Dundrum Village Strategic Housing Development
Public Lighting Design Report

RE: DUNDRUM VILLAGE

STRATEGIC HOUSING DEVELOPMENT (SHD)

APPLICANT: Dundrum Retail GP DAC

(Acting for and on behalf of Dundrum Retail Limited Partnership)

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1. INTRODUCTION

This report outlines the external lighting design strategy proposed for the new Dundrum Village Strategic Housing Development (SHD), Main Street, Dundrum, Dublin 14.

The development comprises 11no. Urban blocks arranged around the central pedestrian spine and a series of 4 courtyards corresponding to 4 separate "zones" or character areas. The buildings range in height from 4-5 storeys on Main Street to 9-16 storeys to the Dundrum Bypass. The development will consist of c. 881no. Residential units. This development also includes a food store, retail, café/restaurant and a crèche are at ground floor level, fronting Main Street, as detailed in the Schedule of Accommodation included with this submission. The development will include the demolition of all existing structures on the site with the exception of No.'s 1-3 Glenville Terrace which will be refurbished. Vehicular and cycle parking is provided below podium with visitor cycle parking spaces in the public realm. Vehicular access to serve the proposed development will be provided via Dundrum Bypass. The existing vehicular entrance on Main Street will be closed. Pedestrian connections and linkages are proposed through the site, forming connections that are not currently possible from within the site to Main Street; to the south via Church Square and Dom Marmion Bridge; and west via the proposed new Sweetmount Bridge connecting Main Street to the residential communities west of the Bypass.

The new lighting design shall:

- Promote easy movement of pedestrians and cyclists, provide a general feeling of security and wellbeing.
- Promote easy access to dwellings and car parks, provide a general feeling of security and wellbeing.
- Create an inviting and attractive night time environment that encourages people to visit and make use of the facilities.
- Be robust, low energy and maintainable.
- Be sensitive to light pollution.

All public lighting design shall be integrated with, and co-ordinated with the Civil Engineering underground services proposals and the Landscape Architect's proposal.

The illumination from the existing street lighting along the By-Pass and on Dundrum Main Street will be included in the new external lighting design for these spaces. The new lighting in the internal courtyards and walkways will generally comprise a combination of 4-metres column mounted and low-level bollard type LED fittings.

Any new lighting along taken-in-charge public areas shall also be taken-in-charge by DLRCC at completion.

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2. ILLUMINATION LEVELS

The proposed Public Lighting design has been developed in accordance with a number of different standards and codes of practise, including BS 5489:2020, BS EN 13201:2015, and local County Council specific road lighting guidelines. All new lighting installations shall also comply with the National Rules for Electrical Installations IS 10101 and ESB National Code of Practice for Customer Interface.

The SLL (Society of Light and Lighting) have developed a Lighting Handbook in order to consolidate the various standards and codes of practise into one physical document.

BDP have developed and refined our designs in accordance with this publication. SLL Lighting Handbook contains the following recommendations with respect to light levels appropriate to an external environment.

Ref No.	Type of area, task or activity	$\bar{E}_m$ / lx	U_o	GR_L	R_a	Remarks
3.5.1	*Walkways exclusively for pedestrians*	*5*	*0.25*	*50*	*20*	Where there are other hazards present higher values of $\bar{E}_m$ are required. For example in water and sewerage treatment works 20 lx, on building sites 20–50 lx and in petroleum and chemical works 50 lx
3.5.2	*Traffic areas for slowly moving vehicles (max. 10 km/h), e.g. bicycles, trucks and excavators*	*10*	*0.40*	*50*	*20*	
3.5.3	*Regular vehicle traffic (max. 40 km/h)*	*20*	*0.40*	*45*	*20*	*At shipyards and in docks, GR_L may be 50*
3.5.4	*Pedestrian passages, vehicle turning, loading and unloading points*	*50*	*0.40*	*50*	*20*	For reading labels and signs: $\bar{E}_m$ 50 lx

BS 5489: 2020 further refines the above by describing illumination requirements associated typical town centre roads.

Road Type	Lighting Class	Maintained Average Illuminance	Maintained Minimum Illuminance	Uniformity
Secondary Roads Where: • Traffic Usage is likely to be moderate Pedestrian & cyclist walkways: • Usage is likely to be high & slow moving traffic is expected.	C4 P4	10.00 5.0	7.5 2.0	0.4 0.25

In order to achieve the above requirements, the proposed LED luminaires have been spaced between 20-25 meters apart for the 6.0 m hinged street lamps on the access road to the basement car parks and 10-15 meters for the 4.0 m urban lamps for the pedestrian walkways. Bollard LED lights have been also selected to light up the green areas adjacent to the residential buildings. This is dependent on a number of factors including overshadow from foliage, street orientation, junction location and pedestrian crossing locations.

For the Amenity areas, more flexibility may be provided in the design, which may incorporate features such as CCTV, device charging, or Wi-Fi incorporated into lighting poles to integrate with the street furniture.

3. LUMINAIRES

The proposed luminaires EX2 type on the back road giving access to the car parks shall consist of IP66, robust 6.0-metre high column mounted high specification LED luminaires, with carefully controlled optics to focus the light where required and to allow dimming.

EX1 type Urban style luminaries are proposed for pedestrian and cycle ways, these shall consist of IP66, 6.0-metre high column mounted high specification LED luminaires, with controlled optics to focus the light where required and to allow dimming.

LED light Bollard are to be employed on the green areas accessing the apartment blocks to minimise the spill of light towards the buildings. These luminaires shall consist of IP66, 0.9-metre bollard LED luminaires, with controlled optics and to allow dimming.

L1 type linear LED Luminaires Incorporated into Handrail will be incorporated on pedestrian bridges and stairways.

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4. LIGHT POLLUTION

Light intensity and distribution has been carefully considered to ensure that upward light spill is minimised and that light distribution cut-offs from luminaires do not result in severe light trespass either onto the water or into the sky.

Luminaires, lamps, optics and equipment shall be specified and located to minimise any unnecessary indirect upward light component in order to reduce light pollution. In addition light trespass and light spill will be, wherever possible, prevented. It is the intention for the new installation to minimise any light ingress.

Key Considerations:

The following steps have been undertaken to keep light pollution and effects of external lighting on the environment to the minimum:

- Where applicable mounting heights will be set at a uniform height to maintain consistency in light levels though out the design.
- The use of uplight will be contained to key features only, and focused such as to have as little impact on the sky as possible.
- Restrict lighting to ensure there are dark areas. Light is only provided where required along circulation routes.
- Only luminaires with flat glass protectors will be provided to restrict light being directed at a greater angle than 70 degrees from the vertical plane.
- Minimal and simple light fittings will be used for a pleasing day and night time aesthetic. This has an important implication in terms of how well the lighting is received by users.
- Low level lighting will be either recessed or use appropriate glare shielding to minimise light source visibility.
- Over-lighting: This is avoided by designing to the minimum levels prescribed in the codes and standards, whilst maintaining safety and carefully selecting the most appropriate lighting equipment and lamp types.
- Luminaires will be specified for their photometric performance, with suitable distribution, efficiency and appropriate glare control (louvres, cowls or glare shields) for effective illumination of a particular task or space.
- Lamp selection will be determined by luminous output, longevity, colour appearance, colour stability and colour rendering (Ra>80).

Only manufacturers of quality LEDs, produced by well known, industry respected manufacturers will be specified.

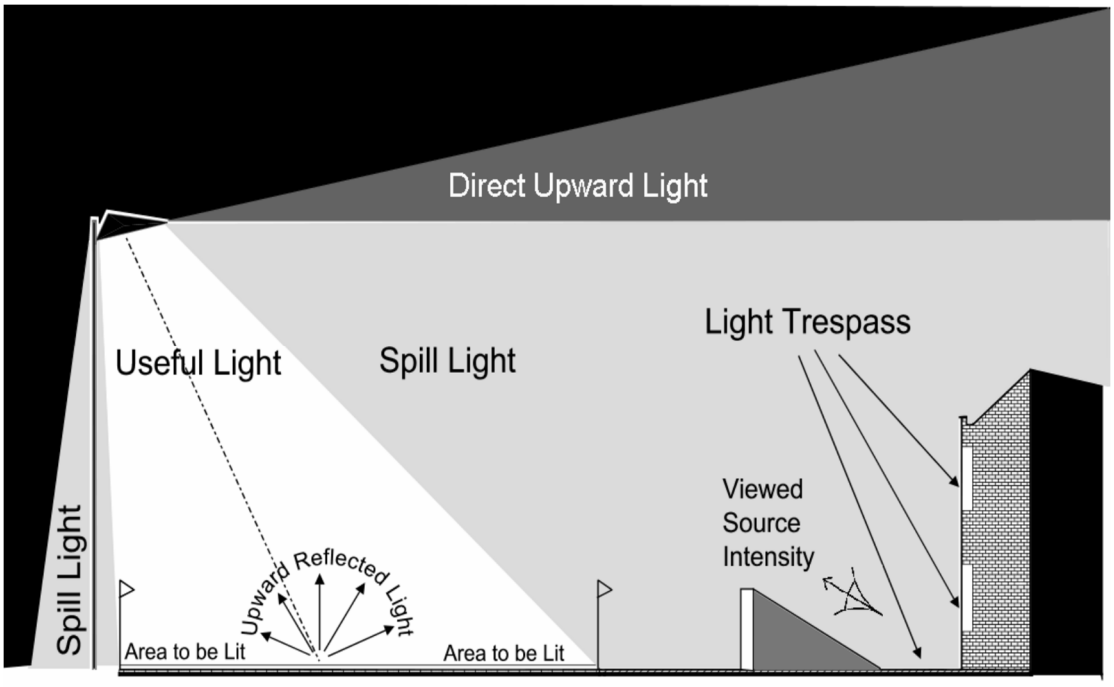

Fig 1. ILP GN01:2011 - Guidance Notes for the Reduction of Obtrusive Light

5. ECOLOGY

As detailed within the Biodiversity chapter of the EIAR; due to the suburban nature of the site, the only habitats identified within the proposed development were buildings and artificial surfaces with small isolated areas of ornamental/non-native scrub growing. As these areas have little to no ecological value due to the lack of vegetation and urbanised environment, the habitats within the proposed development site are valued as being of local importance (lower value).

All lighting shall be designed to minimise light pollution. By minimising light spill we will ensure that any impact on surrounding wildlife habitats is mitigated.

These may include, but are not limited to, the review of the following:

- Type of light source
- Colour Temperature
- Height of the lighting
- Light levels (Should be a maximum of 3.0 lux)
- Time of lighting

LED lighting is available in a number of colour temperatures. Older installations tend to use ‘cool white’ (blueish colour) at 5700°Kelvin. More recently, 4000°K has become more commonly used. ‘Warm white’ (more yellow/orange colour) at around 3000°K and as low as 2700°K can now be used with little reduction in lumen output. LED typically features no UV component and research indicates that while lower UV components attract fewer invertebrates, warmer colour temperatures with peak wavelengths greater than 550nm (~3000°K) cause less impact on bats (Stone, 2012, 2015a, 2015b).

The above considerations are in line with the Bats & Lighting Guidance Notes for Planners, Engineers, Architects and Developers December 2010.

6. ENERGY SAVING

Energy saving in the form of dimming shall also be incorporated to reduce the lighting intensity during periods when there is little pedestrian or vehicular movement. Ever-improving technology has allowed for more flexibility in the variation of lighting level dependant on usage at any one time. As the usage is reduced, typically the lighting level can be reduced, unless there are over-riding reasons not to do so (such as high accident rate or crime rate).

Dimming will be incorporated to provide the correct lighting class to meet the specific road parameters at a particular time to reduce light intrusion, light pollution, electricity consumption and carbon emissions.

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7. DIALUX CALCULATIONS