



BUILDING LIFE CYCLE REPORT

Proposed Mixed Use Residential Development at

Rosshill, Co.Galway

On Behalf of

Keagata Ltd.

18th December 2019

O'Neill | O'Malley

Architecture + Project Management
London • Galway

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1.0 INTRODUCTION AND OVERVIEW

1.1 Planning Policy Context

The Sustainable Urban Housing: Design Standards for New Apartments – Guidelines for Planning Authorities were published in March 2018. These Guidelines introduced a requirement to include details on the management and maintenance of apartment schemes. This is set out in Section 6.11 to 6.14 – “Operation & Management of Apartment Developments”, specifically Section 6.13. This Building Lifecycle Report sets out to address the requirements of Section 6.13 of the Apartment Guidelines 2018.

Section 6.13 of the Apartment Guidelines 2018 requires that apartment applications shall: “include a Building Lifecycle Report, which in turn includes an assessment of long term running and maintenance costs as they would apply on a per residential unit basis at the time of application.”

“demonstrate what measures have been specifically considered by the proposer to effectively manage and reduce costs for the benefit of residents.”

1.2 Site Location

The site is located to the east of Galway city and south of Merlin Park University Hospital and old Dublin road (the R338). The site is 5km by car from the Eyre square, the perceived centre of Galway City and 3.8km by car from Main street, Oranmore. The development site is accessed from the Rosshill Road just south of the existing railway bridge. The Rosshill Road can be accessed from the Old Dublin Road (R338) via a junction close to Galway Irish Crystal to the north and from the Coast Road serving Oranmore from the east.

The overall site measures approximately 10.069 hectares of which approximately 9.539 hectares are considered developable. The Galway to Dublin/ Limerick railway line bounds the site to the north. North of this Railway line a housing development of 16 houses is currently under construction (Galway City Pl reg.ref. 16/228). To the east of the site is Agricultural/ high amenity lands and beyond this are the Murrough Local Area Plan lands. To the west is what appears to be a family business unit and some one off houses following a typical ribbon development.

The South of the site is bounded mainly by undeveloped zoned low-density residential land. These lands are backed onto by ribbon development of one-off houses. To the southeast, close to the site is an orthogonal stone walled folly (Recorded monument GAO94-070). Adjoining this is a large dwelling which had been converted to several apartments. The site was previously a par 3 pitch & putt course. The newer landscaping and typography including bunkers and hillocks show evidence of this. Close to the centre of the site is an old farmstead in ruins. Vegetation has taken to allot of the farmstead ruins. To the central part of the farmstead a modern concrete apron & walls has been constructed for the use as a modern silage storage pit. The typology is generally flat except for falls in level forming a ridge generally running north to south, located to the west of the ruined farmstead. The eastern site boundary has extensive broadleaf trees as does some of the south boundary and part of the eastern boundary. A triangular copse of trees is located to the northeast but are of a low quality. It is proposed to maintain & enhance the best quality existing trees where possible.

1.3 Description for Proposed Development

The development will consist of 342 residential units comprising of 185 no. houses and 157 no. apartments broken down to:

- 002 no. 4-bedroom 2 storey detached dwellings
- 041 no. 4-bedroom 2 storey semi-detached dwellings
- 073 no. 3-bedroom 2 storey semi-detached dwellings
- 063 no. 3-bedroom 2 storey terraced dwellings
- 006 no. 2-bedroom 2 storey terraced dwellings
- 119 no. 2-bedroom apartments and
- 038 no. 1-bedroom apartments

The proposed development also includes a ground-floor community space, office, cafe and retail unit. A two-storey childcare facility. The provision of public realm landscaping including shared public open space and play areas, public art, public lighting, resident and visitor parking including car rental bays, electric vehicle charging points and bike rental spaces. Pedestrian, cyclist and vehicular links throughout the development. Access road and junction improvements at Rosshill Road/Old Dublin Road. Provision of all associated surface water and foul drainage services and connections including pumping station. All associated site works and ancillary services. A Natura Impact Statement (‘NIS’) and Environmental Impact Assessment Report (‘EIAR’) have been prepared and accompany the application. The application is also accompanied by a Statement of Material Contravention of the Development Plan.

2.0 Assessment of Long Term Running & Maintenance Costs

2.1 Owners Management Company and Property Management Company

The Owners Management Company will engage a suitably qualified Property Management Company at an early stage of the development to ensure that all property management functions are dealt with for the development and that the maintenance and running costs of the development's common areas are kept within agreed budgets. The Property Management Company will enter into a contract directly within the Owners Management Company (OMC) for the ongoing management of the completed development. The Property Management Company will use best practice policies and procedures to oversee the management of the entire development. The operation of a highly visible management regime is one of the key objectives of the development and is in line with good estate management practices. The Estate Director will be responsible for the overall management of the development and their key responsibilities will be; team management, health and safety, risk management, mobility management, implementation of estate policies and procedures, tenant management, security, cleaning and maintenance.

2.2 Property Management of Common Areas

The proposed development has been designed and configured to provide the occupants, residents and neighbors with generous communal facilities and social spaces within the development. The following is proposed:

- Landscaped communal central open spaces
- Secure bike spaces
- Commercial and residential refuse storage.

It is proposed that the maintenance of the development will be managed by a suitably qualified Maintenance Manager who will ensure that all maintenance works are undertaken in accordance with servicing requirements. It will be the responsibility of the Property Management company to ensure all maintenance works are undertaken when required and to the required standard.

1.2 Property Management Company (PMC)

The long-term running costs for residents and maintenance costs has been considered for the operators from the commencement of the design process, with the aim to manage and minimise potential unnecessarily high running costs for expenditure on a per residential unit basis. This exercise is a result of learning from previously undertaken residential projects and the application of changes in the standards arising from the new apartment guidelines. In this regard it is advised that when granting permission for such developments planning authorities attach appropriate planning conditions that require:

- Establishment of an Owners Management Company (OMC) and:
- Establishment and ongoing maintenance of a sinking fund commensurate with the facilities in a development that require ongoing maintenance and renewal.

Planning authorities should provide planning conditions for such developments which ensure the provision of appropriate management and maintenance structures.

1.3 Service Charge Budget

The property management company (PMC) has a number of key responsibilities for the development for agreement with the development owners. There would typically be a service charge budget in multi-unit developments to cover items such as cleaning, landscaping, refuse management, utility bills, insurance, maintenance of mechanical/electrical lifts/ life safety systems, security, property management fee, etc, to the development common areas.

1.4 Sinking Fund

It is expected that a sinking fund allowance will account for future major maintenance and upgrade costs. A 10 year Planned Preventative Maintenance (PPM) strategy will determine the level of sinking fund required.

3.0 Measures to Manage & Reduce Costs for Residents Benefit

MEASURES SPECIFICALLY CONSIDERED BY THE PROPOSER TO EFFECTIVELY MANAGE REDUCE / COSTS FOR THE BENEFIT OF RESIDENTS

Energy and Carbon Emissions

The following are low energy technologies that are being considered for the development and during the design stage of the development the specific combination from the list below will be decided on and then implemented to achieve a minimum of A2 BER Rating

Measure	Description	Benefit
BER Certificates	<p>A Building Energy Rating (BER) certificate will be provided for each dwelling Apartment unit in the proposed development which will provide detail of the energy performance of the dwellings. A BER is calculated through energy use for space and hot water heating, ventilation, and lighting and occupancy. It is proposed to target an A2/A3 rating for the apartments this will equate to the following emissions.</p> <p>A2 – 25-50 kwh/m2/yr with CO2 emissions circa 10kgCO2/m2 year A3 – 51-75 kwh/m2/yr with CO2 emissions circa 12kgCO2/m2 /year</p>	Higher BER ratings reduce energy consumption and running costs.
Fabric Energy Efficiency	<p>The U-values being investigated will be in line with the requirements set out by the current regulatory requirements of the Technical Guidance Documents Part L, titled “Conservation of Fuel and Energy Buildings other than Dwellings”.</p> <p>Thermal bridging at junctions between construction elements and at other locations will be minimised in accordance Paragraphs 1.2.4.2 and 1.2.4.3 within the Technical Guidance Documents Part L. See below Table 1 of Part L, Building Regulations.</p>	<p>Lower U-values and improved air tightness is being considered to help minimise heat losses through the building fabric and lead to lower energy consumption, thus minimising carbon emissions to the environment.</p>

Column 1 Fabric Elements	Column 2 Area-weighted Average Elemental U-Value (Um)	Column 3 Average Elemental U-value – individual element or section of element
Roofs		
Pitched roof		
- Insulation at ceiling	0.16	0.3
- Insulation on slope	0.16	
Flat roof	0.20	
Walls		
Ground floors ³	0.21	0.6
Other exposed floors	0.21	0.6
External doors, windows and rooflights	1.6 ⁴	3.0
Notes:		
1. The U-value includes the effect of unheated voids or other spaces.		
2. For alternative method of showing compliance see paragraph 1.3.2.3.		
3. For insulation of ground floors and exposed floors incorporating underfloor heating, see paragraph 1.3.2.2.		
4. Windows, doors and rooflights should have a maximum U-value of 1.6 W/m ² K when their combined area is 25% of floor area. However areas and U-values may be varied as set out in Table 2.		

Measure	Description	Benefit																														
NZEB and TGD Part L	<p>The NZEB “Nearly Zero Energy Buildings” directive in conjunction with the TGD Part L document sets out clearly that all new dwellings built in Ireland will comply with the following:</p> <ul style="list-style-type: none"> • A Maximum Permitted Energy Performance Coefficient (MPEPC) of no greater than 0.3 • A Maximum Permitted Carbon Performance Coefficient (MPCPC) of no greater than 0.35 <p>These changes apply to works, or buildings in which material alteration or change of use or major renovation takes place and came into effect on 1st April 2019.</p>	<table border="1"> <thead> <tr> <th>GD Part L - Dwellings</th> <th>2005</th> <th>2008</th> <th>2011</th> <th>2020</th> </tr> </thead> <tbody> <tr> <td>% Improvement</td> <td>Baseline</td> <td>40%</td> <td>60%</td> <td>NZEB 25%</td> </tr> <tr> <td>Primary Energy Consumption (kWh/m²/yr)</td> <td>150</td> <td>90</td> <td>60</td> <td>45</td> </tr> <tr> <td>Maximum Permitted Energy Performance Co-efficient (MPEPC)</td> <td></td> <td>0.6</td> <td>0.4</td> <td><u>0.30</u></td> </tr> <tr> <td>Maximum Permitted Carbon Performance Co-efficient (MPCPC)</td> <td></td> <td>0.69</td> <td>0.46</td> <td><u>0.35</u></td> </tr> <tr> <td>BER</td> <td>B3</td> <td>B1</td> <td>A3</td> <td>A2/A3</td> </tr> </tbody> </table>	GD Part L - Dwellings	2005	2008	2011	2020	% Improvement	Baseline	40%	60%	NZEB 25%	Primary Energy Consumption (kWh/m ² /yr)	150	90	60	45	Maximum Permitted Energy Performance Co-efficient (MPEPC)		0.6	0.4	<u>0.30</u>	Maximum Permitted Carbon Performance Co-efficient (MPCPC)		0.69	0.46	<u>0.35</u>	BER	B3	B1	A3	A2/A3
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External Lighting	<p>The proposed lighting scheme within the development consists of pole mounted fittings as indicated on the drawings. The luminaire selected is the Metro Streetlight 36w 16 LED 700mA 4000K Street Optic S fitting, this fitting was selected for the following reasons;</p> <ul style="list-style-type: none"> • Low level lighting • Minimal upward light spill • Low voltage LED lamps • Manufactured in Ireland <p>Each light fitting shall be controlled via an individual Photoelectric Control Unit (PECU). The operation of the lighting shall be on a dusk-dawn profile.</p>	<p>The site lighting has been designed to provide a safe environment for pedestrians, cyclists and moving vehicles, to deter anti-social behaviour and to limit the environmental impact of artificial lighting on existing flora and fauna in the area.</p> <p>Having PECU allows for the optimum operation of lighting which minimizes costs.</p>																														
Energy Labelled White Goods	<p>High standard white goods with high energy efficiency ratings will be supplied to all units. It is expected to install appliances of the following ratings:</p> <p>Oven – A+ Fridge Freezer – A+ Dishwasher – AAA Washer / Dryer – B</p>	<p>High energy rated appliances reduce the amount of electricity required for occupants</p>																														

Low-energy Technologies considered:

The following are Low energy technologies that are being considered for the development and during the design stage of the development the specific combination from the list below will be decided on and then implemented to achieve the A2/A3 BER Rating and NZEB compliance

Measure	Description	Benefit
Natural Ventilation	Natural ventilation is being evaluated as a ventilation strategy to minimise energy usage and noise levels.	The main advantages of natural ventilation are: <ul style="list-style-type: none"> • Low noise impact for occupants and adjacent units. • Completely passive therefore no energy required with associated. • Minimal maintenance required. • Reduced environmental impact as minimal equipment disposal over life cycle. • Full fresh air resulting in healthier indoor environment.
Mechanical Ventilation Heat Recovery	Mechanical heat recovery ventilation will be considered to provide ventilation with low energy usage.	Mechanical Heat Recovery Ventilation provides ventilation with low energy usage. The MVHR reduces overall energy and ensures a continuous fresh clean air supply.
Air to water Heat Pumps	An air to water heat pump is being considered to provide space heating and domestic hot water. An air source heat pump is a system which transfers heat from outside to inside a building.	The air to water heat pump can absorb heat from outside air and release it inside the building, via radiators, underfloor heating and/or domestic hot water supply. Air source heat pumps use electrical energy from the grid to drive the refrigerant cycle but do so extremely efficiently. Modern heat pumps will typically provide 4 to 5 times more heat energy to the dwelling than the electrical energy they consume.
Exhaust Air Heat Pumps	For the Apartments, an exhaust air heat pump is being considered to provide mechanical ventilation, space heating and domestic hot water. An exhaust air heat pump (EAHP) extracts heat from the building and transfers the heat to the supply air, domestic hot water and/or space heating system (underfloor heating / radiators).	Exhaust Air Heat Pumps allows you reuse energy already available in the property.
PV Solar Panels	PV Solar Panels are being considered which converts the electricity produced by the PV system (which is DC) into AC electricity. The panels are typically placed on the South facing side of the building for maximum heat gain and in some instances, can also be used to assist the heating system.	PV Solar Panels offer the benefit of reducing fossil fuel consumption and carbon emissions to the environment. They also reduce the overall requirement to purchase electricity from the grid.
Combined Heat and Power	Combined Heat and Power, (CHP), is a technology being evaluated. This technology generates electricity and captures the waste heat from the generation unit that can be used within the development.	CHP can achieve energy efficiencies by reusing waste heat from the unit to generate heat required for space heating and domestic hot water services in the apartment developments. As electricity from CHP is both generated and consumed onsite, this also eliminates energy losses from transmission of the electricity
ECAR Charging Points	Provision for the installation of a fully functional electric vehicle charging point will be provided in the apartment blocks as agreed with the management company	Providing the option of E-car charging points will allow occupants to avail of the ever-improving efficient electric car technologies.

Materials:

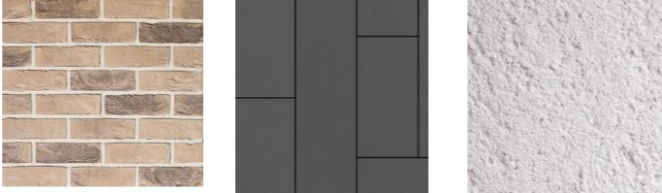
Building Design

Implementation of the Design and Material principles to the design of building position, internal layouts, facades and detailing has informed the materiality of the proposed development. The proposed envelope of the buildings is brick and render, with aluminium double-glazed windows. Based on comparison with similar schemes developed, the proposed materials are durable and would not require regular replacement or maintenance. To improve on building standards there has been an increase in the expected build cost. Materials have been selected with a view to longevity, durability and low maintenance. Consideration has been given to Building Regulations and includes reference to BS 7543:2015 'Guide to Durability of Buildings and Building elements, Products and Components'.

It is expected that a sinking fund allowance will account for future major maintenance and upgrade costs. A 10 year Planned Preventative Maintenance (PPM) strategy will determine the level of sinking fund required. All proposed buildings are designed in accordance with the Building Regulations, in particular Part D 'Materials and Workmanship', which includes all elements of the construction. The Design Principles and Specification are applied to both the apartment units and the common parts of the building and specific measures taken include:

Measure Description	Benefit
Daylighting to units	Where possible, as outlined in 'Sustainable Urban Housing: Design Standards for New Apartments Guidelines for Planning Authorities (March 2018)' to have regard for quantitative performance approaches to daylight provisions 'outlined in guides like the BRE guide 'Site Layout Planning for Daylight and Sunlight' (2nd edition) or BS 8206-2: 2008 – 'Lighting for Buildings – Part 2: Code of Practice for Daylighting' when undertaken by development proposers which offer the capability to satisfy minimum standards of daylight provision'. This Reduces the requirement for continuous daylighting, thus reducing the expense of artificial lighting
Openable window sections are provided to all stair cores within the development providing natural daylight to circulation areas.	Avoids the requirement for continuous artificial lighting
Openable window sections are provided to all stair cores within the development providing Natural/Passive ventilation to common circulation areas.	Openable window sections are provided to all stair cores within the development providing natural daylight and ventilation throughout all common areas. Avoids costly mechanical ventilation systems and associated maintenance and future replacement.
External paved and landscaped areas	All these require low / minimal maintenance

Material Specification

Measure Description		Benefit
<p>Consideration is given to the requirements of the Building Regulations and includes reference to BS 7543:2015, 'Guide to Durability of Buildings and Building elements, Products and Components', which provides guidance on the durability, design life and predicted service life of buildings and their parts. All common parts of the proposed Apartment buildings and, the durability and performance of these are designed and specified in accordance with Figure 4; Phases of the Life Cycle of BS7543; 2015. (Please see Appendix B for this figure). The common parts are designed to incorporate the guidance, best practice principles and mitigations of Annexes of BS 7543: 2015 including:</p> <p>Annex A Climatic Agents affecting Durability Annex B Guidance on materials and durability Annex C Examples of UK material or component failures Annex D Design Life Data sheets</p>		<p>Ensures that the long-term durability and maintenance of Materials is an integral part of the Design and Specification of the proposed development.</p>
Measure Description		Benefit
<p>The architectural approach to the scheme proposed the extensive use of robust materials of brickwork and render to the building envelope.</p> <p>Use of brickwork, fibre cement cladding and sand / cement render systems to envelope.</p>		<p>These robust traditional materials will require minimal on-going maintenance and have a long life-cycle expectancy.</p>
Measure Description		Benefit
<p>Use of factory finished and Alu-clad windows and doors, and powder coated steel balconies</p>		<p>Requires no on-going maintenance.</p>
<p>Factory Finished Balcony balustrades and railings to be powder coated</p>		<p>Requires minimal maintenance and does not require regular replacement</p>

Landscape

Measure	Description	Benefit
Site Planning	<p>The landscape strategy aims to integrate the proposed residential development with the existing landscape and create a network of attractive and useable open spaces while contributing to local biodiversity. Open spaces offer the opportunity for meeting, walking and formal and informal play. Pedestrian circulation routes are prioritized throughout the site.</p>	<p>Well-designed path networks support long term maintenance of lawn, wildflower and planting areas by reducing desire lines and man-made tracks</p>
Retaining Existing Landscape	<p>Existing native hedgerow and trees of good health and importance to green infrastructure links are to be retained.</p>	<p>Provides the scheme with high quality and robust landscape features. Improves local biodiversity which helps growth of new planting.</p>

Materials	Use of low maintenance surface materials such as in situ concrete. Feature paving limited to seating areas, robust and durable paving used. Similarly, robust street furniture used throughout open spaces. A preference for natural play equipment where possible.	Robust materials provide more durability and longevity to the open spaces, while the appearance of the space is more harmonious with a landscape.
Planting details	Woodland planting and wildflower used along edges and boundaries. Open lawn areas provided. Planting selected to be suited to Irish climatic and specific site conditions.	Woodland and wildflower reduce maintenance operations. Areas of open lawn provide natural attenuation areas. Correct planting procedures ensure longevity to planting scheme.

Waste Management

The following measures illustrate the intentions for the management of Waste

Measure	Description	Benefit
Construction and Demolition Waste Management Plan	The final application will be accompanied by a Construction and Demolition Waste Management Plan.	Will demonstrate how construction & demolition waste will be managed to maximise recycling and reuse rates, while minimising waste for disposal to landfill.
Operational Waste Management Plan	The final application will be accompanied by an Operational Waste Management Plan	Will demonstrate how construction & demolition waste will be managed to maximise recycling and reuse rates, while minimising waste for disposal to landfill.
Storage of Non-Recyclable Waste and Recyclable Household Waste	Domestic waste management strategy: 1) Grey, Brown and Green bin distinction 2) Competitive tender for waste management collection	Helps reduce potential waste charges.
Composting	Brown Bins	Helps reduce potential waste charges.

Human Health & Well Being

The following measures illustrate the intentions for the management of Waste

Measure	Description	Benefit
Natural / Day Light	The design, separation distances and layout of the apartment blocks have been designed to optimize the ingress of natural daylight/ sunlight to the proposed dwellings to provide good levels of natural light.	Reduces reliance on artificial lighting thereby reducing costs.
Accessibility	All units will comply with the requirements of Part M/K.	Reduces the level of adaptation, and associated costs, potentially necessitated by residents' future circumstances.
Security	Passive surveillance is incorporated into the design	Help to reduce potential security/management costs.
Natural Amenity	Provision of both internal and external public / communal amenity space	Facilitates community interaction, socialising and play – resulting in improved wellbeing
Private Open Space	Provision of private open space	Facilitates interaction with outdoors

Transport & Accessibility

Transport considerations for increasing the update of the use of public transport, cycling and walking and reducing the ownership of private cars and reducing oil dependency:

Measure	Description	Benefit
Access to Public Transport	BUS ROUTES 404 & 409 1.1 km distance from the proposed development (12min.walk time)	Availability, proximity to quality bus routes reduces the reliance on private motor
Pedestrian Permeability	Provision of dedicated pedestrian and cycle infrastructure within the site	Ensures long term attractiveness of walking, and cycling to a range of local facilities
Bicycle Storage	741 no. bicycle parking spaces are provided within the scheme. This is in line with the new apartment guidelines requirements and promotes sustainable transport modes.	Accommodates the uptake of cycling and reduces the reliance on the private motor vehicle

Bike storage management

There is a large provision of 741 for bicycle storage spaces within the scheme. The management of how these are stored is key to maximising the use of bicycles and the safe storage of these. There will be a combination of storage types ranging from publicly available Sheffield stand types to more secure bicycle storage buildings. Each system will be carefully chosen and set out through consultation between the design team members to ensure the best system is used in the best and most practical locations.

Appendix A

ITEMS INCLUDED IN A TYPICAL BUILDING INVESTMENT FUND (SINKING FUND)

The BIF Table below illustrates what would be incorporated for the calculation of a Sinking Fund

Ref	Element	Life Expectancy (Years)
1.00	Roofs	
1.01	Replacement felt roof covering incl. insulation to main roofs	18
1.02	Replacement parapet, fascia details	18
1.03	Replace roof access hatches	25
1.04	Specialist Roof Systems Fall arrest	25
2.00	Elevations	
2.01	Repair of render areas	18
2.02	Replace rainwater goods	25
2.03	Recoat powder coated finishes to balconies	20
2.04	Periodic replacement and overhauling of external fixings	5
3.00	External Areas	
3.01	External handrails & guards	18
3.02	Surface finishes	18
3.03	Check drains for accumulation of debris and other sediments	6
3.04	Repaint parking spaces and numbering	7
4.00	M&E Services	
4.01	Central boilers	12
4.02	CHP Engine	12
4.03	Circulation pumps	15
4.04	HIU Apartment Heat Exchange	10
4.05	Exhaust Air Heat Pump	10
4.06	Replace internal light fittings	18
4.07	Replace smoke detectors	18
4.08	Replace manual break glass units	18
4.09	Replace fire alarm panel	18
4.10	Replace security access control installation	15
4.11	External mains water connection	20
4.12	Electrical mains and sub mains distribution	20
4.13	Emergency lighting	20
5.00	Stairwells & lobbies	
5.01	Decorate ceilings and walls	2
5.02	Decorate joinery	2
5.03	Replace fire doors	25
5.04	Replace floor finishes	10
5.05	Replace entrance mats	10
5.06	Replace nosing's	10
5.07	Replace ceramic door tiles	20
5.08	Fixed furniture & equipment	18

Appendix B

Table 1 Maximum elemental U-value ¹ (W/m ² K)		
Column 1 Fabric Elements	Column 2 Area – weighted Average Elemental U-Value (U _m)	Column 3 Average Elemental U-value Individual element or section of element
Roofs ² Pitched roof - Insulation at ceiling - Insulation on slope	0.16 0.16	0.3
Flat roof	0.20	
Walls ²	0.21	0.6
Ground Floors ^{2,3}	0.21	0.6
Other exposed floors ²	0.21	0.6
External personnel doors, windows ⁴ and rooflights ⁶	1.6 ⁵	3.0
Curtain Walling	1.8	3.0
Vehicle access and similar large doors	1.5	3.0
High usage entrance door ⁷	3.0	3.0
Swimming Pool Basin ⁸	0.25	0.6
<p>Notes:</p> <ol style="list-style-type: none"> The U-value includes the effect of unheated voids or other spaces. Reasonable provision would also be achieved if the total heat loss through the roof, wall and floor elements did not exceed that which would be the case if each of the area weighted average U-value (U_m) for these elements set out in Column 2 were achieved individually. Where the source of space heating is underfloor heating, a floor U-value of 0.15 W/m²K should generally be satisfactory. Excludes display windows and similar glazing but their impact on overall performance must be taken into account in EPC and CPC calculation. In buildings with high internal heat gains a less demanding area-weighted average U-Value for the glazing may be an appropriate way of reducing overall primary energy and CO₂ emissions. Where this can be shown then the average U-value for windows can be relaxed from the values given above. However values should be no worse than 2.2 W/m²K. This is the overall U-value including the frame and edge effects, and it relates to the performance of the unit in the vertical plane so, for roof-lights, it must be adjusted for the slope of the roof as described in Sect 11.1 of BR 443 High Usage Entrance door means a door to an entrance primarily for the use of people that is expected to experience larger volumes of traffic, and where robustness and/or powered operation is the main performance requirement. To qualify as a high-usage entrance door the door should be equipped with automatic closers and except where operational requirements preclude it, be protected by a lobby. Where a swimming pool is constructed as part of a new building, reasonable provision should be made to limit heat loss from the pool basin by achieving a U Value no worse than 0.25 W/m²K as calculated according to BS EN 13370 		

Figure 1- TGD Part L Conservation of Fuel & Energy – Buildings other than Dwellings 2017, Table 1

Appendix C

Phases of the Life Cycle of BS 7543 2015

Building Assessment Information														
Building Life Cycle Information												Supplementary Information beyond the Building Life Cycle		
A1-A3			A4-A5		B1-B7					C1-C4				D
PRODUCT stage			CONSTRUCTION PROCESS stage		USE stage					END OF LIFE stage				Benefits and loads beyond the system boundary
A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	C1	C2	C3	C4	
Raw material supply	Transport	Manufacturing	Transport	Construction-installation process	Use	Maintenance	Repair	Replacement	Refurbishment	Deconstruction Demolition	Transport	Waste Processing	Disposal	Reuse-Recovery-Recycling-Potential
			scenario	scenario	scenario	scenario	scenario	scenario	scenario	scenario	scenario	scenario	scenario	
					B6 Operational energy use									
					scenario									
					B7 Operational water use									
					scenario									

Key

1. Highest severity of consequence of failure
2. Anticipated severity of consequence of failure
3. Lowest severity of consequence of failure
4. Minimum service life
5. Most likely service life
6. Maximum service life