

BUILDINGS AND BUILT ENVIRONMENT

Liberty Care Developments Ltd
Yew Tree Care Home
Northern Moor
Lighting Impact Assessment

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Yew Tree Care Home
Northern Moor
Lighting Impact Assessment

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June 2022

DOCUMENT ISSUE RECORD

Document Number:	YTCH-BWB-00-XX-RP-E-0001_LIA
BWB Reference:	220454_LIA

Revision	Date of Issue	Status	Author:	Checked:	Approved:
P1	27/06/2022	S2	Danny Alasfar	Peter Leonard	Peter Leonard

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1. INTRODUCTION

Instruction

- 1.1 BWB Consulting Limited (BWB) was instructed by Liberty Care Developments Ltd (the Client) to undertake a lighting impact assessment to support a full planning application for the demolition of existing buildings and structures and the construction of a new care home facility including basement, access, landscaping and associated infrastructure in Northern Moor, Manchester ('the Site').

Proposed Development

- 1.2 The Proposed Development Masterplan is included within **Appendix 1**.

Objectives

- 1.3 This report has been produced to identify the proposed lighting strategy and subsequent impact of the external lighting installation on the existing site environment and the wider locality.
- 1.4 A lighting installation is required to enable users to operate safely and reduce the fear of crime. Lighting is needed for both pedestrians and vehicle drivers. For pedestrians, lighting for good viewing conditions and avoidance of dark areas is necessary. For vehicle drivers the emphasis is on good lighting for vehicle movement and use of roads.
- 1.5 This report reviews the potential effects of new lighting and reviews methods of lighting the proposed external areas while limiting potentially obtrusive effects to receptors that may have a negative response to a change in their lighting condition. Nearby residential properties and wildlife / habitat which are found on, near or utilising the site are typical receptors considered for analysis.

Scope of Works

- 1.6 The Scope of work includes:
- Identification and assessment of receptors and their sensitivity.
 - Identification of required / anticipated lighting provisions for the proposed development; and
 - Assessment of the potential effects created by a new lighting strategy with respect to the baseline condition.

2. RELEVANT POLICY AND GUIDANCE

International guidance

Commission Internationale De L'Eclairage (CIE 150)

- 2.1 The purpose of this guide is to help formulate guidelines for assessing the environmental effects of outdoor lighting and to give recommended limits for relevant lighting parameters to contain the obtrusive effects of outdoor lighting within tolerable levels. As the obtrusive effects of outdoor lighting are best controlled initially by appropriate design, the guidance given is primarily applicable to new installations; however, some advice is also provided on remedial measures which may be taken for existing installations. This guide refers to the potentially adverse effects of outdoor lighting on both natural and man-made environments for people in most aspects of daily life, from residents, sightseers, transport users to environmentalists and astronomers.

Guidelines for Minimising Sky Glow (CIE 126)

- 2.2 These guidelines prepared by Commission Internationale De L'Eclairage provide general guidance for lighting designers and policy makers on the reduction of sky glow. The report gives recommendations about maximum permissible values for lighting installations. These values must be regarded as limiting values. Lighting designers should seek to meet the lowest specifications for the design. Other uses of the open air areas at night will usually result in less stringent sky-glow requirements. Practical implementation of the general guidance is left to National Regulations.

National guidance

National Planning Policy Framework (2021)

- 2.3 The Revised National Planning Policy Framework (NPPF) provides guidance relating to planning and pollution control for new development in England. The purpose of the planning system is to contribute to achievement of sustainable development. In relation to lighting, Paragraph 185 states: "Planning policies and decisions should also ensure that new development is appropriate for its location taking into account the likely effects (including cumulative effects) of pollution on health, living conditions and the natural environment, as well as the potential sensitivity of the site or the wider area to impacts that could arise from the development. In doing so they should: c) limit the impact of light pollution from artificial light on local amenity, intrinsically dark landscapes and nature conservation"

DEFRA's Lighting in the Countryside: Towards Good Practice (2001)

- 2.4 The Office of the Deputy Prime Minister (ODPM – now Department for Communities and Local Government) in conjunction with the Countryside Commission published 'Lighting in the Countryside: Towards Good Practice' in July 1997, and a revised issue in 2001. The guidance was developed to 'provide practical advice on the prevention and control of lighting effects through appropriate action by all those involved with lighting in the countryside'. Its objective is 'to identify good practice in the planning and design of lighting in rural areas; and advise on how it can be achieved, using case study examples'. The guide aims to provide an overview and common understanding of all aspects of good lighting practice stating that close co-operation and participation is

required for all those involved in planning, designing and installing lighting schemes. The guidance provides valuable information on lighting best practice and the standard methodology outlined in this guidance document has been followed as part of this assessment. Whilst the guidance relates to 'lighting in the countryside', it is considered best practice to adopt many of the principles contained within the guidance to sites of a more urban nature.

Institute of Lighting Professionals (ILP) Guidance Notes for the Reduction of Obtrusive Light (2021)

- 2.5 The ILP has proposed lighting guidance and criteria for local authorities with a recommendation that they are incorporated at the local plan level. The guidance defines various forms of light pollution and describes a series of environmental zones (similar to the CIE 150 environmental zones). The ILP guidance provides suitable criteria against which the effects of artificial lighting can be assessed and is used in this assessment.
- 2.6 The ILP Guidance Notes recommends that the immediate environment is classified systematically as shown in **Table 1**. ILP Guidance Notes then make recommendations for limiting obtrusive light according to the environmental zone in which the lighting would be situated. The stringency depends on the capacity to absorb lighting effects, with Zone E0 requiring the strictest level of control and E4 the lowest.

Table 1. Environmental Zones

Zone	Surrounding	Lighting Environment	Examples
E0	Protected	Dark	UNESCO Starlight Reserves, IDA Dark Sky Parks
E1	Natural	Intrinsically dark	National Parks, Areas of Outstanding Natural Beauty etc
E2	Rural	Low district brightness	Village or relatively dark outer suburban locations
E3	Suburban	Medium district brightness	Small town centres or suburban locations
E4	Urban	High district brightness	Town/city centres with high levels of night- time activity

- 2.7 For each Environmental Zone, recommended obtrusive light limits for exterior lighting installations have also been determined. These are summarised in **Table 2**.

Table 2. Obtrusive Light Limitations for Exterior Lighting Installations

Light Technical Parameter	Application Conditions	Environmental Zones				
		E0	E1	E2	E3	E4
Illuminance in the vertical plane (E _v)	Pre-curfew	n/a	2 lx	5 lx	10 lx	25 lx
	Post-curfew	n/a	<0.1 lx	1 lx	2 lx	5 lx
Upward light ratio (ULR) %		0	0	2.5	5	15

Institute of Lighting Professionals (ILP) BCT Guidance Note 08 for Bats and artificial lighting in the UK (2018)

- 2.8 This document is aimed at lighting professionals, lighting designers, planning officers, developers, bat workers/ecologists and anyone specifying lighting. It is intended to raise awareness of the impacts of artificial lighting on bats, and mitigation is suggested for various scenarios.
- 2.9 The Guidance Note provides recommendations for appropriate external lighting specification:
- All luminaires should lack UV elements when manufactured. Metal halide, fluorescent sources should not be used.
 - LED luminaires should be used where possible due to their sharp cut-off, lower intensity, good colour rendition and dimming capability.
 - A warm white spectrum (ideally <2700 Kelvin) should be adopted to reduce blue light component.
 - Luminaires should feature peak wavelengths higher than 550nm to avoid the component of light most disturbing to bats.
 - Column heights should be carefully considered to minimise light spill.
 - Only luminaires with an upward light ratio of 0% and with good optical control should be used.
 - Luminaires should always be mounted on the horizontal, ie no upward tilt.
 - As a last resort, accessories such as baffles, hoods or louvres can be used to reduce light spill and direct it only to where it is needed.

British Standards

BS EN 12464-2: Lighting of Workplaces, Outdoor Workplaces (2014)

- 2.10 This standard specifies requirements for lighting of tasks in most outdoor work places and their associated area in terms of quantity and quality of illumination. In addition, recommendations are given for good lighting practice. This standard includes important recommendations on how obtrusive light can be limited to keep night skies free of light pollution.

Local guidance

Manchester City Council: Core Strategy Development Plan (Adopted 2012)

- 2.11 The Core Strategy was adopted by Manchester City Council on 11th July 2012. It is the key document in Manchester's Local Development Framework and covers a period of 15 years from 2012 to 2027. It describes Manchester today and outlines the Council's vision for Manchester in 2027 along with the planning policies which will be used to deliver that vision.
- 2.12 Policy DM 1 is in relation to Development Management and states the following with relevance to external lighting:
- All development should have regard to the following specific issues for which more detailed guidance may be given within a supplementary planning document:-
 - Appropriate siting, layout, scale, form, massing, materials and detail.
 - Impact on the surrounding areas in terms of the design, scale and appearance of the proposed development. Development should have regard to the character of the surrounding area.
 - Effects on amenity, including privacy, light, noise, vibration, air quality, odours, litter, vermin, birds, road safety and traffic generation. This could also include proposals which would be sensitive to existing environmental conditions, such as noise.
 - Community safety and crime prevention.
 - Effects relating to biodiversity, landscape, archaeological or built heritage.

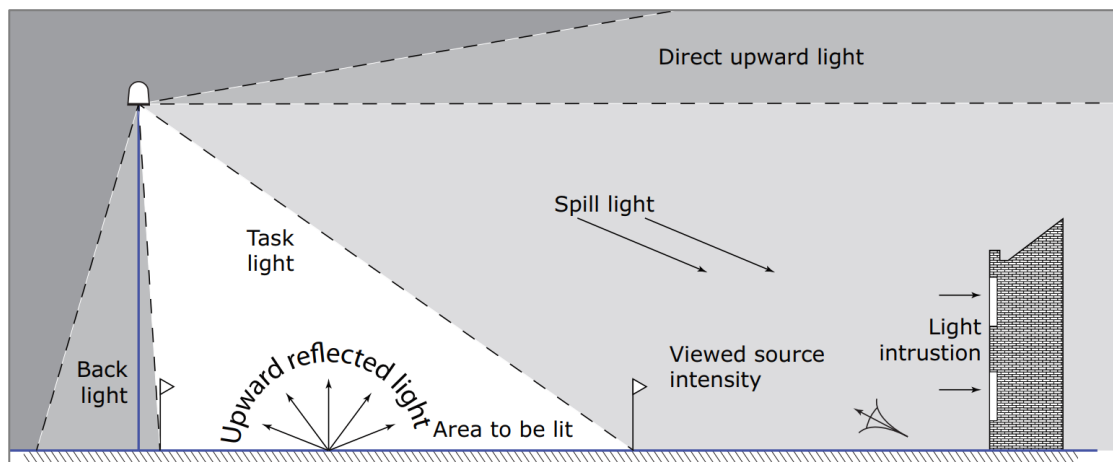
Extended Phase 1 Habitat Survey & Daytime Bat Survey (April 2022)

- 2.13 This report includes a description of survey methods, a summary description of habitats and fauna and outlines measures to provide protection and enhancements for biodiversity.
- 2.14 This report states the following with reference to bats:
- No evidence of bat activity was located within any of the accessible loft voids. However, a very small number of potential bat entry points do exist on the external features as well as some slipped slate roof tiles. Part of the older loft voids were inaccessible. Therefore, the building is considered to offer low suitability for a bat roost and a single precautionary bat emergence survey should be undertaken. The trees on site offer no potential bat roosting features. The trees are considered to offer negligible suitability for a bat roost. Only the northern hedgerow on site offers suitable bat foraging and commuting habitat and this is to be retained. This should be maintained as a dark wildlife corridor.
- 2.15 During landscaping design, the following measures should be implemented to increase the biodiversity value of the site:
- Soft landscaping should include the provision of native and non-native flowering perennial species, to provide a pollen and nectar source for invertebrates.
 - Bird boxes and bat boxes should be erected/incorporated onto the new building.
 - Native trees and/or fruit trees should be planted.

3. LIGHT POLLUTION

- 3.1 Light pollution is a generic term for all the adverse impacts that artificial lighting can have after dark. The main types of light pollution are shown diagrammatically in **Figure 1**.

Figure 1. Types of Light Pollution



- 3.2 Contributing to these direct effects are three design aspects that should be considered alongside the purpose for a new lighting installation and the type of sensitive receptors found in the local area. These are described later in this report.

Types of Light Pollution

Light Spill (Light intrusion, back light)

- 3.3 Light spill is 'the spilling of light beyond the boundary of the site on which a light source is located', such that it causes a noticeably adverse effect. More simply, light spill is often termed as the intrusion of light into homes. It can also have a negative effect on wildlife and ecological systems local to an installation.

- 3.4 As set out in the ILP Guidance Notes, the limits for light spill vary according to the environmental zone of the existing location and have been set to encourage appropriate lighting design. Through careful design, it can readily be ensured that this impact is prevented and that the illumination falling within any residential property can be reduced to zero. This is incorporated into the Lighting Strategy contained within this report.

Sky Glow (Direct upward light)

- 3.5 Sky glow is the 'the brightening of the night sky' above illuminated areas. The brightness created is constantly varying as a function of many parameters such as direct upward-lighting, ground surface reflectance, overhead cloud cover, and the degree of water droplets in the atmosphere - rain, fog/mist, and snow, for example, exacerbate the effect.

- 3.6 Mitigation is achieved by complying with the recommended limits in the ILP Guidance Notes for upward light emission. The limits vary according to the environmental zone of

the existing location and have been set to encourage appropriate lighting design. The Lighting Strategy will ensure that these limits can be met for the Proposed Development.

- 3.7 To mitigate sky glow as much as possible, lighting must be accurately targeted and kept to a minimum, and this design principle is incorporated into the Lighting Strategy.
- 3.8 The magnitude of the impact is a matter of judgement, taking into account the existing night-time view. The magnitude is lessened for those views where an observer is subject to direct illumination from, say, a nearby streetlight, or where light spill from a nearby light source illuminates the foreground, because the observer's vision is not fully dark adapted.

Glare (Viewed source intensity)

- 3.9 Glare occurs when an individual experiences visual discomfort or disability stemming from direct views of lamp sources, or high contrast of a lighting installation against a dark background. The placement of luminaires, their photometric characteristics, and the viewing context contribute to glare, which has been noted to result from uncontrolled private lighting installations, security lighting, street lighting mounted at high level near residences or habitat.

Design Aspects

Building Luminance

- 3.10 This considers the appropriateness and scale of brightness for the lighting / highlighting of built structures. Design criteria is included within ILP guidance notes as more of a main effect. While this is addressed independently, building luminance can also be considered as an indirect contributor to light spill, sky glow and glare.

Light Levels

- 3.11 Light levels, both as designed and installed, have the potential to create areas which have a noticeable difference in brightness. A new lighting installation in an area that has not been lit or is significantly brighter than the surrounding area may affect both adjacent receptors in the form of light spill or glare, and those over a larger area by contributing to sky glow through over-lighting.

Light Colour

- 3.12 Light colour has the potential to alter an individual's perception of their environment with respect to colour and clarity, as the human eye responds best to whiter light with higher quantities of ultraviolet wavelengths. Various wildlife species may respond differently to spectral composition depending on how reliant they are on darkness; many nocturnal animals continue their social habits and feeding behaviours with increased activity in the area while others may decrease their activity and possibly desert their habitat. This type of impact could affect pedestrians, vehicle operators and wildlife, and is likely to occur where new lighting is placed.

4. BASELINE

- 4.1 This section provides a review of the existing conditions at the site. The review is based on a desktop study using Google Earth satellite and Street View imagery.
- 4.2 The Site is located off Yewtree Lane, Northern Moor.
- 4.3 The Site is bound to the north by a row of hedges and a fence, with residential properties off Barry Road beyond.
- 4.4 The Site is bound to the south by Yewtree Lane which is provided with assumed 6m high street lighting columns.
- 4.5 The Site is bound to the east by Willenhall Road which is provided with assumed 6m high street lighting columns.
- 4.6 The Site is bound to the west by Cherry Blossom Close, a new residential development, which is lit via a 1m high bollard lighting installation.
- 4.7 The Site itself currently contains Yew Tree Manor, an existing nursing and residential care home. Yew Tree Manor does not appear to be provided with an external lighting installation.
- 4.8 **Figure 2** shows an aerial view of the proposed site.

Figure 2. Aerial view of site



Environmental Zone

- 4.9 Following the desktop study, it was concluded that the development is in a suburban location and the proposed development site should be classified as 'Environmental Zone E3 – Medium district brightness area, in accordance with the ILP guidance limits outlined within **Table 1**. Therefore, with reference to **Table 2**, the worst case permitted light trespass limit at an offsite receptor in the pre-curfew period (typically considered to be 07:00-23:00) is 10 Lux and in the post curfew period (typically considered to be 23:00-07:00) is 2 Lux. The maximum upward light ratio (ULR) is 5%.

5. PROPOSED DEVELOPMENT

Proposed Site Lighting

5.1 A lighting design strategy has been prepared that reflects:

- Environmental requirements and the applicable guidance / standards.
- Local Authority requirements.
- Technical requirements and the applicable guidance / standards; and
- Appropriate selection of lighting typologies to suite the above.

Overview

5.2 The proposed lighting design comprises high quality LED luminaires, equipped with specific optics to maximum useful light and minimise wasteful light. The proposed installation comprises the following lighting types:

- Building mounted luminaires (2.4m and 3m high);
- Column mounted luminaires (6m);
- Bollard luminaires (1m); and
- Recessed downlight (underside of the balcony).

5.3 The lighting design layout is included in **Appendix 2**. The lighting lux plot layout is included in **Appendix 3**. Literature from the manufacturer literature of the proposed luminaire types is included in **Appendix 4**.

5.4 **Table 3** illustrates the design lighting levels meet target levels in line with the recommendations of BS EN 13201-2.

Table 3. Proposed external lighting design levels

Area	Target		Design	
	Maintained Illuminance Em (Lux)	Uniformity (u0)	Maintained Illuminance Em (Lux)	Minimum Illuminance Em (Lux)
Resident Pathways	5	0.25	8.13	0.37
Recycling Store	5	0.25	10.00	0.70
Patio Area	5	0.25	15.59	0.26
Car Park	10	0.25	12.09	0.33

Upward light ratio (ULR)

- 5.5 The proposed luminaires have been designed to achieve the target lighting illuminance and uniformity at full cut-off, at 0° tilt.
- 5.6 The design has been used to calculate the predicted ULR of the proposed external lighting scheme. Model outputs predict a ULR of 0.14%. As illustrated in **Table 2**, the ILP sky glow limitation for an area classified as Environmental Zone E3 is 5% ULR. As such the proposed lighting scheme meets the ILP sky glow limitations and is therefore not considered to result in unacceptable impacts on the dark sky landscape.

Light spill

- 5.7 The lux plot layout, included in Appendix 3, has been produced in industry standard lighting calculation software. The lux plot assumes a level, clear site. In practice, the effect of changes in elevation and obstructions such as walls, trees and hedges will contain the light spill further than is shown in the plot, i.e. this Lux plot represents the absolute worst case scenario.
- 5.8 The mounting height for all luminaires has been limited to a maximum of 6m, at 0° tilt, to reduce the quantity of light spill. Limiting column heights also helps to reduce the impact on the daytime setting. Specific optics have been used to minimise spill.
- 5.9 Vertical calculation surfaces have been included between 1-5m above ground level to simulate the neighbouring properties. The calculations shows maximum 2 Lux vertical illumination. As illustrated in **Table 2**, the ILP obtrusive light limitation for an area classified as environmental zone E3 is 10 Lux pre-curfew and 2 Lux post-curfew. As such the proposed lighting scheme meets the ILP obtrusive light limitations and is therefore not considered to result in unacceptable impacts on residential properties.

Ecology measures

- 5.10 To increase the biodiversity value of the Site, the Ecologist has recommended that bird boxes and bat boxes should be erected/incorporated onto the new building.
- 5.11 The paths in the garden area are proposed to be lit via 1m high bollards, providing downward light only, to minimise light impact to the northern hedgerow. Light is generally <2 Lux on the northern hedgerow does not impact the hedgerow above 1m above ground level.
- 5.12 To maximise the value of the bat boxes, the design has been produced in accordance with the recommendations of the ILP BCT Guidance Note 08 for Bats and artificial lighting in the UK (2018):
- All luminaires lack UV elements when manufactured.
 - LED luminaires have been used.
 - A warm white spectrum (2700 Kelvin) has been used.
 - Luminaires feature peak wavelengths higher than 550nm to avoid the component of light most disturbing to bats.
 - Column heights have been minimised to minimise light spill.
 - Luminaires with an upward light ratio of 0% and with good optical control have been used.

- All luminaires are mounted on the horizontal, ie no upward tilt.

5.13 The agreed final location of bat boxes should be selected with direct reference to the proposed lighting layout to ensure the areas avoid direct illumination from the installation.

6. RECOMMENDATIONS

- 6.1 All external lighting, whether for the construction or operation phase, must comply with the recommended limitations given in the ILP Guidance Notes for an Environmental Zone E3 location. The limits, set out in **Table 2**, prohibits excessive emission of upward light and helps to minimise light spill and glare.
- 6.2 Light colour should be addressed as part of the overall approach to the masterplan lighting design. Warmer light colour (2700K) is preferred in accordance with accordance to Institute of Lighting Professionals (ILP) BCT Guidance Note 08 for Bats and artificial lighting in the UK (2018). LED typically features no UV component and research indicates that while lower UV components attract fewer invertebrates, warmer colour temperatures (2700K) cause less impacts on bats.
- 6.3 During the detailed design phase of the project the locations of proposed bat boxes must be coordinated with the proposed lighting installation.
- 6.4 The paths in the garden area should be lit via 1m high bollards that provide downward light only to minimise light impact to the northern hedgerow.
- 6.5 Spectral composition is somewhat related to light colour, but the effects are not always immediately apparent. It is desirable for light quality, safety and wildlife effect limitation purposes to use LED technology. LEDs present good working efficacy, a smaller light emitting area which is good for light control and spectral compositions which are less disturbing to nocturnal wildlife or their food sources than UV rich traditional light sources.
- 6.6 The use of horizontal cut-off luminaires installed at zero tilt with flat glass lenses and internal optics is recommended to limit views of the lamp, control glare and direct light in a controlled pattern. This will help to minimise potential glare, sky glow and light spill.
- 6.7 New generation LED light sources are recommended for new external lighting.
- 6.8 Wattages shall achieve required light levels without over-lighting.

7. CONCLUSION

- 7.1 As part of the lighting strategy a review has been undertaken of the potential impact created by new lighting in relation to the proposed development.
- 7.2 Legislation, British standards, and good practice guidance recommends the development requires new exterior lighting for purposes of vehicular and pedestrian safety.
- 7.3 Potentially significant effects from the proposed lighting on sensitive receptors can be managed to create a negligible night-time impact.
- 7.4 The lighting design strategy presented indicates the potential significant effects from new lighting for the proposed development can be adequately managed and all tested parameters are expected to meet recommended guidance benchmarks.
- 7.5 The proposed development lighting will not directly illuminate the proposed integrated bat boxes.
- 7.6 The indicative lighting design strategy presented indicates the proposed lighting installation can achieve the required minimum lighting levels and distribution to meet the applicable standards while causing negligible light trespass to the adjoining land and negligible increase in local sky glow.
- 7.7 The northern hedgerow will remain a dark corridor above 1m above ground level and will remain dark as far as practicable at ground level.
- 7.8 The impact of the proposed development lighting is considered to be negligible with respect to sensitive receptors. The most noticeable effect due to the proposed lighting installation expected to remain is sky glow.

APPENDICES

Appendix 1: Proposed Development Masterplan



LEGEND

SOFT LANDSCAPE

Existing Trees and Hedges to be Retained

Proposed Large Ornamental Tree
To be 14-16cm girth, Extra Heavy Standard, 400-500cm high or multi-stem tree 300-350cm high.

Proposed Medium Ornamental Trees
To be 10-12cm girth or multistem specimen 300-350cm high.

Proposed Small Ornamental Trees
To be 10-12cm girth or multistem specimen 200-250cm high.

Proposed Ornamental Shrubs and Perennials
Proposed shrubs and flowering herbaceous plan to be planted as 3-5L pots at 3-5 per sq.m. with individual specimen shrubs.

Proposed Evergreen Hedge
Box hedge, 20-30cm high, to be planted at 5 plants per l/m.

Proposed Wildflower
To be Emorsgate general willflower mix or otherwise agreed with ecologist. Sowing rate: 5g/square metre

Proposed Grass
To be turf.

FEATURES

Proposed Timber Gazebo

Proposed Timber Bench
To be Westminster Flat Arm Teak Bench 3 Seater by Sloane and Sons or similar approved.

Proposed Rectangular Timber Planter
To be Raised bed by Woodblock or similar approved. size varies. To be planted by residents.

Proposed Timber Dining Set
To be Canfield patio set

Proposed Arbor
To be Jasmine Trellis Arch Pergola, W1.5 x D0.8m, by Dunster House or similar approved

Proposed Pergola
Single timber pergola system 2m high with climber plants

Proposed Shed
To be Value Overlap Shed, L1.75 x D1.15m, by Tiger Shed or similar approved

Proposed Timber Gazebo
To be Atlas Open Chunky Gazebo, L6 x D3m, by Dunster House or similar approved.

HARD SURFACE MATERIALS

Proposed Coloured Tarmac for Circulation Paths within Residents Garden
In Buff / Dark colour by Utlicolour or similar approved.

Proposed Flag Paving for Patios and Pathways
To Architects details

Proposed Concrete Hardstanding
To Architects details

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2. This drawing is to be read in conjunction with detail landscape drawings, details and specification.

3. This drawing is to be read in conjunction with all relevant Architects', Engineer's, Specialists, Bills of Quantities and Specifications.

4. The insertion of any firm or proprietary brand on this drawing is an indication of the class or quality required and does not exclude the use of alternative materials that are equal in performance, quality and appearance, provided that they have been approved in writing by the Landscape Architect.

5. The Contractor is responsible for accurately ascertaining the position of underground services and responding to all relevant service easement requirements.

6. All dimensions are in millimetres unless stated otherwise, for the purposes of construction this drawing must not be scaled and only written dimensions used. Written and scaled dimensions to be checked on site, any discrepancies reported prior to work commencing. IF IN DOUBT PLEASE ASK.

7. All work and materials are to be in accordance with the relevant British Standards and Code of Practice.

8. All Proprietary products are to be used strictly in accordance with the manufacturer's instructions and details.

BOUNDARY TREATMENTS

Entrance Wall with Signage
To Architects details.

2.1m high closed boarded timber fencing
To Architects details.

2m High Railing
To Architects details.

1200mm high Gates within railings
To Architects details.

0.55m high brick dwarf wall with 0.65m railings above and between brick piers (Total high 1.2m)
To Architects details.

0.55m high brick dwarf wall with 1.4m railings above and between brick piers (Total high 2m)
To Architects details.

REVISION NOTES			
Rev	By	Description	Date
B	JW	Revised in line with Architect's comment	23-06-22
A	JW	Revised in line with Architect's comment	14-06-22

Client
Liberty Care

Project
Northern Moor

Description
Landscape Layout

Status
For Approval

Scale @ A2
1:200

Job number
4153

Drawn
CT

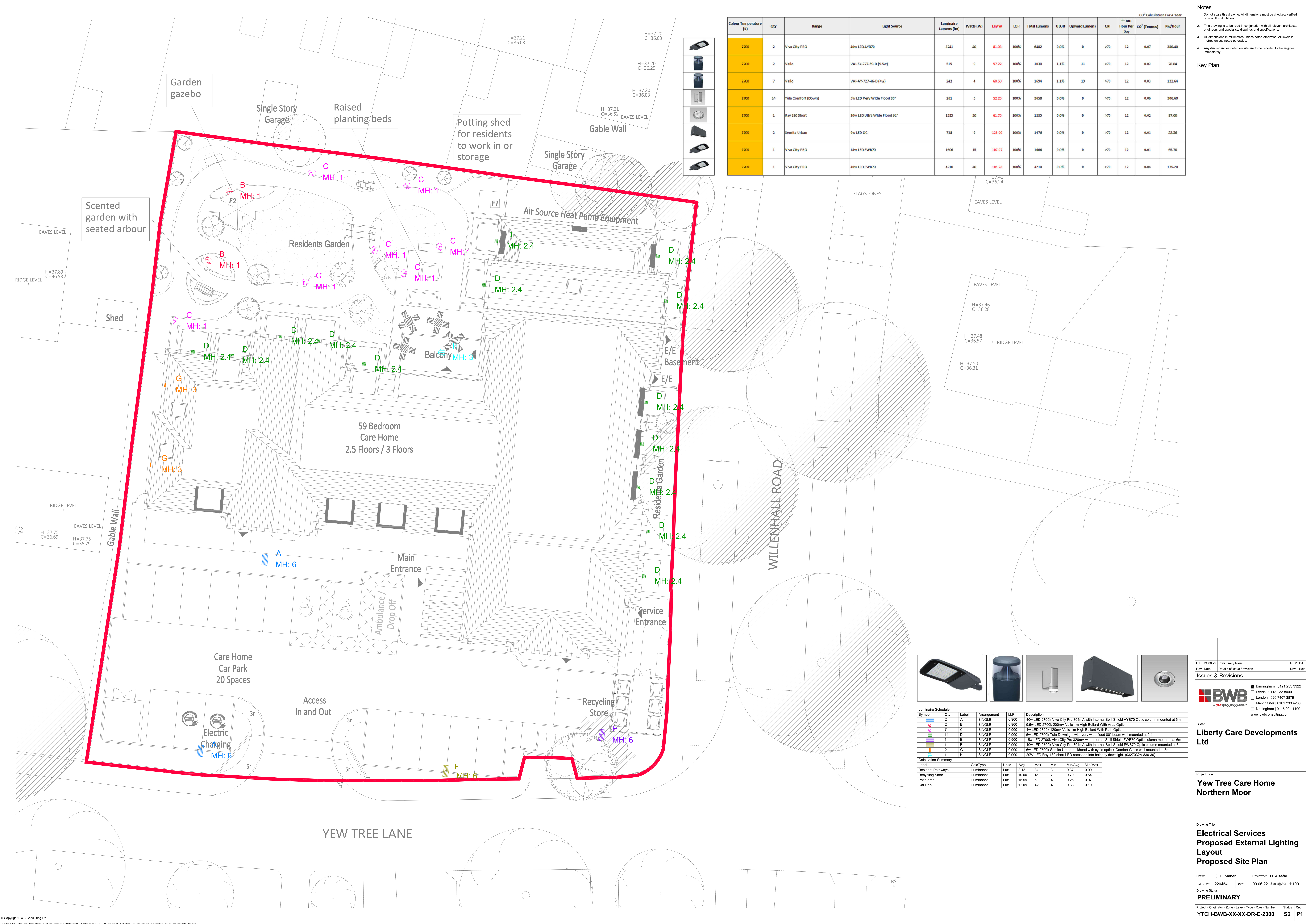
Drawing number
101

Checked
CT

Revision
B

Date
01-06-2022

Appendix 2: Proposed External Lighting Layout



CO ₂ Calculation For A Year																
Colour Temperature (K)	Qty	Range	Light Source	Luminaire Lumens (lm)	Watts (W)	Lm/W	LOR	Total Lumens	UIGR	Upward Lumens	CRI	** AMY Hour Per Day	CO ₂ (Tonnas)	Kwh/Hour		
2700	2	Viva City PRO	40w LED AYB70	3241	40	81.03	100%	6482	0.0%	0	>70	12	0.07	350.40		
2700	2	Vallo	VAI-SV-727-SB-D (9.5w)	515	9	57.22	100%	1030	1.1%	11	>70	12	0.02	78.84		
2700	7	Vallo	VAI-AY-727-46-D (4w)	242	4	60.50	100%	1694	1.1%	19	>70	12	0.03	122.64		
2700	14	Tula Comfort (Down)	5w LED Very Wide Flood 80°	243	5	52.25	100%	3405	0.0%	0	>70	12	0.06	306.00		
2700	1	Ray 180 Short	20w LED Ultra Wide Flood 91°	1235	20	61.75	100%	1235	0.0%	0	>70	12	0.02	87.00		
2700	2	Semita Urban	6w LED OC	738	6	123.00	100%	1476	0.0%	0	>70	12	0.01	52.56		
2700	1	Viva City PRO	15w LED FWB70	1606	15	107.07	100%	1606	0.0%	0	>70	12	0.01	65.70		
2700	1	Viva City PRO	40w LED FWB70	4210	40	105.25	100%	4210	0.0%	0	>70	12	0.04	175.20		

- Notes
1. Do not scale this drawing. All dimensions must be checked verified on site. If it should ask.
 2. This drawing is to be read in conjunction with all relevant architects, engineers and specialists drawings and specifications.
 3. All dimensions in millimetres unless noted otherwise. All levels in metres unless noted otherwise.
 4. Any discrepancies noted on site are to be reported to the engineer immediately.

Key Plan

P1	24.06.22	Preliminary Issue	GEM/DA
Rev	Date	Details of issue / revision	Dwn / Rev

Issues & Revisions

- BWB** A CAP GROUP COMPANY
- Birmingham | 0121 233 3322
 - Leeds | 0115 233 8000
 - London | 020 7407 3879
 - Manchester | 0161 233 4280
 - Nottingham | 0115 924 1100
- www.bwbconsulting.com

Client

Liberty Care Developments Ltd

Project Title

Yew Tree Care Home Northern Moor

Drawing Title

**Electrical Services
Proposed External Lighting
Layout
Proposed Site Plan**

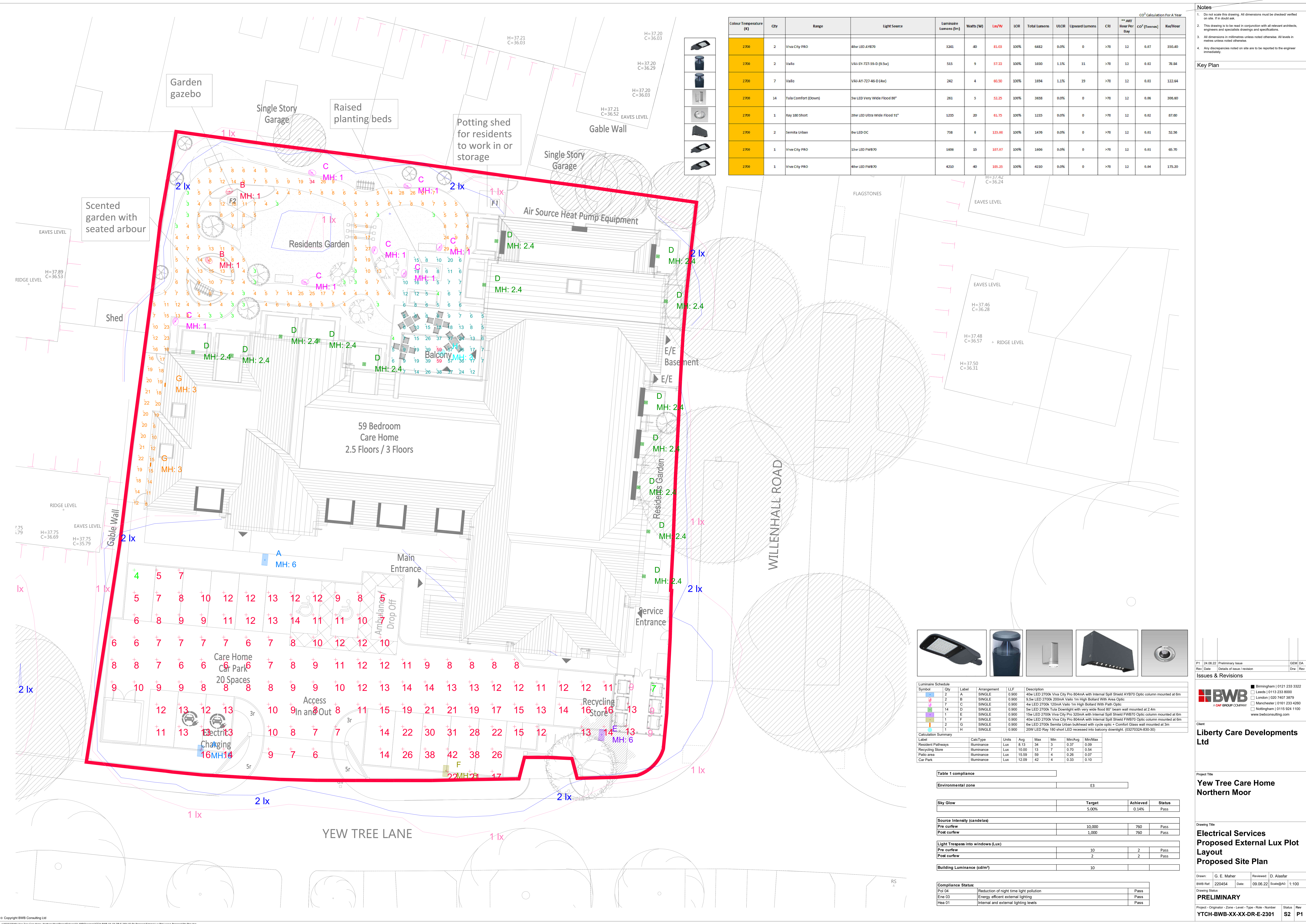
Drawn:	G. E. Maher	Reviewed:	D. Alazfar
BWB Ref:	220454	Date:	09.06.22
Scale:	1:100	Scale:	1:100

Drawing Status

PRELIMINARY

Project - Originator - Zone - Level - Type - Role - Number	Status	Rev
YTCH-BWB-XX-XX-DR-E-2300	S2	P1

Appendix 3: Proposed External Lux Plot Layout



CO ₂ Calculation For A Year														
Colour Temperature (K)	City	Range	Light Source	Luminaire Lumens (lm)	Watts (W)	lm/W	IOR	Total Lumens	UIGR	Upward Lumens	CRI	*** AMY Hour Per Day	CO ₂ (Tonnes)	Kwh/Year
2700	2	Viva City PRO	40w LED AYB70	3241	40	81.03	100%	6482	0.0%	0	>70	12	0.07	350.40
2700	2	Vallo	VAL-SY-727-59-D (9.5w)	515	9	57.22	100%	1030	1.1%	11	>70	12	0.02	78.84
2700	7	Vallo	VAL-AY-727-46-D (4w)	242	4	60.50	100%	1694	1.1%	19	>70	12	0.03	122.64
2700	14	Tula Comfort (Down)	5w LED Very Wide Flood 80°	261	5	52.25	100%	3638	0.0%	0	>70	12	0.06	306.60
2700	1	Ray 380 Short	20w LED Ultra Wide Flood 91°	1235	20	61.75	100%	1235	0.0%	0	>70	12	0.02	67.60
2700	2	Semita Urban	8w LED OC	738	6	123.00	100%	1476	0.0%	0	>70	12	0.01	52.56
2700	1	Viva City PRO	15w LED FWB70	1806	15	107.07	100%	1806	0.0%	0	>70	12	0.01	65.70
2700	1	Vive City PRO	40w LED FWB70	4210	40	105.25	100%	4210	0.0%	0	>70	12	0.04	175.20

- Notes
1. Do not scale this drawing. All dimensions must be checked verified on site. If it should ask.
 2. This drawing is to be read in conjunction with all relevant architects, engineers and specialists drawings and specifications.
 3. All dimensions in millimetres unless noted otherwise. All levels in metres unless noted otherwise.
 4. Any discrepancies noted on site are to be reported to the engineer immediately.

Key Plan



Luminaire Schedule				
Symbol	City	Label	Arrangement	ULF
2	A	SINGLE	0.900	40w LED 2700K Viva City Pro 804mA with Internal Spill Shield AYB70 Optic column mounted at 6m
2	B	SINGLE	0.900	9.5w LED 2700K 200mA Vallo 1m High Bollard With Area Optic
7	C	SINGLE	0.900	4w LED 2700K 120mA Vallo 1m High Bollard With Path Optic
14	D	SINGLE	0.900	5w LED 2700K Tula Downlight with very wide flood 80° beam wall mounted at 2.4m
1	E	SINGLE	0.800	15w LED 2700K Viva City Pro 320mA with Internal Spill Shield FWB70 Optic column mounted at 6m
1	F	SINGLE	0.900	40w LED 2700K Viva City Pro 804mA with Internal Spill Shield FWB70 Optic column mounted at 6m
2	G	SINGLE	0.900	6w LED 2700K Semita Urban bollard with cycle optic + Comfort Glass wall mounted at 3m
1	H	SINGLE	0.900	20W LED Ray 180 short LED recessed into balcony downlight. (0327032A-830-30)

Calculation Summary							
Label	CalcType	Units	Avg	Max	Min	Min/Avg	Min/Max
Resident Pathways	Illuminance	Lux	8.13	34	3	0.37	0.09
Recycling Store	Illuminance	Lux	10.00	13	7	0.70	0.54
Patio area	Illuminance	Lux	15.59	59	4	0.26	0.07
Car Park	Illuminance	Lux	12.09	42	4	0.33	0.10

Table 1 compliance			
Environmental zone	E3		
Sky Glow	Target	Achieved	Status
	5.00%	0.14%	Pass
Source Intensity (candelas)			
Pre curfew	10,000	760	Pass
Post curfew	1,000	760	Pass
Light Trespass into windows (Lux)			
Pre curfew	10	2	Pass
Post curfew	2	2	Pass
Building Luminance (cd/m²)			
	10		

Compliance Status:		
Pol 04	Reduction of night time light pollution	Pass
Ene 03	Energy efficient external lighting	Pass
Hea 01	Internal and external lighting levels	Pass

P1	24.06.22	Preliminary Issue	GEM	DA
Rev	Date	Details of issue / revision	Drw	Rev

Issues & Revisions

- Birmingham | 0121 233 3322
■ Leeds | 0113 233 8000
■ London | 020 7407 3879
■ Manchester | 0161 233 4280
■ Nottingham | 0115 924 1100
www.bwbconsulting.com

Client

Liberty Care Developments Ltd

Project Title

Yew Tree Care Home Northern Moor

Drawing Title

Electrical Services
Proposed External Lux Plot Layout
Proposed Site Plan

Drawn:	G. E. Maher	Reviewed:	D. Alazfar
BWB Ref:	220454	Date:	09.06.22
Scale:	BA0	Scale:	1:100
Drawing Status			
PRELIMINARY			
Project - Originator - Zone - Level - Type - Role - Number	YTCB-BWB-XX-XX-DR-E-2301	Status	Rev
	S2		P1

Appendix 4: Proposed Luminaire Type

Datasheet

Viva-City Pro



Product Description

A modular, slimline, performance street lantern with improved efficacy and output. Viva-City Pro offers a choice of optics with asymmetrical distribution including an area optic.

Specification Text

The luminaire shall be manufactured from high-pressure die-cast aluminium. It shall have an LED efficacy of up to 150.0 lm/W and will be capable of producing up to 24,660 luminaire lumens at 4000K with a CRI >70. It shall have an asymmetric forward throw optic and is rated at IP66 and IK08.

Specify 2700K for IDA compliance.

Specification

Weight: 4.5 - 9.1kg

Windage: 0.04m²

Material: Die-cast Aluminium

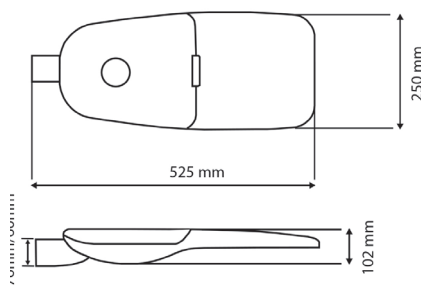
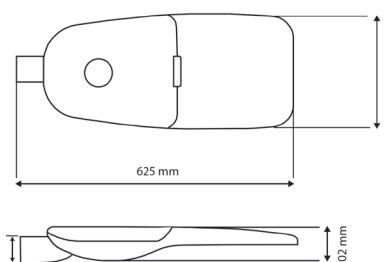
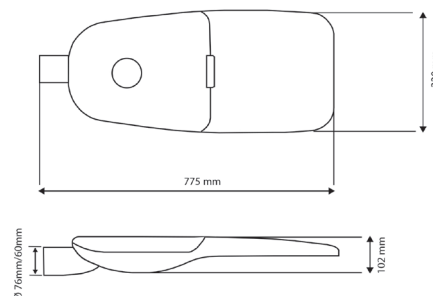
Paint finish: RAL7016 Anthracite Grey Finish

Key Features

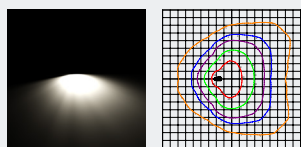
- 15.0 - 180.0W
- 2,250 - 24,660 Luminaire Lumens
- Efficacy up to 150.0 lm/W
- 4000K, CRI >70
- Lifetime >100,000hr, L80



Dimensions



Optics



Asymmetric Forward Throw Optic 70°



Code	Power	Luminaire Lumens	Drive Current	Optic	CCT(K)	IP	IK	Weight kg	Paint Finish	Driver Included	Driver Type
VCYP-FW70-4.3-15D	15.0	2,250	640	Asymmetrical Forward Throw Optic - 70°	4000	IP66	IK08	4.5	RAL7016 Anthracite Grey Finish	Driver inc	Dali
VCYP-FW70-4.3-15DPEC	15.0	2,250	640		4000	IP66	IK08	4.6	RAL7016 Anthracite Grey Finish	Driver inc	Dali
VCYP-FW70-4.8-40D	40.0	5,880	805		4000	IP66	IK08	6.0	RAL7016 Anthracite Grey Finish	Driver inc	Dali
VCYP-FW70-4.8-40DPEC	40.0	5,880	805		4000	IP66	IK08	6.1	RAL7016 Anthracite Grey Finish	Driver inc	Dali
VCYP-FW70-4.6-60D	60.0	8,760	610		4000	IP66	IK08	6.0	RAL7016 Anthracite Grey Finish	Driver inc	Dali
VCYP-FW70-4.6-60DPEC	60.0	8,760	610		4000	IP66	IK08	6.1	RAL7016 Anthracite Grey Finish	Driver inc	Dali
VCYP-FW70-4.8-80D	80.0	11,040	805		4000	IP66	IK08	6.0	RAL7016 Anthracite Grey Finish	Driver inc	Dali
VCYP-FW70-4.8-80DPEC	80.0	11,040	805		4000	IP66	IK08	6.1	RAL7016 Anthracite Grey Finish	Driver inc	Dali
VCYP-FW70-4.6-120D	120.0	17,760	620		4000	IP66	IK08	9.0	RAL7016 Anthracite Grey Finish	Driver inc	Dali
VCYP-FW70-4.6-120DPEC	120.0	17,760	620		4000	IP66	IK08	9.1	RAL7016 Anthracite Grey Finish	Driver inc	Dali
VCYP-FW70-4.8-180D	180.0	24,660	880		4000	IP66	IK08	9.0	RAL7016 Anthracite Grey Finish	Driver inc	Dali
VCYP-FW70-4.8-180DPEC	180.0	24,660	880		4000	IP66	IK08	9.1	RAL7016 Anthracite Grey Finish	Driver inc	Dali



Accessories & Options

Mounting Options

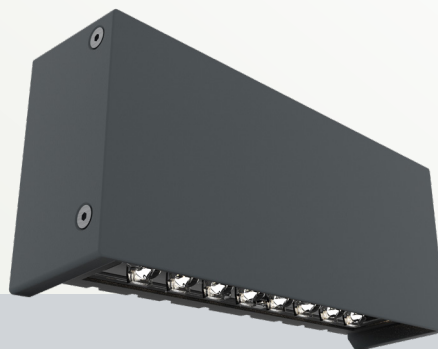
- Post top 60mm
[Contact for details](#)

Other Options

- Part Night Dimming
- Colour Temperature Option
- Photocell Option
- Emergency Option
[Contact for details](#)

Datasheet

Semita Urban



Product Description

Designed and engineered in the UK, Semita Urban is a contemporary, slimline wallpack. The newest addition to our popular wallpack family is available with street, path or flood optics and comes equipped with an optional 'click on' comfort diffuser for a softer output.

Specification Text

The luminaire shall be manufactured from high-pressure die-cast aluminium. It shall have an LED efficacy of up to 146.0 lm/W and will be capable of producing up to 146.0 luminaire lumens at 4000K with a CRI >70. It shall have an asymmetric forward throw optic and is rated at IP66 and IK10.

Specify 2700K for IDA compliance.

Specification

Weight: 2.4kg

Material: Die-cast Aluminium

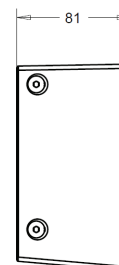
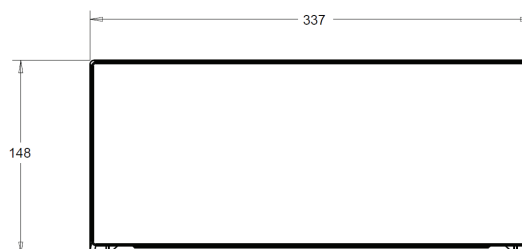
Paint finish: RAL7016 Anthracite Grey Finish

Key Features

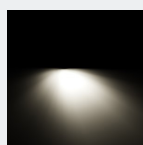
- 6.0 - 11.0W
- 812 - 1,611 Luminaire Lumens
- Efficacy up to 146.0 lm/W
- 4000K, CRI >70
- Lifetime >100,000hr, L80



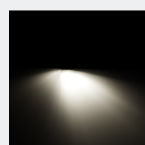
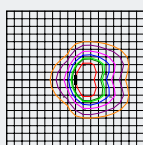
Dimensions



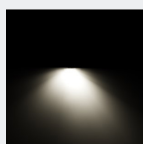
Optics



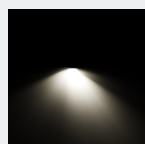
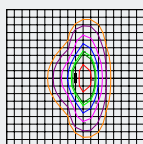
Comfort Flood Light Optic



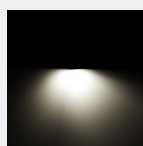
Flood Light Optic



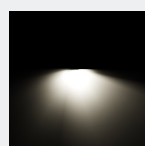
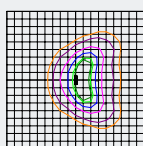
Comfort Path Optic



Path Optic



Comfort Street Optic



Street Optic



Code	Power	Luminaire Lumens	Drive Current	Optic	CCT(K)	IP	IK	Weight kg	Paint Finish	Driver Included
SEMUFL08D	6.0	812	205	Asymmetrical Flood Light Optic FL	4000	IP66	IK10	2.4	RAL7016 Anthracite Grey Finish	Driver inc
SEMUFL15D	11.0	1,611	410		4000	IP66	IK10	2.4	RAL7016 Anthracite Grey Finish	Driver inc
SEMUOC08D	6.0	802	205	Asymmetrical Path Optic OC	4000	IP66	IK10	2.4	RAL7016 Anthracite Grey Finish	Driver inc
SEMUOC15D	11.0	1,570	410		4000	IP66	IK10	2.4	RAL7016 Anthracite Grey Finish	Driver inc
SEMUST08D	6.0	783	205	Asymmetrical Street Optic ST	4000	IP66	IK10	2.4	RAL7016 Anthracite Grey Finish	Driver inc
SEMUST15D	11.0	1,496	410		4000	IP66	IK10	2.4	RAL7016 Anthracite Grey Finish	Driver inc



Accessories & Options

Mounting Options

- Wall Mount
[Contact for details](#)

Other Options

- Colour Temperature Option
- Photocell Option
- Emergency Option
[Contact for details](#)

Datasheet

Ray Series



Product Description

The Ray series is a range stainless steel down lighters available in an array of sizes and beam angles. Perfect for canopy lighting and wall washes.

Specification Text

The luminaire shall be manufactured from high-pressure die-cast aluminium. It shall have an LED efficacy of up to 128 lm/W and will be capable of producing up to 1,150 luminaire lumens at 4000K with a CRI >80. It shall have an asymmetric forward throw optic and is rated at IP68 and IK08.

Specification

Weight: 0.8 - 2.4kg
Material: Extruded Aluminium
Paint finish: Stainless Steel Finish

Key Features

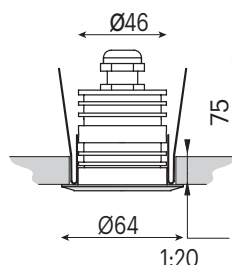


- 4.0 - 12.0W
- 1,450 - 1,150 Luminaire Lumens
- Efficacy up to 128 lm/W
- 4000K, CRI >80
- Lifetime >60000hr, L80

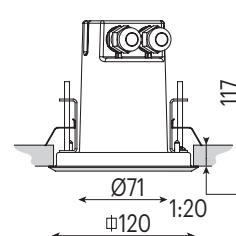


Dimensions

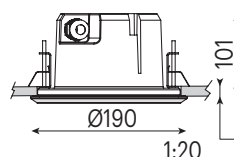
Ray 55



Ray 110



Ray 180

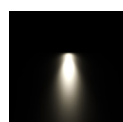
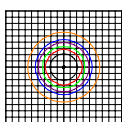


All units of measurement in mm.

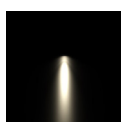
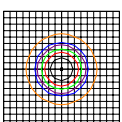
Optics



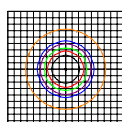
Medium 24°



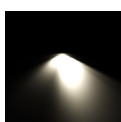
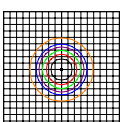
Medium 25°



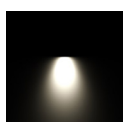
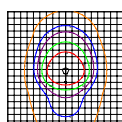
Medium 17°



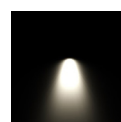
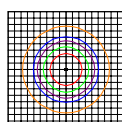
Narrow 10°



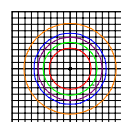
Wide 30°



Wide Flood 46°



Wide Flood 47°



Code	Power	Luminaire Lumens	Optic	CCT(K)	IP	IK	Weight kg	Paint Finish	Driver Included
RAY55-SY25-840-4-30	4.0	450	Medium 25°	4000	IP68	IK08	0.8	Stainless Steel Finish	Driver not included
RAY55-SY46-840-4-30	4.0	375	Wide 46°	4000	IP68	IK08	0.8	Stainless Steel Finish	Driver not included
RAY110S-SY10-840-4-30	4.0	520	Narrow 10°	4000	IP67	IK09	0.9	Stainless Steel Finish	Driver not included
RAY110S-SY24-840-4-30	4.0	510	Medium 24°	4000	IP67	IK09	0.9	Stainless Steel Finish	Driver not included
RAY110S-SY47-840-4-30	4.0	460	Wide 47°	4000	IP67	IK09	0.9	Stainless Steel Finish	Driver not included
RAY180S-SY17-840-12-30	12.0	1,150	Medium 17°	4000	IP67	IK07	2.4	Stainless Steel Finish	Driver inc
RAY180S-SY30-840-12-30	12.0	1,100	Wide 30°	4000	IP67	IK07	2.4	Stainless Steel Finish	Driver inc



Accessories & Options

Mounting Options

- Recessed Mount
[Contact for details](#)

Other Options

- Colour Temperature Options
- Paint Finish Options
[Contact for details](#)



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