIONS

Regulations Compliance Report

Approved Document L1A, 2013 Edition, England assessed by Stroma FSAP 2012 program, Version: 1.0.4.16
Printed on 22 November 2018 at 12:41:11

Project Information:

Assessed By: () **Building Type:** Flat

Dwelling Details:

NEW DWELLING DESIGN STAGE Total Floor Area: 57.4m²
Site Reference : Clarion Richmond College **Plot Reference:** GF 1B2P WCH Type 1A
Address : , London, TW2 7SJ

Client Details:

Name:
Address :

This report covers items included within the SAP calculations.
It is not a complete report of regulations compliance.

1a TER and DER

Fuel for main heating system: Mains gas
Fuel factor: 1.00 (mains gas)

Target Carbon Dioxide Emission Rate (TER)	19.09 kg/m²	
Dwelling Carbon Dioxide Emission Rate (DER)	10.06 kg/m²	**OK**

1b TFEE and DFEE

Target Fabric Energy Efficiency (TFEE)	47.4 kWh/m²	
Dwelling Fabric Energy Efficiency (DFEE)	41.3 kWh/m²	
		OK

2 Fabric U-values

Element	Average	Highest	
External wall	0.15 (max. 0.30)	0.15 (max. 0.70)	**OK**
Party wall	0.00 (max. 0.20)	-	**OK**
Floor	0.13 (max. 0.25)	0.13 (max. 0.70)	**OK**
Roof	(no roof)		
Openings	1.22 (max. 2.00)	1.27 (max. 3.30)	**OK**

2a Thermal bridging

Thermal bridging calculated from linear thermal transmittances for each junction

3 Air permeability

Air permeability at 50 pascals	3.00 (design value)	
Maximum	10.0	**OK**

4 Heating efficiency

Main Heating system: Database: (rev 435, product index 017511):
Boiler systems with radiators or underfloor heating - mains gas
Brand name: Worcester
Model: Greenstar
Model qualifier: 28CDi Compact ErP (Combi)
Efficiency 89.8 % SEDBUK2009
Minimum 88.0 % **OK**

Secondary heating system: None

Regulations Compliance Report

5 Cylinder insulation

Hot water Storage:	No cylinder	

6 Controls

Space heating controls	Time and temperature zone control by device in database	**OK**
Hot water controls:	No cylinder	
	No cylinder	
Boiler interlock:	Yes	**OK**

7 Low energy lights

Percentage of fixed lights with low-energy fittings	100.0%	
Minimum	75.0%	**OK**

8 Mechanical ventilation

Continuous supply and extract system		
Specific fan power:	0.52	
Maximum	1.5	**OK**
MVHR efficiency:	90%	
Minimum	70%	**OK**

9 Summertime temperature

Overheating risk (Thames valley):	Medium	**OK**

Based on:

Overshading:	Average or unknown
Windows facing: North	1.08m²
Windows facing: North	3.78m²
Windows facing: South	3.78m²
Windows facing: East	1.08m²
Ventilation rate:	3.00
Blinds/curtains:	None
	Closed 100% of daylight hours

10 Key features

Air permeablility	3.0 m³/m²h
Doors U-value	1 W/m²K
Party Walls U-value	0 W/m²K
Photovoltaic array	

Regulations Compliance Report

Approved Document L1A, 2013 Edition, England assessed by Stroma FSAP 2012 program, Version: 1.0.4.16
Printed on 22 November 2018 at 12:41:10

Project Information:

Assessed By: () **Building Type:** Flat

Dwelling Details:

NEW DWELLING DESIGN STAGE Total Floor Area: 57.98m²
Site Reference : Clarion Richmond College **Plot Reference:** GF 1B2P WCH Type 1B
Address : , London, TW2 7SJ

Client Details:

Name:
Address :

This report covers items included within the SAP calculations.
It is not a complete report of regulations compliance.

1a TER and DER

Fuel for main heating system: Mains gas
Fuel factor: 1.00 (mains gas)

Target Carbon Dioxide Emission Rate (TER)	19.12 kg/m²	
Dwelling Carbon Dioxide Emission Rate (DER)	10.13 kg/m²	**OK**

1b TFEE and DFEE

Target Fabric Energy Efficiency (TFEE)	45.5 kWh/m²	
Dwelling Fabric Energy Efficiency (DFEE)	41.0 kWh/m²	
		OK

2 Fabric U-values

Element	Average	Highest	
External wall	0.14 (max. 0.30)	0.15 (max. 0.70)	**OK**
Party wall	0.00 (max. 0.20)	-	**OK**
Floor	0.13 (max. 0.25)	0.13 (max. 0.70)	**OK**
Roof	(no roof)		
Openings	1.20 (max. 2.00)	1.27 (max. 3.30)	**OK**

2a Thermal bridging

Thermal bridging calculated from linear thermal transmittances for each junction

3 Air permeability

Air permeability at 50 pascals	3.00 (design value)	
Maximum	10.0	**OK**

4 Heating efficiency

Main Heating system: Database: (rev 435, product index 017511):
Boiler systems with radiators or underfloor heating - mains gas
Brand name: Worcester
Model: Greenstar
Model qualifier: 28CDi Compact ErP (Combi)
Efficiency 89.8 % SEDBUK2009
Minimum 88.0 % **OK**

Secondary heating system: None

Regulations Compliance Report

5 Cylinder insulation

Hot water Storage:	No cylinder	

6 Controls

Space heating controls	Time and temperature zone control by device in database	OK
Hot water controls:	No cylinder	
	No cylinder	
Boiler interlock:	Yes	OK

7 Low energy lights

Percentage of fixed lights with low-energy fittings	100.0%	
Minimum	75.0%	OK

8 Mechanical ventilation

Continuous supply and extract system		
Specific fan power:	0.52	
Maximum	1.5	OK
MVHR efficiency:	90%	
Minimum	70%	OK

9 Summertime temperature

Overheating risk (Thames valley):	Slight	OK

Based on:

Overshading:	Average or unknown
Windows facing: South	2.16m²
Windows facing: North	3.78m²
Ventilation rate:	3.00
Blinds/curtains:	None
	Closed 100% of daylight hours

10 Key features

Air permeablility	3.0 m³/m²h
Doors U-value	1 W/m²K
Party Walls U-value	0 W/m²K
Photovoltaic array	

Regulations Compliance Report

Approved Document L1A, 2013 Edition, England assessed by Stroma FSAP 2012 program, Version: 1.0.4.16
Printed on 22 November 2018 at 12:41:10

Project Information:

Assessed By: ()

Building Type: Flat

Dwelling Details:

NEW DWELLING DESIGN STAGE

Total Floor Area: 55.24m²

Site Reference : Clarion Richmond College

Plot Reference: GF 1B2P WCH Type 2

Address : , London, TW2 7SJ

Client Details:

Name:

Address :

This report covers items included within the SAP calculations.
It is not a complete report of regulations compliance.

1a TER and DER

Fuel for main heating system: Mains gas
Fuel factor: 1.00 (mains gas)

Target Carbon Dioxide Emission Rate (TER)	18.13 kg/m²	
Dwelling Carbon Dioxide Emission Rate (DER)	8.75 kg/m²	**OK**

1b TFEE and DFEE

Target Fabric Energy Efficiency (TFEE)	39.4 kWh/m²	
Dwelling Fabric Energy Efficiency (DFEE)	34.1 kWh/m²	
		OK

2 Fabric U-values

Element	Average	Highest	
External wall	0.14 (max. 0.30)	0.15 (max. 0.70)	**OK**
Party wall	0.00 (max. 0.20)	-	**OK**
Floor	0.13 (max. 0.25)	0.13 (max. 0.70)	**OK**
Roof	(no roof)		
Openings	1.20 (max. 2.00)	1.27 (max. 3.30)	**OK**

2a Thermal bridging

Thermal bridging calculated from linear thermal transmittances for each junction

3 Air permeability

Air permeability at 50 pascals	3.00 (design value)	
Maximum	10.0	**OK**

4 Heating efficiency

Main Heating system: Database: (rev 435, product index 017511):
Boiler systems with radiators or underfloor heating - mains gas
Brand name: Worcester
Model: Greenstar
Model qualifier: 28CDi Compact ErP (Combi)
Efficiency 89.8 % SEDBUK2009
Minimum 88.0 % **OK**

Secondary heating system: None

Regulations Compliance Report

5 Cylinder insulation

Hot water Storage:	No cylinder	

6 Controls

Space heating controls	Time and temperature zone control by device in database	**OK**
Hot water controls:	No cylinder	
	No cylinder	
Boiler interlock:	Yes	**OK**

7 Low energy lights

Percentage of fixed lights with low-energy fittings	100.0%	
Minimum	75.0%	**OK**

8 Mechanical ventilation

Continuous supply and extract system		
Specific fan power:	0.52	
Maximum	1.5	**OK**
MVHR efficiency:	90%	
Minimum	70%	**OK**

9 Summertime temperature

Overheating risk (Thames valley):	Medium	**OK**

Based on:

Overshading:	Average or unknown
Windows facing: South	2.16m²
Windows facing: South	3.78m²
Ventilation rate:	3.00
Blinds/curtains:	None
	Closed 100% of daylight hours

10 Key features

Air permeablility	3.0 m³/m²h
Doors U-value	1 W/m²K
Party Walls U-value	0 W/m²K
Photovoltaic array	

Regulations Compliance Report

Approved Document L1A, 2013 Edition, England assessed by Stroma FSAP 2012 program, Version: 1.0.4.16
Printed on 22 November 2018 at 12:41:09

Project Information:

Assessed By: ()

Building Type: Maisonette

Dwelling Details:

NEW DWELLING DESIGN STAGE

Total Floor Area: 84.96m²

Site Reference : Clarion Richmond College

Plot Reference: GF 2B4P Masionette Type 3A

Address : , London, TW2 7SJ

Client Details:

Name:

Address :

This report covers items included within the SAP calculations.
It is not a complete report of regulations compliance.

1a TER and DER

Fuel for main heating system: Mains gas
Fuel factor: 1.00 (mains gas)

Target Carbon Dioxide Emission Rate (TER)	17.98 kg/m²	
Dwelling Carbon Dioxide Emission Rate (DER)	10.03 kg/m²	**OK**

1b TFEE and DFEE

Target Fabric Energy Efficiency (TFEE)	51.8 kWh/m²	
Dwelling Fabric Energy Efficiency (DFEE)	45.0 kWh/m²	
		OK

2 Fabric U-values

Element	Average	Highest	
External wall	0.14 (max. 0.30)	0.15 (max. 0.70)	**OK**
Party wall	0.00 (max. 0.20)	-	**OK**
Floor	0.13 (max. 0.25)	0.13 (max. 0.70)	**OK**
Roof	(no roof)		
Openings	1.24 (max. 2.00)	1.27 (max. 3.30)	**OK**

2a Thermal bridging

Thermal bridging calculated from linear thermal transmittances for each junction

3 Air permeability

Air permeability at 50 pascals	3.00 (design value)	
Maximum	10.0	**OK**

4 Heating efficiency

Main Heating system:

Database: (rev 435, product index 017511):
Boiler systems with radiators or underfloor heating - mains gas
Brand name: Worcester
Model: Greenstar
Model qualifier: 28CDi Compact ErP (Combi)
Efficiency 89.8 % SEDBUK2009
Minimum 88.0 % **OK**

Secondary heating system: None

Regulations Compliance Report

5 Cylinder insulation

Hot water Storage:	No cylinder	

6 Controls

Space heating controls	Time and temperature zone control by device in database	**OK**
Hot water controls:	No cylinder	
	No cylinder	
Boiler interlock:	Yes	**OK**

7 Low energy lights

Percentage of fixed lights with low-energy fittings	100.0%	
Minimum	75.0%	**OK**

8 Mechanical ventilation

Continuous supply and extract system		
Specific fan power:	0.77	
Maximum	1.5	**OK**
MVHR efficiency:	87%	
Minimum	70%	**OK**

9 Summertime temperature

Overheating risk (Thames valley):	Medium	**OK**

Based on:

Overshading:	Average or unknown
Windows facing: North	1.08m²
Windows facing: West	2.16m²
Windows facing: South	2.16m²
Windows facing: North	2.16m²
Windows facing: West	2.16m²
Windows facing: South	3.78m²
Windows facing: North	2.16m²
Windows facing: North	3.78m²
Ventilation rate:	4.00
Blinds/curtains:	
	Closed 100% of daylight hours

10 Key features

Air permeablility	3.0 m³/m²h
Doors U-value	1 W/m²K
External Walls U-value	0.13 W/m²K
Party Walls U-value	0 W/m²K
Photovoltaic array	

Regulations Compliance Report

Approved Document L1A, 2013 Edition, England assessed by Stroma FSAP 2012 program, Version: 1.0.4.16
Printed on 22 November 2018 at 12:41:08

Project Information:

Assessed By: () **Building Type:** Maisonette

Dwelling Details:

NEW DWELLING DESIGN STAGE Total Floor Area: 85.98m²
Site Reference : Clarion Richmond College **Plot Reference:** GF 2B4P Masionette Type 3B
Address : , London, TW2 7SJ

Client Details:

Name:
Address :

This report covers items included within the SAP calculations.
It is not a complete report of regulations compliance.

1a TER and DER

Fuel for main heating system: Mains gas
Fuel factor: 1.00 (mains gas)

Target Carbon Dioxide Emission Rate (TER)	16.31 kg/m²	
Dwelling Carbon Dioxide Emission Rate (DER)	7.64 kg/m²	**OK**

1b TFEE and DFEE

Target Fabric Energy Efficiency (TFEE)	41.6 kWh/m²	
Dwelling Fabric Energy Efficiency (DFEE)	34.8 kWh/m²	
		OK

2 Fabric U-values

Element	Average	Highest	
External wall	0.14 (max. 0.30)	0.15 (max. 0.70)	**OK**
Party wall	0.00 (max. 0.20)	-	**OK**
Floor	0.13 (max. 0.25)	0.13 (max. 0.70)	**OK**
Roof	(no roof)		
Openings	1.23 (max. 2.00)	1.27 (max. 3.30)	**OK**

2a Thermal bridging

Thermal bridging calculated from linear thermal transmittances for each junction

3 Air permeability

Air permeability at 50 pascals	3.00 (design value)	
Maximum	10.0	**OK**

4 Heating efficiency

Main Heating system: Database: (rev 435, product index 017511):
Boiler systems with radiators or underfloor heating - mains gas
Brand name: Worcester
Model: Greenstar
Model qualifier: 28CDi Compact ErP (Combi)
Efficiency 89.8 % SEDBUK2009
Minimum 88.0 % **OK**

Secondary heating system: None

Regulations Compliance Report

5 Cylinder insulation

Hot water Storage:	No cylinder	

6 Controls

Space heating controls	Time and temperature zone control by device in database	**OK**
Hot water controls:	No cylinder	
	No cylinder	
Boiler interlock:	Yes	**OK**

7 Low energy lights

Percentage of fixed lights with low-energy fittings	100.0%	
Minimum	75.0%	**OK**

8 Mechanical ventilation

Continuous supply and extract system		
Specific fan power:	0.77	
Maximum	1.5	**OK**
MVHR efficiency:	87%	
Minimum	70%	**OK**

9 Summertime temperature

Overheating risk (Thames valley):	Medium	**OK**

Based on:

Overshading:	Average or unknown
Windows facing: North	1.08m²
Windows facing: North	3.78m²
Windows facing: North	1.08m²
Windows facing: North	2.16m²
Windows facing: South	3.78m²
Ventilation rate:	2.50
Blinds/curtains:	Closed 100% of daylight hours

10 Key features

Air permeablility	3.0 m³/m²h
Doors U-value	1 W/m²K
External Walls U-value	0.13 W/m²K
Party Walls U-value	0 W/m²K
Photovoltaic array	

Regulations Compliance Report

Approved Document L1A, 2013 Edition, England assessed by Stroma FSAP 2012 program, Version: 1.0.4.16
Printed on 22 November 2018 at 12:41:07

Project Information:

Assessed By: () **Building Type:** Flat

Dwelling Details:

NEW DWELLING DESIGN STAGE Total Floor Area: 66.06m²
Site Reference : Clarion Richmond College **Plot Reference:** GF 1B2P WCH Type 4
Address : , London, TW2 7SJ

Client Details:

Name:
Address :

This report covers items included within the SAP calculations.
It is not a complete report of regulations compliance.

1a TER and DER

Fuel for main heating system: Mains gas
Fuel factor: 1.00 (mains gas)

Target Carbon Dioxide Emission Rate (TER)	18.35 kg/m²	
Dwelling Carbon Dioxide Emission Rate (DER)	9.40 kg/m²	**OK**

1b TFEE and DFEE

Target Fabric Energy Efficiency (TFEE)	45.4 kWh/m²	
Dwelling Fabric Energy Efficiency (DFEE)	41.6 kWh/m²	
		OK

2 Fabric U-values

Element	Average	Highest	
External wall	0.14 (max. 0.30)	0.15 (max. 0.70)	**OK**
Party wall	0.00 (max. 0.20)	-	**OK**
Floor	0.13 (max. 0.25)	0.13 (max. 0.70)	**OK**
Roof	(no roof)		
Openings	1.21 (max. 2.00)	1.27 (max. 3.30)	**OK**

2a Thermal bridging

Thermal bridging calculated from linear thermal transmittances for each junction

3 Air permeability

Air permeability at 50 pascals	3.00 (design value)	
Maximum	10.0	**OK**

4 Heating efficiency

Main Heating system: Database: (rev 435, product index 017511):
Boiler systems with radiators or underfloor heating - mains gas
Brand name: Worcester
Model: Greenstar
Model qualifier: 28CDi Compact ErP (Combi)
Efficiency 89.8 % SEDBUK2009
Minimum 88.0 % **OK**

Secondary heating system: None

Regulations Compliance Report

5 Cylinder insulation

Hot water Storage:	No cylinder	

6 Controls

Space heating controls	Time and temperature zone control by device in database	OK
Hot water controls:	No cylinder	
	No cylinder	
Boiler interlock:	Yes	OK

7 Low energy lights

Percentage of fixed lights with low-energy fittings	100.0%	
Minimum	75.0%	OK

8 Mechanical ventilation

Continuous supply and extract system		
Specific fan power:	0.52	
Maximum	1.5	OK
MVHR efficiency:	90%	
Minimum	70%	OK

9 Summertime temperature

Overheating risk (Thames valley):	Medium	OK

Based on:

Overshading:	Average or unknown
Windows facing: North	2.16m²
Windows facing: North	2.16m²
Windows facing: West	3.78m²
Ventilation rate:	3.00
Blinds/curtains:	None
	Closed 100% of daylight hours

10 Key features

Air permeablility	3.0 m³/m²h
Doors U-value	1 W/m²K
External Walls U-value	0.13 W/m²K
Party Walls U-value	0 W/m²K
Photovoltaic array	

Regulations Compliance Report

Approved Document L1A, 2013 Edition, England assessed by Stroma FSAP 2012 program, Version: 1.0.4.16
Printed on 22 November 2018 at 12:41:07

Project Information:

Assessed By: ()

Building Type: Flat

Dwelling Details:

NEW DWELLING DESIGN STAGE

Total Floor Area: 75m²

Site Reference : Clarion Richmond College

Plot Reference: GF 3B5P Type 5

Address : , London, TW2 7SJ

Client Details:

Name:

Address :

This report covers items included within the SAP calculations.
It is not a complete report of regulations compliance.

1a TER and DER

Fuel for main heating system: Mains gas
Fuel factor: 1.00 (mains gas)

Target Carbon Dioxide Emission Rate (TER)	16.81 kg/m²	
Dwelling Carbon Dioxide Emission Rate (DER)	7.30 kg/m²	**OK**

1b TFEE and DFEE

Target Fabric Energy Efficiency (TFEE)	41.9 kWh/m²	
Dwelling Fabric Energy Efficiency (DFEE)	34.9 kWh/m²	
		OK

2 Fabric U-values

Element	Average	Highest	
External wall	0.14 (max. 0.30)	0.15 (max. 0.70)	**OK**
Party wall	0.00 (max. 0.20)	-	**OK**
Floor	0.13 (max. 0.25)	0.13 (max. 0.70)	**OK**
Roof	(no roof)		
Openings	1.23 (max. 2.00)	1.27 (max. 3.30)	**OK**

2a Thermal bridging

Thermal bridging calculated from linear thermal transmittances for each junction

3 Air permeability

Air permeability at 50 pascals	3.00 (design value)	
Maximum	10.0	**OK**

4 Heating efficiency

Main Heating system: Database: (rev 435, product index 017511):
Boiler systems with radiators or underfloor heating - mains gas
Brand name: Worcester
Model: Greenstar
Model qualifier: 28CDi Compact ErP (Combi)
Efficiency 89.8 % SEDBUK2009
Minimum 88.0 % **OK**

Secondary heating system: None

Regulations Compliance Report

5 Cylinder insulation

Hot water Storage:	No cylinder	

6 Controls

Space heating controls	Time and temperature zone control by device in database	**OK**
Hot water controls:	No cylinder	
	No cylinder	
Boiler interlock:	Yes	**OK**

7 Low energy lights

Percentage of fixed lights with low-energy fittings	100.0%	
Minimum	75.0%	**OK**

8 Mechanical ventilation

Continuous supply and extract system		
Specific fan power:	0.52	
Maximum	1.5	**OK**
MVHR efficiency:	90%	
Minimum	70%	**OK**

9 Summertime temperature

Overheating risk (Thames valley):	Medium	**OK**

Based on:

Overshading:	Average or unknown
Windows facing: West	2.16m²
Windows facing: South	4.32m²
Windows facing: West	2.16m²
Windows facing: South	3.78m²
Ventilation rate:	3.00
Blinds/curtains:	None
	Closed 100% of daylight hours

10 Key features

Air permeablility	3.0 m³/m²h
Doors U-value	1 W/m²K
External Walls U-value	0.13 W/m²K
Party Walls U-value	0 W/m²K
Photovoltaic array	

Regulations Compliance Report

Approved Document L1A, 2013 Edition, England assessed by Stroma FSAP 2012 program, Version: 1.0.4.16
Printed on 22 November 2018 at 12:41:06

Project Information:

Assessed By: ()

Building Type: Flat

Dwelling Details:

NEW DWELLING DESIGN STAGE

Total Floor Area: 64m²

Site Reference : Clarion Richmond College

Plot Reference: GF 1B2P WCH Type 6

Address : , London, TW2 7SJ

Client Details:

Name:

Address :

This report covers items included within the SAP calculations.
It is not a complete report of regulations compliance.

1a TER and DER

Fuel for main heating system: Mains gas
Fuel factor: 1.00 (mains gas)

Target Carbon Dioxide Emission Rate (TER)	17.18 kg/m²	
Dwelling Carbon Dioxide Emission Rate (DER)	7.89 kg/m²	**OK**

1b TFEE and DFEE

Target Fabric Energy Efficiency (TFEE)	37.5 kWh/m²	
Dwelling Fabric Energy Efficiency (DFEE)	33.4 kWh/m²	
		OK

2 Fabric U-values

Element	Average	Highest	
External wall	0.14 (max. 0.30)	0.15 (max. 0.70)	**OK**
Party wall	0.00 (max. 0.20)	-	**OK**
Floor	0.13 (max. 0.25)	0.13 (max. 0.70)	**OK**
Roof	(no roof)		
Openings	1.20 (max. 2.00)	1.27 (max. 3.30)	**OK**

2a Thermal bridging

Thermal bridging calculated from linear thermal transmittances for each junction

3 Air permeability

Air permeability at 50 pascals	3.00 (design value)	
Maximum	10.0	**OK**

4 Heating efficiency

Main Heating system: Database: (rev 435, product index 017511):
Boiler systems with radiators or underfloor heating - mains gas
Brand name: Worcester
Model: Greenstar
Model qualifier: 28CDi Compact ErP (Combi)
Efficiency 89.8 % SEDBUK2009
Minimum 88.0 % **OK**

Secondary heating system: None

Regulations Compliance Report

5 Cylinder insulation

Hot water Storage:	No cylinder	

6 Controls

Space heating controls	Time and temperature zone control by device in database	OK
Hot water controls:	No cylinder	
	No cylinder	
Boiler interlock:	Yes	OK

7 Low energy lights

Percentage of fixed lights with low-energy fittings	100.0%	
Minimum	75.0%	OK

8 Mechanical ventilation

Continuous supply and extract system		
Specific fan power:	0.52	
Maximum	1.5	OK
MVHR efficiency:	90%	
Minimum	70%	OK

9 Summertime temperature

Overheating risk (Thames valley):	Medium	OK

Based on:

Overshading:	Average or unknown
Windows facing: South	2.16m²
Windows facing: South	3.78m²
Ventilation rate:	2.00
Blinds/curtains:	None
	Closed 100% of daylight hours

10 Key features

Air permeablility	3.0 m³/m²h
Doors U-value	1 W/m²K
Party Walls U-value	0 W/m²K
Photovoltaic array	

Regulations Compliance Report

Approved Document L1A, 2013 Edition, England assessed by Stroma FSAP 2012 program, Version: 1.0.4.16
Printed on 22 November 2018 at 12:41:06

Project Information:

Assessed By: ()

Building Type: Flat

Dwelling Details:

NEW DWELLING DESIGN STAGE

Total Floor Area: 73.04m²

Site Reference : Clarion Richmond College

Plot Reference: MF 2B4P Type 7

Address : , London, TW2 7SJ

Client Details:

Name:

Address :

This report covers items included within the SAP calculations.
It is not a complete report of regulations compliance.

1a TER and DER

Fuel for main heating system: Mains gas
Fuel factor: 1.00 (mains gas)

Target Carbon Dioxide Emission Rate (TER)	16.19 kg/m²	
Dwelling Carbon Dioxide Emission Rate (DER)	6.28 kg/m²	**OK**

1b TFEE and DFEE

Target Fabric Energy Efficiency (TFEE)	36.6 kWh/m²	
Dwelling Fabric Energy Efficiency (DFEE)	28.3 kWh/m²	
		OK

2 Fabric U-values

Element	Average	Highest	
External wall	0.14 (max. 0.30)	0.15 (max. 0.70)	**OK**
Party wall	0.00 (max. 0.20)	-	**OK**
Floor	(no floor)		
Roof	(no roof)		
Openings	1.22 (max. 2.00)	1.27 (max. 3.30)	**OK**

2a Thermal bridging

Thermal bridging calculated from linear thermal transmittances for each junction

3 Air permeability

Air permeability at 50 pascals	3.00 (design value)	
Maximum	10.0	**OK**

4 Heating efficiency

Main Heating system:

Database: (rev 435, product index 017511):
Boiler systems with radiators or underfloor heating - mains gas
Brand name: Worcester
Model: Greenstar
Model qualifier: 28CDi Compact ErP
(Combi)
Efficiency 89.8 % SEDBUK2009
Minimum 88.0 % **OK**

Secondary heating system: None

Regulations Compliance Report

5 Cylinder insulation

Hot water Storage:	No cylinder	

6 Controls

Space heating controls	Time and temperature zone control by device in database	OK
Hot water controls:	No cylinder	
	No cylinder	
Boiler interlock:	Yes	OK

7 Low energy lights

Percentage of fixed lights with low-energy fittings	100.0%	
Minimum	75.0%	OK

8 Mechanical ventilation

Continuous supply and extract system		
Specific fan power:	0.59	
Maximum	1.5	OK
MVHR efficiency:	89%	
Minimum	70%	OK

9 Summertime temperature

Overheating risk (Thames valley):	Slight	OK

Based on:

Overshading:	Average or unknown
Windows facing: North	4.32m²
Windows facing: South	1.08m²
Windows facing: South	3.78m²
Ventilation rate:	6.00
Blinds/curtains:	None
	Closed 100% of daylight hours

10 Key features

Air permeablility	3.0 m³/m²h
Doors U-value	1 W/m²K
External Walls U-value	0.13 W/m²K
Party Walls U-value	0 W/m²K
Photovoltaic array	

Regulations Compliance Report

Approved Document L1A, 2013 Edition, England assessed by Stroma FSAP 2012 program, Version: 1.0.4.16
Printed on 22 November 2018 at 12:41:05

Project Information:

Assessed By: ()

Building Type: Flat

Dwelling Details:

NEW DWELLING DESIGN STAGE

Total Floor Area: 50.69m²

Site Reference : Clarion Richmond College

Plot Reference: MF 1B2P Type 8

Address : , London, TW2 7SJ

Client Details:

Name:

Address :

This report covers items included within the SAP calculations.
It is not a complete report of regulations compliance.

1a TER and DER

Fuel for main heating system: Mains gas
Fuel factor: 1.00 (mains gas)

Target Carbon Dioxide Emission Rate (TER)	17.43 kg/m²	
Dwelling Carbon Dioxide Emission Rate (DER)	7.71 kg/m²	**OK**

1b TFEE and DFEE

Target Fabric Energy Efficiency (TFEE)	35.4 kWh/m²	
Dwelling Fabric Energy Efficiency (DFEE)	28.4 kWh/m²	
		OK

2 Fabric U-values

Element	Average	Highest	
External wall	0.14 (max. 0.30)	0.15 (max. 0.70)	**OK**
Party wall	0.00 (max. 0.20)	-	**OK**
Floor	(no floor)		
Roof	(no roof)		
Openings	1.21 (max. 2.00)	1.27 (max. 3.30)	**OK**

2a Thermal bridging

Thermal bridging calculated from linear thermal transmittances for each junction

3 Air permeability

Air permeability at 50 pascals	3.00 (design value)	
Maximum	10.0	**OK**

4 Heating efficiency

Main Heating system:

Database: (rev 435, product index 017511):
Boiler systems with radiators or underfloor heating - mains gas
Brand name: Worcester
Model: Greenstar
Model qualifier: 28CDi Compact ErP
(Combi)
Efficiency 89.8 % SEDBUK2009
Minimum 88.0 % **OK**

Secondary heating system: None

Regulations Compliance Report

5 Cylinder insulation

Hot water Storage:	No cylinder	

6 Controls

Space heating controls	Time and temperature zone control by device in database	**OK**
Hot water controls:	No cylinder	
	No cylinder	
Boiler interlock:	Yes	**OK**

7 Low energy lights

Percentage of fixed lights with low-energy fittings	100.0%	
Minimum	75.0%	**OK**

8 Mechanical ventilation

Continuous supply and extract system		
Specific fan power:	0.52	
Maximum	1.5	**OK**
MVHR efficiency:	90%	
Minimum	70%	**OK**

9 Summertime temperature

Overheating risk (Thames valley):	Medium	**OK**

Based on:

Overshading:	Average or unknown
Windows facing: South	2.16m²
Windows facing: South	3.78m²
Windows facing: East	1.89m²
Ventilation rate:	4.00
Blinds/curtains:	None
	Closed 100% of daylight hours

10 Key features

Air permeablility	3.0 m³/m²h
Doors U-value	1 W/m²K
External Walls U-value	0.13 W/m²K
Party Walls U-value	0 W/m²K
Photovoltaic array	

Regulations Compliance Report

Approved Document L1A, 2013 Edition, England assessed by Stroma FSAP 2012 program, Version: 1.0.4.16
Printed on 22 November 2018 at 12:41:05

Project Information:

Assessed By: ()

Building Type: Flat

Dwelling Details:

NEW DWELLING DESIGN STAGE

Total Floor Area: 50.33m²

Site Reference : Clarion Richmond College

Plot Reference: MF 1B2P Type 9

Address : , London, TW2 7SJ

Client Details:

Name:

Address :

This report covers items included within the SAP calculations.
It is not a complete report of regulations compliance.

1a TER and DER

Fuel for main heating system: Mains gas
Fuel factor: 1.00 (mains gas)

Target Carbon Dioxide Emission Rate (TER)	19.53 kg/m²	
Dwelling Carbon Dioxide Emission Rate (DER)	9.52 kg/m²	**OK**

1b TFEE and DFEE

Target Fabric Energy Efficiency (TFEE)	47.1 kWh/m²	
Dwelling Fabric Energy Efficiency (DFEE)	38.3 kWh/m²	
		OK

2 Fabric U-values

Element	Average	Highest	
External wall	0.15 (max. 0.30)	0.15 (max. 0.70)	**OK**
Party wall	0.00 (max. 0.20)	-	**OK**
Floor	(no floor)		
Roof	(no roof)		
Openings	1.23 (max. 2.00)	1.27 (max. 3.30)	**OK**

2a Thermal bridging

Thermal bridging calculated from linear thermal transmittances for each junction

3 Air permeability

Air permeability at 50 pascals	3.00 (design value)	
Maximum	10.0	**OK**

4 Heating efficiency

Main Heating system:

Database: (rev 435, product index 017511):
Boiler systems with radiators or underfloor heating - mains gas
Brand name: Worcester
Model: Greenstar
Model qualifier: 28CDi Compact ErP
(Combi)
Efficiency 89.8 % SEDBUK2009
Minimum 88.0 % **OK**

Secondary heating system: None

Regulations Compliance Report

5 Cylinder insulation

Hot water Storage:	No cylinder	

6 Controls

Space heating controls	Time and temperature zone control by device in database	OK
Hot water controls:	No cylinder	
	No cylinder	
Boiler interlock:	Yes	OK

7 Low energy lights

Percentage of fixed lights with low-energy fittings	100.0%	
Minimum	75.0%	OK

8 Mechanical ventilation

Continuous supply and extract system		
Specific fan power:	0.52	
Maximum	1.5	OK
MVHR efficiency:	90%	
Minimum	70%	OK

9 Summertime temperature

Overheating risk (Thames valley):	Slight	OK

Based on:

Overshading:	Average or unknown
Windows facing: North	2.16m²
Windows facing: South	3.78m²
Windows facing: North	1.08m²
Windows facing: East	2.16m²
Windows facing: East	2.16m²
Ventilation rate:	6.00
Blinds/curtains:	None
	Closed 100% of daylight hours

10 Key features

Air permeablility	3.0 m³/m²h
Doors U-value	1 W/m²K
External Walls U-value	0.13 W/m²K
Party Walls U-value	0 W/m²K
Photovoltaic array	

Regulations Compliance Report

Approved Document L1A, 2013 Edition, England assessed by Stroma FSAP 2012 program, Version: 1.0.4.16
Printed on 22 November 2018 at 12:41:04

Project Information:

Assessed By: ()

Building Type: Flat

Dwelling Details:

NEW DWELLING DESIGN STAGE

Total Floor Area: 53.52m²

Site Reference : Clarion Richmond College

Plot Reference: MF 1B2P Type 10

Address : , London, TW2 7SJ

Client Details:

Name:

Address :

This report covers items included within the SAP calculations.
It is not a complete report of regulations compliance.

1a TER and DER

Fuel for main heating system: Mains gas
Fuel factor: 1.00 (mains gas)

Target Carbon Dioxide Emission Rate (TER)	17.24 kg/m²	
Dwelling Carbon Dioxide Emission Rate (DER)	7.62 kg/m²	**OK**

1b TFEE and DFEE

Target Fabric Energy Efficiency (TFEE)	35.6 kWh/m²	
Dwelling Fabric Energy Efficiency (DFEE)	28.6 kWh/m²	
		OK

2 Fabric U-values

Element	Average	Highest	
External wall	0.14 (max. 0.30)	0.15 (max. 0.70)	**OK**
Party wall	0.00 (max. 0.20)	-	**OK**
Floor	(no floor)		
Roof	(no roof)		
Openings	1.21 (max. 2.00)	1.27 (max. 3.30)	**OK**

2a Thermal bridging

Thermal bridging calculated from linear thermal transmittances for each junction

3 Air permeability

Air permeability at 50 pascals	3.00 (design value)	
Maximum	10.0	**OK**

4 Heating efficiency

Main Heating system:

Database: (rev 435, product index 017511):
Boiler systems with radiators or underfloor heating - mains gas
Brand name: Worcester
Model: Greenstar
Model qualifier: 28CDi Compact ErP
(Combi)
Efficiency 89.8 % SEDBUK2009
Minimum 88.0 % **OK**

Secondary heating system: None

Regulations Compliance Report

5 Cylinder insulation

Hot water Storage:	No cylinder	

6 Controls

Space heating controls	Time and temperature zone control by device in database	**OK**
Hot water controls:	No cylinder	
	No cylinder	
Boiler interlock:	Yes	**OK**

7 Low energy lights

Percentage of fixed lights with low-energy fittings	100.0%	
Minimum	75.0%	**OK**

8 Mechanical ventilation

Continuous supply and extract system		
Specific fan power:	0.52	
Maximum	1.5	**OK**
MVHR efficiency:	90%	
Minimum	70%	**OK**

9 Summertime temperature

Overheating risk (Thames valley):	Medium	**OK**

Based on:

Overshading:	Average or unknown
Windows facing: South	2.16m²
Windows facing: South	3.78m²
Windows facing: West	1.89m²
Ventilation rate:	4.00
Blinds/curtains:	None
	Closed 100% of daylight hours

10 Key features

Air permeablility	3.0 m³/m²h
Doors U-value	1 W/m²K
External Walls U-value	0.13 W/m²K
Party Walls U-value	0 W/m²K
Photovoltaic array	

Regulations Compliance Report

Approved Document L1A, 2013 Edition, England assessed by Stroma FSAP 2012 program, Version: 1.0.4.16
Printed on 22 November 2018 at 12:41:04

Project Information:

Assessed By: ()

Building Type: Flat

Dwelling Details:

NEW DWELLING DESIGN STAGE

Total Floor Area: 70.08m²

Site Reference : Clarion Richmond College

Plot Reference: MF 2B4P Type 11

Address : , London, TW2 7SJ

Client Details:

Name:

Address :

This report covers items included within the SAP calculations.
It is not a complete report of regulations compliance.

1a TER and DER

Fuel for main heating system: Mains gas
Fuel factor: 1.00 (mains gas)

Target Carbon Dioxide Emission Rate (TER)	17.69 kg/m²	
Dwelling Carbon Dioxide Emission Rate (DER)	7.69 kg/m²	**OK**

1b TFEE and DFEE

Target Fabric Energy Efficiency (TFEE)	44.5 kWh/m²	
Dwelling Fabric Energy Efficiency (DFEE)	35.6 kWh/m²	
		OK

2 Fabric U-values

Element	Average	Highest	
External wall	0.14 (max. 0.30)	0.15 (max. 0.70)	**OK**
Party wall	0.00 (max. 0.20)	-	**OK**
Floor	(no floor)		
Roof	(no roof)		
Openings	1.23 (max. 2.00)	1.27 (max. 3.30)	**OK**

2a Thermal bridging

Thermal bridging calculated from linear thermal transmittances for each junction

3 Air permeability

Air permeability at 50 pascals	3.00 (design value)	
Maximum	10.0	**OK**

4 Heating efficiency

Main Heating system:

Database: (rev 435, product index 017511):
Boiler systems with radiators or underfloor heating - mains gas
Brand name: Worcester
Model: Greenstar
Model qualifier: 28CDi Compact ErP
(Combi)
Efficiency 89.8 % SEDBUK2009
Minimum 88.0 % **OK**

Secondary heating system: None

Regulations Compliance Report

5 Cylinder insulation

Hot water Storage:	No cylinder	

6 Controls

Space heating controls	Time and temperature zone control by device in database	**OK**
Hot water controls:	No cylinder	
	No cylinder	
Boiler interlock:	Yes	**OK**

7 Low energy lights

Percentage of fixed lights with low-energy fittings	100.0%	
Minimum	75.0%	**OK**

8 Mechanical ventilation

Continuous supply and extract system		
Specific fan power:	0.52	
Maximum	1.5	**OK**
MVHR efficiency:	90%	
Minimum	70%	**OK**

9 Summertime temperature

Overheating risk (Thames valley):	Medium	**OK**

Based on:

Overshading:	Average or unknown
Windows facing: North	2.16m²
Windows facing: North	1.08m²
Windows facing: West	4.32m²
Windows facing: North	3.78m²
Ventilation rate:	4.00
Blinds/curtains:	None
	Closed 100% of daylight hours

10 Key features

Air permeablility	3.0 m³/m²h
Doors U-value	1 W/m²K
External Walls U-value	0.13 W/m²K
Party Walls U-value	0 W/m²K
Photovoltaic array	

Regulations Compliance Report

Approved Document L1A, 2013 Edition, England assessed by Stroma FSAP 2012 program, Version: 1.0.4.16
Printed on 22 November 2018 at 12:41:03

Project Information:

Assessed By: ()

Building Type: Flat

Dwelling Details:

NEW DWELLING DESIGN STAGE

Total Floor Area: 70.25m²

Site Reference : Clarion Richmond College

Plot Reference: MF 2B4P Type 12

Address : , London, TW2 7SJ

Client Details:

Name:

Address :

This report covers items included within the SAP calculations.
It is not a complete report of regulations compliance.

1a TER and DER

Fuel for main heating system: Mains gas
Fuel factor: 1.00 (mains gas)

Target Carbon Dioxide Emission Rate (TER)	15.78 kg/m²	
Dwelling Carbon Dioxide Emission Rate (DER)	5.97 kg/m²	**OK**

1b TFEE and DFEE

Target Fabric Energy Efficiency (TFEE)	35.4 kWh/m²	
Dwelling Fabric Energy Efficiency (DFEE)	27.7 kWh/m²	
		OK

2 Fabric U-values

Element	Average	Highest	
External wall	0.15 (max. 0.30)	0.15 (max. 0.70)	**OK**
Party wall	0.00 (max. 0.20)	-	**OK**
Floor	(no floor)		
Roof	(no roof)		
Openings	1.23 (max. 2.00)	1.27 (max. 3.30)	**OK**

2a Thermal bridging

Thermal bridging calculated from linear thermal transmittances for each junction

3 Air permeability

Air permeability at 50 pascals	3.00 (design value)	
Maximum	10.0	**OK**

4 Heating efficiency

Main Heating system:

Database: (rev 435, product index 017511):
Boiler systems with radiators or underfloor heating - mains gas
Brand name: Worcester
Model: Greenstar
Model qualifier: 28CDi Compact ErP
(Combi)
Efficiency 89.8 % SEDBUK2009
Minimum 88.0 % **OK**

Secondary heating system: None

Regulations Compliance Report

5 Cylinder insulation

Hot water Storage:	No cylinder	

6 Controls

Space heating controls	Time and temperature zone control by device in database	**OK**
Hot water controls:	No cylinder	
	No cylinder	
Boiler interlock:	Yes	**OK**

7 Low energy lights

Percentage of fixed lights with low-energy fittings	100.0%	
Minimum	75.0%	**OK**

8 Mechanical ventilation

Continuous supply and extract system		
Specific fan power:	0.52	
Maximum	1.5	**OK**
MVHR efficiency:	90%	
Minimum	70%	**OK**

9 Summertime temperature

Overheating risk (Thames valley):	Medium	**OK**

Based on:

Overshading:	Average or unknown
Windows facing: West	2.16m²
Windows facing: South	3.78m²
Windows facing: South	4.32m²
Windows facing: West	2.16m²
Ventilation rate:	4.00
Blinds/curtains:	None
	Closed 100% of daylight hours

10 Key features

Air permeablility	3.0 m³/m²h
Doors U-value	1 W/m²K
Party Walls U-value	0 W/m²K
Photovoltaic array	

Regulations Compliance Report

Approved Document L1A, 2013 Edition, England assessed by Stroma FSAP 2012 program, Version: 1.0.4.16
Printed on 22 November 2018 at 12:41:02

Project Information:

Assessed By: ()

Building Type: Flat

Dwelling Details:

NEW DWELLING DESIGN STAGE

Total Floor Area: 70.46m²

Site Reference : Clarion Richmond College

Plot Reference: MF 2B4P Type 13

Address : , London, TW2 7SJ

Client Details:

Name:

Address :

This report covers items included within the SAP calculations.
It is not a complete report of regulations compliance.

1a TER and DER

Fuel for main heating system: Mains gas
Fuel factor: 1.00 (mains gas)

Target Carbon Dioxide Emission Rate (TER)	15.14 kg/m²	
Dwelling Carbon Dioxide Emission Rate (DER)	5.36 kg/m²	**OK**

1b TFEE and DFEE

Target Fabric Energy Efficiency (TFEE)	30.7 kWh/m²	
Dwelling Fabric Energy Efficiency (DFEE)	23.8 kWh/m²	
		OK

2 Fabric U-values

Element	Average	Highest	
External wall	0.15 (max. 0.30)	0.15 (max. 0.70)	**OK**
Party wall	0.00 (max. 0.20)	-	**OK**
Floor	(no floor)		
Roof	(no roof)		
Openings	1.22 (max. 2.00)	1.27 (max. 3.30)	**OK**

2a Thermal bridging

Thermal bridging calculated from linear thermal transmittances for each junction

3 Air permeability

Air permeability at 50 pascals	3.00 (design value)	
Maximum	10.0	**OK**

4 Heating efficiency

Main Heating system:

Database: (rev 435, product index 017511):
Boiler systems with radiators or underfloor heating - mains gas
Brand name: Worcester
Model: Greenstar
Model qualifier: 28CDi Compact ErP
(Combi)
Efficiency 89.8 % SEDBUK2009
Minimum 88.0 % **OK**

Secondary heating system: None

Regulations Compliance Report

5 Cylinder insulation

Hot water Storage:	No cylinder	

6 Controls

Space heating controls	Time and temperature zone control by device in database	**OK**
Hot water controls:	No cylinder	
	No cylinder	
Boiler interlock:	Yes	**OK**

7 Low energy lights

Percentage of fixed lights with low-energy fittings	100.0%	
Minimum	75.0%	**OK**

8 Mechanical ventilation

Continuous supply and extract system		
Specific fan power:	0.52	
Maximum	1.5	**OK**
MVHR efficiency:	90%	
Minimum	70%	**OK**

9 Summertime temperature

Overheating risk (Thames valley):	Medium	**OK**

Based on:

Overshading:	Average or unknown
Windows facing: South	4.32m²
Windows facing: East	1.08m²
Windows facing: South	3.78m²
Ventilation rate:	4.00
Blinds/curtains:	None
	Closed 100% of daylight hours

10 Key features

Air permeablility	3.0 m³/m²h
Doors U-value	1 W/m²K
External Walls U-value	0.13 W/m²K
Party Walls U-value	0 W/m²K
Photovoltaic array	

Regulations Compliance Report

Approved Document L1A, 2013 Edition, England assessed by Stroma FSAP 2012 program, Version: 1.0.4.16
Printed on 22 November 2018 at 12:41:02

Project Information:

Assessed By: ()

Building Type: Flat

Dwelling Details:

NEW DWELLING DESIGN STAGE

Total Floor Area: 70.02m²

Site Reference : Clarion Richmond College

Plot Reference: MF 2B4P Type 14

Address : , London, TW2 7SJ

Client Details:

Name:

Address :

This report covers items included within the SAP calculations.
It is not a complete report of regulations compliance.

1a TER and DER

Fuel for main heating system: Mains gas
Fuel factor: 1.00 (mains gas)

Target Carbon Dioxide Emission Rate (TER)	17.33 kg/m²	
Dwelling Carbon Dioxide Emission Rate (DER)	7.29 kg/m²	**OK**

1b TFEE and DFEE

Target Fabric Energy Efficiency (TFEE)	41.7 kWh/m²	
Dwelling Fabric Energy Efficiency (DFEE)	33.5 kWh/m²	
		OK

2 Fabric U-values

Element	Average	Highest	
External wall	0.14 (max. 0.30)	0.15 (max. 0.70)	**OK**
Party wall	0.00 (max. 0.20)	-	**OK**
Floor	(no floor)		
Roof	(no roof)		
Openings	1.22 (max. 2.00)	1.27 (max. 3.30)	**OK**

2a Thermal bridging

Thermal bridging calculated from linear thermal transmittances for each junction

3 Air permeability

Air permeability at 50 pascals	3.00 (design value)	
Maximum	10.0	**OK**

4 Heating efficiency

Main Heating system:

Database: (rev 435, product index 017511):
Boiler systems with radiators or underfloor heating - mains gas
Brand name: Worcester
Model: Greenstar
Model qualifier: 28CDi Compact ErP
(Combi)
Efficiency 89.8 % SEDBUK2009
Minimum 88.0 % **OK**

Secondary heating system: None

Regulations Compliance Report

5 Cylinder insulation

Hot water Storage:	No cylinder	

6 Controls

Space heating controls	Time and temperature zone control by device in database	OK
Hot water controls:	No cylinder	
	No cylinder	
Boiler interlock:	Yes	OK

7 Low energy lights

Percentage of fixed lights with low-energy fittings	100.0%	
Minimum	75.0%	OK

8 Mechanical ventilation

Continuous supply and extract system		
Specific fan power:	0.52	
Maximum	1.5	OK
MVHR efficiency:	90%	
Minimum	70%	OK

9 Summertime temperature

Overheating risk (Thames valley):	Slight	OK

Based on:

Overshading:	Average or unknown
Windows facing: North	4.32m²
Windows facing: North	3.78m²
Windows facing: East	1.08m²
Ventilation rate:	4.00
Blinds/curtains:	None
	Closed 100% of daylight hours

10 Key features

Air permeablility	3.0 m³/m²h
Doors U-value	1 W/m²K
External Walls U-value	0.13 W/m²K
Party Walls U-value	0 W/m²K
Photovoltaic array	

Regulations Compliance Report

Approved Document L1A, 2013 Edition, England assessed by Stroma FSAP 2012 program, Version: 1.0.4.16
Printed on 22 November 2018 at 12:41:02

Project Information:

Assessed By: ()

Building Type: Maisonette

Dwelling Details:

NEW DWELLING DESIGN STAGE

Total Floor Area: 83.48m²

Site Reference : Clarion Richmond College

Plot Reference: TF 2B4P Masionette Type 15

Address : , London, TW2 7SJ

Client Details:

Name:

Address :

This report covers items included within the SAP calculations.
It is not a complete report of regulations compliance.

1a TER and DER

Fuel for main heating system: Mains gas
Fuel factor: 1.00 (mains gas)

Target Carbon Dioxide Emission Rate (TER)	15.72 kg/m²	
Dwelling Carbon Dioxide Emission Rate (DER)	7.33 kg/m²	**OK**

1b TFEE and DFEE

Target Fabric Energy Efficiency (TFEE)	38.8 kWh/m²	
Dwelling Fabric Energy Efficiency (DFEE)	33.5 kWh/m²	
		OK

2 Fabric U-values

Element	Average	Highest	
External wall	0.14 (max. 0.30)	0.15 (max. 0.70)	**OK**
Party wall	0.00 (max. 0.20)	-	**OK**
Floor	(no floor)		
Roof	0.13 (max. 0.20)	0.13 (max. 0.35)	**OK**
Openings	1.23 (max. 2.00)	1.27 (max. 3.30)	**OK**

2a Thermal bridging

Thermal bridging calculated from linear thermal transmittances for each junction

3 Air permeability

Air permeability at 50 pascals	3.00 (design value)	
Maximum	10.0	**OK**

4 Heating efficiency

Main Heating system: Database: (rev 435, product index 017511):

Boiler systems with radiators or underfloor heating - mains gas
Brand name: Worcester
Model: Greenstar
Model qualifier: 28CDi Compact ErP
(Combi)
Efficiency 89.8 % SEDBUK2009
Minimum 88.0 % **OK**

Secondary heating system: None

Regulations Compliance Report

5 Cylinder insulation

Hot water Storage:	No cylinder	

6 Controls

Space heating controls	Time and temperature zone control by device in database	**OK**
Hot water controls:	No cylinder	
	No cylinder	
Boiler interlock:	Yes	**OK**

7 Low energy lights

Percentage of fixed lights with low-energy fittings	100.0%	
Minimum	75.0%	**OK**

8 Mechanical ventilation

Continuous supply and extract system		
Specific fan power:	0.59	
Maximum	1.5	**OK**
MVHR efficiency:	89%	
Minimum	70%	**OK**

9 Summertime temperature

Overheating risk (Thames valley):	Slight	**OK**

Based on:

Overshading:	Average or unknown
Windows facing: North	2.16m²
Windows facing: South	1.08m²
Windows facing: North	2.16m²
Windows facing: South	1.08m²
Windows facing: South	3.78m²
Windows facing: South	3.78m²
Ventilation rate:	8.00
Blinds/curtains:	None
	Closed 100% of daylight hours

10 Key features

Air permeablility	3.0 m³/m²h
Doors U-value	1 W/m²K
External Walls U-value	0.13 W/m²K
Party Walls U-value	0 W/m²K
Photovoltaic array	

Regulations Compliance Report

Approved Document L1A, 2013 Edition, England assessed by Stroma FSAP 2012 program, Version: 1.0.4.16
Printed on 22 November 2018 at 12:41:01

Project Information:

Assessed By: ()

Building Type: Maisonette

Dwelling Details:

NEW DWELLING DESIGN STAGE

Total Floor Area: 90.66m²

Site Reference : Clarion Richmond College

Plot Reference: TF 3B5P Masionette Type 16

Address : , London, TW2 7SJ

Client Details:

Name:

Address :

This report covers items included within the SAP calculations.
It is not a complete report of regulations compliance.

1a TER and DER

Fuel for main heating system: Mains gas
Fuel factor: 1.00 (mains gas)

Target Carbon Dioxide Emission Rate (TER)	17.44 kg/m²	
Dwelling Carbon Dioxide Emission Rate (DER)	9.29 kg/m²	**OK**

1b TFEE and DFEE

Target Fabric Energy Efficiency (TFEE)	50.5 kWh/m²	
Dwelling Fabric Energy Efficiency (DFEE)	42.7 kWh/m²	
		OK

2 Fabric U-values

Element	Average	Highest	
External wall	0.15 (max. 0.30)	0.15 (max. 0.70)	**OK**
Party wall	0.00 (max. 0.20)	-	**OK**
Floor	0.13 (max. 0.25)	0.13 (max. 0.70)	**OK**
Roof	0.13 (max. 0.20)	0.13 (max. 0.35)	**OK**
Openings	1.24 (max. 2.00)	1.27 (max. 3.30)	**OK**

2a Thermal bridging

Thermal bridging calculated from linear thermal transmittances for each junction

3 Air permeability

Air permeability at 50 pascals	3.00 (design value)	
Maximum	10.0	**OK**

4 Heating efficiency

Main Heating system: Database: (rev 435, product index 017511):

Boiler systems with radiators or underfloor heating - mains gas
Brand name: Worcester
Model: Greenstar
Model qualifier: 28CDi Compact ErP (Combi)
Efficiency 89.8 % SEDBUK2009
Minimum 88.0 % **OK**

Secondary heating system: None

Regulations Compliance Report

5 Cylinder insulation

Hot water Storage:	No cylinder	

6 Controls

Space heating controls	Time and temperature zone control by device in database	OK
Hot water controls:	No cylinder	
	No cylinder	
Boiler interlock:	Yes	OK

7 Low energy lights

Percentage of fixed lights with low-energy fittings	100.0%	
Minimum	75.0%	OK

8 Mechanical ventilation

Continuous supply and extract system		
Specific fan power:	0.59	
Maximum	1.5	OK
MVHR efficiency:	89%	
Minimum	70%	OK

9 Summertime temperature

Overheating risk (Thames valley):	Slight	OK

Based on:

Overshading:	Average or unknown
Windows facing: North	2.16m²
Windows facing: South	3.78m²
Windows facing: South	1.08m²
Windows facing: North	2.16m²
Windows facing: South	3.78m²
Windows facing: South	1.08m²
Windows facing: North	2.31m²
Windows facing: South	2.31m²
Ventilation rate:	8.00
Blinds/curtains:	None
	Closed 100% of daylight hours

10 Key features

Air permeablility	3.0 m³/m²h
Doors U-value	1 W/m²K
External Walls U-value	0.13 W/m²K
Party Walls U-value	0 W/m²K
Photovoltaic array	

Regulations Compliance Report

Approved Document L1A, 2013 Edition, England assessed by Stroma FSAP 2012 program, Version: 1.0.4.16
Printed on 22 November 2018 at 12:41:01

Project Information:

Assessed By: () **Building Type:** Flat

Dwelling Details:

NEW DWELLING DESIGN STAGE Total Floor Area: 72.88m²
Site Reference : Clarion Richmond College **Plot Reference:** TF 2B4P Type 17
Address : , London, TW2 7SJ

Client Details:

Name:
Address :

This report covers items included within the SAP calculations.
It is not a complete report of regulations compliance.

1a TER and DER

Fuel for main heating system: Mains gas
Fuel factor: 1.00 (mains gas)

Target Carbon Dioxide Emission Rate (TER)	17.75 kg/m²	
Dwelling Carbon Dioxide Emission Rate (DER)	9.47 kg/m²	**OK**

1b TFEE and DFEE

Target Fabric Energy Efficiency (TFEE)	44.6 kWh/m²	
Dwelling Fabric Energy Efficiency (DFEE)	38.0 kWh/m²	
		OK

2 Fabric U-values

Element	Average	Highest	
External wall	0.14 (max. 0.30)	0.15 (max. 0.70)	**OK**
Party wall	0.00 (max. 0.20)	-	**OK**
Floor	(no floor)		
Roof	0.13 (max. 0.20)	0.13 (max. 0.35)	**OK**
Openings	1.22 (max. 2.00)	1.27 (max. 3.30)	**OK**

2a Thermal bridging

Thermal bridging calculated from linear thermal transmittances for each junction

3 Air permeability

Air permeability at 50 pascals	3.00 (design value)	
Maximum	10.0	**OK**

4 Heating efficiency

Main Heating system: Database: (rev 435, product index 017511):
Boiler systems with radiators or underfloor heating - mains gas
Brand name: Worcester
Model: Greenstar
Model qualifier: 28CDi Compact ErP
(Combi)
Efficiency 89.8 % SEDBUK2009
Minimum 88.0 % **OK**

Secondary heating system: None

Regulations Compliance Report

5 Cylinder insulation

Hot water Storage:	No cylinder	

6 Controls

Space heating controls	Time and temperature zone control by device in database	OK
Hot water controls:	No cylinder	
	No cylinder	
Boiler interlock:	Yes	OK

7 Low energy lights

Percentage of fixed lights with low-energy fittings	100.0%	
Minimum	75.0%	OK

8 Mechanical ventilation

Continuous supply and extract system		
Specific fan power:	0.59	
Maximum	1.5	OK
MVHR efficiency:	89%	
Minimum	70%	OK

9 Summertime temperature

Overheating risk (Thames valley):	Slight	OK

Based on:

Overshading:	Average or unknown
Windows facing: North	4.32m²
Windows facing: South	1.08m²
Windows facing: South	3.78m²
Ventilation rate:	6.00
Blinds/curtains:	None
	Closed 100% of daylight hours

10 Key features

Air permeablility	3.0 m³/m²h
Doors U-value	1 W/m²K
External Walls U-value	0.13 W/m²K
Party Walls U-value	0 W/m²K
Photovoltaic array	

Regulations Compliance Report

Approved Document L1A, 2013 Edition, England assessed by Stroma FSAP 2012 program, Version: 1.0.4.16
Printed on 22 November 2018 at 12:41:00

Project Information:

Assessed By: ()

Building Type: Flat

Dwelling Details:

NEW DWELLING DESIGN STAGE

Total Floor Area: 50.69m²

Site Reference : Clarion Richmond College

Plot Reference: TF 1B2P Type 18

Address : , London, TW2 7SJ

Client Details:

Name:

Address :

This report covers items included within the SAP calculations.
It is not a complete report of regulations compliance.

1a TER and DER

Fuel for main heating system: Mains gas
Fuel factor: 1.00 (mains gas)

Target Carbon Dioxide Emission Rate (TER)	19.13 kg/m²	
Dwelling Carbon Dioxide Emission Rate (DER)	11.10 kg/m²	**OK**

1b TFEE and DFEE

Target Fabric Energy Efficiency (TFEE)	44.1 kWh/m²	
Dwelling Fabric Energy Efficiency (DFEE)	40.3 kWh/m²	
		OK

2 Fabric U-values

Element	Average	Highest	
External wall	0.14 (max. 0.30)	0.15 (max. 0.70)	**OK**
Party wall	0.00 (max. 0.20)	-	**OK**
Floor	(no floor)		
Roof	0.13 (max. 0.20)	0.13 (max. 0.35)	**OK**
Openings	1.21 (max. 2.00)	1.27 (max. 3.30)	**OK**

2a Thermal bridging

Thermal bridging calculated from linear thermal transmittances for each junction

3 Air permeability

Air permeability at 50 pascals	3.00 (design value)	
Maximum	10.0	**OK**

4 Heating efficiency

Main Heating system: Database: (rev 435, product index 017511):

Boiler systems with radiators or underfloor heating - mains gas
Brand name: Worcester
Model: Greenstar
Model qualifier: 28CDi Compact ErP (Combi)
Efficiency 89.8 % SEDBUK2009
Minimum 88.0 % **OK**

Secondary heating system: None

Regulations Compliance Report

5 Cylinder insulation

Hot water Storage:	No cylinder	

6 Controls

Space heating controls	Time and temperature zone control by device in database	**OK**
Hot water controls:	No cylinder	
	No cylinder	
Boiler interlock:	Yes	**OK**

7 Low energy lights

Percentage of fixed lights with low-energy fittings	100.0%	
Minimum	75.0%	**OK**

8 Mechanical ventilation

Continuous supply and extract system		
Specific fan power:	0.52	
Maximum	1.5	**OK**
MVHR efficiency:	90%	
Minimum	70%	**OK**

9 Summertime temperature

Overheating risk (Thames valley):	Medium	**OK**

Based on:

Overshading:	Average or unknown
Windows facing: South	2.16m²
Windows facing: South	3.78m²
Windows facing: East	1.89m²
Ventilation rate:	4.00
Blinds/curtains:	None
	Closed 100% of daylight hours

10 Key features

Air permeablility	3.0 m³/m²h
Doors U-value	1 W/m²K
External Walls U-value	0.13 W/m²K
Party Walls U-value	0 W/m²K
Photovoltaic array	

Regulations Compliance Report

Approved Document L1A, 2013 Edition, England assessed by Stroma FSAP 2012 program, Version: 1.0.4.16
Printed on 22 November 2018 at 12:41:00

Project Information:

Assessed By: ()

Building Type: Flat

Dwelling Details:

NEW DWELLING DESIGN STAGE

Total Floor Area: 50.33m²

Site Reference : Clarion Richmond College

Plot Reference: TF 1B2P Type 19

Address : , London, TW2 7SJ

Client Details:

Name:

Address :

This report covers items included within the SAP calculations.
It is not a complete report of regulations compliance.

1a TER and DER

Fuel for main heating system: Mains gas
Fuel factor: 1.00 (mains gas)

Target Carbon Dioxide Emission Rate (TER)	21.3 kg/m²	
Dwelling Carbon Dioxide Emission Rate (DER)	13.04 kg/m²	**OK**

1b TFEE and DFEE

Target Fabric Energy Efficiency (TFEE)	56.1 kWh/m²	
Dwelling Fabric Energy Efficiency (DFEE)	49.1 kWh/m²	
		OK

2 Fabric U-values

Element	Average	Highest	
External wall	0.15 (max. 0.30)	0.15 (max. 0.70)	**OK**
Party wall	0.00 (max. 0.20)	-	**OK**
Floor	(no floor)		
Roof	0.13 (max. 0.20)	0.13 (max. 0.35)	**OK**
Openings	1.23 (max. 2.00)	1.27 (max. 3.30)	**OK**

2a Thermal bridging

Thermal bridging calculated from linear thermal transmittances for each junction

3 Air permeability

Air permeability at 50 pascals	3.00 (design value)	
Maximum	10.0	**OK**

4 Heating efficiency

Main Heating system:

Database: (rev 435, product index 017511):
Boiler systems with radiators or underfloor heating - mains gas
Brand name: Worcester
Model: Greenstar
Model qualifier: 28CDi Compact ErP
(Combi)
Efficiency 89.8 % SEDBUK2009
Minimum 88.0 % **OK**

Secondary heating system: None

Regulations Compliance Report

5 Cylinder insulation

Hot water Storage:	No cylinder	

6 Controls

Space heating controls	Time and temperature zone control by device in database	**OK**
Hot water controls:	No cylinder	
	No cylinder	
Boiler interlock:	Yes	**OK**

7 Low energy lights

Percentage of fixed lights with low-energy fittings	100.0%	
Minimum	75.0%	**OK**

8 Mechanical ventilation

Continuous supply and extract system		
Specific fan power:	0.52	
Maximum	1.5	**OK**
MVHR efficiency:	90%	
Minimum	70%	**OK**

9 Summertime temperature

Overheating risk (Thames valley):	Medium	**OK**

Based on:

Overshading:	Average or unknown
Windows facing: North	2.16m²
Windows facing: North	1.08m²
Windows facing: South	3.78m²
Windows facing: East	2.16m²
Windows facing: East	2.16m²
Ventilation rate:	5.00
Blinds/curtains:	None
	Closed 100% of daylight hours

10 Key features

Air permeablility	3.0 m³/m²h
Doors U-value	1 W/m²K
External Walls U-value	0.13 W/m²K
Party Walls U-value	0 W/m²K
Photovoltaic array	

Regulations Compliance Report

Approved Document L1A, 2013 Edition, England assessed by Stroma FSAP 2012 program, Version: 1.0.4.16
Printed on 22 November 2018 at 12:41:00

Project Information:

Assessed By: ()

Building Type: Flat

Dwelling Details:

NEW DWELLING DESIGN STAGE

Total Floor Area: 70.02m²

Site Reference : Clarion Richmond College

Plot Reference: TF 2B4P Type 20

Address : , London, TW2 7SJ

Client Details:

Name:

Address :

This report covers items included within the SAP calculations.
It is not a complete report of regulations compliance.

1a TER and DER

Fuel for main heating system: Mains gas
Fuel factor: 1.00 (mains gas)

Target Carbon Dioxide Emission Rate (TER)	19.03 kg/m²	
Dwelling Carbon Dioxide Emission Rate (DER)	11.01 kg/m²	**OK**

1b TFEE and DFEE

Target Fabric Energy Efficiency (TFEE)	52.3 kWh/m²	
Dwelling Fabric Energy Efficiency (DFEE)	46.4 kWh/m²	
		OK

2 Fabric U-values

Element	Average	Highest	
External wall	0.15 (max. 0.30)	0.15 (max. 0.70)	**OK**
Party wall	0.00 (max. 0.20)	-	**OK**
Floor	(no floor)		
Roof	0.13 (max. 0.20)	0.13 (max. 0.35)	**OK**
Openings	1.24 (max. 2.00)	1.27 (max. 3.30)	**OK**

2a Thermal bridging

Thermal bridging calculated from linear thermal transmittances for each junction

3 Air permeability

Air permeability at 50 pascals	3.00 (design value)	
Maximum	10.0	**OK**

4 Heating efficiency

Main Heating system: Database: (rev 435, product index 017511):

Boiler systems with radiators or underfloor heating - mains gas
Brand name: Worcester
Model: Greenstar
Model qualifier: 28CDi Compact ErP
(Combi)
Efficiency 89.8 % SEDBUK2009
Minimum 88.0 % **OK**

Secondary heating system: None

Regulations Compliance Report

5 Cylinder insulation

Hot water Storage:	No cylinder	

6 Controls

Space heating controls	Time and temperature zone control by device in database	**OK**
Hot water controls:	No cylinder	
	No cylinder	
Boiler interlock:	Yes	**OK**

7 Low energy lights

Percentage of fixed lights with low-energy fittings	100.0%	
Minimum	75.0%	**OK**

8 Mechanical ventilation

Continuous supply and extract system		
Specific fan power:	0.59	
Maximum	1.5	**OK**
MVHR efficiency:	89%	
Minimum	70%	**OK**

9 Summertime temperature

Overheating risk (Thames valley):	Medium	**OK**

Based on:

Overshading:	Average or unknown
Windows facing: North	7.56m²
Windows facing: South	3.78m²
Windows facing: South	6.48m²
Ventilation rate:	6.00
Blinds/curtains:	None
	Closed 100% of daylight hours

10 Key features

Air permeablility	3.0 m³/m²h
Doors U-value	1 W/m²K
External Walls U-value	0.13 W/m²K
Party Walls U-value	0 W/m²K
Photovoltaic array	

Regulations Compliance Report

Approved Document L1A, 2013 Edition, England assessed by Stroma FSAP 2012 program, Version: 1.0.4.16
Printed on 22 November 2018 at 12:41:00

Project Information:

Assessed By: ()

Building Type: Flat

Dwelling Details:

NEW DWELLING DESIGN STAGE

Total Floor Area: 53.52m²

Site Reference : Clarion Richmond College

Plot Reference: TF 1B2P Type 21

Address : , London, TW2 7SJ

Client Details:

Name:

Address :

This report covers items included within the SAP calculations.
It is not a complete report of regulations compliance.

1a TER and DER

Fuel for main heating system: Mains gas
Fuel factor: 1.00 (mains gas)

Target Carbon Dioxide Emission Rate (TER)	18.99 kg/m²	
Dwelling Carbon Dioxide Emission Rate (DER)	11.04 kg/m²	**OK**

1b TFEE and DFEE

Target Fabric Energy Efficiency (TFEE)	44.5 kWh/m²	
Dwelling Fabric Energy Efficiency (DFEE)	40.8 kWh/m²	
		OK

2 Fabric U-values

Element	Average	Highest	
External wall	0.15 (max. 0.30)	0.15 (max. 0.70)	**OK**
Party wall	0.00 (max. 0.20)	-	**OK**
Floor	(no floor)		
Roof	0.13 (max. 0.20)	0.13 (max. 0.35)	**OK**
Openings	1.25 (max. 2.00)	1.27 (max. 3.30)	**OK**

2a Thermal bridging

Thermal bridging calculated from linear thermal transmittances for each junction

3 Air permeability

Air permeability at 50 pascals	3.00 (design value)	
Maximum	10.0	**OK**

4 Heating efficiency

Main Heating system: Database: (rev 435, product index 017511):

Boiler systems with radiators or underfloor heating - mains gas
Brand name: Worcester
Model: Greenstar
Model qualifier: 28CDi Compact ErP (Combi)
Efficiency 89.8 % SEDBUK2009
Minimum 88.0 % **OK**

Secondary heating system: None

Regulations Compliance Report

5 Cylinder insulation

Hot water Storage:	No cylinder	

6 Controls

Space heating controls	Time and temperature zone control by device in database	**OK**
Hot water controls:	No cylinder	
	No cylinder	
Boiler interlock:	Yes	**OK**

7 Low energy lights

Percentage of fixed lights with low-energy fittings	100.0%	
Minimum	75.0%	**OK**

8 Mechanical ventilation

Continuous supply and extract system		
Specific fan power:	0.52	
Maximum	1.5	**OK**
MVHR efficiency:	90%	
Minimum	70%	**OK**

9 Summertime temperature

Overheating risk (Thames valley):	Medium	**OK**

Based on:

Overshading:	Average or unknown
Windows facing: West	1.89m²
Windows facing: South	2.16m²
Windows facing: South	3.78m²
Ventilation rate:	4.00
Blinds/curtains:	None
	Closed 100% of daylight hours

10 Key features

Air permeablility	3.0 m³/m²h
Party Walls U-value	0 W/m²K
Photovoltaic array	

Regulations Compliance Report

Approved Document L1A, 2013 Edition, England assessed by Stroma FSAP 2012 program, Version: 1.0.4.16
Printed on 22 November 2018 at 12:40:59

Project Information:

Assessed By: ()

Building Type: Flat

Dwelling Details:

NEW DWELLING DESIGN STAGE

Total Floor Area: 50.61m²

Site Reference : Clarion Richmond College

Plot Reference: TF 1B2P Type 22

Address : , London, TW2 7SJ

Client Details:

Name:

Address :

This report covers items included within the SAP calculations.
It is not a complete report of regulations compliance.

1a TER and DER

Fuel for main heating system: Mains gas
Fuel factor: 1.00 (mains gas)

Target Carbon Dioxide Emission Rate (TER)	21.23 kg/m²	
Dwelling Carbon Dioxide Emission Rate (DER)	12.92 kg/m²	**OK**

1b TFEE and DFEE

Target Fabric Energy Efficiency (TFEE)	54.7 kWh/m²	
Dwelling Fabric Energy Efficiency (DFEE)	47.0 kWh/m²	
		OK

2 Fabric U-values

Element	Average	Highest	
External wall	0.14 (max. 0.30)	0.15 (max. 0.70)	**OK**
Party wall	0.00 (max. 0.20)	-	**OK**
Floor	(no floor)		
Roof	0.13 (max. 0.20)	0.13 (max. 0.35)	**OK**
Openings	1.26 (max. 2.00)	1.27 (max. 3.30)	**OK**

2a Thermal bridging

Thermal bridging calculated from linear thermal transmittances for each junction

3 Air permeability

Air permeability at 50 pascals	3.00 (design value)	
Maximum	10.0	**OK**

4 Heating efficiency

Main Heating system: Database: (rev 435, product index 017511):

Boiler systems with radiators or underfloor heating - mains gas
Brand name: Worcester
Model: Greenstar
Model qualifier: 28CDi Compact ErP
(Combi)
Efficiency 89.8 % SEDBUK2009
Minimum 88.0 % **OK**

Secondary heating system: None

Regulations Compliance Report

5 Cylinder insulation

Hot water Storage:	No cylinder	

6 Controls

Space heating controls	Time and temperature zone control by device in database	**OK**
Hot water controls:	No cylinder	
	No cylinder	
Boiler interlock:	Yes	**OK**

7 Low energy lights

Percentage of fixed lights with low-energy fittings	100.0%	
Minimum	75.0%	**OK**

8 Mechanical ventilation

Continuous supply and extract system		
Specific fan power:	0.52	
Maximum	1.5	**OK**
MVHR efficiency:	90%	
Minimum	70%	**OK**

9 Summertime temperature

Overheating risk (Thames valley):	Slight	**OK**

Based on:

Overshading:	Average or unknown
Windows facing: South	3.78m²
Windows facing: North	2.16m²
Windows facing: North	1.08m²
Windows facing: South	1.08m²
Ventilation rate:	6.00
Blinds/curtains:	None
	Closed 100% of daylight hours

10 Key features

Air permeablility	3.0 m³/m²h
External Walls U-value	0.13 W/m²K
Party Walls U-value	0 W/m²K
Photovoltaic array	

Regulations Compliance Report

Approved Document L1A, 2013 Edition, England assessed by Stroma FSAP 2012 program, Version: 1.0.4.16
Printed on 22 November 2018 at 12:40:59

Project Information:

Assessed By: () **Building Type:** Flat

Dwelling Details:

NEW DWELLING DESIGN STAGE Total Floor Area: 70.25m²
Site Reference : Clarion Richmond College **Plot Reference:** TF 2B4P Type 23
Address : , London, TW2 7SJ

Client Details:

Name:
Address :

This report covers items included within the SAP calculations.
It is not a complete report of regulations compliance.

1a TER and DER

Fuel for main heating system: Mains gas
Fuel factor: 1.00 (mains gas)

Target Carbon Dioxide Emission Rate (TER)	17.52 kg/m²	
Dwelling Carbon Dioxide Emission Rate (DER)	10.66 kg/m²	**OK**

1b TFEE and DFEE

Target Fabric Energy Efficiency (TFEE)	44.2 kWh/m²	
Dwelling Fabric Energy Efficiency (DFEE)	40.1 kWh/m²	
		OK

2 Fabric U-values

Element	Average	Highest	
External wall	0.15 (max. 0.30)	0.15 (max. 0.70)	**OK**
Party wall	0.00 (max. 0.20)	-	**OK**
Floor	(no floor)		
Roof	0.13 (max. 0.20)	0.13 (max. 0.35)	**OK**
Openings	1.26 (max. 2.00)	1.27 (max. 3.30)	**OK**

2a Thermal bridging

Thermal bridging calculated from linear thermal transmittances for each junction

3 Air permeability

Air permeability at 50 pascals	3.00 (design value)	
Maximum	10.0	**OK**

4 Heating efficiency

Main Heating system: Database: (rev 435, product index 017511):
Boiler systems with radiators or underfloor heating - mains gas
Brand name: Worcester
Model: Greenstar
Model qualifier: 28CDi Compact ErP
(Combi)
Efficiency 89.8 % SEDBUK2009
Minimum 88.0 % **OK**

Secondary heating system: None

Regulations Compliance Report

5 Cylinder insulation

Hot water Storage:	No cylinder	

6 Controls

Space heating controls	Time and temperature zone control by device in database	**OK**
Hot water controls:	No cylinder	
	No cylinder	
Boiler interlock:	Yes	**OK**

7 Low energy lights

Percentage of fixed lights with low-energy fittings	100.0%	
Minimum	75.0%	**OK**

8 Mechanical ventilation

Continuous supply and extract system		
Specific fan power:	0.52	
Maximum	1.5	**OK**
MVHR efficiency:	90%	
Minimum	70%	**OK**

9 Summertime temperature

Overheating risk (Thames valley):	Medium	**OK**

Based on:

Overshading:	Average or unknown
Windows facing: South	4.32m²
Windows facing: South	3.78m²
Windows facing: West	2.16m²
Windows facing: West	2.16m²
Ventilation rate:	4.00
Blinds/curtains:	None
	Closed 100% of daylight hours

10 Key features

Air permeablility	3.0 m³/m²h
Party Walls U-value	0 W/m²K
Photovoltaic array	

Regulations Compliance Report

Approved Document L1A, 2013 Edition, England assessed by Stroma FSAP 2012 program, Version: 1.0.4.16
Printed on 22 November 2018 at 12:40:59

Project Information:

Assessed By: () **Building Type:** Flat

Dwelling Details:

NEW DWELLING DESIGN STAGE Total Floor Area: 70.46m²
Site Reference : Clarion Richmond College **Plot Reference:** TF 2B4P Type 24
Address : , London, TW2 7SJ

Client Details:

Name:
Address :

This report covers items included within the SAP calculations.
It is not a complete report of regulations compliance.

1a TER and DER

Fuel for main heating system: Mains gas
Fuel factor: 1.00 (mains gas)

Target Carbon Dioxide Emission Rate (TER)	16.85 kg/m²	
Dwelling Carbon Dioxide Emission Rate (DER)	9.94 kg/m²	**OK**

1b TFEE and DFEE

Target Fabric Energy Efficiency (TFEE)	39.6 kWh/m²	
Dwelling Fabric Energy Efficiency (DFEE)	36.3 kWh/m²	
		OK

2 Fabric U-values

Element	Average	Highest	
External wall	0.15 (max. 0.30)	0.15 (max. 0.70)	**OK**
Party wall	0.00 (max. 0.20)	-	**OK**
Floor	(no floor)		
Roof	0.13 (max. 0.20)	0.13 (max. 0.35)	**OK**
Openings	1.26 (max. 2.00)	1.27 (max. 3.30)	**OK**

2a Thermal bridging

Thermal bridging calculated from linear thermal transmittances for each junction

3 Air permeability

Air permeability at 50 pascals	3.00 (design value)	
Maximum	10.0	**OK**

4 Heating efficiency

Main Heating system: Database: (rev 435, product index 017511):
Boiler systems with radiators or underfloor heating - mains gas
Brand name: Worcester
Model: Greenstar
Model qualifier: 28CDi Compact ErP (Combi)
Efficiency 89.8 % SEDBUK2009
Minimum 88.0 % **OK**

Secondary heating system: None

Regulations Compliance Report

5 Cylinder insulation

Hot water Storage:	No cylinder	

6 Controls

Space heating controls	Time and temperature zone control by device in database	OK
Hot water controls:	No cylinder	
	No cylinder	
Boiler interlock:	Yes	OK

7 Low energy lights

Percentage of fixed lights with low-energy fittings	100.0%	
Minimum	75.0%	OK

8 Mechanical ventilation

Continuous supply and extract system		
Specific fan power:	0.52	
Maximum	1.5	OK
MVHR efficiency:	90%	
Minimum	70%	OK

9 Summertime temperature

Overheating risk (Thames valley):	Medium	OK

Based on:

Overshading:	Average or unknown
Windows facing: South	4.32m²
Windows facing: East	1.32m²
Windows facing: South	3.78m²
Ventilation rate:	4.00
Blinds/curtains:	None
	Closed 100% of daylight hours

10 Key features

Air permeablility	3.0 m³/m²h
External Walls U-value	0.13 W/m²K
Party Walls U-value	0 W/m²K
Photovoltaic array	

Regulations Compliance Report

Approved Document L1A, 2013 Edition, England assessed by Stroma FSAP 2012 program, Version: 1.0.4.16
Printed on 22 November 2018 at 12:40:58

Project Information:

Assessed By: () **Building Type:** Flat

Dwelling Details:

NEW DWELLING DESIGN STAGE Total Floor Area: 81.11m²
Site Reference : Clarion Richmond College **Plot Reference:** TF 2B4P Type 25
Address : , London, TW2 7SJ

Client Details:

Name:
Address :

This report covers items included within the SAP calculations.
It is not a complete report of regulations compliance.

1a TER and DER

Fuel for main heating system: Mains gas
Fuel factor: 1.00 (mains gas)

Target Carbon Dioxide Emission Rate (TER)	19.47 kg/m²	
Dwelling Carbon Dioxide Emission Rate (DER)	10.86 kg/m²	**OK**

1b TFEE and DFEE

Target Fabric Energy Efficiency (TFEE)	56.4 kWh/m²	
Dwelling Fabric Energy Efficiency (DFEE)	45.7 kWh/m²	
		OK

2 Fabric U-values

Element	Average	Highest	
External wall	0.14 (max. 0.30)	0.15 (max. 0.70)	**OK**
Floor	(no floor)		
Roof	0.13 (max. 0.20)	0.13 (max. 0.35)	**OK**
Openings	1.26 (max. 2.00)	1.27 (max. 3.30)	**OK**

2a Thermal bridging

Thermal bridging calculated from linear thermal transmittances for each junction

3 Air permeability

Air permeability at 50 pascals	3.00 (design value)	
Maximum	10.0	**OK**

4 Heating efficiency

Main Heating system: Database: (rev 435, product index 017511):
Boiler systems with radiators or underfloor heating - mains gas
Brand name: Worcester
Model: Greenstar
Model qualifier: 28CDi Compact ErP
(Combi)
Efficiency 89.8 % SEDBUK2009
Minimum 88.0 % **OK**

Secondary heating system: None

Regulations Compliance Report

5 Cylinder insulation

Hot water Storage:	No cylinder	

6 Controls

Space heating controls	Time and temperature zone control by device in database	OK
Hot water controls:	No cylinder	
	No cylinder	
Boiler interlock:	Yes	OK

7 Low energy lights

Percentage of fixed lights with low-energy fittings	100.0%	
Minimum	75.0%	OK

8 Mechanical ventilation

Continuous supply and extract system		
Specific fan power:	0.52	
Maximum	1.5	OK
MVHR efficiency:	90%	
Minimum	70%	OK

9 Summertime temperature

Overheating risk (Thames valley):	Medium	OK

Based on:

Overshading:	Average or unknown
Windows facing: North	2.16m²
Windows facing: North	1.08m²
Windows facing: West	4.32m²
Windows facing: North	3.78m²
Ventilation rate:	4.00
Blinds/curtains:	None
	Closed 100% of daylight hours

10 Key features

Air permeablility	3.0 m³/m²h
External Walls U-value	0.13 W/m²K
Photovoltaic array	

Regulations Compliance Report

Approved Document L1A, 2013 Edition, England assessed by Stroma FSAP 2012 program, Version: 1.0.4.16
Printed on 22 November 2018 at 12:40:58

Project Information:

Assessed By: () **Building Type:** Flat

Dwelling Details:

NEW DWELLING DESIGN STAGE Total Floor Area: 69.87m²
Site Reference : Clarion Richmond College **Plot Reference:** TF 2B4P Type 26
Address : , London, TW2 7SJ

Client Details:

Name:
Address :

This report covers items included within the SAP calculations.
It is not a complete report of regulations compliance.

1a TER and DER

Fuel for main heating system: Mains gas
Fuel factor: 1.00 (mains gas)

Target Carbon Dioxide Emission Rate (TER)	19.54 kg/m²	
Dwelling Carbon Dioxide Emission Rate (DER)	12.59 kg/m²	**OK**

1b TFEE and DFEE

Target Fabric Energy Efficiency (TFEE)	53.5 kWh/m²	
Dwelling Fabric Energy Efficiency (DFEE)	45.3 kWh/m²	
		OK

2 Fabric U-values

Element	Average	Highest	
External wall	0.14 (max. 0.30)	0.15 (max. 0.70)	**OK**
Floor	(no floor)		
Roof	0.13 (max. 0.20)	0.13 (max. 0.35)	**OK**
Openings	1.26 (max. 2.00)	1.27 (max. 3.30)	**OK**

2a Thermal bridging

Thermal bridging calculated from linear thermal transmittances for each junction

3 Air permeability

Air permeability at 50 pascals	3.00 (design value)	
Maximum	10.0	**OK**

4 Heating efficiency

Main Heating system: Database: (rev 435, product index 017511):
Boiler systems with radiators or underfloor heating - mains gas
Brand name: Worcester
Model: Greenstar
Model qualifier: 28CDi Compact ErP
(Combi)
Efficiency 89.8 % SEDBUK2009
Minimum 88.0 % **OK**

Secondary heating system: None

Regulations Compliance Report

5 Cylinder insulation

Hot water Storage:	No cylinder	

6 Controls

Space heating controls	Time and temperature zone control by device in database	**OK**
Hot water controls:	No cylinder	
	No cylinder	
Boiler interlock:	Yes	**OK**

7 Low energy lights

Percentage of fixed lights with low-energy fittings	100.0%	
Minimum	75.0%	**OK**

8 Mechanical ventilation

Continuous supply and extract system		
Specific fan power:	0.52	
Maximum	1.5	**OK**
MVHR efficiency:	90%	
Minimum	70%	**OK**

9 Summertime temperature

Overheating risk (Thames valley):	Medium	**OK**

Based on:

Overshading:	Average or unknown
Windows facing: South	4.32m²
Windows facing: East	2.16m²
Windows facing: North	3.78m²
Ventilation rate:	4.00
Blinds/curtains:	None
	Closed 100% of daylight hours

10 Key features

Air permeablility	3.0 m³/m²h
External Walls U-value	0.13 W/m²K
Photovoltaic array	

Regulations Compliance Report

Approved Document L1A, 2013 Edition, England assessed by Stroma FSAP 2012 program, Version: 1.0.4.16
Printed on 22 November 2018 at 12:40:58

Project Information:

Assessed By: ()

Building Type: Maisonette

Dwelling Details:

NEW DWELLING DESIGN STAGE

Total Floor Area: 82.02m²

Site Reference : Clarion Richmond College

Plot Reference: TF 2B4P Masionette Type 27

Address : , London, TW2 7SJ

Client Details:

Name:

Address :

This report covers items included within the SAP calculations.
It is not a complete report of regulations compliance.

1a TER and DER

Fuel for main heating system: Mains gas
Fuel factor: 1.00 (mains gas)

Target Carbon Dioxide Emission Rate (TER)	18.64 kg/m²	
Dwelling Carbon Dioxide Emission Rate (DER)	11.61 kg/m²	**OK**

1b TFEE and DFEE

Target Fabric Energy Efficiency (TFEE)	54.5 kWh/m²	
Dwelling Fabric Energy Efficiency (DFEE)	47.4 kWh/m²	
		OK

2 Fabric U-values

Element	Average	Highest	
External wall	0.15 (max. 0.30)	0.15 (max. 0.70)	**OK**
Party wall	0.00 (max. 0.20)	-	**OK**
Floor	(no floor)		
Roof	0.13 (max. 0.20)	0.13 (max. 0.35)	**OK**
Openings	1.24 (max. 2.00)	1.27 (max. 3.30)	**OK**

2a Thermal bridging

Thermal bridging calculated from linear thermal transmittances for each junction

3 Air permeability

Air permeability at 50 pascals	3.00 (design value)	
Maximum	10.0	**OK**

4 Heating efficiency

Main Heating system: Database: (rev 435, product index 017511):

Boiler systems with radiators or underfloor heating - mains gas
Brand name: Worcester
Model: Greenstar
Model qualifier: 28CDi Compact ErP (Combi)
Efficiency 89.8 % SEDBUK2009
Minimum 88.0 % **OK**

Secondary heating system: None

Regulations Compliance Report

5 Cylinder insulation

Hot water Storage:	No cylinder	

6 Controls

Space heating controls	Time and temperature zone control by device in database	**OK**
Hot water controls:	No cylinder	
	No cylinder	
Boiler interlock:	Yes	**OK**

7 Low energy lights

Percentage of fixed lights with low-energy fittings	100.0%	
Minimum	75.0%	**OK**

8 Mechanical ventilation

Continuous supply and extract system		
Specific fan power:	0.77	
Maximum	1.5	**OK**
MVHR efficiency:	87%	
Minimum	70%	**OK**

9 Summertime temperature

Overheating risk (Thames valley):	Slight	**OK**

Based on:

Overshading:	Average or unknown
Windows facing: North	1.08m²
Windows facing: South	3.78m²
Windows facing: North	2.16m²
Windows facing: West	2.16m²
Windows facing: South	3.78m²
Windows facing: West	2.16m²
Windows facing: North	2.16m²
Windows facing: North	1.08m²
Windows facing: East	1.08m²
Ventilation rate:	8.00
Blinds/curtains:	
	Closed 100% of daylight hours

10 Key features

Air permeablility	3.0 m³/m²h
Doors U-value	1 W/m²K
External Walls U-value	0.13 W/m²K
Party Walls U-value	0 W/m²K
Photovoltaic array	

Regulations Compliance Report

Approved Document L1A, 2013 Edition, England assessed by Stroma FSAP 2012 program, Version: 1.0.4.16
Printed on 22 November 2018 at 12:45:59

Project Information:

Assessed By: () **Building Type:** Flat

Dwelling Details:

NEW DWELLING DESIGN STAGE Total Floor Area: 75.56m²
Site Reference : Clarion Richmond College **Plot Reference:** GF 2B3P WCH Type 1
Address : , London, TW2 7SJ

Client Details:

Name:
Address :

This report covers items included within the SAP calculations.
It is not a complete report of regulations compliance.

1a TER and DER

Fuel for main heating system: Mains gas
Fuel factor: 1.00 (mains gas)

Target Carbon Dioxide Emission Rate (TER)	17.49 kg/m²	
Dwelling Carbon Dioxide Emission Rate (DER)	4.02 kg/m²	**OK**

1b TFEE and DFEE

Target Fabric Energy Efficiency (TFEE)	45.0 kWh/m²	
Dwelling Fabric Energy Efficiency (DFEE)	39.6 kWh/m²	
		OK

2 Fabric U-values

Element	Average	Highest	
External wall	0.15 (max. 0.30)	0.15 (max. 0.70)	**OK**
Party wall	0.00 (max. 0.20)	-	**OK**
Floor	0.13 (max. 0.25)	0.13 (max. 0.70)	**OK**
Roof	(no roof)		
Openings	1.23 (max. 2.00)	1.27 (max. 3.30)	**OK**

2a Thermal bridging

Thermal bridging calculated from linear thermal transmittances for each junction

3 Air permeability

Air permeability at 50 pascals	3.00 (design value)	
Maximum	10.0	**OK**

4 Heating efficiency

Main Heating system: Database: (rev 435, product index 017511):
Boiler systems with radiators or underfloor heating - mains gas
Brand name: Worcester
Model: Greenstar
Model qualifier: 28CDi Compact ErP (Combi)
Efficiency 89.8 % SEDBUK2009
Minimum 88.0 % **OK**

Secondary heating system: None

Regulations Compliance Report

5 Cylinder insulation

Hot water Storage:	No cylinder	

6 Controls

Space heating controls	Time and temperature zone control by device in database	**OK**
Hot water controls:	No cylinder	
	No cylinder	
Boiler interlock:	Yes	**OK**

7 Low energy lights

Percentage of fixed lights with low-energy fittings	100.0%	
Minimum	75.0%	**OK**

8 Mechanical ventilation

Continuous supply and extract system		
Specific fan power:	0.52	
Maximum	1.5	**OK**
MVHR efficiency:	90%	
Minimum	70%	**OK**

9 Summertime temperature

Overheating risk (Thames valley):	Medium	**OK**

Based on:

Overshading:	Average or unknown
Windows facing: East	1.08m²
Windows facing: North	3.78m²
Windows facing: North	3.78m²
Windows facing: East	2.16m²
Windows facing: North	1.08m²
Ventilation rate:	3.00
Blinds/curtains:	None
	Closed 100% of daylight hours

10 Key features

Air permeablility	3.0 m³/m²h
Doors U-value	1 W/m²K
Party Walls U-value	0 W/m²K
Photovoltaic array	

Regulations Compliance Report

Approved Document L1A, 2013 Edition, England assessed by Stroma FSAP 2012 program, Version: 1.0.4.16
Printed on 22 November 2018 at 12:45:58

Project Information:

Assessed By: () **Building Type:** Flat

Dwelling Details:

NEW DWELLING DESIGN STAGE Total Floor Area: 73.37m²
Site Reference : Clarion Richmond College **Plot Reference:** GF 2B4P Type 2
Address : , London, TW2 7SJ

Client Details:

Name:
Address :

This report covers items included within the SAP calculations.
It is not a complete report of regulations compliance.

1a TER and DER

Fuel for main heating system: Mains gas
Fuel factor: 1.00 (mains gas)

Target Carbon Dioxide Emission Rate (TER)	17.31 kg/m²	
Dwelling Carbon Dioxide Emission Rate (DER)	8.21 kg/m²	**OK**

1b TFEE and DFEE

Target Fabric Energy Efficiency (TFEE)	42.1 kWh/m²	
Dwelling Fabric Energy Efficiency (DFEE)	36.5 kWh/m²	
		OK

2 Fabric U-values

Element	Average	Highest	
External wall	0.15 (max. 0.30)	0.15 (max. 0.70)	**OK**
Party wall	0.00 (max. 0.20)	-	**OK**
Floor	0.13 (max. 0.25)	0.13 (max. 0.70)	**OK**
Roof	(no roof)		
Openings	1.21 (max. 2.00)	1.27 (max. 3.30)	**OK**

2a Thermal bridging

Thermal bridging calculated from linear thermal transmittances for each junction

3 Air permeability

Air permeability at 50 pascals	3.00 (design value)	
Maximum	10.0	**OK**

4 Heating efficiency

Main Heating system: Database: (rev 435, product index 017511):
Boiler systems with radiators or underfloor heating - mains gas
Brand name: Worcester
Model: Greenstar
Model qualifier: 28CDi Compact ErP (Combi)
Efficiency 89.8 % SEDBUK2009
Minimum 88.0 % **OK**

Secondary heating system: None

Regulations Compliance Report

5 Cylinder insulation

Hot water Storage:	No cylinder	

6 Controls

Space heating controls	Time and temperature zone control by device in database	**OK**
Hot water controls:	No cylinder	
	No cylinder	
Boiler interlock:	Yes	**OK**

7 Low energy lights

Percentage of fixed lights with low-energy fittings	100.0%	
Minimum	75.0%	**OK**

8 Mechanical ventilation

Continuous supply and extract system		
Specific fan power:	0.59	
Maximum	1.5	**OK**
MVHR efficiency:	89%	
Minimum	70%	**OK**

9 Summertime temperature

Overheating risk (Thames valley):	Slight	**OK**

Based on:

Overshading:	Average or unknown
Windows facing: South	1.08m²
Windows facing: South	3.78m²
Windows facing: North	1.08m²
Windows facing: North	2.16m²
Ventilation rate:	3.00
Blinds/curtains:	None
	Closed 100% of daylight hours

10 Key features

Air permeablility	3.0 m³/m²h
Doors U-value	1 W/m²K
External Walls U-value	0.13 W/m²K
Party Walls U-value	0 W/m²K
Photovoltaic array	

Regulations Compliance Report

Approved Document L1A, 2013 Edition, England assessed by Stroma FSAP 2012 program, Version: 1.0.4.16
Printed on 22 November 2018 at 12:45:58

Project Information:

Assessed By: ()

Building Type: Flat

Dwelling Details:

NEW DWELLING DESIGN STAGE

Total Floor Area: 72.75m²

Site Reference : Clarion Richmond College

Plot Reference: GF 2B3P WCH Type 3

Address : , London, TW2 7SJ

Client Details:

Name:

Address :

This report covers items included within the SAP calculations.
It is not a complete report of regulations compliance.

1a TER and DER

Fuel for main heating system: Mains gas
Fuel factor: 1.00 (mains gas)

Target Carbon Dioxide Emission Rate (TER)	18.04 kg/m²	
Dwelling Carbon Dioxide Emission Rate (DER)	8.93 kg/m²	**OK**

1b TFEE and DFEE

Target Fabric Energy Efficiency (TFEE)	46.8 kWh/m²	
Dwelling Fabric Energy Efficiency (DFEE)	41.4 kWh/m²	
		OK

2 Fabric U-values

Element	Average	Highest	
External wall	0.14 (max. 0.30)	0.15 (max. 0.70)	**OK**
Party wall	0.00 (max. 0.20)	-	**OK**
Floor	0.13 (max. 0.25)	0.13 (max. 0.70)	**OK**
Roof	(no roof)		
Openings	1.22 (max. 2.00)	1.27 (max. 3.30)	**OK**

2a Thermal bridging

Thermal bridging calculated from linear thermal transmittances for each junction

3 Air permeability

Air permeability at 50 pascals	3.00 (design value)	
Maximum	10.0	**OK**

4 Heating efficiency

Main Heating system:

Database: (rev 435, product index 017511):
Boiler systems with radiators or underfloor heating - mains gas
Brand name: Worcester
Model: Greenstar
Model qualifier: 28CDi Compact ErP (Combi)
Efficiency 89.8 % SEDBUK2009
Minimum 88.0 % **OK**

Secondary heating system: None

Regulations Compliance Report

5 Cylinder insulation

Hot water Storage:	No cylinder	

6 Controls

Space heating controls	Time and temperature zone control by device in database	OK
Hot water controls:	No cylinder	
	No cylinder	
Boiler interlock:	Yes	OK

7 Low energy lights

Percentage of fixed lights with low-energy fittings	100.0%	
Minimum	75.0%	OK

8 Mechanical ventilation

Continuous supply and extract system		
Specific fan power:	0.52	
Maximum	1.5	OK
MVHR efficiency:	90%	
Minimum	70%	OK

9 Summertime temperature

Overheating risk (Thames valley):	Medium	OK

Based on:

Overshading:	Average or unknown
Windows facing: North	2.16m²
Windows facing: West	3.78m²
Windows facing: North	1.08m²
Windows facing: West	1.08m²
Windows facing: West	2.16m²
Ventilation rate:	3.00
Blinds/curtains:	None
	Closed 100% of daylight hours

10 Key features

Air permeablility	3.0 m³/m²h
Doors U-value	1 W/m²K
External Walls U-value	0.13 W/m²K
Party Walls U-value	0 W/m²K
Photovoltaic array	

Regulations Compliance Report

Approved Document L1A, 2013 Edition, England assessed by Stroma FSAP 2012 program, Version: 1.0.4.16
Printed on 22 November 2018 at 12:45:57

Project Information:

Assessed By: () **Building Type:** Flat

Dwelling Details:

NEW DWELLING DESIGN STAGE Total Floor Area: 72.75m²
Site Reference : Clarion Richmond College **Plot Reference:** GF 2B3P WCH Type 4
Address : , London, TW2 7SJ

Client Details:

Name:
Address :

This report covers items included within the SAP calculations.
It is not a complete report of regulations compliance.

1a TER and DER

Fuel for main heating system: Mains gas
Fuel factor: 1.00 (mains gas)

Target Carbon Dioxide Emission Rate (TER)	16.79 kg/m²	
Dwelling Carbon Dioxide Emission Rate (DER)	7.91 kg/m²	**OK**

1b TFEE and DFEE

Target Fabric Energy Efficiency (TFEE)	40.3 kWh/m²	
Dwelling Fabric Energy Efficiency (DFEE)	36.8 kWh/m²	
		OK

2 Fabric U-values

Element	Average	Highest	
External wall	0.15 (max. 0.30)	0.15 (max. 0.70)	**OK**
Party wall	0.00 (max. 0.20)	-	**OK**
Floor	0.13 (max. 0.25)	0.13 (max. 0.70)	**OK**
Roof	(no roof)		
Openings	1.22 (max. 2.00)	1.27 (max. 3.30)	**OK**

2a Thermal bridging

Thermal bridging calculated from linear thermal transmittances for each junction

3 Air permeability

Air permeability at 50 pascals	3.00 (design value)	
Maximum	10.0	**OK**

4 Heating efficiency

Main Heating system: Database: (rev 435, product index 017511):
Boiler systems with radiators or underfloor heating - mains gas
Brand name: Worcester
Model: Greenstar
Model qualifier: 28CDi Compact ErP (Combi)
Efficiency 89.8 % SEDBUK2009
Minimum 88.0 % **OK**

Secondary heating system: None

Regulations Compliance Report

5 Cylinder insulation

Hot water Storage:	No cylinder	

6 Controls

Space heating controls	Time and temperature zone control by device in database	OK
Hot water controls:	No cylinder	
	No cylinder	
Boiler interlock:	Yes	OK

7 Low energy lights

Percentage of fixed lights with low-energy fittings	100.0%	
Minimum	75.0%	OK

8 Mechanical ventilation

Continuous supply and extract system		
Specific fan power:	0.52	
Maximum	1.5	OK
MVHR efficiency:	90%	
Minimum	70%	OK

9 Summertime temperature

Overheating risk (Thames valley):	Medium	OK

Based on:

Overshading:	Average or unknown
Windows facing: West	2.16m²
Windows facing: West	2.16m²
Windows facing: South	1.08m²
Windows facing: West	3.78m²
Windows facing: South	0.6m²
Ventilation rate:	3.00
Blinds/curtains:	Closed 100% of daylight hours

10 Key features

Air permeablility	3.0 m³/m²h
Doors U-value	1 W/m²K
Party Walls U-value	0 W/m²K
Photovoltaic array	

Regulations Compliance Report

Approved Document L1A, 2013 Edition, England assessed by Stroma FSAP 2012 program, Version: 1.0.4.16
Printed on 22 November 2018 at 12:45:56

Project Information:

Assessed By: ()

Building Type: Flat

Dwelling Details:

NEW DWELLING DESIGN STAGE

Total Floor Area: 77.55m²

Site Reference : Clarion Richmond College

Plot Reference: GF 2B4P Type 5

Address : , London, TW2 7SJ

Client Details:

Name:

Address :

This report covers items included within the SAP calculations.
It is not a complete report of regulations compliance.

1a TER and DER

Fuel for main heating system: Mains gas
Fuel factor: 1.00 (mains gas)

Target Carbon Dioxide Emission Rate (TER)	17.07 kg/m²	
Dwelling Carbon Dioxide Emission Rate (DER)	8.65 kg/m²	**OK**

1b TFEE and DFEE

Target Fabric Energy Efficiency (TFEE)	42.6 kWh/m²	
Dwelling Fabric Energy Efficiency (DFEE)	39.6 kWh/m²	
		OK

2 Fabric U-values

Element	Average	Highest	
External wall	0.15 (max. 0.30)	0.15 (max. 0.70)	**OK**
Party wall	0.00 (max. 0.20)	-	**OK**
Floor	0.13 (max. 0.25)	0.13 (max. 0.70)	**OK**
Roof	(no roof)		
Openings	1.22 (max. 2.00)	1.27 (max. 3.30)	**OK**

2a Thermal bridging

Thermal bridging calculated from linear thermal transmittances for each junction

3 Air permeability

Air permeability at 50 pascals	3.00 (design value)	
Maximum	10.0	**OK**

4 Heating efficiency

Main Heating system: Database: (rev 435, product index 017511):
Boiler systems with radiators or underfloor heating - mains gas
Brand name: Worcester
Model: Greenstar
Model qualifier: 28CDi Compact ErP (Combi)
Efficiency 89.8 % SEDBUK2009
Minimum 88.0 % **OK**

Secondary heating system: None

Regulations Compliance Report

5 Cylinder insulation

Hot water Storage:	No cylinder	

6 Controls

Space heating controls	Time and temperature zone control by device in database	**OK**
Hot water controls:	No cylinder	
	No cylinder	
Boiler interlock:	Yes	**OK**

7 Low energy lights

Percentage of fixed lights with low-energy fittings	100.0%	
Minimum	75.0%	**OK**

8 Mechanical ventilation

Continuous supply and extract system		
Specific fan power:	0.59	
Maximum	1.5	**OK**
MVHR efficiency:	89%	
Minimum	70%	**OK**

9 Summertime temperature

Overheating risk (Thames valley):	Medium	**OK**

Based on:

Overshading:	Average or unknown
Windows facing: East	1.08m²
Windows facing: East	3.78m²
Windows facing: East	2.16m²
Windows facing: South	1.32m²
Windows facing: South	0.6m²
Ventilation rate:	2.00
Blinds/curtains:	Closed 100% of daylight hours

10 Key features

Air permeablility	3.0 m³/m²h
Doors U-value	1 W/m²K
Party Walls U-value	0 W/m²K
Photovoltaic array	

Regulations Compliance Report

Approved Document L1A, 2013 Edition, England assessed by Stroma FSAP 2012 program, Version: 1.0.4.16
Printed on 22 November 2018 at 12:45:56

Project Information:

Assessed By: () **Building Type:** Flat

Dwelling Details:

NEW DWELLING DESIGN STAGE Total Floor Area: 93.64m²
Site Reference : Clarion Richmond College **Plot Reference:** MF 3B5P Type 6
Address : , London, TW2 7SJ

Client Details:

Name:
Address :

This report covers items included within the SAP calculations.
It is not a complete report of regulations compliance.

1a TER and DER

Fuel for main heating system: Mains gas
Fuel factor: 1.00 (mains gas)

Target Carbon Dioxide Emission Rate (TER)	15.54 kg/m²	
Dwelling Carbon Dioxide Emission Rate (DER)	5.96 kg/m²	**OK**

1b TFEE and DFEE

Target Fabric Energy Efficiency (TFEE)	40.2 kWh/m²	
Dwelling Fabric Energy Efficiency (DFEE)	31.2 kWh/m²	
		OK

2 Fabric U-values

Element	Average	Highest	
External wall	0.14 (max. 0.30)	0.15 (max. 0.70)	**OK**
Party wall	0.00 (max. 0.20)	-	**OK**
Floor	(no floor)		
Roof	(no roof)		
Openings	1.23 (max. 2.00)	1.27 (max. 3.30)	**OK**

2a Thermal bridging

Thermal bridging calculated from linear thermal transmittances for each junction

3 Air permeability

Air permeability at 50 pascals	3.00 (design value)	
Maximum	10.0	**OK**

4 Heating efficiency

Main Heating system: Database: (rev 435, product index 017511):
Boiler systems with radiators or underfloor heating - mains gas
Brand name: Worcester
Model: Greenstar
Model qualifier: 28CDi Compact ErP
(Combi)
Efficiency 89.8 % SEDBUK2009
Minimum 88.0 % **OK**

Secondary heating system: None

Regulations Compliance Report

5 Cylinder insulation

Hot water Storage:	No cylinder	

6 Controls

Space heating controls	Time and temperature zone control by device in database	**OK**
Hot water controls:	No cylinder	
	No cylinder	
Boiler interlock:	Yes	**OK**

7 Low energy lights

Percentage of fixed lights with low-energy fittings	100.0%	
Minimum	75.0%	**OK**

8 Mechanical ventilation

Continuous supply and extract system		
Specific fan power:	0.59	
Maximum	1.5	**OK**
MVHR efficiency:	89%	
Minimum	70%	**OK**

9 Summertime temperature

Overheating risk (Thames valley):	Slight	**OK**

Based on:

Overshading:	Average or unknown
Windows facing: North	1.08m²
Windows facing: North	2.16m²
Windows facing: South	2.16m²
Windows facing: East	2.14m²
Windows facing: South	1.08m²
Windows facing: East	2.16m²
Windows facing: East	2.16m²
Ventilation rate:	6.00
Blinds/curtains:	None
	Closed 100% of daylight hours

10 Key features

Air permeablility	3.0 m³/m²h
Doors U-value	1 W/m²K
External Walls U-value	0.13 W/m²K
Party Walls U-value	0 W/m²K
Photovoltaic array	

Regulations Compliance Report

Approved Document L1A, 2013 Edition, England assessed by Stroma FSAP 2012 program, Version: 1.0.4.16
Printed on 22 November 2018 at 12:45:55

Project Information:

Assessed By: ()

Building Type: Flat

Dwelling Details:

NEW DWELLING DESIGN STAGE

Total Floor Area: 74.77m²

Site Reference : Clarion Richmond College

Plot Reference: MF 2B4P Type 7

Address : , London, TW2 7SJ

Client Details:

Name:

Address :

This report covers items included within the SAP calculations.
It is not a complete report of regulations compliance.

1a TER and DER

Fuel for main heating system: Mains gas
Fuel factor: 1.00 (mains gas)

Target Carbon Dioxide Emission Rate (TER)	16.23 kg/m²	
Dwelling Carbon Dioxide Emission Rate (DER)	6.34 kg/m²	**OK**

1b TFEE and DFEE

Target Fabric Energy Efficiency (TFEE)	37.1 kWh/m²	
Dwelling Fabric Energy Efficiency (DFEE)	28.8 kWh/m²	
		OK

2 Fabric U-values

Element	Average	Highest	
External wall	0.15 (max. 0.30)	0.15 (max. 0.70)	**OK**
Party wall	0.00 (max. 0.20)	-	**OK**
Floor	(no floor)		
Roof	(no roof)		
Openings	1.18 (max. 2.00)	1.27 (max. 3.30)	**OK**

2a Thermal bridging

Thermal bridging calculated from linear thermal transmittances for each junction

3 Air permeability

Air permeability at 50 pascals	3.00 (design value)	
Maximum	10.0	**OK**

4 Heating efficiency

Main Heating system:

Database: (rev 435, product index 017511):
Boiler systems with radiators or underfloor heating - mains gas
Brand name: Worcester
Model: Greenstar
Model qualifier: 28CDi Compact ErP
(Combi)
Efficiency 89.8 % SEDBUK2009
Minimum 88.0 % **OK**

Secondary heating system: None

Regulations Compliance Report

5 Cylinder insulation

Hot water Storage:	No cylinder	

6 Controls

Space heating controls	Time and temperature zone control by device in database	**OK**
Hot water controls:	No cylinder	
	No cylinder	
Boiler interlock:	Yes	**OK**

7 Low energy lights

Percentage of fixed lights with low-energy fittings	100.0%	
Minimum	75.0%	**OK**

8 Mechanical ventilation

Continuous supply and extract system		
Specific fan power:	0.59	
Maximum	1.5	**OK**
MVHR efficiency:	89%	
Minimum	70%	**OK**

9 Summertime temperature

Overheating risk (Thames valley):	Slight	**OK**

Based on:

Overshading:	Average or unknown
Windows facing: North	2.16m²
Windows facing: South	1.32m²
Windows facing: North	3.78m²
Windows facing: South	1.68m²
Ventilation rate:	6.00
Blinds/curtains:	None
	Closed 100% of daylight hours

10 Key features

Air permeablility	3.0 m³/m²h
Doors U-value	1 W/m²K
Party Walls U-value	0 W/m²K
Photovoltaic array	

Regulations Compliance Report

Approved Document L1A, 2013 Edition, England assessed by Stroma FSAP 2012 program, Version: 1.0.4.16
Printed on 22 November 2018 at 12:45:55

Project Information:

Assessed By: () **Building Type:** Flat

Dwelling Details:

NEW DWELLING DESIGN STAGE Total Floor Area: 55.3m²
Site Reference : Clarion Richmond College **Plot Reference:** MF 1B2P Type 8
Address : , London, TW2 7SJ

Client Details:

Name:
Address :

This report covers items included within the SAP calculations.
It is not a complete report of regulations compliance.

1a TER and DER

Fuel for main heating system: Mains gas
Fuel factor: 1.00 (mains gas)

Target Carbon Dioxide Emission Rate (TER)	18.46 kg/m²	
Dwelling Carbon Dioxide Emission Rate (DER)	8.53 kg/m²	**OK**

1b TFEE and DFEE

Target Fabric Energy Efficiency (TFEE)	42.4 kWh/m²	
Dwelling Fabric Energy Efficiency (DFEE)	34.0 kWh/m²	
		OK

2 Fabric U-values

Element	Average	Highest	
External wall	0.14 (max. 0.30)	0.15 (max. 0.70)	**OK**
Party wall	0.00 (max. 0.20)	-	**OK**
Floor	(no floor)		
Roof	(no roof)		
Openings	1.21 (max. 2.00)	1.27 (max. 3.30)	**OK**

2a Thermal bridging

Thermal bridging calculated from linear thermal transmittances for each junction

3 Air permeability

Air permeability at 50 pascals	3.00 (design value)	
Maximum	10.0	**OK**

4 Heating efficiency

Main Heating system: Database: (rev 435, product index 017511):
Boiler systems with radiators or underfloor heating - mains gas
Brand name: Worcester
Model: Greenstar
Model qualifier: 28CDi Compact ErP
(Combi)
Efficiency 89.8 % SEDBUK2009
Minimum 88.0 % **OK**

Secondary heating system: None

Regulations Compliance Report

5 Cylinder insulation

Hot water Storage:	No cylinder	

6 Controls

Space heating controls	Time and temperature zone control by device in database	**OK**
Hot water controls:	No cylinder	
	No cylinder	
Boiler interlock:	Yes	**OK**

7 Low energy lights

Percentage of fixed lights with low-energy fittings	100.0%	
Minimum	75.0%	**OK**

8 Mechanical ventilation

Continuous supply and extract system		
Specific fan power:	0.52	
Maximum	1.5	**OK**
MVHR efficiency:	90%	
Minimum	70%	**OK**

9 Summertime temperature

Overheating risk (Thames valley):	Medium	**OK**

Based on:

Overshading:	Average or unknown
Windows facing: North	3.78m²
Windows facing: North	2.16m²
Windows facing: North	1.08m²
Windows facing: West	1.08m²
Ventilation rate:	4.00
Blinds/curtains:	None
	Closed 100% of daylight hours

10 Key features

Air permeablility	3.0 m³/m²h
Doors U-value	1 W/m²K
External Walls U-value	0.13 W/m²K
Party Walls U-value	0 W/m²K
Photovoltaic array	

Regulations Compliance Report

Approved Document L1A, 2013 Edition, England assessed by Stroma FSAP 2012 program, Version: 1.0.4.16
Printed on 22 November 2018 at 12:45:54

Project Information:

Assessed By: ()

Building Type: Flat

Dwelling Details:

NEW DWELLING DESIGN STAGE

Total Floor Area: 72.75m²

Site Reference : Clarion Richmond College

Plot Reference: MF 2B4P Type 9

Address : , London, TW2 7SJ

Client Details:

Name:

Address :

This report covers items included within the SAP calculations.
It is not a complete report of regulations compliance.

1a TER and DER

Fuel for main heating system: Mains gas
Fuel factor: 1.00 (mains gas)

Target Carbon Dioxide Emission Rate (TER)	16.88 kg/m²	
Dwelling Carbon Dioxide Emission Rate (DER)	6.99 kg/m²	**OK**

1b TFEE and DFEE

Target Fabric Energy Efficiency (TFEE)	41.8 kWh/m²	
Dwelling Fabric Energy Efficiency (DFEE)	33.4 kWh/m²	
		OK

2 Fabric U-values

Element	Average	Highest	
External wall	0.15 (max. 0.30)	0.15 (max. 0.70)	**OK**
Party wall	0.00 (max. 0.20)	-	**OK**
Floor	(no floor)		
Roof	(no roof)		
Openings	1.23 (max. 2.00)	1.27 (max. 3.30)	**OK**

2a Thermal bridging

Thermal bridging calculated from linear thermal transmittances for each junction

3 Air permeability

Air permeability at 50 pascals	3.00 (design value)	
Maximum	10.0	**OK**

4 Heating efficiency

Main Heating system:

Database: (rev 435, product index 017511):
Boiler systems with radiators or underfloor heating - mains gas
Brand name: Worcester
Model: Greenstar
Model qualifier: 28CDi Compact ErP
(Combi)
Efficiency 89.8 % SEDBUK2009
Minimum 88.0 % **OK**

Secondary heating system: None

Regulations Compliance Report

5 Cylinder insulation

Hot water Storage:	No cylinder	

6 Controls

Space heating controls	Time and temperature zone control by device in database	OK
Hot water controls:	No cylinder	
	No cylinder	
Boiler interlock:	Yes	OK

7 Low energy lights

Percentage of fixed lights with low-energy fittings	100.0%	
Minimum	75.0%	OK

8 Mechanical ventilation

Continuous supply and extract system		
Specific fan power:	0.59	
Maximum	1.5	OK
MVHR efficiency:	89%	
Minimum	70%	OK

9 Summertime temperature

Overheating risk (Thames valley):	Medium	OK

Based on:

Overshading:	Average or unknown
Windows facing: North	2.16m²
Windows facing: North	1.08m²
Windows facing: West	3.78m²
Windows facing: West	1.08m²
Windows facing: West	4.32m²
Ventilation rate:	4.00
Blinds/curtains:	None
	Closed 100% of daylight hours

10 Key features

Air permeablility	3.0 m³/m²h
Doors U-value	1 W/m²K
Party Walls U-value	0 W/m²K
Photovoltaic array	

Regulations Compliance Report

Approved Document L1A, 2013 Edition, England assessed by Stroma FSAP 2012 program, Version: 1.0.4.16
Printed on 22 November 2018 at 12:45:54

Project Information:

Assessed By: () **Building Type:** Flat

Dwelling Details:

NEW DWELLING DESIGN STAGE Total Floor Area: 72.75m²
Site Reference : Clarion Richmond College **Plot Reference:** MF 2B4P Type 10
Address : , London, TW2 7SJ

Client Details:

Name:
Address :

This report covers items included within the SAP calculations.
It is not a complete report of regulations compliance.

1a TER and DER

Fuel for main heating system: Mains gas
Fuel factor: 1.00 (mains gas)

Target Carbon Dioxide Emission Rate (TER)	17.1 kg/m²	
Dwelling Carbon Dioxide Emission Rate (DER)	7.28 kg/m²	**OK**

1b TFEE and DFEE

Target Fabric Energy Efficiency (TFEE)	41.7 kWh/m²	
Dwelling Fabric Energy Efficiency (DFEE)	33.6 kWh/m²	
		OK

2 Fabric U-values

Element	Average	Highest	
External wall	0.15 (max. 0.30)	0.15 (max. 0.70)	**OK**
Party wall	0.00 (max. 0.20)	-	**OK**
Floor	(no floor)		
Roof	(no roof)		
Openings	1.22 (max. 2.00)	1.27 (max. 3.30)	**OK**

2a Thermal bridging

Thermal bridging calculated from linear thermal transmittances for each junction

3 Air permeability

Air permeability at 50 pascals	3.00 (design value)	
Maximum	10.0	**OK**

4 Heating efficiency

Main Heating system: Database: (rev 435, product index 017511):
Boiler systems with radiators or underfloor heating - mains gas
Brand name: Worcester
Model: Greenstar
Model qualifier: 28CDi Compact ErP
(Combi)
Efficiency 89.8 % SEDBUK2009
Minimum 88.0 % **OK**

Secondary heating system: None

Regulations Compliance Report

5 Cylinder insulation

Hot water Storage:	No cylinder	

6 Controls

Space heating controls	Time and temperature zone control by device in database	OK
Hot water controls:	No cylinder	
	No cylinder	
Boiler interlock:	Yes	OK

7 Low energy lights

Percentage of fixed lights with low-energy fittings	100.0%	
Minimum	75.0%	OK

8 Mechanical ventilation

Continuous supply and extract system		
Specific fan power:	0.59	
Maximum	1.5	OK
MVHR efficiency:	89%	
Minimum	70%	OK

9 Summertime temperature

Overheating risk (Thames valley):	Medium	OK

Based on:

Overshading:	Average or unknown
Windows facing: West	4.32m²
Windows facing: West	3.78m²
Windows facing: West	1.08m²
Ventilation rate:	4.00
Blinds/curtains:	None
	Closed 100% of daylight hours

10 Key features

Air permeablility	3.0 m³/m²h
Doors U-value	1 W/m²K
Party Walls U-value	0 W/m²K
Photovoltaic array	

Regulations Compliance Report

Approved Document L1A, 2013 Edition, England assessed by Stroma FSAP 2012 program, Version: 1.0.4.16
Printed on 22 November 2018 at 12:45:53

Project Information:

Assessed By: () **Building Type:** Flat

Dwelling Details:

NEW DWELLING DESIGN STAGE Total Floor Area: 54.06m²
Site Reference : Clarion Richmond College **Plot Reference:** MF 1B2P Type 11
Address : , London, TW2 7SJ

Client Details:

Name:
Address :

This report covers items included within the SAP calculations.
It is not a complete report of regulations compliance.

1a TER and DER

Fuel for main heating system: Mains gas
Fuel factor: 1.00 (mains gas)

Target Carbon Dioxide Emission Rate (TER)	19.58 kg/m²	
Dwelling Carbon Dioxide Emission Rate (DER)	9.77 kg/m²	**OK**

1b TFEE and DFEE

Target Fabric Energy Efficiency (TFEE)	47.4 kWh/m²	
Dwelling Fabric Energy Efficiency (DFEE)	39.4 kWh/m²	
		OK

2 Fabric U-values

Element	Average	Highest	
External wall	0.15 (max. 0.30)	0.15 (max. 0.70)	**OK**
Floor	(no floor)		
Roof	(no roof)		
Openings	1.21 (max. 2.00)	1.27 (max. 3.30)	**OK**

2a Thermal bridging

Thermal bridging calculated from linear thermal transmittances for each junction

3 Air permeability

Air permeability at 50 pascals	3.00 (design value)	
Maximum	10.0	**OK**

4 Heating efficiency

Main Heating system: Database: (rev 435, product index 017511):
Boiler systems with radiators or underfloor heating - mains gas
Brand name: Worcester
Model: Greenstar
Model qualifier: 28CDi Compact ErP
(Combi)
Efficiency 89.8 % SEDBUK2009
Minimum 88.0 % **OK**

Secondary heating system: None

Regulations Compliance Report

5 Cylinder insulation

Hot water Storage:	No cylinder	

6 Controls

Space heating controls	Time and temperature zone control by device in database	OK
Hot water controls:	No cylinder	
	No cylinder	
Boiler interlock:	Yes	OK

7 Low energy lights

Percentage of fixed lights with low-energy fittings	100.0%	
Minimum	75.0%	OK

8 Mechanical ventilation

Continuous supply and extract system		
Specific fan power:	0.52	
Maximum	1.5	OK
MVHR efficiency:	90%	
Minimum	70%	OK

9 Summertime temperature

Overheating risk (Thames valley):	Medium	OK

Based on:

Overshading:	Average or unknown
Windows facing: East	2.16m²
Windows facing: East	3.78m²
Windows facing: East	1.08m²
Ventilation rate:	4.00
Blinds/curtains:	None
	Closed 100% of daylight hours

10 Key features

Air permeablility	3.0 m³/m²h
Doors U-value	1 W/m²K
Photovoltaic array	

Regulations Compliance Report

Approved Document L1A, 2013 Edition, England assessed by Stroma FSAP 2012 program, Version: 1.0.4.16
Printed on 22 November 2018 at 12:45:53

Project Information:

Assessed By: ()

Building Type: Flat

Dwelling Details:

NEW DWELLING DESIGN STAGE

Total Floor Area: 50.72m²

Site Reference : Clarion Richmond College

Plot Reference: MF 1B2P Type 12

Address : , London, TW2 7SJ

Client Details:

Name:

Address :

This report covers items included within the SAP calculations.
It is not a complete report of regulations compliance.

1a TER and DER

Fuel for main heating system: Mains gas
Fuel factor: 1.00 (mains gas)

Target Carbon Dioxide Emission Rate (TER)	19.35 kg/m²	
Dwelling Carbon Dioxide Emission Rate (DER)	9.57 kg/m²	**OK**

1b TFEE and DFEE

Target Fabric Energy Efficiency (TFEE)	45.5 kWh/m²	
Dwelling Fabric Energy Efficiency (DFEE)	37.0 kWh/m²	
		OK

2 Fabric U-values

Element	Average	Highest	
External wall	0.14 (max. 0.30)	0.15 (max. 0.70)	**OK**
Party wall	0.00 (max. 0.20)	-	**OK**
Floor	(no floor)		
Roof	(no roof)		
Openings	1.21 (max. 2.00)	1.27 (max. 3.30)	**OK**

2a Thermal bridging

Thermal bridging calculated from linear thermal transmittances for each junction

3 Air permeability

Air permeability at 50 pascals	3.00 (design value)	
Maximum	10.0	**OK**

4 Heating efficiency

Main Heating system:

Database: (rev 435, product index 017511):
Boiler systems with radiators or underfloor heating - mains gas
Brand name: Worcester
Model: Greenstar
Model qualifier: 28CDi Compact ErP
(Combi)
Efficiency 89.8 % SEDBUK2009
Minimum 88.0 % **OK**

Secondary heating system: None

Regulations Compliance Report

5 Cylinder insulation

Hot water Storage:	No cylinder	

6 Controls

Space heating controls	Time and temperature zone control by device in database	**OK**
Hot water controls:	No cylinder	
	No cylinder	
Boiler interlock:	Yes	**OK**

7 Low energy lights

Percentage of fixed lights with low-energy fittings	100.0%	
Minimum	75.0%	**OK**

8 Mechanical ventilation

Continuous supply and extract system		
Specific fan power:	0.52	
Maximum	1.5	**OK**
MVHR efficiency:	90%	
Minimum	70%	**OK**

9 Summertime temperature

Overheating risk (Thames valley):	Medium	**OK**

Based on:

Overshading:	Average or unknown
Windows facing: North	2.16m²
Windows facing: East	3.78m²
Windows facing: East	2.16m²
Ventilation rate:	4.00
Blinds/curtains:	None
	Closed 100% of daylight hours

10 Key features

Air permeablility	3.0 m³/m²h
Doors U-value	1 W/m²K
External Walls U-value	0.13 W/m²K
Party Walls U-value	0 W/m²K
Photovoltaic array	

Regulations Compliance Report

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Printed on 22 November 2018 at 12:45:52

Project Information:

Assessed By: () **Building Type:** Flat

Dwelling Details:

NEW DWELLING DESIGN STAGE Total Floor Area: 72.75m²
Site Reference : Clarion Richmond College **Plot Reference:** MF 2B4P Type 13
Address : , London, TW2 7SJ

Client Details:

Name:
Address :

This report covers items included within the SAP calculations.
It is not a complete report of regulations compliance.

1a TER and DER

Fuel for main heating system: Mains gas
Fuel factor: 1.00 (mains gas)

Target Carbon Dioxide Emission Rate (TER)	16.41 kg/m²	
Dwelling Carbon Dioxide Emission Rate (DER)	6.72 kg/m²	**OK**

1b TFEE and DFEE

Target Fabric Energy Efficiency (TFEE)	38.2 kWh/m²	
Dwelling Fabric Energy Efficiency (DFEE)	30.5 kWh/m²	
		OK

2 Fabric U-values

Element	Average	Highest	
External wall	0.15 (max. 0.30)	0.15 (max. 0.70)	**OK**
Party wall	0.00 (max. 0.20)	-	**OK**
Floor	(no floor)		
Roof	(no roof)		
Openings	1.22 (max. 2.00)	1.27 (max. 3.30)	**OK**

2a Thermal bridging

Thermal bridging calculated from linear thermal transmittances for each junction

3 Air permeability

Air permeability at 50 pascals	3.00 (design value)	
Maximum	10.0	**OK**

4 Heating efficiency

Main Heating system: Database: (rev 435, product index 017511):
Boiler systems with radiators or underfloor heating - mains gas
Brand name: Worcester
Model: Greenstar
Model qualifier: 28CDi Compact ErP
(Combi)
Efficiency 89.8 % SEDBUK2009
Minimum 88.0 % **OK**

Secondary heating system: None

Regulations Compliance Report

5 Cylinder insulation

Hot water Storage:	No cylinder	

6 Controls

Space heating controls	Time and temperature zone control by device in database	OK
Hot water controls:	No cylinder	
	No cylinder	
Boiler interlock:	Yes	OK

7 Low energy lights

Percentage of fixed lights with low-energy fittings	100.0%	
Minimum	75.0%	OK

8 Mechanical ventilation

Continuous supply and extract system		
Specific fan power:	0.59	
Maximum	1.5	OK
MVHR efficiency:	89%	
Minimum	70%	OK

9 Summertime temperature

Overheating risk (Thames valley):	Medium	OK

Based on:

Overshading:	Average or unknown
Windows facing: West	4.32m²
Windows facing: West	1.08m²
Windows facing: West	3.78m²
Ventilation rate:	4.00
Blinds/curtains:	None
	Closed 100% of daylight hours

10 Key features

Air permeablility	3.0 m³/m²h
Doors U-value	1 W/m²K
Party Walls U-value	0 W/m²K
Photovoltaic array	

Regulations Compliance Report

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Printed on 22 November 2018 at 12:45:52

Project Information:

Assessed By: ()

Building Type: Flat

Dwelling Details:

NEW DWELLING DESIGN STAGE

Total Floor Area: 72.82m²

Site Reference : Clarion Richmond College

Plot Reference: MF 2B4P Type 14

Address : , London, TW2 7SJ

Client Details:

Name:

Address :

This report covers items included within the SAP calculations.
It is not a complete report of regulations compliance.

1a TER and DER

Fuel for main heating system: Mains gas
Fuel factor: 1.00 (mains gas)

Target Carbon Dioxide Emission Rate (TER)	15.96 kg/m²	
Dwelling Carbon Dioxide Emission Rate (DER)	6.24 kg/m²	**OK**

1b TFEE and DFEE

Target Fabric Energy Efficiency (TFEE)	36.4 kWh/m²	
Dwelling Fabric Energy Efficiency (DFEE)	28.7 kWh/m²	
		OK

2 Fabric U-values

Element	Average	Highest	
External wall	0.15 (max. 0.30)	0.15 (max. 0.70)	**OK**
Party wall	0.00 (max. 0.20)	-	**OK**
Floor	(no floor)		
Roof	(no roof)		
Openings	1.22 (max. 2.00)	1.27 (max. 3.30)	**OK**

2a Thermal bridging

Thermal bridging calculated from linear thermal transmittances for each junction

3 Air permeability

Air permeability at 50 pascals	3.00 (design value)	
Maximum	10.0	**OK**

4 Heating efficiency

Main Heating system:

Database: (rev 435, product index 017511):
Boiler systems with radiators or underfloor heating - mains gas
Brand name: Worcester
Model: Greenstar
Model qualifier: 28CDi Compact ErP
(Combi)
Efficiency 89.8 % SEDBUK2009
Minimum 88.0 % **OK**

Secondary heating system: None

Regulations Compliance Report

5 Cylinder insulation

Hot water Storage:	No cylinder	

6 Controls

Space heating controls	Time and temperature zone control by device in database	**OK**
Hot water controls:	No cylinder	
	No cylinder	
Boiler interlock:	Yes	**OK**

7 Low energy lights

Percentage of fixed lights with low-energy fittings	100.0%	
Minimum	75.0%	**OK**

8 Mechanical ventilation

Continuous supply and extract system		
Specific fan power:	0.59	
Maximum	1.5	**OK**
MVHR efficiency:	89%	
Minimum	70%	**OK**

9 Summertime temperature

Overheating risk (Thames valley):	Medium	**OK**

Based on:

Overshading:	Average or unknown
Windows facing: West	1.08m²
Windows facing: West	3.78m²
Windows facing: West	4.32m²
Windows facing: North	1.32m²
Ventilation rate:	4.00
Blinds/curtains:	None
	Closed 100% of daylight hours

10 Key features

Air permeablility	3.0 m³/m²h
Doors U-value	1 W/m²K
Party Walls U-value	0 W/m²K
Photovoltaic array	

Regulations Compliance Report

Approved Document L1A, 2013 Edition, England assessed by Stroma FSAP 2012 program, Version: 1.0.4.16
Printed on 22 November 2018 at 12:45:51

Project Information:

Assessed By: ()

Building Type: Flat

Dwelling Details:

NEW DWELLING DESIGN STAGE

Total Floor Area: 50.72m²

Site Reference : Clarion Richmond College

Plot Reference: MF 1B2P Type 15

Address : , London, TW2 7SJ

Client Details:

Name:

Address :

This report covers items included within the SAP calculations.
It is not a complete report of regulations compliance.

1a TER and DER

Fuel for main heating system: Mains gas
Fuel factor: 1.00 (mains gas)

Target Carbon Dioxide Emission Rate (TER)	18.17 kg/m²	
Dwelling Carbon Dioxide Emission Rate (DER)	8.40 kg/m²	**OK**

1b TFEE and DFEE

Target Fabric Energy Efficiency (TFEE)	38.9 kWh/m²	
Dwelling Fabric Energy Efficiency (DFEE)	31.8 kWh/m²	
		OK

2 Fabric U-values

Element	Average	Highest	
External wall	0.14 (max. 0.30)	0.15 (max. 0.70)	**OK**
Party wall	0.00 (max. 0.20)	-	**OK**
Floor	(no floor)		
Roof	(no roof)		
Openings	1.21 (max. 2.00)	1.27 (max. 3.30)	**OK**

2a Thermal bridging

Thermal bridging calculated from linear thermal transmittances for each junction

3 Air permeability

Air permeability at 50 pascals	3.00 (design value)	
Maximum	10.0	**OK**

4 Heating efficiency

Main Heating system:

Database: (rev 435, product index 017511):
Boiler systems with radiators or underfloor heating - mains gas
Brand name: Worcester
Model: Greenstar
Model qualifier: 28CDi Compact ErP
(Combi)
Efficiency 89.8 % SEDBUK2009
Minimum 88.0 % **OK**

Secondary heating system: None

Regulations Compliance Report

5 Cylinder insulation

Hot water Storage:	No cylinder	

6 Controls

Space heating controls	Time and temperature zone control by device in database	**OK**
Hot water controls:	No cylinder	
	No cylinder	
Boiler interlock:	Yes	**OK**

7 Low energy lights

Percentage of fixed lights with low-energy fittings	100.0%	
Minimum	75.0%	**OK**

8 Mechanical ventilation

Continuous supply and extract system		
Specific fan power:	0.52	
Maximum	1.5	**OK**
MVHR efficiency:	90%	
Minimum	70%	**OK**

9 Summertime temperature

Overheating risk (Thames valley):	Medium	**OK**

Based on:

Overshading:	Average or unknown
Windows facing: North	1.08m²
Windows facing: East	2.16m²
Windows facing: East	3.78m²
Ventilation rate:	4.00
Blinds/curtains:	None
	Closed 100% of daylight hours

10 Key features

Air permeablility	3.0 m³/m²h
Doors U-value	1 W/m²K
Party Walls U-value	0 W/m²K
Photovoltaic array	

Regulations Compliance Report

Approved Document L1A, 2013 Edition, England assessed by Stroma FSAP 2012 program, Version: 1.0.4.16
Printed on 22 November 2018 at 12:45:51

Project Information:

Assessed By: ()

Building Type: Flat

Dwelling Details:

NEW DWELLING DESIGN STAGE

Total Floor Area: 72.76m²

Site Reference : Clarion Richmond College

Plot Reference: MF 2B4P Type 16

Address : , London, TW2 7SJ

Client Details:

Name:

Address :

This report covers items included within the SAP calculations.
It is not a complete report of regulations compliance.

1a TER and DER

Fuel for main heating system: Mains gas
Fuel factor: 1.00 (mains gas)

Target Carbon Dioxide Emission Rate (TER)	15.81 kg/m²	
Dwelling Carbon Dioxide Emission Rate (DER)	6.11 kg/m²	**OK**

1b TFEE and DFEE

Target Fabric Energy Efficiency (TFEE)	35.1 kWh/m²	
Dwelling Fabric Energy Efficiency (DFEE)	27.6 kWh/m²	
		OK

2 Fabric U-values

Element	Average	Highest	
External wall	0.15 (max. 0.30)	0.15 (max. 0.70)	**OK**
Party wall	0.00 (max. 0.20)	-	**OK**
Floor	(no floor)		
Roof	(no roof)		
Openings	1.22 (max. 2.00)	1.27 (max. 3.30)	**OK**

2a Thermal bridging

Thermal bridging calculated from linear thermal transmittances for each junction

3 Air permeability

Air permeability at 50 pascals	3.00 (design value)	
Maximum	10.0	**OK**

4 Heating efficiency

Main Heating system: Database: (rev 435, product index 017511):

Boiler systems with radiators or underfloor heating - mains gas
Brand name: Worcester
Model: Greenstar
Model qualifier: 28CDi Compact ErP
(Combi)
Efficiency 89.8 % SEDBUK2009
Minimum 88.0 % **OK**

Secondary heating system: None

Regulations Compliance Report

5 Cylinder insulation

Hot water Storage:	No cylinder	

6 Controls

Space heating controls	Time and temperature zone control by device in database	**OK**
Hot water controls:	No cylinder	
	No cylinder	
Boiler interlock:	Yes	**OK**

7 Low energy lights

Percentage of fixed lights with low-energy fittings	100.0%	
Minimum	75.0%	**OK**

8 Mechanical ventilation

Continuous supply and extract system		
Specific fan power:	0.59	
Maximum	1.5	**OK**
MVHR efficiency:	89%	
Minimum	70%	**OK**

9 Summertime temperature

Overheating risk (Thames valley):	Slight	**OK**

Based on:

Overshading:	Average or unknown
Windows facing: West	4.32m²
Windows facing: East	3.78m²
Windows facing: East	1.08m²
Ventilation rate:	6.00
Blinds/curtains:	None
	Closed 100% of daylight hours

10 Key features

Air permeablility	3.0 m³/m²h
Doors U-value	1 W/m²K
Party Walls U-value	0 W/m²K
Photovoltaic array	

Regulations Compliance Report

Approved Document L1A, 2013 Edition, England assessed by Stroma FSAP 2012 program, Version: 1.0.4.16
Printed on 22 November 2018 at 12:45:51

Project Information:

Assessed By: ()
Building Type: Flat

Dwelling Details:

NEW DWELLING DESIGN STAGE
Total Floor Area: 54.06m²
Site Reference : Clarion Richmond College
Plot Reference: MF 1B2P Type 17
Address : , London, TW2 7SJ

Client Details:

Name:
Address :

This report covers items included within the SAP calculations.
It is not a complete report of regulations compliance.

1a TER and DER

Fuel for main heating system: Mains gas
Fuel factor: 1.00 (mains gas)

Target Carbon Dioxide Emission Rate (TER)	19.01 kg/m²	
Dwelling Carbon Dioxide Emission Rate (DER)	9.34 kg/m²	**OK**

1b TFEE and DFEE

Target Fabric Energy Efficiency (TFEE)	44.4 kWh/m²	
Dwelling Fabric Energy Efficiency (DFEE)	36.9 kWh/m²	
		OK

2 Fabric U-values

Element	Average	Highest	
External wall	0.14 (max. 0.30)	0.15 (max. 0.70)	**OK**
Party wall	0.00 (max. 0.20)	-	**OK**
Floor	(no floor)		
Roof	(no roof)		
Openings	1.21 (max. 2.00)	1.27 (max. 3.30)	**OK**

2a Thermal bridging

Thermal bridging calculated from linear thermal transmittances for each junction

3 Air permeability

Air permeability at 50 pascals	3.00 (design value)	
Maximum	10.0	**OK**

4 Heating efficiency

Main Heating system:
Database: (rev 435, product index 017511):
Boiler systems with radiators or underfloor heating - mains gas
Brand name: Worcester
Model: Greenstar
Model qualifier: 28CDi Compact ErP
(Combi)
Efficiency 89.8 % SEDBUK2009
Minimum 88.0 % **OK**

Secondary heating system: None

Regulations Compliance Report

5 Cylinder insulation

Hot water Storage:	No cylinder	

6 Controls

Space heating controls	Time and temperature zone control by device in database	**OK**
Hot water controls:	No cylinder	
	No cylinder	
Boiler interlock:	Yes	**OK**

7 Low energy lights

Percentage of fixed lights with low-energy fittings	100.0%	
Minimum	75.0%	**OK**

8 Mechanical ventilation

Continuous supply and extract system		
Specific fan power:	0.52	
Maximum	1.5	**OK**
MVHR efficiency:	90%	
Minimum	70%	**OK**

9 Summertime temperature

Overheating risk (Thames valley):	Medium	**OK**

Based on:

Overshading:	Average or unknown
Windows facing: East	1.92m²
Windows facing: East	1.08m²
Windows facing: East	3.78m²
Ventilation rate:	4.00
Blinds/curtains:	None
	Closed 100% of daylight hours

10 Key features

Air permeablility	3.0 m³/m²h
Doors U-value	1 W/m²K
Party Walls U-value	0 W/m²K
Photovoltaic array	

Regulations Compliance Report

Approved Document L1A, 2013 Edition, England assessed by Stroma FSAP 2012 program, Version: 1.0.4.16
Printed on 22 November 2018 at 12:45:50

Project Information:

Assessed By: ()

Building Type: Flat

Dwelling Details:

NEW DWELLING DESIGN STAGE

Total Floor Area: 73.4m²

Site Reference : Clarion Richmond College

Plot Reference: MF 2B4P Type 18

Address : , London, TW2 7SJ

Client Details:

Name:

Address :

This report covers items included within the SAP calculations.
It is not a complete report of regulations compliance.

1a TER and DER

Fuel for main heating system: Mains gas
Fuel factor: 1.00 (mains gas)

Target Carbon Dioxide Emission Rate (TER)	16.19 kg/m²	
Dwelling Carbon Dioxide Emission Rate (DER)	6.52 kg/m²	**OK**

1b TFEE and DFEE

Target Fabric Energy Efficiency (TFEE)	37.8 kWh/m²	
Dwelling Fabric Energy Efficiency (DFEE)	30.3 kWh/m²	
		OK

2 Fabric U-values

Element	Average	Highest	
External wall	0.14 (max. 0.30)	0.15 (max. 0.70)	**OK**
Party wall	0.00 (max. 0.20)	-	**OK**
Floor	(no floor)		
Roof	(no roof)		
Openings	1.22 (max. 2.00)	1.27 (max. 3.30)	**OK**

2a Thermal bridging

Thermal bridging calculated from linear thermal transmittances for each junction

3 Air permeability

Air permeability at 50 pascals	3.00 (design value)	
Maximum	10.0	**OK**

4 Heating efficiency

Main Heating system:

Database: (rev 435, product index 017511):
Boiler systems with radiators or underfloor heating - mains gas
Brand name: Worcester
Model: Greenstar
Model qualifier: 28CDi Compact ErP
(Combi)
Efficiency 89.8 % SEDBUK2009
Minimum 88.0 % **OK**

Secondary heating system: None

Regulations Compliance Report

5 Cylinder insulation

Hot water Storage:	No cylinder	

6 Controls

Space heating controls	Time and temperature zone control by device in database	**OK**
Hot water controls:	No cylinder	
	No cylinder	
Boiler interlock:	Yes	**OK**

7 Low energy lights

Percentage of fixed lights with low-energy fittings	100.0%	
Minimum	75.0%	**OK**

8 Mechanical ventilation

Continuous supply and extract system		
Specific fan power:	0.59	
Maximum	1.5	**OK**
MVHR efficiency:	89%	
Minimum	70%	**OK**

9 Summertime temperature

Overheating risk (Thames valley):	Medium	**OK**

Based on:

Overshading:	Average or unknown
Windows facing: West	4.32m²
Windows facing: West	3.78m²
Windows facing: West	1.08m²
Windows facing: South	1.32m²
Ventilation rate:	4.00
Blinds/curtains:	None
	Closed 100% of daylight hours

10 Key features

Air permeablility	3.0 m³/m²h
Doors U-value	1 W/m²K
Party Walls U-value	0 W/m²K
Photovoltaic array	

Regulations Compliance Report

Approved Document L1A, 2013 Edition, England assessed by Stroma FSAP 2012 program, Version: 1.0.4.16
Printed on 22 November 2018 at 12:45:50

Project Information:

Assessed By: () **Building Type:** Flat

Dwelling Details:

NEW DWELLING DESIGN STAGE Total Floor Area: 86.39m²
Site Reference : Clarion Richmond College **Plot Reference:** TF 3B5P Type 19
Address : , London, TW2 7SJ

Client Details:

Name:
Address :

This report covers items included within the SAP calculations.
It is not a complete report of regulations compliance.

1a TER and DER

Fuel for main heating system: Mains gas
Fuel factor: 1.00 (mains gas)

Target Carbon Dioxide Emission Rate (TER)	17.63 kg/m²	
Dwelling Carbon Dioxide Emission Rate (DER)	9.53 kg/m²	**OK**

1b TFEE and DFEE

Target Fabric Energy Efficiency (TFEE)	48.8 kWh/m²	
Dwelling Fabric Energy Efficiency (DFEE)	41.3 kWh/m²	
		OK

2 Fabric U-values

Element	Average	Highest	
External wall	0.15 (max. 0.30)	0.15 (max. 0.70)	**OK**
Party wall	0.00 (max. 0.20)	-	**OK**
Floor	(no floor)		
Roof	0.13 (max. 0.20)	0.13 (max. 0.35)	**OK**
Openings	1.23 (max. 2.00)	1.27 (max. 3.30)	**OK**

2a Thermal bridging

Thermal bridging calculated from linear thermal transmittances for each junction

3 Air permeability

Air permeability at 50 pascals	3.00 (design value)	
Maximum	10.0	**OK**

4 Heating efficiency

Main Heating system: Database: (rev 435, product index 017511):
Boiler systems with radiators or underfloor heating - mains gas
Brand name: Worcester
Model: Greenstar
Model qualifier: 28CDi Compact ErP (Combi)
Efficiency 89.8 % SEDBUK2009
Minimum 88.0 % **OK**

Secondary heating system: None

Regulations Compliance Report

5 Cylinder insulation

Hot water Storage:	No cylinder	

6 Controls

Space heating controls	Time and temperature zone control by device in database	OK
Hot water controls:	No cylinder	
	No cylinder	
Boiler interlock:	Yes	OK

7 Low energy lights

Percentage of fixed lights with low-energy fittings	100.0%	
Minimum	75.0%	OK

8 Mechanical ventilation

Continuous supply and extract system		
Specific fan power:	0.59	
Maximum	1.5	OK
MVHR efficiency:	89%	
Minimum	70%	OK

9 Summertime temperature

Overheating risk (Thames valley):	Slight	OK

Based on:

Overshading:	Average or unknown
Windows facing: North	2.16m²
Windows facing: South	1.08m²
Windows facing: East	2.14m²
Windows facing: East	2.16m²
Windows facing: East	2.16m²
Windows facing: South	2.16m²
Ventilation rate:	6.00
Blinds/curtains:	None
	Closed 100% of daylight hours

10 Key features

Air permeablility	3.0 m³/m²h
Doors U-value	1 W/m²K
Party Walls U-value	0 W/m²K
Photovoltaic array	

Regulations Compliance Report

Approved Document L1A, 2013 Edition, England assessed by Stroma FSAP 2012 program, Version: 1.0.4.16
Printed on 22 November 2018 at 12:45:50

Project Information:

Assessed By: ()

Building Type: Flat

Dwelling Details:

NEW DWELLING DESIGN STAGE

Total Floor Area: 74.84m²

Site Reference : Clarion Richmond College

Plot Reference: TF 2B4P Type 20

Address : , London, TW2 7SJ

Client Details:

Name:

Address :

This report covers items included within the SAP calculations.
It is not a complete report of regulations compliance.

1a TER and DER

Fuel for main heating system: Mains gas
Fuel factor: 1.00 (mains gas)

Target Carbon Dioxide Emission Rate (TER)	16.94 kg/m²	
Dwelling Carbon Dioxide Emission Rate (DER)	8.70 kg/m²	**OK**

1b TFEE and DFEE

Target Fabric Energy Efficiency (TFEE)	40.8 kWh/m²	
Dwelling Fabric Energy Efficiency (DFEE)	35.5 kWh/m²	
		OK

2 Fabric U-values

Element	Average	Highest	
External wall	0.15 (max. 0.30)	0.15 (max. 0.70)	**OK**
Party wall	0.00 (max. 0.20)	-	**OK**
Floor	(no floor)		
Roof	0.13 (max. 0.20)	0.13 (max. 0.35)	**OK**
Openings	1.22 (max. 2.00)	1.27 (max. 3.30)	**OK**

2a Thermal bridging

Thermal bridging calculated from linear thermal transmittances for each junction

3 Air permeability

Air permeability at 50 pascals	3.00 (design value)	
Maximum	10.0	**OK**

4 Heating efficiency

Main Heating system: Database: (rev 435, product index 017511):

Boiler systems with radiators or underfloor heating - mains gas
Brand name: Worcester
Model: Greenstar
Model qualifier: 28CDi Compact ErP
(Combi)
Efficiency 89.8 % SEDBUK2009
Minimum 88.0 % **OK**

Secondary heating system: None

Regulations Compliance Report

5 Cylinder insulation

Hot water Storage:	No cylinder	

6 Controls

Space heating controls	Time and temperature zone control by device in database	**OK**
Hot water controls:	No cylinder	
	No cylinder	
Boiler interlock:	Yes	**OK**

7 Low energy lights

Percentage of fixed lights with low-energy fittings	100.0%	
Minimum	75.0%	**OK**

8 Mechanical ventilation

Continuous supply and extract system		
Specific fan power:	0.59	
Maximum	1.5	**OK**
MVHR efficiency:	89%	
Minimum	70%	**OK**

9 Summertime temperature

Overheating risk (Thames valley):	Slight	**OK**

Based on:

Overshading:	Average or unknown
Windows facing: North	1.56m²
Windows facing: South	3.78m²
Windows facing: South	2.16m²
Windows facing: North	1.32m²
Ventilation rate:	6.00
Blinds/curtains:	None
	Closed 100% of daylight hours

10 Key features

Air permeablility	3.0 m³/m²h
Doors U-value	1 W/m²K
Party Walls U-value	0 W/m²K
Photovoltaic array	

Regulations Compliance Report

Approved Document L1A, 2013 Edition, England assessed by Stroma FSAP 2012 program, Version: 1.0.4.16
Printed on 22 November 2018 at 12:45:49

Project Information:

Assessed By: () **Building Type:** Flat

Dwelling Details:

NEW DWELLING DESIGN STAGE Total Floor Area: 55.43m²
Site Reference : Clarion Richmond College **Plot Reference:** TF 1B2P Type 21
Address : , London, TW2 7SJ

Client Details:

Name:
Address :

This report covers items included within the SAP calculations.
It is not a complete report of regulations compliance.

1a TER and DER

Fuel for main heating system: Mains gas
Fuel factor: 1.00 (mains gas)

Target Carbon Dioxide Emission Rate (TER)	18.01 kg/m²	
Dwelling Carbon Dioxide Emission Rate (DER)	10.03 kg/m²	**OK**

1b TFEE and DFEE

Target Fabric Energy Efficiency (TFEE)	39.7 kWh/m²	
Dwelling Fabric Energy Efficiency (DFEE)	36.6 kWh/m²	
		OK

2 Fabric U-values

Element	Average	Highest	
External wall	0.14 (max. 0.30)	0.15 (max. 0.70)	**OK**
Party wall	0.00 (max. 0.20)	-	**OK**
Floor	(no floor)		
Roof	0.13 (max. 0.20)	0.13 (max. 0.35)	**OK**
Openings	1.21 (max. 2.00)	1.27 (max. 3.30)	**OK**

2a Thermal bridging

Thermal bridging calculated from linear thermal transmittances for each junction

3 Air permeability

Air permeability at 50 pascals	3.00 (design value)	
Maximum	10.0	**OK**

4 Heating efficiency

Main Heating system: Database: (rev 435, product index 017511):
Boiler systems with radiators or underfloor heating - mains gas
Brand name: Worcester
Model: Greenstar
Model qualifier: 28CDi Compact ErP (Combi)
Efficiency 89.8 % SEDBUK2009
Minimum 88.0 % **OK**

Secondary heating system: None

Regulations Compliance Report

5 Cylinder insulation

Hot water Storage:	No cylinder	

6 Controls

Space heating controls	Time and temperature zone control by device in database	**OK**
Hot water controls:	No cylinder	
	No cylinder	
Boiler interlock:	Yes	**OK**

7 Low energy lights

Percentage of fixed lights with low-energy fittings	100.0%	
Minimum	75.0%	**OK**

8 Mechanical ventilation

Continuous supply and extract system		
Specific fan power:	0.52	
Maximum	1.5	**OK**
MVHR efficiency:	90%	
Minimum	70%	**OK**

9 Summertime temperature

Overheating risk (Thames valley):	Medium	**OK**

Based on:

Overshading:	Average or unknown
Windows facing: South	2.16m²
Windows facing: South	1.08m²
Windows facing: South	3.78m²
Ventilation rate:	4.00
Blinds/curtains:	None
	Closed 100% of daylight hours

10 Key features

Air permeablility	3.0 m³/m²h
Doors U-value	1 W/m²K
External Walls U-value	0.13 W/m²K
Party Walls U-value	0 W/m²K
Photovoltaic array	

Regulations Compliance Report

Approved Document L1A, 2013 Edition, England assessed by Stroma FSAP 2012 program, Version: 1.0.4.16
Printed on 22 November 2018 at 12:45:49

Project Information:

Assessed By: () **Building Type:** Flat

Dwelling Details:

NEW DWELLING DESIGN STAGE Total Floor Area: 72.68m²
Site Reference : Clarion Richmond College **Plot Reference:** TF 2B4P Type 22
Address : , London, TW2 7SJ

Client Details:

Name:
Address :

This report covers items included within the SAP calculations.
It is not a complete report of regulations compliance.

1a TER and DER

Fuel for main heating system: Mains gas
Fuel factor: 1.00 (mains gas)

Target Carbon Dioxide Emission Rate (TER)	17.73 kg/m²	
Dwelling Carbon Dioxide Emission Rate (DER)	9.62 kg/m²	**OK**

1b TFEE and DFEE

Target Fabric Energy Efficiency (TFEE)	46.1 kWh/m²	
Dwelling Fabric Energy Efficiency (DFEE)	40.5 kWh/m²	
		OK

2 Fabric U-values

Element	Average	Highest	
External wall	0.15 (max. 0.30)	0.15 (max. 0.70)	**OK**
Party wall	0.00 (max. 0.20)	-	**OK**
Floor	(no floor)		
Roof	0.13 (max. 0.20)	0.13 (max. 0.35)	**OK**
Openings	1.23 (max. 2.00)	1.27 (max. 3.30)	**OK**

2a Thermal bridging

Thermal bridging calculated from linear thermal transmittances for each junction

3 Air permeability

Air permeability at 50 pascals	3.00 (design value)	
Maximum	10.0	**OK**

4 Heating efficiency

Main Heating system: Database: (rev 435, product index 017511):
Boiler systems with radiators or underfloor heating - mains gas
Brand name: Worcester
Model: Greenstar
Model qualifier: 28CDi Compact ErP (Combi)
Efficiency 89.8 % SEDBUK2009
Minimum 88.0 % **OK**

Secondary heating system: None

Regulations Compliance Report

5 Cylinder insulation

Hot water Storage:	No cylinder	

6 Controls

Space heating controls	Time and temperature zone control by device in database	**OK**
Hot water controls:	No cylinder	
	No cylinder	
Boiler interlock:	Yes	**OK**

7 Low energy lights

Percentage of fixed lights with low-energy fittings	100.0%	
Minimum	75.0%	**OK**

8 Mechanical ventilation

Continuous supply and extract system		
Specific fan power:	0.59	
Maximum	1.5	**OK**
MVHR efficiency:	89%	
Minimum	70%	**OK**

9 Summertime temperature

Overheating risk (Thames valley):	Medium	**OK**

Based on:

Overshading:	Average or unknown
Windows facing: West	4.32m²
Windows facing: West	3.78m²
Windows facing: South	2.16m²
Windows facing: South	1.08m²
Windows facing: West	1.08m²
Ventilation rate:	4.00
Blinds/curtains:	None
	Closed 100% of daylight hours

10 Key features

Air permeablility	3.0 m³/m²h
Doors U-value	1 W/m²K
Party Walls U-value	0 W/m²K
Photovoltaic array	

Regulations Compliance Report

Approved Document L1A, 2013 Edition, England assessed by Stroma FSAP 2012 program, Version: 1.0.4.16
Printed on 22 November 2018 at 12:45:49

Project Information:

Assessed By: () **Building Type:** Flat

Dwelling Details:

NEW DWELLING DESIGN STAGE Total Floor Area: 96.34m²
Site Reference : Clarion Richmond College **Plot Reference:** TF 3B5P Type 23
Address : , London, TW2 7SJ

Client Details:

Name:
Address :

This report covers items included within the SAP calculations.
It is not a complete report of regulations compliance.

1a TER and DER

Fuel for main heating system: Mains gas
Fuel factor: 1.00 (mains gas)

Target Carbon Dioxide Emission Rate (TER)	16.64 kg/m²	
Dwelling Carbon Dioxide Emission Rate (DER)	8.58 kg/m²	**OK**

1b TFEE and DFEE

Target Fabric Energy Efficiency (TFEE)	47.1 kWh/m²	
Dwelling Fabric Energy Efficiency (DFEE)	40.5 kWh/m²	
		OK

2 Fabric U-values

Element	Average	Highest	
External wall	0.15 (max. 0.30)	0.15 (max. 0.70)	**OK**
Party wall	0.00 (max. 0.20)	-	**OK**
Floor	(no floor)		
Roof	0.13 (max. 0.20)	0.13 (max. 0.35)	**OK**
Openings	1.26 (max. 2.00)	1.27 (max. 3.30)	**OK**

2a Thermal bridging

Thermal bridging calculated from linear thermal transmittances for each junction

3 Air permeability

Air permeability at 50 pascals	3.00 (design value)	
Maximum	10.0	**OK**

4 Heating efficiency

Main Heating system: Database: (rev 435, product index 017511):
Boiler systems with radiators or underfloor heating - mains gas
Brand name: Worcester
Model: Greenstar
Model qualifier: 28CDi Compact ErP
(Combi)
Efficiency 89.8 % SEDBUK2009
Minimum 88.0 % **OK**

Secondary heating system: None

Regulations Compliance Report

5 Cylinder insulation

Hot water Storage:	No cylinder	

6 Controls

Space heating controls	Time and temperature zone control by device in database	**OK**
Hot water controls:	No cylinder	
	No cylinder	
Boiler interlock:	Yes	**OK**

7 Low energy lights

Percentage of fixed lights with low-energy fittings	100.0%	
Minimum	75.0%	**OK**

8 Mechanical ventilation

Continuous supply and extract system		
Specific fan power:	0.59	
Maximum	1.5	**OK**
MVHR efficiency:	89%	
Minimum	70%	**OK**

9 Summertime temperature

Overheating risk (Thames valley):	Medium	**OK**

Based on:

Overshading:	Average or unknown
Windows facing: South	3.78m²
Windows facing: South	1.08m²
Windows facing: West	3.78m²
Windows facing: West	3.24m²
Windows facing: West	2.16m²
Windows facing: North	1.32m²
Ventilation rate:	6.00
Blinds/curtains:	None
	Closed 100% of daylight hours

10 Key features

Air permeablility	3.0 m³/m²h
Party Walls U-value	0 W/m²K
Photovoltaic array	

Regulations Compliance Report

Approved Document L1A, 2013 Edition, England assessed by Stroma FSAP 2012 program, Version: 1.0.4.16
Printed on 22 November 2018 at 12:45:48

Project Information:

Assessed By: () **Building Type:** Flat

Dwelling Details:

NEW DWELLING DESIGN STAGE Total Floor Area: 50.72m²
Site Reference : Clarion Richmond College **Plot Reference:** TF 1B2P Type 24
Address : , London, TW2 7SJ

Client Details:

Name:
Address :

This report covers items included within the SAP calculations.
It is not a complete report of regulations compliance.

1a TER and DER

Fuel for main heating system: Mains gas
Fuel factor: 1.00 (mains gas)

Target Carbon Dioxide Emission Rate (TER)	19.93 kg/m²	
Dwelling Carbon Dioxide Emission Rate (DER)	11.62 kg/m²	**OK**

1b TFEE and DFEE

Target Fabric Energy Efficiency (TFEE)	48.0 kWh/m²	
Dwelling Fabric Energy Efficiency (DFEE)	42.2 kWh/m²	
		OK

2 Fabric U-values

Element	Average	Highest	
External wall	0.14 (max. 0.30)	0.15 (max. 0.70)	**OK**
Party wall	0.00 (max. 0.20)	-	**OK**
Floor	(no floor)		
Roof	0.13 (max. 0.20)	0.13 (max. 0.35)	**OK**
Openings	1.25 (max. 2.00)	1.27 (max. 3.30)	**OK**

2a Thermal bridging

Thermal bridging calculated from linear thermal transmittances for each junction

3 Air permeability

Air permeability at 50 pascals	3.00 (design value)	
Maximum	10.0	**OK**

4 Heating efficiency

Main Heating system: Database: (rev 435, product index 017511):
Boiler systems with radiators or underfloor heating - mains gas
Brand name: Worcester
Model: Greenstar
Model qualifier: 28CDi Compact ErP
(Combi)
Efficiency 89.8 % SEDBUK2009
Minimum 88.0 % **OK**

Secondary heating system: None

Regulations Compliance Report

5 Cylinder insulation

Hot water Storage:	No cylinder	

6 Controls

Space heating controls	Time and temperature zone control by device in database	OK
Hot water controls:	No cylinder	
	No cylinder	
Boiler interlock:	Yes	OK

7 Low energy lights

Percentage of fixed lights with low-energy fittings	100.0%	
Minimum	75.0%	OK

8 Mechanical ventilation

Continuous supply and extract system		
Specific fan power:	0.52	
Maximum	1.5	OK
MVHR efficiency:	90%	
Minimum	70%	OK

9 Summertime temperature

Overheating risk (Thames valley):	Medium	OK

Based on:

Overshading:	Average or unknown
Windows facing: East	3.78m²
Windows facing: North	1.32m²
Windows facing: East	2.16m²
Ventilation rate:	4.00
Blinds/curtains:	None
	Closed 100% of daylight hours

10 Key features

Air permeablility	3.0 m³/m²h
Party Walls U-value	0 W/m²K
Photovoltaic array	

Regulations Compliance Report

Approved Document L1A, 2013 Edition, England assessed by Stroma FSAP 2012 program, Version: 1.0.4.16
Printed on 22 November 2018 at 12:45:48

Project Information:

Assessed By: () **Building Type:** Flat

Dwelling Details:

NEW DWELLING DESIGN STAGE Total Floor Area: 72.75m²
Site Reference : Clarion Richmond College **Plot Reference:** TF 2B4P Type 25
Address : , London, TW2 7SJ

Client Details:

Name:
Address :

This report covers items included within the SAP calculations.
It is not a complete report of regulations compliance.

1a TER and DER

Fuel for main heating system: Mains gas
Fuel factor: 1.00 (mains gas)

Target Carbon Dioxide Emission Rate (TER)	17.56 kg/m²	
Dwelling Carbon Dioxide Emission Rate (DER)	9.29 kg/m²	**OK**

1b TFEE and DFEE

Target Fabric Energy Efficiency (TFEE)	44.0 kWh/m²	
Dwelling Fabric Energy Efficiency (DFEE)	38.0 kWh/m²	
		OK

2 Fabric U-values

Element	Average	Highest	
External wall	0.15 (max. 0.30)	0.15 (max. 0.70)	**OK**
Party wall	0.00 (max. 0.20)	-	**OK**
Floor	(no floor)		
Roof	0.13 (max. 0.20)	0.13 (max. 0.35)	**OK**
Openings	1.26 (max. 2.00)	1.27 (max. 3.30)	**OK**

2a Thermal bridging

Thermal bridging calculated from linear thermal transmittances for each junction

3 Air permeability

Air permeability at 50 pascals	3.00 (design value)	
Maximum	10.0	**OK**

4 Heating efficiency

Main Heating system: Database: (rev 435, product index 017511):
Boiler systems with radiators or underfloor heating - mains gas
Brand name: Worcester
Model: Greenstar
Model qualifier: 28CDi Compact ErP (Combi)
Efficiency 89.8 % SEDBUK2009
Minimum 88.0 % **OK**

Secondary heating system: None

Regulations Compliance Report

5 Cylinder insulation

Hot water Storage:	No cylinder	

6 Controls

Space heating controls	Time and temperature zone control by device in database	OK
Hot water controls:	No cylinder	
	No cylinder	
Boiler interlock:	Yes	OK

7 Low energy lights

Percentage of fixed lights with low-energy fittings	100.0%	
Minimum	75.0%	OK

8 Mechanical ventilation

Continuous supply and extract system		
Specific fan power:	0.59	
Maximum	1.5	OK
MVHR efficiency:	89%	
Minimum	70%	OK

9 Summertime temperature

Overheating risk (Thames valley):	Slight	OK

Based on:

Overshading:	Average or unknown
Windows facing: East	1.08m²
Windows facing: East	3.78m²
Windows facing: West	4.32m²
Ventilation rate:	6.00
Blinds/curtains:	None
	Closed 100% of daylight hours

10 Key features

Air permeablility	3.0 m³/m²h
Party Walls U-value	0 W/m²K
Photovoltaic array	

Regulations Compliance Report

Approved Document L1A, 2013 Edition, England assessed by Stroma FSAP 2012 program, Version: 1.0.4.16
Printed on 22 November 2018 at 12:45:48

Project Information:

Assessed By: () **Building Type:** Flat

Dwelling Details:

NEW DWELLING DESIGN STAGE Total Floor Area: 73.25m²
Site Reference : Clarion Richmond College **Plot Reference:** TF 2B4P Type 26
Address : , London, TW2 7SJ

Client Details:

Name:
Address :

This report covers items included within the SAP calculations.
It is not a complete report of regulations compliance.

1a TER and DER

Fuel for main heating system: Mains gas
Fuel factor: 1.00 (mains gas)

Target Carbon Dioxide Emission Rate (TER)	18.01 kg/m²	
Dwelling Carbon Dioxide Emission Rate (DER)	9.79 kg/m²	**OK**

1b TFEE and DFEE

Target Fabric Energy Efficiency (TFEE)	46.9 kWh/m²	
Dwelling Fabric Energy Efficiency (DFEE)	40.9 kWh/m²	
		OK

2 Fabric U-values

Element	Average	Highest	
External wall	0.14 (max. 0.30)	0.15 (max. 0.70)	**OK**
Party wall	0.00 (max. 0.20)	-	**OK**
Floor	(no floor)		
Roof	0.13 (max. 0.20)	0.13 (max. 0.35)	**OK**
Openings	1.26 (max. 2.00)	1.27 (max. 3.30)	**OK**

2a Thermal bridging

Thermal bridging calculated from linear thermal transmittances for each junction

3 Air permeability

Air permeability at 50 pascals	3.00 (design value)	
Maximum	10.0	**OK**

4 Heating efficiency

Main Heating system: Database: (rev 435, product index 017511):
Boiler systems with radiators or underfloor heating - mains gas
Brand name: Worcester
Model: Greenstar
Model qualifier: 28CDi Compact ErP (Combi)
Efficiency 89.8 % SEDBUK2009
Minimum 88.0 % **OK**

Secondary heating system: None

Regulations Compliance Report

5 Cylinder insulation

Hot water Storage:	No cylinder	

6 Controls

Space heating controls	Time and temperature zone control by device in database	**OK**
Hot water controls:	No cylinder	
	No cylinder	
Boiler interlock:	Yes	**OK**

7 Low energy lights

Percentage of fixed lights with low-energy fittings	100.0%	
Minimum	75.0%	**OK**

8 Mechanical ventilation

Continuous supply and extract system		
Specific fan power:	0.59	
Maximum	1.5	**OK**
MVHR efficiency:	89%	
Minimum	70%	**OK**

9 Summertime temperature

Overheating risk (Thames valley):	Medium	**OK**

Based on:

Overshading:	Average or unknown
Windows facing: South	1.32m²
Windows facing: West	4.32m²
Windows facing: West	3.78m²
Windows facing: West	1.08m²
Ventilation rate:	4.00
Blinds/curtains:	None
	Closed 100% of daylight hours

10 Key features

Air permeablility	3.0 m³/m²h
Party Walls U-value	0 W/m²K
Photovoltaic array	

Regulations Compliance Report

Approved Document L1A, 2013 Edition, England assessed by Stroma FSAP 2012 program, Version: 1.0.4.16
Printed on 22 November 2018 at 12:45:48

Project Information:

Assessed By: () **Building Type:** Flat

Dwelling Details:

NEW DWELLING DESIGN STAGE Total Floor Area: 72.75m²
Site Reference : Clarion Richmond College **Plot Reference:** TF 2B4P Type 27
Address : , London, TW2 7SJ

Client Details:

Name:
Address :

This report covers items included within the SAP calculations.
It is not a complete report of regulations compliance.

1a TER and DER

Fuel for main heating system: Mains gas
Fuel factor: 1.00 (mains gas)

Target Carbon Dioxide Emission Rate (TER)	18.51 kg/m²	
Dwelling Carbon Dioxide Emission Rate (DER)	10.35 kg/m²	**OK**

1b TFEE and DFEE

Target Fabric Energy Efficiency (TFEE)	50.2 kWh/m²	
Dwelling Fabric Energy Efficiency (DFEE)	42.8 kWh/m²	
		OK

2 Fabric U-values

Element	Average	Highest	
External wall	0.15 (max. 0.30)	0.15 (max. 0.70)	**OK**
Party wall	0.00 (max. 0.20)	-	**OK**
Floor	(no floor)		
Roof	0.13 (max. 0.20)	0.13 (max. 0.35)	**OK**
Openings	1.26 (max. 2.00)	1.27 (max. 3.30)	**OK**

2a Thermal bridging

Thermal bridging calculated from linear thermal transmittances for each junction

3 Air permeability

Air permeability at 50 pascals	3.00 (design value)	
Maximum	10.0	**OK**

4 Heating efficiency

Main Heating system: Database: (rev 435, product index 017511):
Boiler systems with radiators or underfloor heating - mains gas
Brand name: Worcester
Model: Greenstar
Model qualifier: 28CDi Compact ErP (Combi)
Efficiency 89.8 % SEDBUK2009
Minimum 88.0 % **OK**

Secondary heating system: None

Regulations Compliance Report

5 Cylinder insulation

Hot water Storage:	No cylinder	

6 Controls

Space heating controls	Time and temperature zone control by device in database	**OK**
Hot water controls:	No cylinder	
	No cylinder	
Boiler interlock:	Yes	**OK**

7 Low energy lights

Percentage of fixed lights with low-energy fittings	100.0%	
Minimum	75.0%	**OK**

8 Mechanical ventilation

Continuous supply and extract system		
Specific fan power:	0.59	
Maximum	1.5	**OK**
MVHR efficiency:	89%	
Minimum	70%	**OK**

9 Summertime temperature

Overheating risk (Thames valley):	Medium	**OK**

Based on:

Overshading:	Average or unknown
Windows facing: North	2.16m²
Windows facing: North	1.08m²
Windows facing: West	4.32m²
Windows facing: West	3.78m²
Windows facing: West	1.08m²
Ventilation rate:	4.00
Blinds/curtains:	None
	Closed 100% of daylight hours

10 Key features

Air permeablility	3.0 m³/m²h
Party Walls U-value	0 W/m²K
Photovoltaic array	

Regulations Compliance Report

Approved Document L1A, 2013 Edition, England assessed by Stroma FSAP 2012 program, Version: 1.0.4.16
Printed on 22 November 2018 at 12:45:48

Project Information:

Assessed By: ()

Building Type: Flat

Dwelling Details:

NEW DWELLING DESIGN STAGE

Total Floor Area: 54.06m²

Site Reference : Clarion Richmond College

Plot Reference: TF 1B2P Type 28

Address : , London, TW2 7SJ

Client Details:

Name:

Address :

This report covers items included within the SAP calculations.
It is not a complete report of regulations compliance.

1a TER and DER

Fuel for main heating system: Mains gas
Fuel factor: 1.00 (mains gas)

Target Carbon Dioxide Emission Rate (TER)	20.76 kg/m²	
Dwelling Carbon Dioxide Emission Rate (DER)	13.72 kg/m²	**OK**

1b TFEE and DFEE

Target Fabric Energy Efficiency (TFEE)	53.5 kWh/m²	
Dwelling Fabric Energy Efficiency (DFEE)	46.2 kWh/m²	
		OK

2 Fabric U-values

Element	Average	Highest	
External wall	0.14 (max. 0.30)	0.15 (max. 0.70)	**OK**
Party wall	0.00 (max. 0.20)	-	**OK**
Floor	(no floor)		
Roof	0.13 (max. 0.20)	0.13 (max. 0.35)	**OK**
Openings	1.25 (max. 2.00)	1.27 (max. 3.30)	**OK**

2a Thermal bridging

Thermal bridging calculated from linear thermal transmittances for each junction

3 Air permeability

Air permeability at 50 pascals	3.00 (design value)	
Maximum	10.0	**OK**

4 Heating efficiency

Main Heating system: Database: (rev 435, product index 017511):

Boiler systems with radiators or underfloor heating - mains gas
Brand name: Worcester
Model: Greenstar
Model qualifier: 28CDi Compact ErP (Combi)
Efficiency 89.8 % SEDBUK2009
Minimum 88.0 % **OK**

Secondary heating system: None

Regulations Compliance Report

5 Cylinder insulation

Hot water Storage:	No cylinder	

6 Controls

Space heating controls	Time and temperature zone control by device in database	**OK**
Hot water controls:	No cylinder	
	No cylinder	
Boiler interlock:	Yes	**OK**

7 Low energy lights

Percentage of fixed lights with low-energy fittings	100.0%	
Minimum	75.0%	**OK**

8 Mechanical ventilation

Continuous supply and extract system		
Specific fan power:	0.52	
Maximum	1.5	**OK**
MVHR efficiency:	90%	
Minimum	70%	**OK**

9 Summertime temperature

Overheating risk (Thames valley):	Medium	**OK**

Based on:

Overshading:	Average or unknown
Windows facing: East	1.08m²
Windows facing: East	2.16m²
Windows facing: East	3.78m²
Ventilation rate:	4.00
Blinds/curtains:	None
	Closed 100% of daylight hours

10 Key features

Air permeablility	3.0 m³/m²h
Party Walls U-value	0 W/m²K
Photovoltaic array	

Regulations Compliance Report

Approved Document L1A, 2013 Edition, England assessed by Stroma FSAP 2012 program, Version: 1.0.4.16
Printed on 22 November 2018 at 12:45:47

Project Information:

Assessed By: ()

Building Type: Flat

Dwelling Details:

NEW DWELLING DESIGN STAGE

Total Floor Area: 72.75m²

Site Reference : Clarion Richmond College

Plot Reference: GF 2B3P WCH Type 29

Address : , London, TW2 7SJ

Client Details:

Name:

Address :

This report covers items included within the SAP calculations.
It is not a complete report of regulations compliance.

1a TER and DER

Fuel for main heating system: Mains gas
Fuel factor: 1.00 (mains gas)

Target Carbon Dioxide Emission Rate (TER)	18 kg/m²	
Dwelling Carbon Dioxide Emission Rate (DER)	9.58 kg/m²	**OK**

1b TFEE and DFEE

Target Fabric Energy Efficiency (TFEE)	46.5 kWh/m²	
Dwelling Fabric Energy Efficiency (DFEE)	43.9 kWh/m²	
		OK

2 Fabric U-values

Element	Average	Highest	
External wall	0.15 (max. 0.30)	0.15 (max. 0.70)	**OK**
Party wall	0.00 (max. 0.20)	-	**OK**
Floor	0.13 (max. 0.25)	0.13 (max. 0.70)	**OK**
Roof	(no roof)		
Openings	1.22 (max. 2.00)	1.27 (max. 3.30)	**OK**

2a Thermal bridging

Thermal bridging calculated from linear thermal transmittances for each junction

3 Air permeability

Air permeability at 50 pascals	3.00 (design value)	
Maximum	10.0	**OK**

4 Heating efficiency

Main Heating system: Database: (rev 435, product index 017511):
Boiler systems with radiators or underfloor heating - mains gas
Brand name: Worcester
Model: Greenstar
Model qualifier: 28CDi Compact ErP (Combi)
Efficiency 89.8 % SEDBUK2009
Minimum 88.0 % **OK**

Secondary heating system: None

Regulations Compliance Report

5 Cylinder insulation

Hot water Storage:	No cylinder	

6 Controls

Space heating controls	Time and temperature zone control by device in database	**OK**
Hot water controls:	No cylinder	
	No cylinder	
Boiler interlock:	Yes	**OK**

7 Low energy lights

Percentage of fixed lights with low-energy fittings	100.0%	
Minimum	75.0%	**OK**

8 Mechanical ventilation

Continuous supply and extract system		
Specific fan power:	0.52	
Maximum	1.5	**OK**
MVHR efficiency:	90%	
Minimum	70%	**OK**

9 Summertime temperature

Overheating risk (Thames valley):	Medium	**OK**

Based on:

Overshading:	Average or unknown
Windows facing: North	1.32m²
Windows facing: West	3.78m²
Windows facing: West	2.16m²
Windows facing: West	2.16m²
Windows facing: North	0.6m²
Ventilation rate:	2.00
Blinds/curtains:	Closed 100% of daylight hours

10 Key features

Air permeablility	3.0 m³/m²h
Doors U-value	1 W/m²K
Party Walls U-value	0 W/m²K
Photovoltaic array	

Regulations Compliance Report

Approved Document L1A, 2013 Edition, England assessed by Stroma FSAP 2012 program, Version: 1.0.4.16
Printed on 22 November 2018 at 12:49:04

Project Information:

Assessed By: ()

Building Type: End-terrace House

Dwelling Details:

NEW DWELLING DESIGN STAGE

Total Floor Area: 117.98m²

Site Reference : Clarion Richmond College

Plot Reference: Terrace 1 House 4B6P Type 30

Address : , London, TW2 7SJ

Client Details:

Name:

Address :

This report covers items included within the SAP calculations.
It is not a complete report of regulations compliance.

1a TER and DER

Fuel for main heating system: Mains gas
Fuel factor: 1.00 (mains gas)

Target Carbon Dioxide Emission Rate (TER)	16.06 kg/m²	
Dwelling Carbon Dioxide Emission Rate (DER)	10.58 kg/m²	**OK**

1b TFEE and DFEE

Target Fabric Energy Efficiency (TFEE)	50.9 kWh/m²	
Dwelling Fabric Energy Efficiency (DFEE)	42.5 kWh/m²	
		OK

2 Fabric U-values

Element	Average	Highest	
External wall	0.15 (max. 0.30)	0.15 (max. 0.70)	**OK**
Party wall	0.00 (max. 0.20)	-	**OK**
Floor	0.13 (max. 0.25)	0.13 (max. 0.70)	**OK**
Roof	0.13 (max. 0.20)	0.13 (max. 0.35)	**OK**
Openings	1.25 (max. 2.00)	1.27 (max. 3.30)	**OK**

2a Thermal bridging

Thermal bridging calculated from linear thermal transmittances for each junction

3 Air permeability

Air permeability at 50 pascals	3.00 (design value)	
Maximum	10.0	**OK**

4 Heating efficiency

Main Heating system:

Database: (rev 435, product index 017511):
Boiler systems with radiators or underfloor heating - mains gas
Brand name: Worcester
Model: Greenstar
Model qualifier: 28CDi Compact ErP (Combi)
Efficiency 89.8 % SEDBUK2009
Minimum 88.0 % **OK**

Secondary heating system: None

Regulations Compliance Report

5 Cylinder insulation

Hot water Storage:	No cylinder	

6 Controls

Space heating controls	Time and temperature zone control by device in database	OK
Hot water controls:	No cylinder	
	No cylinder	
Boiler interlock:	Yes	OK

7 Low energy lights

Percentage of fixed lights with low-energy fittings	100.0%	
Minimum	75.0%	OK

8 Mechanical ventilation

Continuous supply and extract system		
Specific fan power:	1	
Maximum	1.5	OK
MVHR efficiency:	86%	
Minimum	70%	OK

9 Summertime temperature

Overheating risk (Thames valley):	Slight	OK

Based on:

Overshading:	Average or unknown
Windows facing: East	1.08m²
Windows facing: East	1.08m²
Windows facing: East	1.08m²
Windows facing: East	2.04m²
Windows facing: South	1.08m²
Windows facing: South	2.16m²
Windows facing: East	3.36m²
Windows facing: South	2.52m²
Windows facing: West	1.08m²
Windows facing: West	3.57m²
Windows facing: West	1.08m²
Windows facing: West	2.04m²
Windows facing: West	2.04m²
Windows facing: West	1.08m²
Ventilation rate:	8.00
Blinds/curtains:	None
	Closed 100% of daylight hours

10 Key features

Air permeablility	3.0 m³/m²h
Doors U-value	1 W/m²K
Party Walls U-value	0 W/m²K
Photovoltaic array	

Regulations Compliance Report

Approved Document L1A, 2013 Edition, England assessed by Stroma FSAP 2012 program, Version: 1.0.4.16
Printed on 22 November 2018 at 12:49:03

Project Information:

Assessed By: ()

Building Type: End-terrace House

Dwelling Details:

NEW DWELLING DESIGN STAGE

Total Floor Area: 122.15m²

Site Reference : Clarion Richmond College

Plot Reference: Terrace 2 House 4B6P Type 31

Address : , London, TW2 7SJ

Client Details:

Name:

Address :

This report covers items included within the SAP calculations.
It is not a complete report of regulations compliance.

1a TER and DER

Fuel for main heating system: Mains gas
Fuel factor: 1.00 (mains gas)

Target Carbon Dioxide Emission Rate (TER)	16.03 kg/m²	
Dwelling Carbon Dioxide Emission Rate (DER)	11.66 kg/m²	**OK**

1b TFEE and DFEE

Target Fabric Energy Efficiency (TFEE)	51.5 kWh/m²	
Dwelling Fabric Energy Efficiency (DFEE)	42.4 kWh/m²	
		OK

2 Fabric U-values

Element	Average	Highest	
External wall	0.15 (max. 0.30)	0.15 (max. 0.70)	**OK**
Party wall	0.00 (max. 0.20)	-	**OK**
Floor	0.13 (max. 0.25)	0.13 (max. 0.70)	**OK**
Roof	0.13 (max. 0.20)	0.15 (max. 0.35)	**OK**
Openings	1.25 (max. 2.00)	1.27 (max. 3.30)	**OK**

2a Thermal bridging

Thermal bridging calculated from linear thermal transmittances for each junction

3 Air permeability

Air permeability at 50 pascals	3.00 (design value)	
Maximum	10.0	**OK**

4 Heating efficiency

Main Heating system:

Database: (rev 435, product index 017511):
Boiler systems with radiators or underfloor heating - mains gas
Brand name: Worcester
Model: Greenstar
Model qualifier: 28CDi Compact ErP (Combi)
Efficiency 89.8 % SEDBUK2009
Minimum 88.0 % **OK**

Secondary heating system: None

Regulations Compliance Report

5 Cylinder insulation

Hot water Storage:	No cylinder	

6 Controls

Space heating controls	Time and temperature zone control by device in database	OK
Hot water controls:	No cylinder	
	No cylinder	
Boiler interlock:	Yes	OK

7 Low energy lights

Percentage of fixed lights with low-energy fittings	100.0%	
Minimum	75.0%	OK

8 Mechanical ventilation

Continuous supply and extract system		
Specific fan power:	1	
Maximum	1.5	OK
MVHR efficiency:	86%	
Minimum	70%	OK

9 Summertime temperature

Overheating risk (Thames valley):	Slight	OK

Based on:

Overshading:	Average or unknown
Windows facing: East	4.08m²
Windows facing: East	4.08m²
Windows facing: East	1.08m²
Windows facing: East	1.08m²
Windows facing: South	3.78m²
Windows facing: South	1.08m²
Windows facing: South	2.16m²
Windows facing: North	1.08m²
Windows facing: North	2.04m²
Windows facing: North	2.04m²
Windows facing: North	1.08m²
Windows facing: West	1.08m²
Windows facing: North	1.08m²
Roof windows facing: South	1.08m²
Ventilation rate:	8.00
Blinds/curtains:	None
	Closed 100% of daylight hours

10 Key features

Air permeablility	3.0 m³/m²h
Doors U-value	1 W/m²K
Party Walls U-value	0 W/m²K
Photovoltaic array	

Regulations Compliance Report

Approved Document L1A, 2013 Edition, England assessed by Stroma FSAP 2012 program, Version: 1.0.4.16
Printed on 22 November 2018 at 12:49:03

Project Information:

Assessed By: ()

Building Type: End-terrace House

Dwelling Details:

NEW DWELLING DESIGN STAGE

Total Floor Area: 97.42m²

Site Reference : Clarion Richmond College

Plot Reference: Terrace 3 House 3B5P Type 32

Address : , London, TW2 7SJ

Client Details:

Name:

Address :

This report covers items included within the SAP calculations.
It is not a complete report of regulations compliance.

1a TER and DER

Fuel for main heating system: Mains gas
Fuel factor: 1.00 (mains gas)

Target Carbon Dioxide Emission Rate (TER)	17 kg/m²	
Dwelling Carbon Dioxide Emission Rate (DER)	11.21 kg/m²	**OK**

1b TFEE and DFEE

Target Fabric Energy Efficiency (TFEE)	48.7 kWh/m²	
Dwelling Fabric Energy Efficiency (DFEE)	41.0 kWh/m²	
		OK

2 Fabric U-values

Element	Average	Highest	
External wall	0.15 (max. 0.30)	0.15 (max. 0.70)	**OK**
Party wall	0.00 (max. 0.20)	-	**OK**
Floor	0.13 (max. 0.25)	0.13 (max. 0.70)	**OK**
Roof	0.13 (max. 0.20)	0.15 (max. 0.35)	**OK**
Openings	1.24 (max. 2.00)	1.27 (max. 3.30)	**OK**

2a Thermal bridging

Thermal bridging calculated from linear thermal transmittances for each junction

3 Air permeability

Air permeability at 50 pascals	3.00 (design value)	
Maximum	10.0	**OK**

4 Heating efficiency

Main Heating system: Database: (rev 435, product index 017511):
Boiler systems with radiators or underfloor heating - mains gas
Brand name: Worcester
Model: Greenstar
Model qualifier: 28CDi Compact ErP (Combi)
Efficiency 89.8 % SEDBUK2009
Minimum 88.0 % **OK**

Secondary heating system: None

Regulations Compliance Report

5 Cylinder insulation

Hot water Storage:	No cylinder	

6 Controls

Space heating controls	Time and temperature zone control by device in database	OK
Hot water controls:	No cylinder	
	No cylinder	
Boiler interlock:	Yes	OK

7 Low energy lights

Percentage of fixed lights with low-energy fittings	100.0%	
Minimum	75.0%	OK

8 Mechanical ventilation

Continuous supply and extract system		
Specific fan power:	0.77	
Maximum	1.5	OK
MVHR efficiency:	87%	
Minimum	70%	OK

9 Summertime temperature

Overheating risk (Thames valley):	Slight	OK

Based on:

Overshading:	Average or unknown
Windows facing: West	1.08m²
Windows facing: South	3.78m²
Windows facing: South	1.08m²
Windows facing: South	2.16m²
Windows facing: North	1.08m²
Windows facing: North	2.04m²
Windows facing: North	1.08m²
Windows facing: North	1.08m²
Roof windows facing: South	1.08m²
Ventilation rate:	8.00
Blinds/curtains:	None
	Closed 100% of daylight hours

10 Key features

Air permeablility	3.0 m³/m²h
Doors U-value	1 W/m²K
Party Walls U-value	0 W/m²K
Photovoltaic array	

Regulations Compliance Report

Approved Document L1A, 2013 Edition, England assessed by Stroma FSAP 2012 program, Version: 1.0.4.16
Printed on 22 November 2018 at 12:49:02

Project Information:

Assessed By: ()

Building Type: End-terrace House

Dwelling Details:

NEW DWELLING DESIGN STAGE

Total Floor Area: 117.98m²

Site Reference : Clarion Richmond College

Plot Reference: Terrace 1 House 4B6P Type 33

Address : , London, TW2 7SJ

Client Details:

Name:

Address :

This report covers items included within the SAP calculations.
It is not a complete report of regulations compliance.

1a TER and DER

Fuel for main heating system: Mains gas
Fuel factor: 1.00 (mains gas)

Target Carbon Dioxide Emission Rate (TER)	16.74 kg/m²	
Dwelling Carbon Dioxide Emission Rate (DER)	11.18 kg/m²	**OK**

1b TFEE and DFEE

Target Fabric Energy Efficiency (TFEE)	54.2 kWh/m²	
Dwelling Fabric Energy Efficiency (DFEE)	44.7 kWh/m²	
		OK

2 Fabric U-values

Element	Average	Highest	
External wall	0.15 (max. 0.30)	0.15 (max. 0.70)	**OK**
Party wall	0.00 (max. 0.20)	-	**OK**
Floor	0.13 (max. 0.25)	0.13 (max. 0.70)	**OK**
Roof	0.13 (max. 0.20)	0.13 (max. 0.35)	**OK**
Openings	1.25 (max. 2.00)	1.27 (max. 3.30)	**OK**

2a Thermal bridging

Thermal bridging calculated from linear thermal transmittances for each junction

3 Air permeability

Air permeability at 50 pascals	3.00 (design value)	
Maximum	10.0	**OK**

4 Heating efficiency

Main Heating system:

Database: (rev 435, product index 017511):
Boiler systems with radiators or underfloor heating - mains gas
Brand name: Worcester
Model: Greenstar
Model qualifier: 28CDi Compact ErP (Combi)
Efficiency 89.8 % SEDBUK2009
Minimum 88.0 % **OK**

Secondary heating system: None

Regulations Compliance Report

5 Cylinder insulation

Hot water Storage:	No cylinder	

6 Controls

Space heating controls	Time and temperature zone control by device in database	OK
Hot water controls:	No cylinder	
	No cylinder	
Boiler interlock:	Yes	OK

7 Low energy lights

Percentage of fixed lights with low-energy fittings	100.0%	
Minimum	75.0%	OK

8 Mechanical ventilation

Continuous supply and extract system		
Specific fan power:	1	
Maximum	1.5	OK
MVHR efficiency:	86%	
Minimum	70%	OK

9 Summertime temperature

Overheating risk (Thames valley):	Slight	OK

Based on:

Overshading:	Average or unknown
Windows facing: East	1.08m²
Windows facing: East	1.08m²
Windows facing: East	1.08m²
Windows facing: East	2.04m²
Windows facing: North	1.08m²
Windows facing: North	2.16m²
Windows facing: East	3.36m²
Windows facing: North	2.52m²
Windows facing: West	1.08m²
Windows facing: West	3.57m²
Windows facing: West	1.08m²
Windows facing: West	2.04m²
Windows facing: West	2.04m²
Windows facing: West	1.08m²
Ventilation rate:	8.00
Blinds/curtains:	None
	Closed 100% of daylight hours

10 Key features

Air permeablility	3.0 m³/m²h
Doors U-value	1 W/m²K
Party Walls U-value	0 W/m²K
Photovoltaic array	

Regulations Compliance Report

Approved Document L1A, 2013 Edition, England assessed by Stroma FSAP 2012 program, Version: 1.0.4.16
Printed on 22 November 2018 at 12:49:02

Project Information:

Assessed By: ()

Building Type: Mid-terrace House

Dwelling Details:

NEW DWELLING DESIGN STAGE

Total Floor Area: 117.98m²

Site Reference : Clarion Richmond College

Plot Reference: Terrace 1 House 4B6P Type 34

Address : , London, TW2 7SJ

Client Details:

Name:

Address :

This report covers items included within the SAP calculations.
It is not a complete report of regulations compliance.

1a TER and DER

Fuel for main heating system: Mains gas
Fuel factor: 1.00 (mains gas)

Target Carbon Dioxide Emission Rate (TER)	14.77 kg/m²	
Dwelling Carbon Dioxide Emission Rate (DER)	9.01 kg/m²	**OK**

1b TFEE and DFEE

Target Fabric Energy Efficiency (TFEE)	43.8 kWh/m²	
Dwelling Fabric Energy Efficiency (DFEE)	36.5 kWh/m²	
		OK

2 Fabric U-values

Element	Average	Highest	
External wall	0.15 (max. 0.30)	0.15 (max. 0.70)	**OK**
Party wall	0.00 (max. 0.20)	-	**OK**
Floor	0.13 (max. 0.25)	0.13 (max. 0.70)	**OK**
Roof	0.13 (max. 0.20)	0.13 (max. 0.35)	**OK**
Openings	1.25 (max. 2.00)	1.27 (max. 3.30)	**OK**

2a Thermal bridging

Thermal bridging calculated from linear thermal transmittances for each junction

3 Air permeability

Air permeability at 50 pascals	3.00 (design value)	
Maximum	10.0	**OK**

4 Heating efficiency

Main Heating system:

Database: (rev 435, product index 017511):
Boiler systems with radiators or underfloor heating - mains gas
Brand name: Worcester
Model: Greenstar
Model qualifier: 28CDi Compact ErP (Combi)
Efficiency 89.8 % SEDBUK2009
Minimum 88.0 % **OK**

Secondary heating system: None

Regulations Compliance Report

5 Cylinder insulation

Hot water Storage:	No cylinder	

6 Controls

Space heating controls	Time and temperature zone control by device in database	OK
Hot water controls:	No cylinder	
	No cylinder	
Boiler interlock:	Yes	OK

7 Low energy lights

Percentage of fixed lights with low-energy fittings	100.0%	
Minimum	75.0%	OK

8 Mechanical ventilation

Continuous supply and extract system		
Specific fan power:	1	
Maximum	1.5	OK
MVHR efficiency:	86%	
Minimum	70%	OK

9 Summertime temperature

Overheating risk (Thames valley):	Slight	OK

Based on:

Overshading:	Average or unknown
Windows facing: East	1.08m²
Windows facing: East	1.08m²
Windows facing: East	1.08m²
Windows facing: East	2.04m²
Windows facing: East	3.36m²
Windows facing: North	2.52m²
Windows facing: West	1.08m²
Windows facing: West	3.57m²
Windows facing: West	1.08m²
Windows facing: West	2.04m²
Windows facing: West	2.04m²
Windows facing: West	1.08m²
Ventilation rate:	8.00
Blinds/curtains:	None
	Closed 100% of daylight hours

10 Key features

Air permeablility	3.0 m³/m²h
Doors U-value	1 W/m²K
Party Walls U-value	0 W/m²K
Photovoltaic array	

Regulations Compliance Report

Approved Document L1A, 2013 Edition, England assessed by Stroma FSAP 2012 program, Version: 1.0.4.16
Printed on 22 November 2018 at 12:49:02

Project Information:

Assessed By: ()

Building Type: End-terrace House

Dwelling Details:

NEW DWELLING DESIGN STAGE

Total Floor Area: 119.45m²

Site Reference : Clarion Richmond College

Plot Reference: Terrace 2 House 4B6P Type 35

Address : , London, TW2 7SJ

Client Details:

Name:

Address :

This report covers items included within the SAP calculations.
It is not a complete report of regulations compliance.

1a TER and DER

Fuel for main heating system: Mains gas
Fuel factor: 1.00 (mains gas)

Target Carbon Dioxide Emission Rate (TER)	16.07 kg/m²	
Dwelling Carbon Dioxide Emission Rate (DER)	11.58 kg/m²	**OK**

1b TFEE and DFEE

Target Fabric Energy Efficiency (TFEE)	48.8 kWh/m²	
Dwelling Fabric Energy Efficiency (DFEE)	39.7 kWh/m²	
		OK

2 Fabric U-values

Element	Average	Highest	
External wall	0.15 (max. 0.30)	0.15 (max. 0.70)	**OK**
Party wall	0.00 (max. 0.20)	-	**OK**
Floor	0.13 (max. 0.25)	0.13 (max. 0.70)	**OK**
Roof	0.13 (max. 0.20)	0.15 (max. 0.35)	**OK**
Openings	1.24 (max. 2.00)	1.27 (max. 3.30)	**OK**

2a Thermal bridging

Thermal bridging calculated from linear thermal transmittances for each junction

3 Air permeability

Air permeability at 50 pascals	3.00 (design value)	
Maximum	10.0	**OK**

4 Heating efficiency

Main Heating system:

Database: (rev 435, product index 017511):
Boiler systems with radiators or underfloor heating - mains gas
Brand name: Worcester
Model: Greenstar
Model qualifier: 28CDi Compact ErP (Combi)
Efficiency 89.8 % SEDBUK2009
Minimum 88.0 % **OK**

Secondary heating system: None

Regulations Compliance Report

5 Cylinder insulation

Hot water Storage:	No cylinder	

6 Controls

Space heating controls	Time and temperature zone control by device in database	OK
Hot water controls:	No cylinder	
	No cylinder	
Boiler interlock:	Yes	OK

7 Low energy lights

Percentage of fixed lights with low-energy fittings	100.0%	
Minimum	75.0%	OK

8 Mechanical ventilation

Continuous supply and extract system		
Specific fan power:	1	
Maximum	1.5	OK
MVHR efficiency:	86%	
Minimum	70%	OK

9 Summertime temperature

Overheating risk (Thames valley):	Slight	OK

Based on:

Overshading:	Average or unknown
Windows facing: West	1.08m²
Windows facing: South	3.78m²
Windows facing: South	1.08m²
Windows facing: South	2.16m²
Windows facing: North	1.08m²
Windows facing: North	2.04m²
Windows facing: North	1.08m²
Windows facing: North	1.08m²
Roof windows facing: South	1.08m²
Ventilation rate:	8.00
Blinds/curtains:	None
	Closed 100% of daylight hours

10 Key features

Air permeablility	3.0 m³/m²h
Doors U-value	1 W/m²K
Party Walls U-value	0 W/m²K
Photovoltaic array	

Regulations Compliance Report

Approved Document L1A, 2013 Edition, England assessed by Stroma FSAP 2012 program, Version: 1.0.4.16
Printed on 22 November 2018 at 12:49:01

Project Information:

Assessed By: ()

Building Type: Mid-terrace House

Dwelling Details:

NEW DWELLING DESIGN STAGE

Total Floor Area: 119.45m²

Site Reference : Clarion Richmond College

Plot Reference: Terrace 2 House 4B6P Type 36

Address : , London, TW2 7SJ

Client Details:

Name:

Address :

This report covers items included within the SAP calculations.
It is not a complete report of regulations compliance.

1a TER and DER

Fuel for main heating system: Mains gas
Fuel factor: 1.00 (mains gas)

Target Carbon Dioxide Emission Rate (TER)	14.36 kg/m²	
Dwelling Carbon Dioxide Emission Rate (DER)	9.66 kg/m²	**OK**

1b TFEE and DFEE

Target Fabric Energy Efficiency (TFEE)	40.0 kWh/m²	
Dwelling Fabric Energy Efficiency (DFEE)	32.8 kWh/m²	
		OK

2 Fabric U-values

Element	Average	Highest	
External wall	0.15 (max. 0.30)	0.15 (max. 0.70)	**OK**
Party wall	0.00 (max. 0.20)	-	**OK**
Floor	0.13 (max. 0.25)	0.13 (max. 0.70)	**OK**
Roof	0.13 (max. 0.20)	0.15 (max. 0.35)	**OK**
Openings	1.24 (max. 2.00)	1.27 (max. 3.30)	**OK**

2a Thermal bridging

Thermal bridging calculated from linear thermal transmittances for each junction

3 Air permeability

Air permeability at 50 pascals	3.00 (design value)	
Maximum	10.0	**OK**

4 Heating efficiency

Main Heating system: Database: (rev 435, product index 017511):

Boiler systems with radiators or underfloor heating - mains gas
Brand name: Worcester
Model: Greenstar
Model qualifier: 28CDi Compact ErP (Combi)
Efficiency 89.8 % SEDBUK2009
Minimum 88.0 % **OK**

Secondary heating system: None

Regulations Compliance Report

5 Cylinder insulation

Hot water Storage:	No cylinder	

6 Controls

Space heating controls	Time and temperature zone control by device in database	OK
Hot water controls:	No cylinder	
	No cylinder	
Boiler interlock:	Yes	OK

7 Low energy lights

Percentage of fixed lights with low-energy fittings	100.0%	
Minimum	75.0%	OK

8 Mechanical ventilation

Continuous supply and extract system		
Specific fan power:	1	
Maximum	1.5	OK
MVHR efficiency:	86%	
Minimum	70%	OK

9 Summertime temperature

Overheating risk (Thames valley):	Slight	OK

Based on:

Overshading:	Average or unknown
Windows facing: West	1.08m²
Windows facing: South	3.78m²
Windows facing: South	1.08m²
Windows facing: South	2.16m²
Windows facing: North	1.08m²
Windows facing: North	2.04m²
Windows facing: North	1.08m²
Windows facing: North	1.08m²
Roof windows facing: South	1.08m²
Ventilation rate:	8.00
Blinds/curtains:	None
	Closed 100% of daylight hours

10 Key features

Air permeablility	3.0 m³/m²h
Doors U-value	1 W/m²K
Party Walls U-value	0 W/m²K
Photovoltaic array	

Regulations Compliance Report

Approved Document L1A, 2013 Edition, England assessed by Stroma FSAP 2012 program, Version: 1.0.4.16
Printed on 22 November 2018 at 12:49:01

Project Information:

Assessed By: ()

Building Type: End-terrace House

Dwelling Details:

NEW DWELLING DESIGN STAGE

Total Floor Area: 97.42m²

Site Reference : Clarion Richmond College

Plot Reference: Terrace 3 House 3B5P Type 37

Address : , London, TW2 7SJ

Client Details:

Name:

Address :

This report covers items included within the SAP calculations.
It is not a complete report of regulations compliance.

1a TER and DER

Fuel for main heating system: Mains gas
Fuel factor: 1.00 (mains gas)

Target Carbon Dioxide Emission Rate (TER)	17 kg/m²	
Dwelling Carbon Dioxide Emission Rate (DER)	11.21 kg/m²	**OK**

1b TFEE and DFEE

Target Fabric Energy Efficiency (TFEE)	48.7 kWh/m²	
Dwelling Fabric Energy Efficiency (DFEE)	41.0 kWh/m²	
		OK

2 Fabric U-values

Element	Average	Highest	
External wall	0.15 (max. 0.30)	0.15 (max. 0.70)	**OK**
Party wall	0.00 (max. 0.20)	-	**OK**
Floor	0.13 (max. 0.25)	0.13 (max. 0.70)	**OK**
Roof	0.13 (max. 0.20)	0.15 (max. 0.35)	**OK**
Openings	1.24 (max. 2.00)	1.27 (max. 3.30)	**OK**

2a Thermal bridging

Thermal bridging calculated from linear thermal transmittances for each junction

3 Air permeability

Air permeability at 50 pascals	3.00 (design value)	
Maximum	10.0	**OK**

4 Heating efficiency

Main Heating system: Database: (rev 435, product index 017511):
Boiler systems with radiators or underfloor heating - mains gas
Brand name: Worcester
Model: Greenstar
Model qualifier: 28CDi Compact ErP (Combi)
Efficiency 89.8 % SEDBUK2009
Minimum 88.0 % **OK**

Secondary heating system: None

Regulations Compliance Report

5 Cylinder insulation

Hot water Storage:	No cylinder	

6 Controls

Space heating controls	Time and temperature zone control by device in database	OK
Hot water controls:	No cylinder	
	No cylinder	
Boiler interlock:	Yes	OK

7 Low energy lights

Percentage of fixed lights with low-energy fittings	100.0%	
Minimum	75.0%	OK

8 Mechanical ventilation

Continuous supply and extract system		
Specific fan power:	0.77	
Maximum	1.5	OK
MVHR efficiency:	87%	
Minimum	70%	OK

9 Summertime temperature

Overheating risk (Thames valley):	Slight	OK

Based on:

Overshading:	Average or unknown
Windows facing: West	1.08m²
Windows facing: South	3.78m²
Windows facing: South	1.08m²
Windows facing: South	2.16m²
Windows facing: North	1.08m²
Windows facing: North	2.04m²
Windows facing: North	1.08m²
Windows facing: North	1.08m²
Roof windows facing: South	1.08m²
Ventilation rate:	8.00
Blinds/curtains:	None
	Closed 100% of daylight hours

10 Key features

Air permeablility	3.0 m³/m²h
Doors U-value	1 W/m²K
Party Walls U-value	0 W/m²K
Photovoltaic array	

Regulations Compliance Report

Approved Document L1A, 2013 Edition, England assessed by Stroma FSAP 2012 program, Version: 1.0.4.16
Printed on 22 November 2018 at 12:49:01

Project Information:

Assessed By: ()

Building Type: Mid-terrace House

Dwelling Details:

NEW DWELLING DESIGN STAGE

Total Floor Area: 97.42m²

Site Reference : Clarion Richmond College

Plot Reference: Terrace 3 House 3B5P Type 38

Address : , London, TW2 7SJ

Client Details:

Name:

Address :

This report covers items included within the SAP calculations.
It is not a complete report of regulations compliance.

1a TER and DER

Fuel for main heating system: Mains gas
Fuel factor: 1.00 (mains gas)

Target Carbon Dioxide Emission Rate (TER)	15.31 kg/m²	
Dwelling Carbon Dioxide Emission Rate (DER)	9.35 kg/m²	**OK**

1b TFEE and DFEE

Target Fabric Energy Efficiency (TFEE)	40.2 kWh/m²	
Dwelling Fabric Energy Efficiency (DFEE)	34.1 kWh/m²	
		OK

2 Fabric U-values

Element	Average	Highest	
External wall	0.15 (max. 0.30)	0.15 (max. 0.70)	**OK**
Party wall	0.00 (max. 0.20)	-	**OK**
Floor	0.13 (max. 0.25)	0.13 (max. 0.70)	**OK**
Roof	0.13 (max. 0.20)	0.15 (max. 0.35)	**OK**
Openings	1.24 (max. 2.00)	1.27 (max. 3.30)	**OK**

2a Thermal bridging

Thermal bridging calculated from linear thermal transmittances for each junction

3 Air permeability

Air permeability at 50 pascals	3.00 (design value)	
Maximum	10.0	**OK**

4 Heating efficiency

Main Heating system: Database: (rev 435, product index 017511):

Boiler systems with radiators or underfloor heating - mains gas
Brand name: Worcester
Model: Greenstar
Model qualifier: 28CDi Compact ErP (Combi)
Efficiency 89.8 % SEDBUK2009
Minimum 88.0 % **OK**

Secondary heating system: None

Regulations Compliance Report

5 Cylinder insulation

Hot water Storage:	No cylinder	

6 Controls

Space heating controls	Time and temperature zone control by device in database	OK
Hot water controls:	No cylinder	
	No cylinder	
Boiler interlock:	Yes	OK

7 Low energy lights

Percentage of fixed lights with low-energy fittings	100.0%	
Minimum	75.0%	OK

8 Mechanical ventilation

Continuous supply and extract system		
Specific fan power:	0.77	
Maximum	1.5	OK
MVHR efficiency:	87%	
Minimum	70%	OK

9 Summertime temperature

Overheating risk (Thames valley):	Slight	OK

Based on:

Overshading:	Average or unknown
Windows facing: West	1.08m²
Windows facing: South	3.78m²
Windows facing: South	1.08m²
Windows facing: South	2.16m²
Windows facing: North	1.08m²
Windows facing: North	2.04m²
Windows facing: North	1.08m²
Windows facing: North	1.08m²
Roof windows facing: South	1.08m²
Ventilation rate:	8.00
Blinds/curtains:	None
	Closed 100% of daylight hours

10 Key features

Air permeablility	3.0 m³/m²h
Doors U-value	1 W/m²K
Party Walls U-value	0 W/m²K
Photovoltaic array	