The City of Edinburgh Council

Parks and Openspace Lighting Guidance

April 2024

Front Cover Photo. View towards Holyrood Park | Reddit

The Parks and Openspace Lighting Guidance has been developed by AtkinsRéalis on behalf of the City of Edinburgh Council.

Document History

Revision	Purpose description	Originated	Checked	Reviewed	Authorised	Date
1.0	First draft issue to client	DM	SS	UF	PF	27.02.2023
2.0	Final draft report issue to client for comment	DM	SS	UF	PF	19.07.2023
3.0	Final draft report issue to client for comment following case study visit	DM / SSR	SS	UF	PF	16.02.2024
4.0	Final report issue to client following stakeholder consultation	SSR	SS	UF	PF	30.04.2024

Client Sign-off

Client	The City of Edinburgh Council
Project	Parks and Openspace Lighting Guidance
Job Number	5221003
Client Signature & Date	Steven Cuthill

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1.0 Introduction

Introduction Divider Photo: Princes Street Gardens during winter festivals © The City of Edinburgh Council

Status of the Document

This Issue

This guidance document has been prepared by AtkinsRéalis for the City of Edinburgh Council and features Hailes Quarry Park as a case study in the appendix. The case study is subject to a separate approval process. The report should be circulated to all relevant stakeholders for comment. Comments will be captured and incorporated into the final approved document.

Use of the Document

The document aims to become a briefing document for the Council's Parks Technical, Parks Development, and Street Lighting Design Teams (LDTs) working on redevelopment projects within Edinburgh's parks and open spaces. In some cases, the guidance may form part of a specific planning condition to be met regarding public lighting of green spaces within developments. The document is written in the form of a code of practice giving generic guidance to the LDTs on lighting within publicly accessible parks and open spaces. It will always be the responsibility of the LDTs to respond to the project specific aspects of the City of Edinburgh Council's brief and any specific legislative or third-party design requirements.

Scope of the Document

This document encompasses all aspects of lighting to be considered when designing outdoor lighting for the parks and open spaces owned, maintained, and operated by the City of Edinburgh Council. The document is considered as a framework for the LDTs to follow in their design development, and it is considered that LDTs will be required to provide information as how their design complies with this document's guidance and requirements. The LDTs shall provide detailed responses to this document within their design submissions to the Council at each RIBA design stages. To aid in the responses to the lighting guidance document, typical checklists of the information to be provided are contained within Appendix 2.

Waterloo Place | The City of Edinburgh Council

2.0 Lighting Philosophy for Parks and Openspaces

Lighting Philosophy for Parks and Openspaces Divider Photo. View of Edinburgh Castle | Andy Sweet

Principles

The core principle of good lighting is :

"The right light in the right place at the right time and for the right reason".

All lighting should be assessed on a multi-criteria basis to truly understand the nature of the requirements and that it is also acceptable for the solution to be no electric light.

Lighting has unique abilities to provide great social, economic, and environmental benefits when it is correctly designed.

Lighting can improve the perception of safety in night-time environments; extend use of open spaces by everyone; help vulnerable people increase and promote a feeling of safety while outdoors; deter crime and anti-social behaviour; provide visual stimulation and wonder; allow entertainment and other commercial activities to be undertaken as well as extend opening times of public spaces; increase accessibility, promote environmental and ecological areas by restricting the use of lighting; promote public light art and illumination of monuments, statues, and public art; create aesthetic themes and respond to heritage requirements; and generally lift the perception of the public of a park or open spaces.

It should be noted that the design strategies for parks and open spaces should be thought of in the context of the specific use of the space, its location in the city, its purpose, and the stakeholders' aspirations for the future use of the space. These contexts may be quite different to the current usage and may mean reducing or removing lighting as well.

Princes Street Garden during Fringe Festival | The City of Edinburgh Council

Sustainability

Sustainability when applied to lighting has many aspects. The definition responds to the sustainability triple point baseline of Social, Environmental, and Economic aspects of a scheme. A truly sustainable project will balance each of these three baseline elements against the project requirements. Every project will have different sustainability objectives. The following Mind Map is a typical example of the aspects that should be considered. It should be noted that project specific objectives may also apply.

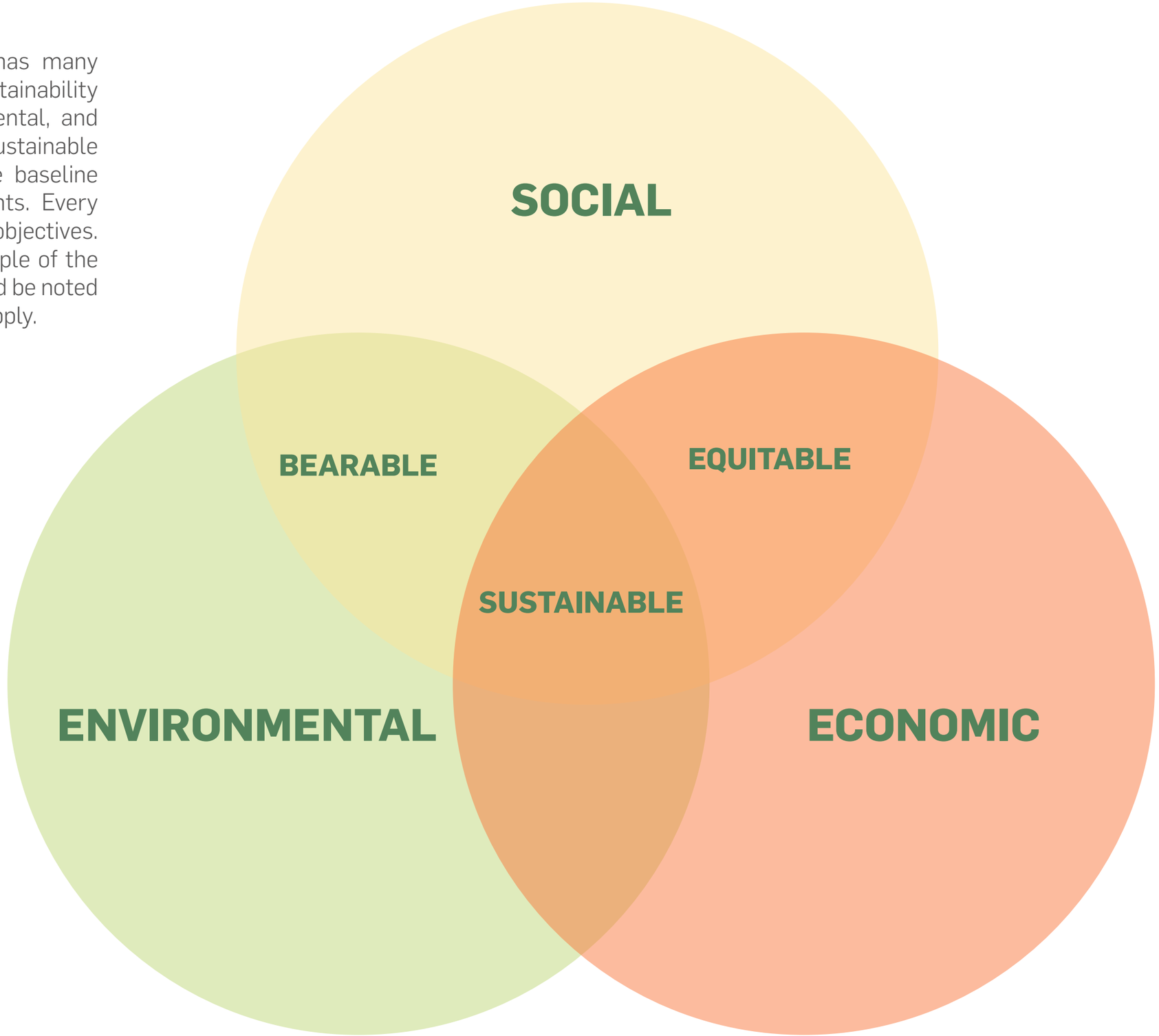


Figure 1-1 Sustainability Triple Baseline.

Mind Map

The following mind-map shows the interconnectivity of aspects of lighting to be considered within parks and open spaces.

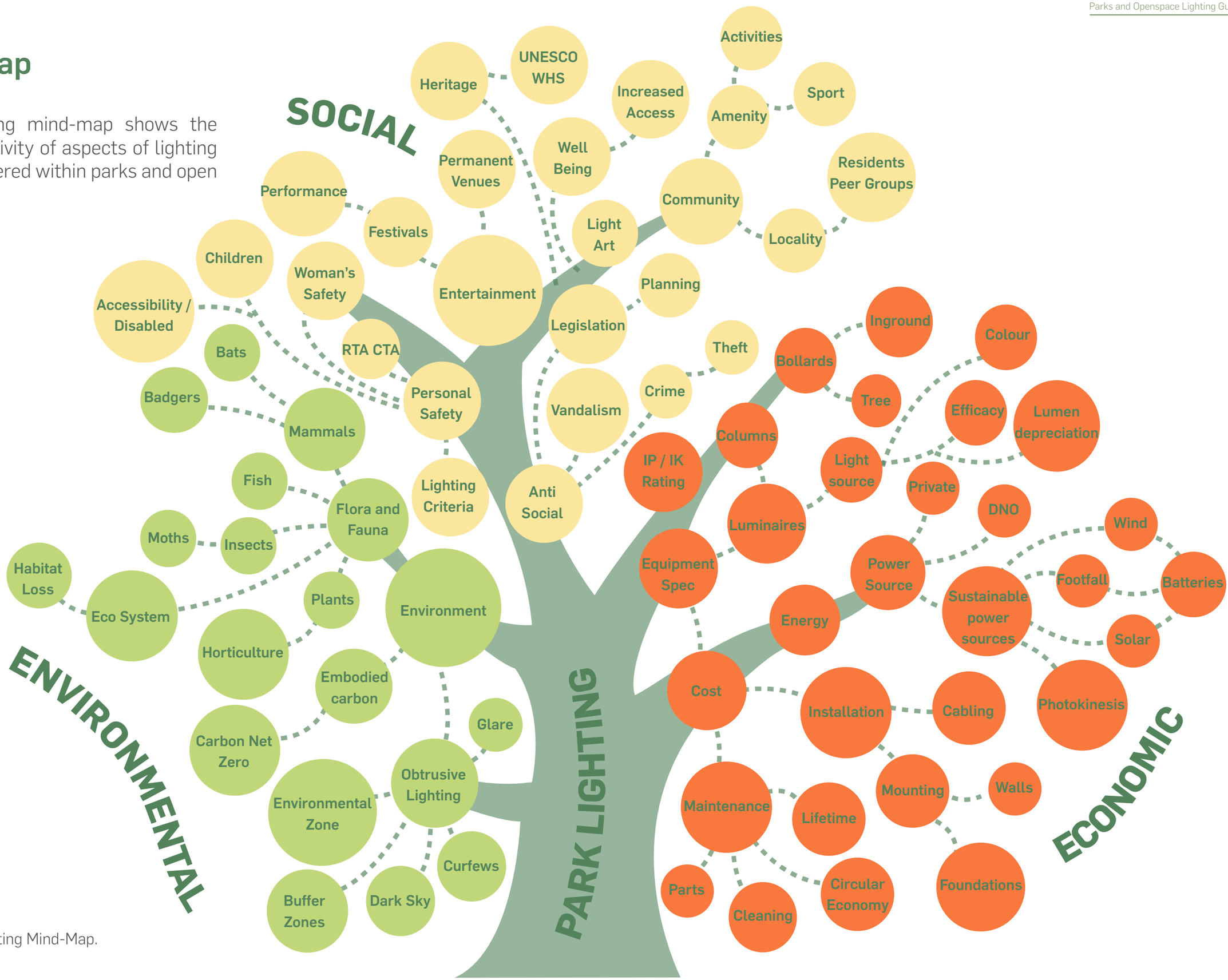


Figure 1-2 Lighting Mind-Map.

Categorisation of Parks and Openspaces

Parks and open spaces in Edinburgh are not designed to any one model and so they differ greatly in size, landscape and the facilities they offer. Currently they also differ in terms of the types of management and maintenance that are applied. Crucially, parks differ in terms of their function, and in terms of the groups of people who make use of them. A notional hierarchy of the Council-managed parks and open spaces is illustrated in Figure 1-3 opposite.

It is logical that some kind of classification system should arise, and there are clear advantages to formalising this system. The creation of a systematic framework helps to group parks and open spaces with similar provision and use, and to make it clear what sorts of standards of design and maintenance are appropriate for each type. This systematic approach does not imply that one type of park or open space is more important than another. The classification system allows for objective evaluations of purpose and allocation of resources based on function, or potential function, rather than on preconceived ideas about the relative values of individual parks and open spaces.

The classification system provides useful pointers to both design and maintenance requirements. The simplicity of design and function required for neighbourhood parks and open spaces should not be confused with poor or inappropriate design. Smaller parks or open spaces with a limited number of functions must be maintained effectively and therefore design quality is as (if not more) important as in city and premier parks.[1]

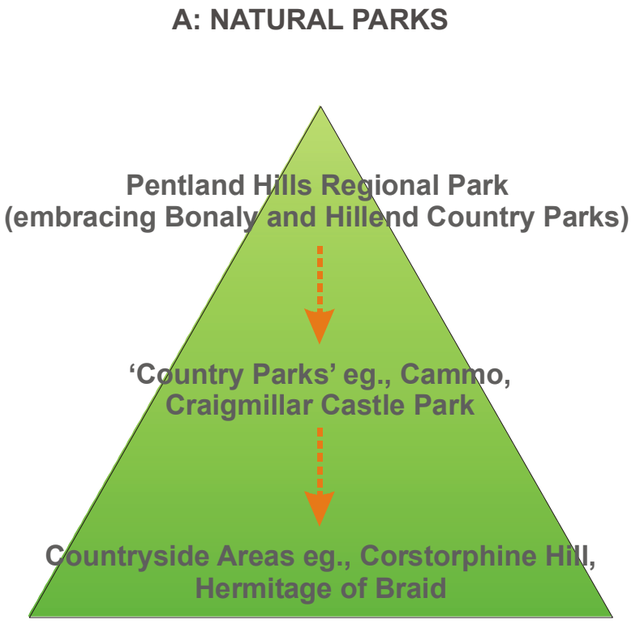


Figure 1-3 Existing notional parks hierarchy.

1 Adapted from Edinburgh Public Parks and Gardens Strategy, March 2006, The City of Edinburgh Council

Pentland Hills Regional Park (PHRP)

Has its own Joint Committee which oversees its operation in terms of the Countryside (Scotland) Act 1979. PHRP is part of the hierarchy of parks provision even though the nature of a Regional Park - its primary land-use is not recreation - makes it different to other public parks.

Premier Parks

There are a small number of high quality parks offering a wide range of facilities aimed at international and national visitors as well as local and city-wide users. These parks will often be areas with significant resources of cultural or natural heritage and may themselves be of historical importance. Design quality should be optimal and unique to each space. Standards of maintenance should be very high, thus dictating the need for designated site-based maintenance teams. The overall impression should bear comparison with the best regarded parks anywhere in the world.

Natural Heritage Sites

Natural heritage sites are generally large areas, the functions of which are determined by topography and ecology. In the main, these spaces will tend to be dominated by woodland but these spaces also include coastal areas or spaces with topographical features, such as hills and river valleys. The semi-natural character of these spaces means that management for biodiversity is of fundamental importance. Many of these spaces are designated or proposed Local Nature Reserves, Urban Wildlife Sites, or Sites of Interest for Nature Conservation. Therefore, these areas are well-suited to informal environmental education. Access is likely to be facilitated via car, hence they will generally include designated car parking areas within their boundaries.

City Parks

City parks provide facilities that are used by people who may live anywhere in the city. These are likely to be larger in size and the facilities provided will be more specialised, with many spaces including sports pitches and other formal facilities. However, these parks may also function as the Community Park for some people by virtue of proximity to their home, and the absence of other smaller areas in the vicinity. Access will be by car or bus, or commonly by bicycle or on foot.

Community Parks

Community parks are spaces serving chiefly the people of a defined local area. These parks are generally smaller in area and the facilities provided are likely to be relatively simple. Functions should be determined as a far as possible by consultation with users and potential users. Access to these parks will be mainly on foot or by cycle.

Ornamental Gardens

Generally, ornamental gardens are small areas subject to intensive horticultural input with some provision for passive recreation (generally seats) with little or no provision for other forms of recreation. These gardens are generally used for quiet enjoyment and relaxation.

Park and Openspaces Categories

General Lighting Requirements

There are 183 sites noted in the City of Edinburgh Council Parks and Openspaces list (22-02-22). These are listed on the pages following this section and each has been classified as previously noted above. The following descriptions outline the general lighting requirements for each classification of space.

Premier Park

There are 11 Premier Parks noted in the City of Edinburgh Council Parks and Openspaces list (22-02-22). Premier parks include Inverleith Park, Princes Street Gardens, Leith Links, Saughton Park and Winter Gardens, and the Meadows and Brunstfield Links. Lighting within these parks should be functional to enable public access and recreational activities associated with the park to be undertaken within the agreed darkness hours. It is likely that lighting curfews will be required within these parks. Curfews will need to be agreed on a project-by-project basis relative to the site.

It should be noted that these parks are expected to be of the highest design standards (see page 6). Therefore, architectural lighting is expected to form a strong design element to increase the perceptions of these spaces for both citizens and visitors to the city. It is expected that these parks may act as venues for cultural events and sports.

Architectural lighting could include focal points, public art, statutes and monuments, and highlight buildings of significance and heritage themes and assets. Vehicular roads are present in some of the parks with associated car parks.

City Park

There are 13 City Parks noted in the City of Edinburgh Council Parks and Openspaces list (22-02-22). City Parks include Gyle Park Gypsy Brae Recreation Ground, Roseburn Park, Victoria Park, and Hunters Hall Park. These parks should also be considered primarily as parks delivering particular functions for citizens of the whole of Edinburgh and providing amenities for the local community. The lighting standards will therefore be guided by the specific activities being undertaken in the park. Vehicular roads are present in some of the parks with associated car parks.

Regional Park

The Pentland Hills Regional Park is primarily seen as an environmental asset. It is expected that the Regional Park will be treated with additional environmental restrictions on lighting. The ecological implications, therefore, must be taken into consideration early in the lighting decision-making process.

The need for lighting for specific tasks or areas, e.g. lighting around buildings or car parks, should be considered carefully with the environmental aspects being a primary consideration.

The obtrusive lighting environmental zoning, which will be discussed later in this document, will be E2 and bordering on E1 in some cases. It is likely that any lighting within the Regional Park with the exception of public roads would be subject to a lighting curfew.

Natural Heritage Park

There are 32 Natural Heritage sites noted in the City of Edinburgh Council Parks and Openspaces list (22-02-22). Natural Heritage Parks would include sites like Cammo Estate, Braid Hills, River Almond Walkway, Blackford Hill and Wester Craiglockhart Hill. These spaces can be considered similar in their lighting approach to the Regional Parks. These spaces are primarily considered environmental assets and should be kept as dark spaces. However, as some of them are within the urban part of the city, such as the Water of Leith Walkway, existing lighting within and abounding the space should be considered. Prior to developing the lighting strategy, a lighting survey should be undertaken to assess the level of obtrusive light present. Findings from the lighting survey will inform the lighting design as well as any ecological and environmental constraints.

The likely environmental zoning for urban and smaller Natural Heritage sites will be E3-E2 whilst the outlying and larger spaces will likely to be able to accept the E2-E1 classification. Lighting curfews should be considered as a primary tool to preserve the environmental and ecological requirements.

Community Park

There are 96 Community Parks noted in the City of Edinburgh Council Parks and Openspaces list (22-02-22). The size and nature of the use of these parks will be heavily influenced by the community and the local environs. Community Parks represent the largest group of spaces that the Council manage. Community Parks include White Park, Seven Acre Park, Drum Brae Park, Figgate Burn Park, Muirhouse Millennium Linear Parks and Pilrig Park. It is expected that these parks will include most forms of lighting discussed within this document with the project specifics determining the lighting character to be applied to each park. Public engagement will be essential in forming a lighting strategy.

Recreation Park

There is only one Recreation Park noted in the City of Edinburgh Council Parks and Openspaces list (22-02-22). The Recreation Park noted is Craigentinney Golf Course.

Gardens

There are 22 Gardens as noted in the City of Edinburgh Council Parks and Openspaces list (22-02-22). Gardens are characterised as formal spaces for pedestrians with reduced cycle use due to their size. All lighting should be scaled for pedestrians. It will be important to ascertain early if there is a restricted opening times for the gardens as this may reduce the lighting requirements or negate the need for lighting entirely.

Walkway

Walkways can be considered cycle/pedestrian routes, particularly those considered as Active Travel routes. However, there may be cycle restrictions on some of the walkway sections.

The walkways are often disused railway lines and, as such, there will be cuttings and tunnels that will restrict ambient daylight. So, these areas should be especially considered for lighting. The mixed nature and easy accessibility of the former railway routes and off-road network will require additional attention to prevent accidents and conflict between cyclists and pedestrians. It is expected that these routes may attract wheelchair users due to having more level access.

Woodland

Woodland areas are considered primarily pedestrian access spaces and the lighting should reflect the natural environment. It is anticipated that these areas will be dark spaces unless there is particular desire line or particular need identified during a site assessment. If lighting is identified as needed, the environmental zoning should be considered as E2.

The City of Edinburgh Council Parks and Openspaces List, 2022

TFCLOUD_SITE_ID	OS_REFERENCE	PAN65	SITE NAME	LOCATION	CLASSIFICATION
SIT0236	PG 59	Public Parks & Gardens	COLINTON MAINS PARK	Oxgangs Road North	City Park
SIT0339	PG 89	Public Parks & Gardens	DAVIDSON'S MAIN'S PARK	27 East Barnton Avenue	City Park
SIT0503			GYLE PARK	Glasgow Road	City Park
SIT0506			GYPSY BRAE RECREATION GROUND	West Shore Road	City Park
SIT0563	PG 24	Public Parks & Gardens	HUNTERS HALL PARK (JACK KANE)	Niddrie Mains Road	City Park
SIT0569	PG 35	Public Parks & Gardens	INCH PARK	Old Dalkeith Road	City Park
SIT0604	PG 114	Public Parks & Gardens	KING GEORGE V EYRE PLACE	(13) Logan Street	City Park
SIT0935	PG 5	Public Parks & Gardens	LONDON ROAD GARDENS	London Road	City Park
SIT0830			PATIE'S ROAD RECREATION GROUND	Katesmill Road	City Park
SIT0927	PG 75	Public Parks & Gardens	ROSEBURN PARK	(6) Roseburn Park, Riversdale Crescent	City Park
SIT1106	PF 27	Playing Field	UNION PARK	Saughton Road North	City Park
SIT1111	PG 105	Public Parks & Gardens	VICTORIA PARK	161 NEWHAVEN ROAD	City Park
SIT0869			PORTOBELLO PARK / GOLF COURSE	21 STANLEY STREET	City Park and Golf Course
SIT0006			ABERCORN PARK	ABERCORN TERRACE	Community Park
SIT0019	PG 83	Public Parks & Gardens	ALLISON PARK	CARMEL ROAD, KIRKLISTON	Community Park
SIT1652			BALGREEN PARK	Balgreen Park	Community Park
SIT0587			BARONSCOURT PARK	Baronscourt Terrace	Community Park
			BARONY COMMUNITY GARDEN		Community Park
SIT0062			BINGHAM PARK	35 Bingham Avenue	Community Park
SIT0077			BLINKBONNY PARK	BLINKBONNY ROAD	Community Park
SIT0078			BLOOMIEHALL PARK	(13) Juniper Park Road	Community Park
SIT0096			BRAIDBURN VALLEY PARK	(168) Comiston Road	Community Park
SIT0102			BRIGHTON PARK	Brighton Place	Community Park
SIT1737			BRUNSTANE MILL PARK	3 Brunstane Mill Rd	Community Park
SIT0351	PG 137	Public Parks & Gardens	BUTTERCUP FARM PARK	Ardshiel Avenue	Community Park
SIT0133	PG 22	Public Parks & Gardens	CAIRNTOWS PARK	Duddingston Road West	Community Park
SIT0148			CAMPBELL PARK	(114A) Woodhall Road	Community Park
SIT1248	PG 76	Public Parks & Gardens	CLERMISTON PARK	Clermiston Gardens	Community Park
SIT1725			CURRIEMUIREND PARK	Wester Hailes Road	Community Park
SIT0324	PG 120	Public Parks & Gardens	DALMENY STREET PARK	Dalmeny Street	Community Park
SIT0447			DONKEYFIELD COMMUNITY ORCHARD	Brunstane Road South, A1	Community Park
SIT0610			DOVECOT PARK (KINGSKNOWE)	Lanark Road	Community Park
SIT1250	PG 77	Public Parks & Gardens	DRUM BRAE PARK	Drum Brae Crescent	Community Park
SIT0353	PG 31	Public Parks & Gardens	DRUM PARK	Drum Avenue (Gilmerton)	Community Park
SIT0375			DUNDAS PARK (SQ)	Dundas Avenue, South Queensferry	Community Park
SIT0385			EAST PILTON PARK	Pilton Avenue	Community Park
SIT0390	PG 108	Public Parks & Gardens	EASTER DRYLAW PARK	Easter Drylaw Drive	Community Park
SIT1730			ELLEN'S GLEN	Ellen's Glen Road	Community Park
SIT0403	PG 60	Public Parks & Gardens	FAIRMILEHEAD PARK	Camus Avenue, Comiston Road	Community Park
SIT0405	PG 78	Public Parks & Gardens	FAULDBURN PARK	Fauldburn Park (East Craigs)	Community Park
SIT0409	PG 30	Public Parks & Gardens	FERNIEHILL COMMUNITY PARK	Ferniehill Road	Community Park
SIT0411	PG 28, PF 10	Public Parks & Gardens, Playing Fie	FERNIESIDE RECREATION GROUND	Fernieside Road	Community Park
SIT1744	PG 16	Public Parks & Gardens	FIGGATE BURN PARK (FIGGATE PARK EAST)	Hamilton Drive	Community Park
SIT0419	PG 16	Public Parks & Gardens	FIGGATE BURN PARK (FIGGATE PARK WEST)	Mountcastle Drive North	Community Park
SIT1735			FOUNTAINBRIDGE GREEN	Bainfield Place	Community Park
SIT1727			GLENDEVON PARK	Glendevon Park	Community Park
SIT0327			GORGIE/DALRY COMMUNITY PARK	Dalry Road	Community Park
SIT1731			GRACEMOUNT COMMUNITY PARK	Gracemount House Drive	Community Park
SIT1726			GRANTON CRESCENT PARK	Granton Cresent	Community Park
SIT0508	PG 56	Public Parks & Gardens	HAILES QUARRY PARK	Dumbryden Drive	Community Park
SIT1594			HARRISON PARK EAST	(4) West Bryson Road	Community Park

Table 1-1 The City of Edinburgh Council Parks and Openspaces List

SIT0508	PG 56	Public Parks & Gardens	HAILES QUARRY PARK	Dumbryden Drive	Community Park
SIT1594			HARRISON PARK EAST	(4) West Bryson Road	Community Park
SIT0519			HARRISON PARK WEST	Harrison Road	Community Park
SIT0092			HAUGH PARK	Brae Park Road	Community Park
SIT1179	PG 131	Public Parks & Gardens	HENDERSON GARDENS	Henderson Gardens (Yardheads)	Community Park
SIT0571			INCHCOLM PARK (SOUTH QUEENSFERRY)	Inchcolm Terrace, South Queensferry	Community Park
SIT0063	PG 21	Public Parks & Gardens	JEWEL PARK	Duddingston Park South	Community Park
SIT0593	PF 4	Public Parks & Gardens	JOPPA QUARRY PARK	Milton Road East	Community Park
SIT0602			KEDDIE PARK	1/1 & 1/2 Largo Place, Leith	Community Park
SIT0603	PG 72	Public Parks & Gardens	KING GEORGE V CURRIE	Lanark Road West, Currie	Community Park
SIT0560			KING GEORGE V SOUTH QUEENSFERRY	Farquhar Terrace, South Queensferry	Community Park
SIT0661			LIBERTON PARK	8-50 Liberton Gardens	Community Park
SIT0668	PG 13	Public Parks & Gardens	LOCHEND PARK	25 Lochend Road South	Community Park
SIT1708			MAGDALENE GLEN		Community Park
SIT1467			MALLENY PARK	Bavelaw Road	Community Park
SIT0217			MARCHBANK PARK	Deanpark Place (Balerno)	Community Park
SIT0705	PG 14	Public Parks & Gardens	MEADOWFIELD PARK	Meadowfield Drive	Community Park
SIT0707			MEADOWSPOT PARK	Meadowspot off (Craighouse Road)	Community Park
SIT0720	PG 119	Public Parks & Gardens	MONTGOMERY STREET PARK	119A Montgomery Street	Community Park
SIT1184	PG 29	Public Parks & Gardens	MOREDUN PARK (GILMERTON)	Moredun Park View	Community Park
SIT1683			MORGAN PLAYING FIELDS	Peffermill Road	Community Park
SIT0733			MORNINGSIDE PARK	Balcarres Street	Community Park
SIT1523			MORTONHALL COMMUNITY PARK	Frogston Road East	Community Park
SIT0744	PG 67	Public Parks & Gardens	MUIR WOOD PARK	Muir Wood Road, Currie	Community Park
SIT0742			MUIRHOUSE LINEAR PARK PHASE 1	Muirhouse Drive	Community Park
SIT1746			MUIRHOUSE LINEAR PARK PHASE 2	Muirhouse Drive	Community Park
SIT0745			MURIESTON PARK	(39) Murieston Crescent	Community Park
SIT0768			NEWCRAIGHALL PARK	Newcraighall Park View	Community Park
SIT1646	PG 111	Public Parks & Gardens	ORCHARD (BRAE) PARK NORTH	Orchard Drive	Community Park
SIT0815	PG 110	Public Parks & Gardens	ORCHARD (BRAE) PARK SOUTH	Queensferry Road	Community Park
SIT1650			PARKSIDE PARK (NEWBRIDGE)	Parkside, Newbridge	Community Park
SIT0317			PENTLAND VIEW PARK	Pentland View, Currie	Community Park
SIT0849	PG 121	Public Parks & Gardens	PILRIG PARK	69 Pilrig Street	Community Park
SIT0878			PRESTONFIELD PARK	Prestonfield Avenue	Community Park
SIT0898			RATHO PARK	Ratho Village	Community Park
SIT1365			RATHO STATION PARK	Ratho Station	Community Park
SIT0669			RATHO STATION RECREATION GROUND	Glasgow Road	Community Park
SIT0902	PG 109	Public Parks & Gardens	RAVELSTON PARK	(17) Keith Crescent	Community Park
SIT1366			REDBRAES PARK	Redbraes Place	Community Park
SIT0907			REDHALL PARK	Kilncroftside, Redhall Drive	Community Park
SIT0908			REGENT ROAD PARK	(12) Regent Road	Community Park
SIT1651			RIVERSIDE PARK	Riverside, Newbridge	Community Park
SIT0929	PG 17	Public Parks & Gardens	ROSEFIELD PARK	Rosefield Place	Community Park
SIT1519			SEAFIELD RECREATION GROUND	Craigentinny Avenue	Community Park
SIT1057	PG 33	Public Parks & Gardens	SEVEN ACRE PARK	Stanedykehead (Alnwickhill)	Community Park
SIT1057	PG 33	Public Parks & Gardens	SEVEN ACRE PARK (LEASED FOR GRAZING)	Stanedykehead (Alnwickhill)	Community Park
SIT0975			SIGHTHILL PARK	250 Broomhouse Road	Community Park
SIT1724			SILVERKNOWES PARK / GOLF COURSE	Silverknowes Parkway	Community Park
SIT1017	PG 62	Public Parks & Gardens	SPYLAW PARK	Bridge Road	Community Park
SIT1660			ST KATHARINE'S PARK	Liberton Gardens	Community Park
SIT1041	PG 74	Public Parks & Gardens	ST MARGARET'S PARK	(29A) Corstorphine High Street	Community Park
SIT1043			ST MARK'S PARK	Warriston Road	Community Park
SIT1059	PG 104	Public Parks & Gardens	STARBANK PARK	(18) Laverockbank Road	Community Park
SIT0679	PG 86	Public Parks & Gardens	STATION ROAD PARK	Station Road (South Queensferry)	Community Park

Table 1-2 The City of Edinburgh Council Parks and Openspaces List

SIT0862	None	None	TREVERLEN PARK	7 Hamilton Terrace	Community Park
SIT1145			WEST PILTON PARK	West Pilton Avenue	Community Park
SIT1715			WHINHILL PARK	West Pilton Avenue	Community Park
SIT1169			WHITE PARK	(1) White Park	Community Park
SIT0215			ATHOLL CRESCENT	ATHOLL CRESCENT	Gardens
SIT1732	PG 12	Public Parks & Gardens	BELLEVUE CRESCENT GARDENS NORTH	Bellevue Crescent	Gardens
SIT0058	PG 12	Public Parks & Gardens	BELLEVUE CRESCENT GARDENS SOUTH	Bellevue Crescent	Gardens
SIT0178			CASTLE TERRACE GARDENS	Castle Terrace	Gardens
SIT0028			COATES CRESCENT	COATES CRESCENT	Gardens
SIT0298			CRAMOND WALLED GARDEN	20/2 CRAMOND GLEBE ROAD	Gardens
SIT1150			DEACONESS GARDEN	West Richmond Street	Gardens
SIT0374			DUNBAR'S CLOSE GARDENS	Canongate, High Street	Gardens
SIT0441			GARDNER'S CRESCENT	Gardeners Crescent	Gardens
SIT0442	PG 8	Public Parks & Gardens	GAYFIELD SQUARE	Gayfield Square	Gardens
SIT1738			GRANNY'S GREEN	King Stables Road	Gardens
SIT1741	PG 23	Public Parks & Gardens, Playing Fie	HAYS PARK	NIDDRIE MAINS DRIVE	Gardens
SIT0550			HILL SQUARE GARDEN	Hill Square	Gardens
SIT0551	PG 118	Public Parks & Gardens	HILLSIDE CRESCENT GARDENS	Hillside Crescent	Gardens
SIT0558	PG 117	Public Parks & Gardens	HOPETOUN CRESCENT GARDENS	Hopetoun Crescent	Gardens
SIT0638	PG 90	Public Parks & Gardens	LAURISTON CASTLE	Cramond Road South	Gardens
SIT0782			NICOLSON SQUARE GARDEN	Nicolson Square	Gardens
SIT0347	PG 26	Public Parks & Gardens	PORTOBELLO COMMUNITY GARDEN	John Street	Gardens
			PRESTONFIELD WAR MEMORIAL		Gardens
SIT1052	PG 44	Public Parks & Gardens	ST PATRICK SQUARE	St Patrick Square	Gardens
SIT1077			TAYLOR GARDENS	(176) Great Junction Street	Gardens
SIT0094			BRAID HILLS GOLF COURSE	Braid Hills Drive	Natural Heritage Park
SIT1249	NAT 26	Semi-natural Park	BURDIEHOUSE BURN LOCAL NATURE RESERVE	Gilmerton Dykes Street	Natural Heritage Park
SIT0147			CAMMO ESTATE LOCAL NATURE RESERVE	CAMMO ROAD	Natural Heritage Park
SIT1531			COLINTON AND CRAIGLOCKHART DELLS (COLINTON DELL WARDS 25&26)	Lanark Road	Natural Heritage Park
SIT0231	NAT 57	Semi-natural Park	COLINTON AND CRAIGLOCKHART DELLS (COLINTON DELL)	Lanark Road	Natural Heritage Park
SIT1729			COLINTON AND CRAIGLOCKHART DELLS (CRAIGLOCKHART DELL)	(31) Lanark Road	Natural Heritage Park
SIT1743			COLINTON AND CRAIGLOCKHART DELLS (CRAIGLOCKHART WOODS)	Colinton Road	Natural Heritage Park
SIT0248	NAT 89	Semi-natural Park	CORSTORPHINE HILL LOCAL NATURE RESERVE	Clermiston Road North	Natural Heritage Park
SIT0101	NAT 24	Semi-natural Park	CRAIGMILLAR CASTLE JUBILEE PARK	Old Dalkeith Road	Natural Heritage Park
SIT0691			CRAMOND FORESHORE	MARINE DRIVE	Natural Heritage Park
			BAUKS VIEW		Natural Heritage Park
SIT0277			EASTER CRAIGLOCKHART HILL LOCAL NATURE RESERVE	COLINTON ROAD	Natural Heritage Park
SIT0412	GRE 138	Green Corridors	FERRY GLEN AND BACK BRAES	Station Road (South Queensferry)	Natural Heritage Park
SIT0286			HAWKHILL WOODS	Craigmillar Castle Road	Natural Heritage Park
SIT0539	NAT 44	Semi-natural Park	HERMITAGE OF BRAID	(163A) Braid Road	Natural Heritage Park
SIT0069			HERMITAGE OF BRAID (BLACKFORD HILL)	(4) Charterhall Road / Observatory Road	Natural Heritage Park
SIT1733	None	None	LITTLE FRANCE PARK	THE WISP	Natural Heritage Park
SIT0706			MEADOWS YARD LOCAL NATURE RESERVE	Fillyside Road	Natural Heritage Park
SIT0126			MOREDUN WOODS	Ellen's Glen Road	Natural Heritage Park
SIT1739	NAT 117	Public Parks & Gardens	PIKES POOL	Carmel Road, Kirkliston	Natural Heritage Park
SIT1745	NAT 108	Semi-natural Park	RAVELSTON WOODS LOCAL NATURE RESERVE	Craigcrook Road	Natural Heritage Park
SIT1581			REDFORD WOODS	Redford Road	Natural Heritage Park
SIT0912	GRE 129	Green Corridors	RIVER ALMOND WALKWAY	Cramond Glebe to Dowies Mill Lane	Natural Heritage Park
SIT1717	GRE 175	Green Corridors	WATER OF LEITH WALKWAY (ROCHEID PATH)	34 Arboretum Avenue	Natural Heritage Park
SIT1736	NAT 51	Other semi-natural greenspace	WESTER CRAIGLOCKHART HILL	Glenlockhart Road	Natural Heritage Park
SIT0837	None	None	PENTLAND HILLS REGIONAL PARK (HARLAW RESERVOIR & VISITOR CENTRE)	Harlaw Road, Balerno	Natural Heritage Park and Regional Park
SIT0080	None	None	PENTLAND HILLS REGIONAL PARK (BONALY COUNTRY PARK)	Bonaly Road, EH14	Natural Heritage Park and Regional Park
SIT1094	None	None	PENTLAND HILLS REGIONAL PARK (TORPHIN QUARRY)		Natural Heritage Park and Regional Park
SIT0086	AM 444	Residential	BOTHWELL STREET GARDENS	Bothwell Street	Open Space Plot and Gardens

Table 1-3 The City of Edinburgh Council Parks and Openspaces List

SIT1747			MALLENY BOWL	Mansfield Road	Open Space Plot and Recreation
SIT0125			BUCKSTONE WOODS	Buckstone Circle	Open Space Plot and Woodland
SIT0141			CALTON HILL	34 CALTON HILL, EDINBURGH	Premier Park
SIT1424			INVERLEITH PARK	8(01) Portgower Place	Premier Park
SIT0652	PG 128	Public Parks & Gardens	LEITH LINKS EAST	LINKS GARDENS, EDINBURGH	Premier Park
SIT0651	PG 126, PG 127	Public Parks & Gardens	LEITH LINKS WEST	11 LINKS PLACE	Premier Park
SIT0386	PG 1	Public Parks & Gardens	PRINCES STREET GARDENS - EAST	PRINCES STREET GARDENS, EDINBURGH, EH2 2	Premier Park
SIT1147	PG 2	Public Parks & Gardens	PRINCES STREET GARDENS - WEST	PRINCES STREET GARDENS	Premier Park
SIT0946			SAUGHTON PARK	172(09) Balgreen Road	Premier Park
SIT1140			SOUTH MEADOW WALK	MELVILLE DRIVE	Premier Park
SIT1200			THE MEADOWS & BRUNTSFIELD LINKS (BRUNTSFIELD LINKS EAST)	Whitehouse Loan	Premier Park
SIT0382			THE MEADOWS & BRUNTSFIELD LINKS (THE MEADOWS)	MELVILLE DRIVE, EH9 1ND	Premier Park
SIT0119			THE MEADOWS AND BRUNTSFIELD LINKS (BRUNTSFIELD LINKS WEST)	WHITEHOUSE LOAN	Premier Park
SIT0265	GC 1	Golf Course	CRAIGENTINNY GOLF COURSE	Fillyside Road	Recreation Park
SIT1652			BALGREEN TO CORSTORPHINE WALKWAY	Balgreen Road	Walkway
SIT1009	GRE 132	Green Corridors	KIRKLISTON TO NEWBRIDGE WALKWAY	Wellflats Road	Walkway
SIT1740			NEWBRIDGE RIVERSIDE WALKWAY	NEWBRIDGE / A8 AREA	Walkway
SIT0959	GRE 179	Green Corridors	SEAFIELD WALKWAY	Easter Road	Walkway
SIT1742			SOUTH QUEENSFERRY WALKWAY	The Loan and The Vennel	Walkway
SIT1774	None	None	WATER OF LEITH WALKWAY (BELLS BRAE TO MILLER ROW)	Bells Brae (15)	Walkway and Natural Heritage Park
SIT1125	None	None	WATER OF LEITH WALKWAY (COLTBRIDGE AVENUE (64) TO DAMSIDE (2))	Coltbridge Avenue (64)	Walkway and Natural Heritage Park
SIT1028	None	None	WATER OF LEITH WALKWAY (MILLER ROW (12) TO MACKENZIE PLACE AT ST B	Miller Row (12)	Walkway and Natural Heritage Park
SIT1779	None	None	WATER OF LEITH WALKWAY (SAUNDERS STREET AT ST BERNARDS BRIDGE TO	Saunders Street	Walkway and Natural Heritage Park
SIT0518	SIT0519	SIT0520	SIT0521	SIT0522	SIT0526

Table 1-4 The City of Edinburgh Council Parks and Openspaces List

Edinburgh Parks and Openspaces Map

Page 1 of 4

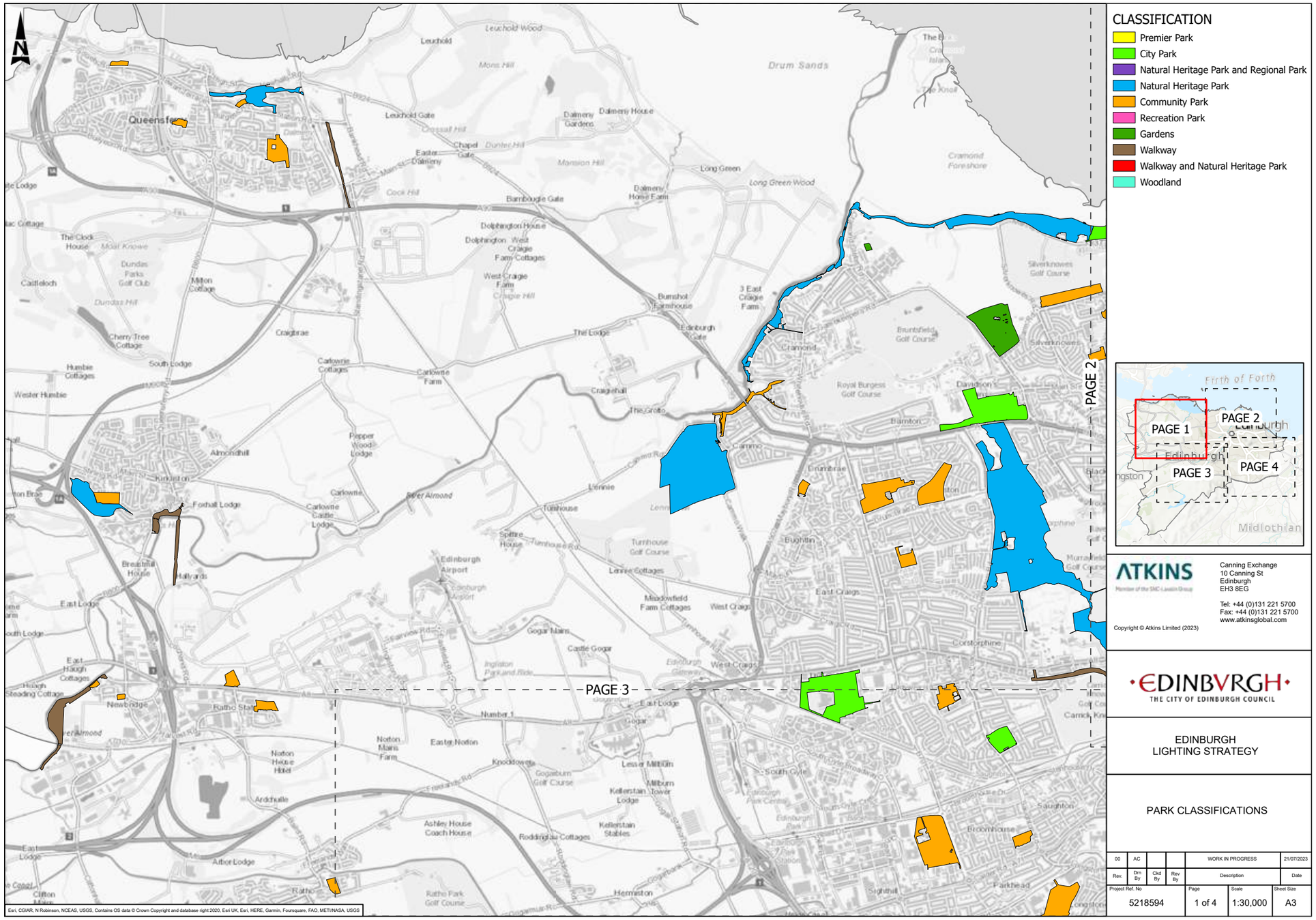


Figure 1-4 Parks classifications map, 1 of 4

Page 2 of 4

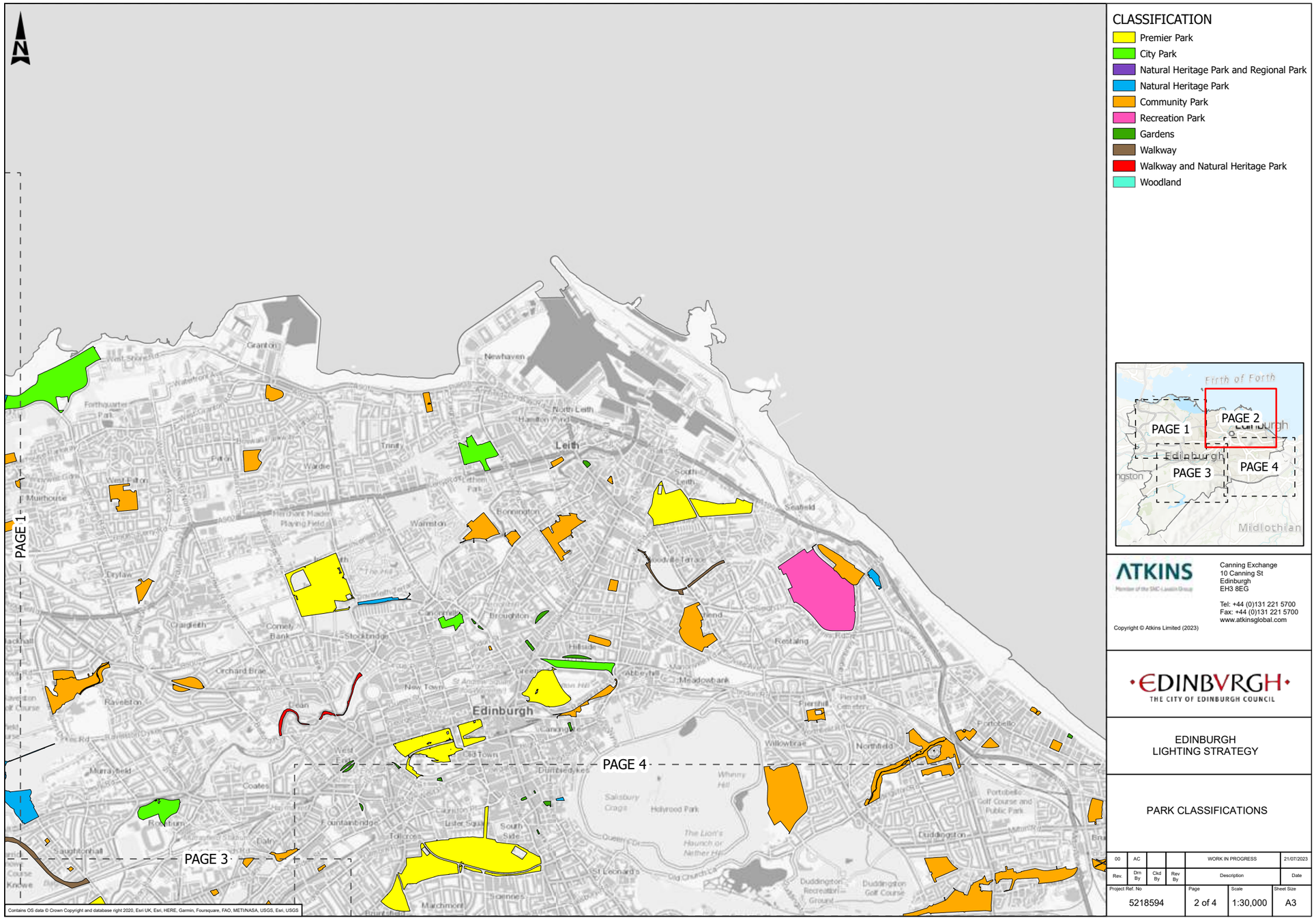
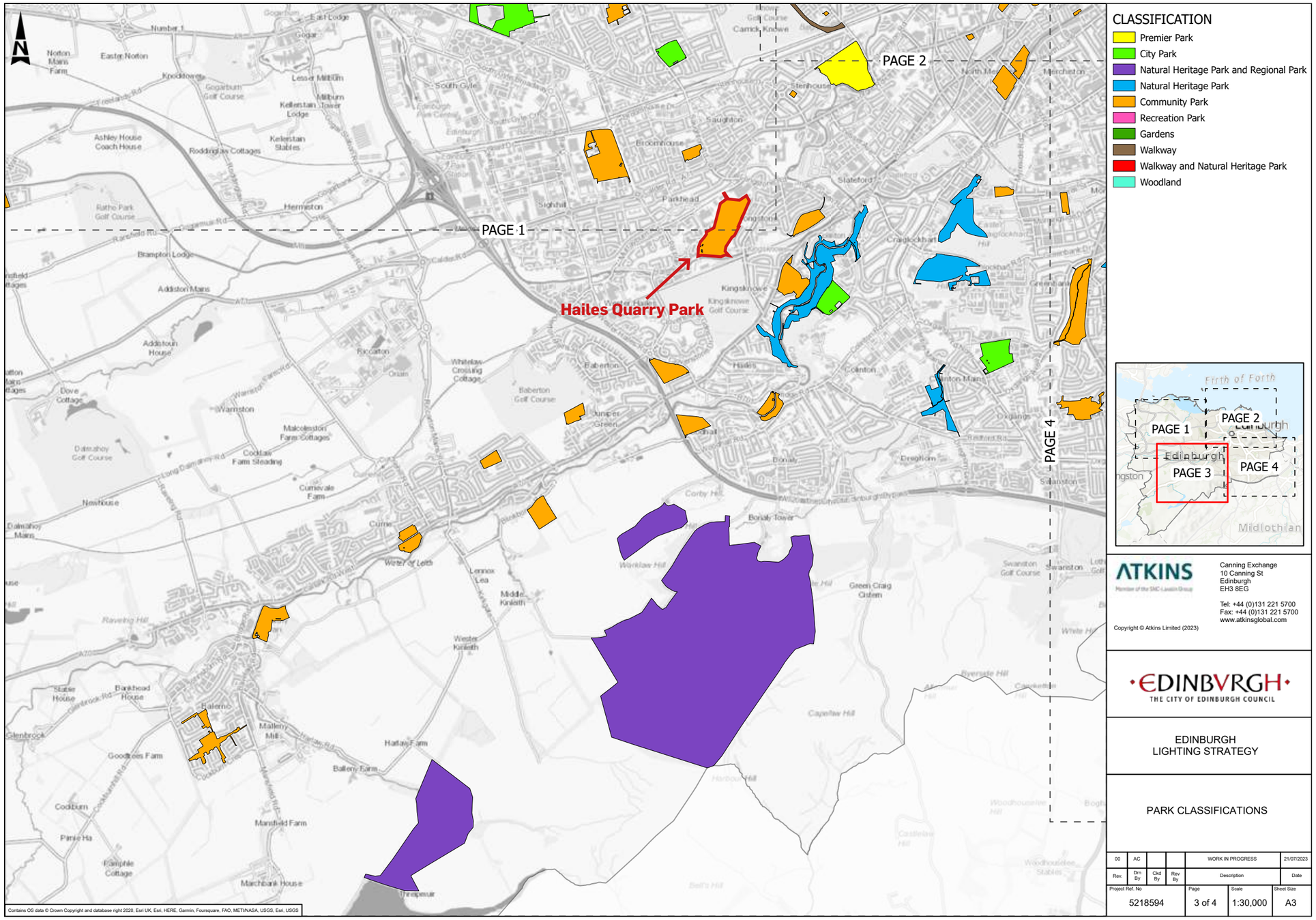


Figure 1-5 Parks classifications map, 2 of 4

Page 3 of 4



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THE CITY OF EDINBURGH COUNCIL

EDINBURGH
LIGHTING STRATEGY

PARK CLASSIFICATIONS

Rev.	Dm By	Ckd By	Rev By	Description	Date
00	AC			WORK IN PROGRESS	21/07/2023

Project Ref. No	Page	Scale	Sheet Size
5218594	3 of 4	1:30,000	A3

Figure 1-6 Parks classifications map, 3 of 4

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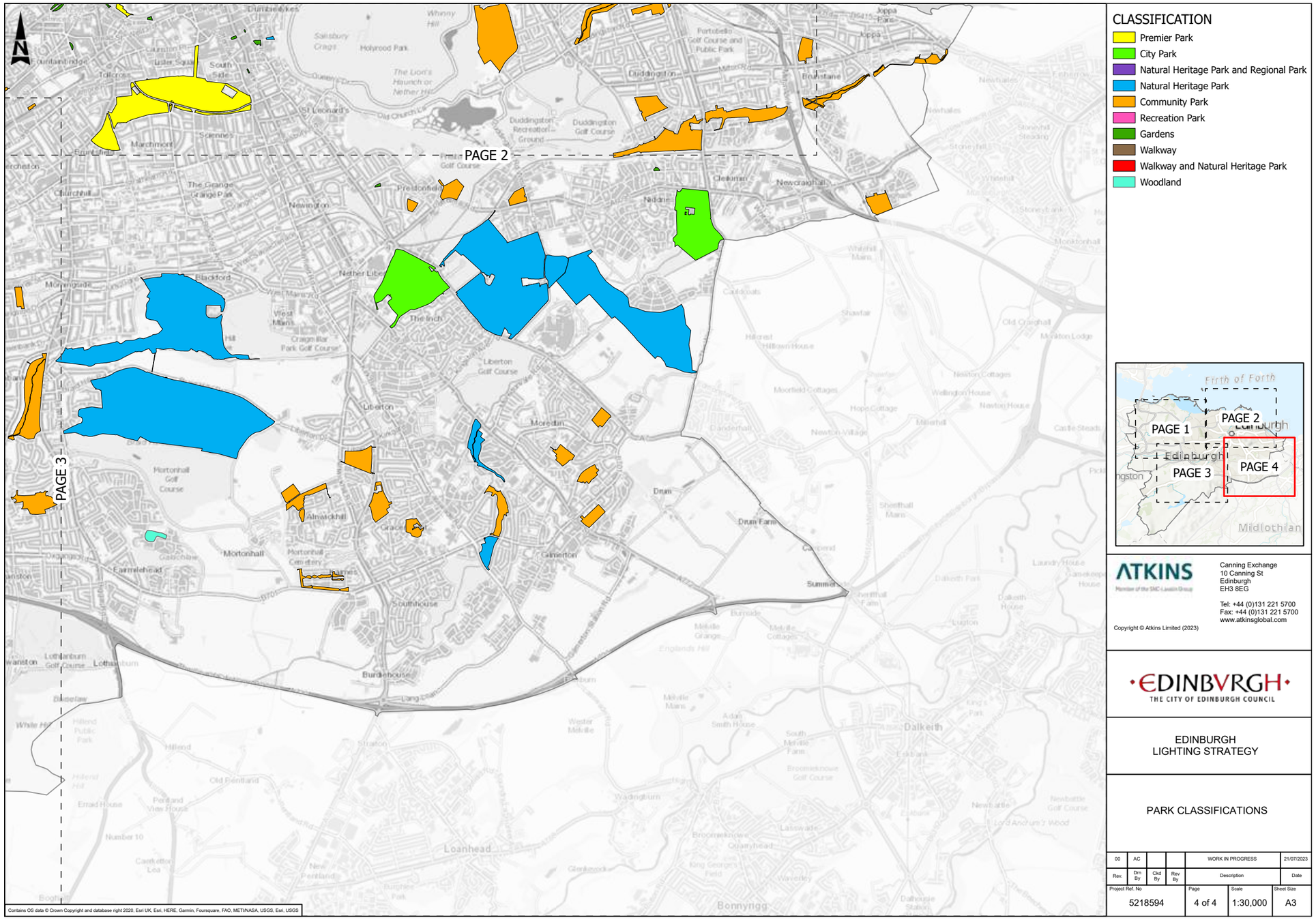


Figure 1-7 Parks classifications map, 4 of 4

World Heritage Site

Edinburgh has been designated by UNESCO as a World Heritage Site covering the Old and New Towns. The extent of the site is identified on the map in Figure 1-8.

The parks located within the World Heritage Site include:

Name	Classification
Barony Community Garden	Community Park
Calton Hill	Premier Park
Dunbar's Close	Gardens
East Princes Street Gardens	Premier Park
Gayfield Square	Gardens
Geddes Garden	Gardens
Hillside Crescent Gardens	Gardens
King George V Park	City Park
London Road Gardens	City Park
New Calton Burial Ground	Community Park
Princes Street Gardens	Premier Park
Regents Road Park	Community Park
Water of Leith Gardens	Walkway and Natural Heritage Park

Table 1-5 Edinburgh World Heritage parks list.

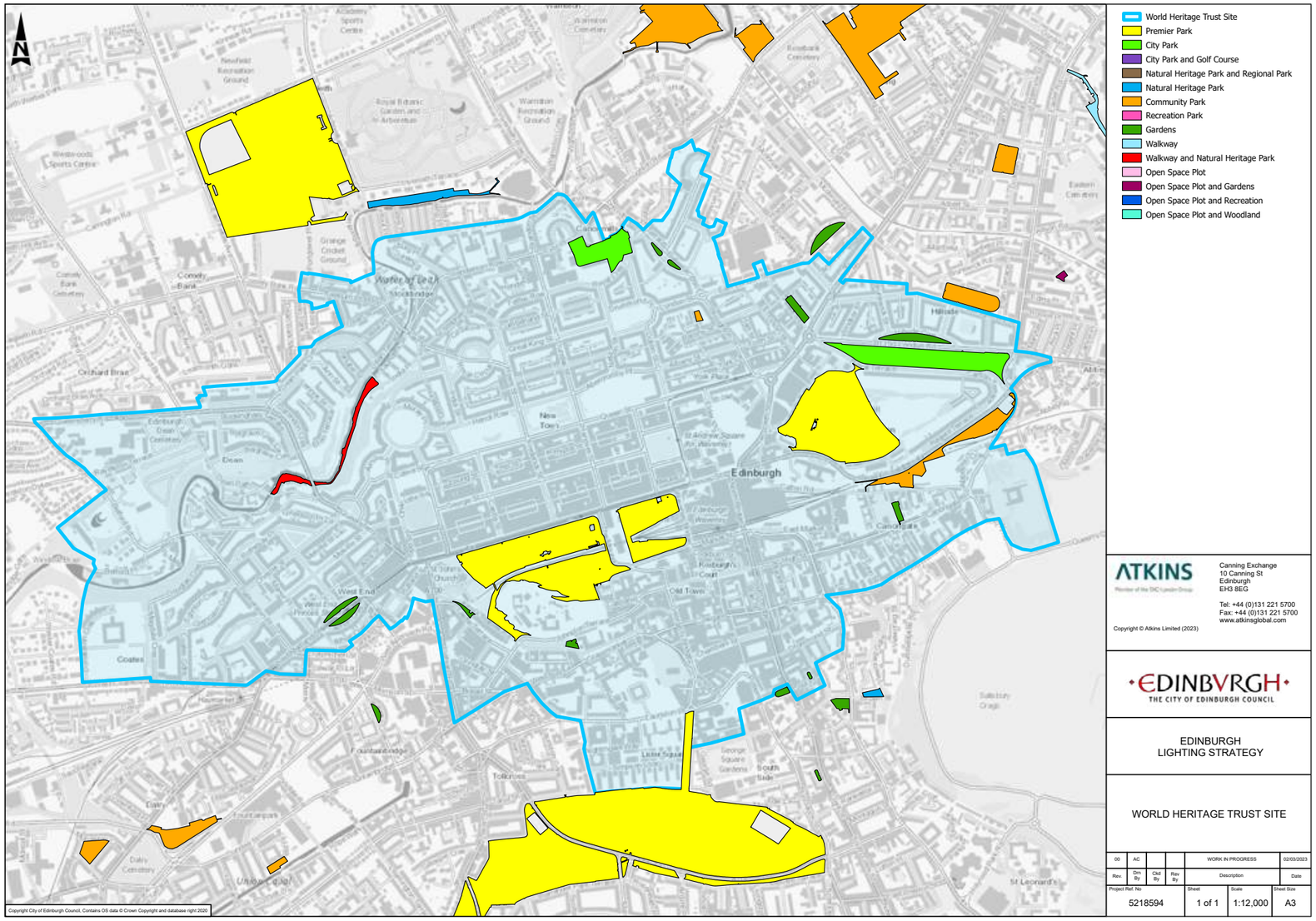


Figure 1-8 GIS map indicating the parks within the World Heritage Site with their designations.

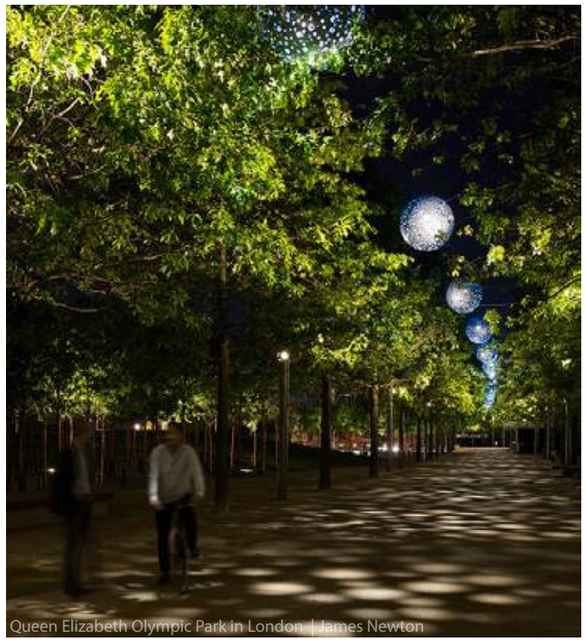
Lighting within the World Heritage Site will have a strong heritage influence and may have additional stakeholders such as Edinburgh World Heritage, Historic Environment Scotland, etc. Further guidance can be found in https://ewh.org.uk/wp-content/uploads/2017/09/Lighting-project-publication-ver-6-Feb-2012 and the City of Edinburgh Council: http://www.edinburgh.gov.uk/downloads/download/238/edinburgh_lighting_strategy

Conservation Areas

Parks maybe located within designated conservation areas and as such the park lighting may be required to take on aspects of the local environs of the surrounding buildings; this is probably most strongly recommended for parks and gardens.

Park Lighting Precedents Around the World

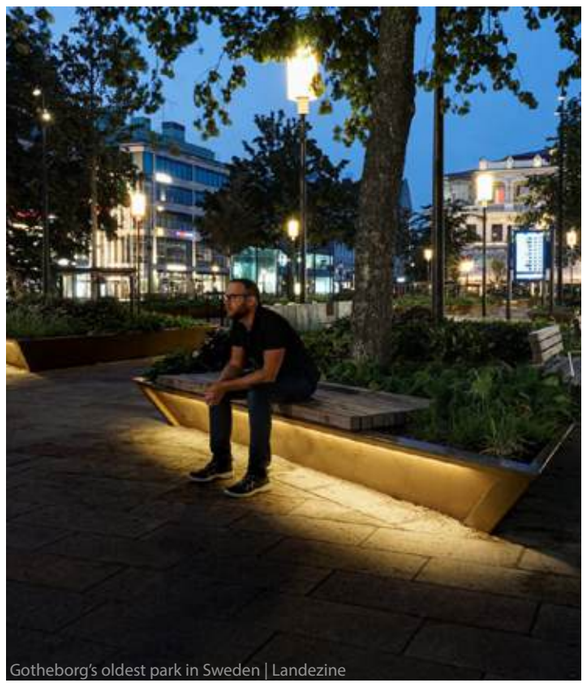
To see full descriptions of Case Studies, go to Appendix 3.1


Queen Elizabeth Olympic Park in London | James Newton

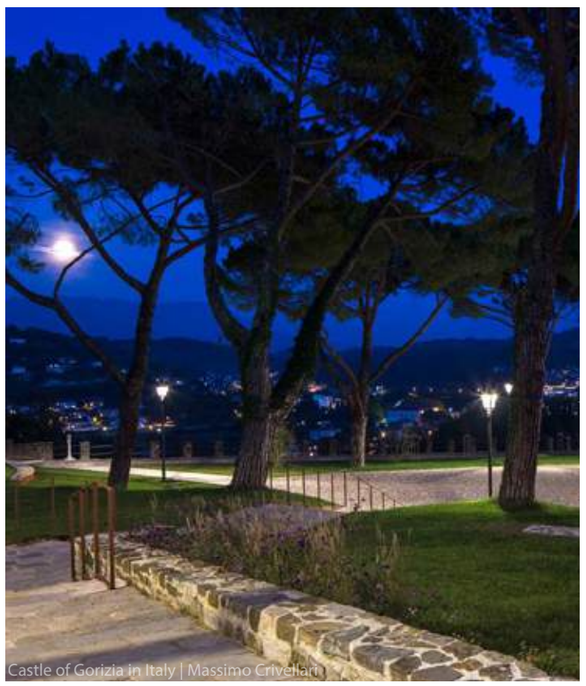

Guerilla Parking London | Urban 75

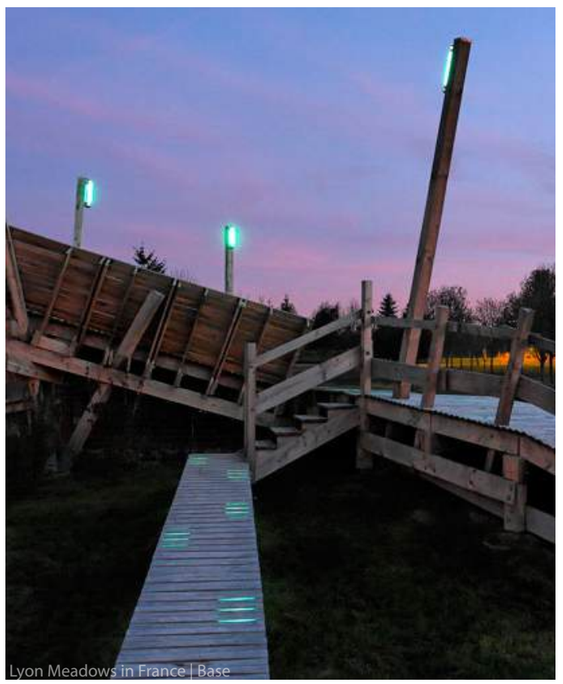

High Line in New York City | Iwan Bann


Tivoli Gardens in Copenhagen | Daderot


Gotheborg's oldest park in Sweden | Landezine


Gardens by the Bay in Singapore | Anolis Lighitng


Castle of Gorizia in Italy | Massimo Crivellari


Lyon Meadows in France | Base

3.0 Lighting Parameters

Lighting Parameters Divider Photo. George IV Bridge | The City of Edinburgh Council

Lighting Criteria, Legislation, Standards and Best Practice Guidance

LDTs are required to identifying all relevant standards that their design is intended to comply with. The standards and guidance identified in this document represent the minimum standards that shall be taken into account in their design. The table opposite is not exhaustive but it represents a snapshot of the applicable standards currently in place. It should be noted that there are variations in standards for the same situation. Where possible, this document will advise the preferred standard or criteria to be followed. It is required that the LDTs provide a list of the lighting criteria and standards that their design is based upon when developing proposals for individual sites.

Document reference	Title	Publisher	Date	Comments
Legislation				
	Health and safety at work act (Workplace regulations)	HMSO	1971	The employer is required to safe and adequate lighting
	Environmental Protection act (Clean neighbourhoods and environment sections 101-103)	HMSO	1990 2005	Requirements for obtrusive lighting
Lighting criteria and performance				
BS EN 12464-2	Lighting for workplaces External workplaces	BSI	2013	To be used when there is specific nigh time work within the parks
BS 5489-1	Design of road lighting Part 1: Lighting of roads and public amenity areas – Code of practice	BSI	2016	
BS EN-1201 93	Sports Lighting	BSI	2018	
BS 8300-1	Design of an accessible and inclusive built environment External	BSI	2018	
LG 06	Lighting Guide 6: The exterior environment	CIBSE/SLL	2016	
Environment and Sustainability				
GN01/21	The Reduction of Obtrusive Light	ILP	2021	To be produced in response to specific planning requirements but the general principals should be used throughout.
GN08	Bats and artificial lighting in the UK bats and artificial light	ILP/BCT	2018	Only to be used when there is a specific ecological requirement is identified in the project environmental statement
CIE 150:	Guide on the Limitation of the Effects of Obtrusive Light *from Outdoor Lighting Installations*1	CIE	2017	To be used in conjunction with GN01
Lighting Product and Electrical Standards				
BS7671	IET Wiring Regulations	BSI/IET	2022	
BS EN IEC60598-1-A11	Luminaire General requirements and tests	BSI	2021	
BS EN 60598-2-3:2003+A1	Luminaire Particular requirements External Luminaires	BSI	2011	
TM66	Creating a circular economy in the lighting industry	CIBSE/SLL	2021	
TM65	Embodied carbon in building services: a calculation methodology	CIBSE/SLL	2021	

Table 1-6 Lighting criteria table.

Environmental Zoning

The LDTs will be required to identify and agree the environmental zoning for their project. It should be noted that the macro environmental zoning for Edinburgh will be either E3 or E4. The local environs of the particular park or openspace may approach E2. However, justification of this classification will be required from the LDT in the form of illuminance readings for the park or openspace for an E2 classification. It would be expected that the existing ambient lighting levels across the paths, walkway, etc., would be greater than 1 lux.

Zone	Surrounding	Lighting environment	Examples
E0	Protected	Dark (SQM 20.5+)	Astronomical Observable dark skies, UNESCO starlight reserves, IDA dark sky places
E1	Natural	Dark (SQM 20 to 20.5)	Relatively uninhabited rural areas, National Parks, Areas of Outstanding Natural Beauty, IDA buffer zones etc.
E2	Rural	Low district brightness (SQM ~15 to 20)	Sparsely inhabited rural areas, village or relatively dark outer suburban locations
E3	Suburban	Medium district brightness	Well inhabited rural and urban settlements, small town centres of suburban locations
E4	Urban	High district brightness	Town / City centres with high levels of night-time activity

Table 1-7 Excerpt from ILP GN01/21 showing environmental zoning

Edinburgh Street Design Guidance - Street Lighting

Whilst it is likely that public roads sit outside of the scope of this document, it is likely that the nature of the road lighting that is either adjacent to or bisects a park or openspace may need to have parameters that will need to be influenced by lighting or development projects. This may include the choice of lighting equipment and additional features, such as hanging baskets, banners etc. The lighting design must also take due account of any adjacent public roads. This is especially important with the floodlighting of sports pitches where glare from floodlights must be calculated for road users.

The Edinburgh Street Design Guidance: Part C Detailed Design Manual has significant overlap with this document and should be consulted in tandem with this document when forming a lighting strategy for parks and openspaces. It is likely that some of the management of park and openspace lighting assets will fall under the management of the Council's Street Lighting team.

https://www.edinburgh.gov.uk/downloads/file/24963/f6-street-lighting

Routes Through the Park Environment

In some instances, the LDT will be required to produce a lighting design report as part of their submission of a planning application for their project. Within that report, the LDT should include a study of the night-time activities within the park or openspace. The study should identify all types of usage, desire lines and routes, frequency of use, and areas of ecological importance. It is expected that the LDT will use the categorisation of the routes identified below in the development of their lighting design:

Primary Routes (Mixed Vehicular, Cyclists and Pedestrians Traffic)

Primary routes are thoroughfare roads and footways or main paths that public vehicular traffic, cyclists, and/or most pedestrians use that cross a park or openspace. These routes would be designed to the appropriate road lighting standards and would be classified using the standards outlined in BS EN 13201 and BS 5489. It would generally be expected that speed restrictions (e.g. 20mph) and weight-limits would be enforced for these routes. It is expected that column lighting up to 6m would be used for the lighting of these routes, unless there are special circumstances that require either increased lighting for high traffic flow or reduced lighting due to environmental issues.

Secondary Routes (Cyclists and Pedestrians Traffic and Maintenance Vehicles)

Secondary routes are core routes that link the main elements of the park or openspace, or are seen to be desire lines for crossing the space predominantly for pedestrians and cyclists. These routes may also form part of the Active Travel plans for the park. The routes will also be used by grounds maintenance or service vehicles. This maintenance vehicle use is expected to be predominantly during daylight hours and speed restricted to below 10mph.

Tertiary Routes (Pedestrian and Occasional Maintenance Vehicles)

Tertiary routes are restricted for use mostly by pedestrians and are made up pathways primarily for access during daylight hours. Maintenance vehicles access is expected to be limited and occasional and be undertaken by grounds maintenance or service vehicles.

Nature Pathways (Pedestrian and Occasional Off-Road Maintenance Vehicles)

These pathways may not have any made up path surface or may have only loose gravel, or such, as a wearing surface. However, they may also be routes that are desire lines for local users and may require some lighting to be considered for wayfinding or lighting of sign posts.

Figure 1-9 Lighting methodologies indicative section.

Winding Paths

These pedestrian only pathways are seen to be surrounded by ecologically sensitive areas and it is mostly considered appropriate that no permanent lighting shall be provided. Generally, the public should not be encouraged to use these routes during darkness hours and, therefore, there should be no introduction of lighting to these routes. Darkness is also an amenity for users. It should be noted that the feeling of true darkness is often not something that many town and city children actually experience, so properly supervised trips into dark areas of the city should be available.

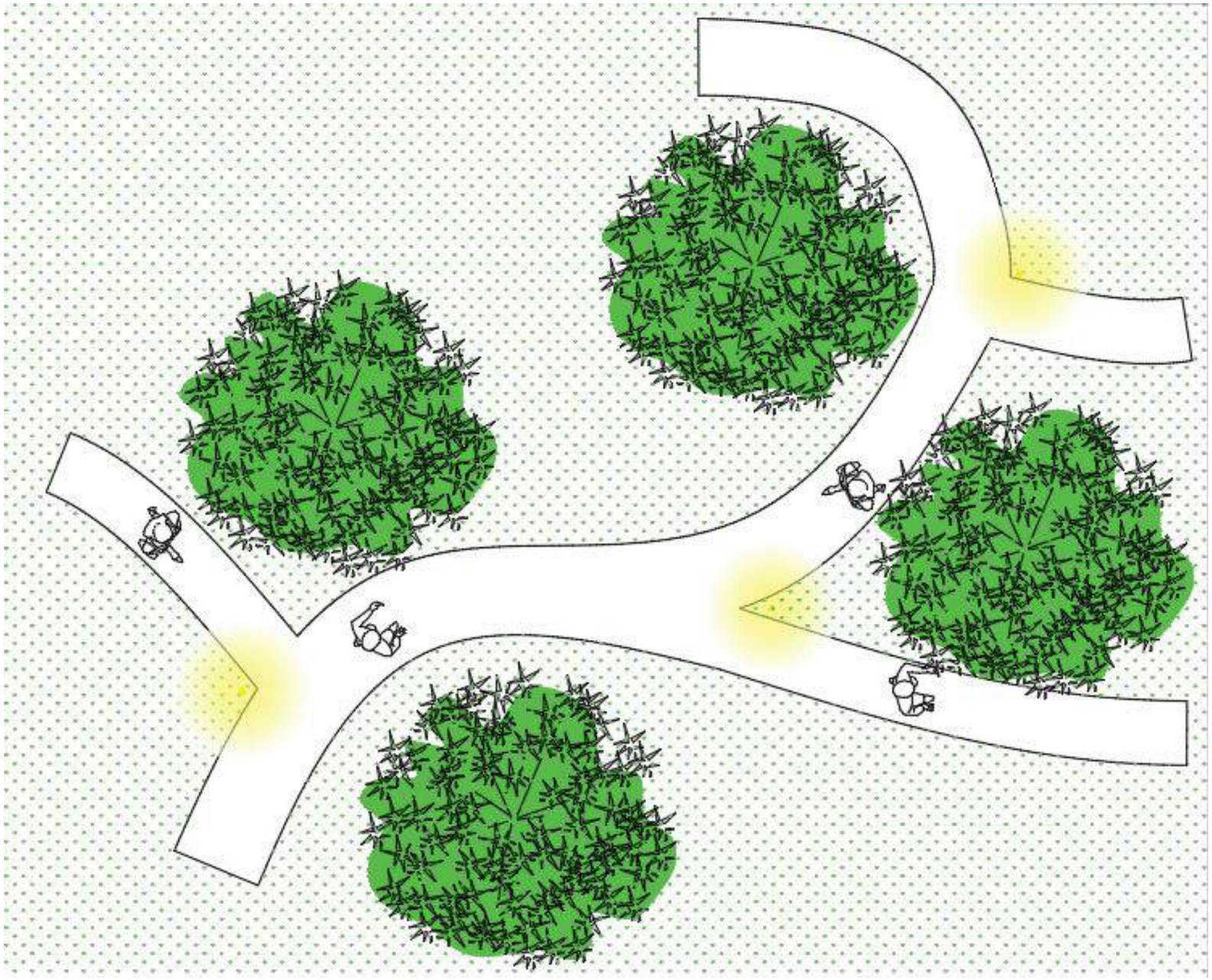


Figure 1-10 Wayfinding luminaires for winding paths.

Lighting Parameters by Function

Ecological Areas

Ecological areas will be identified in the Environmental Impact Assessment (EIA) for lighting projects. The effects of light on flora and fauna are seen to be a prime concern in these areas. The lighting, if any, will be required to perform to the requirements of the ecology section of the EIA (see section 5.0 for a detailed approach).

Focal Points

Focal points are important as they create destinations either intermediate or final. Lit object at the end of the path or a number of lit objects along a path help night-time users gauge how long it will take them to get to where they are going. A short distance between lit areas can be seen as heightening perceived personal safety at night. A focal point might be a building, a structure, a statue or work of art.

Festival and Event Lighting

Lighting for festivals and events tends to be temporary by its nature. It is unlikely that permanent lighting will form a significant part of event lighting for most parks and openspaces. However, lighting may form part of the infrastructure that allows events to happen by providing power supplies or mounting positions for additional luminaires. Individual park masterplans should consider opportunities for event lighting and how it could be incorporated into the park's infrastructure.

Light Art

Artists such as Rachel West, Vong Phaophanit, James Turrell, Jason Bruge and Olafur Eliasson are part of a group of artists whose primary media is light. Public light artworks are increasingly popular for public realm installations. Public light artworks that comprise light should be considered under the Council's Public Art Strategy.

Figure 1-11 Mute Meadow Londonderry Vong Phaophanit.

Figure 1-12 Light festivals are also popular such as Canary Wharf's bi-annual Winter Lights and Edinburgh Castle's Castle of Light.

Lighting of Heritage Assets

The World Heritage Site and other parts of the city will have heritage aspects that need to be considered. The lighting aspects in these areas that will need to be considered are mostly aesthetic. This will include the look of the lighting equipment during both daytime and night-time, the lighting of facades to create both focal points and reveal heritage structures within parks and openspaces.

Security and Personal Safety Lighting

There is a lot of mixed opinions as to whether lighting reduces crime and increases personal safety. The International Dark Sky Organisation believes that there is no additional benefit; however, there is a research from the University of Chicago that suggests there can be reductions in crime, or perception of crime, but not always and it depends on the project. The LDTs should consult local stakeholders, such as the local crime prevention officer, park user groups and women's groups to assess the current crime risks and the perception of crime in the local areas and jointly assess whether additional lighting would improve safety and increase the use of parks and openspaces during darkness hours. Lighting along with creating openness, minimising enclosed and hidden places, creating escape routes, improving visibility, and increasing presence in parks and openspaces can assist in making spaces more welcoming and safer for all.

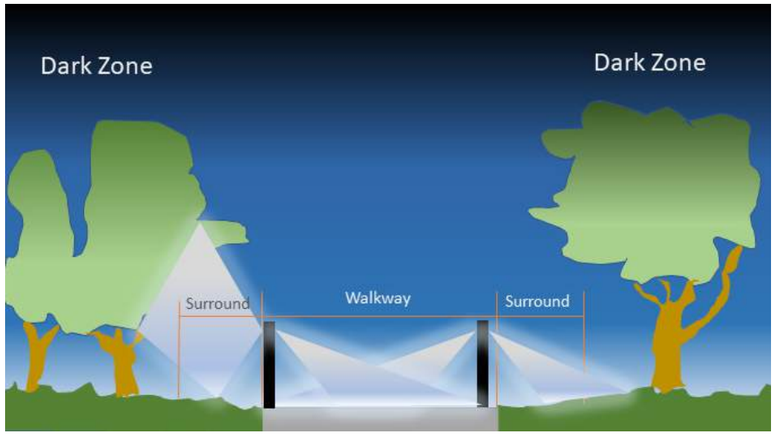


Figure 1-13 Walkway lighting with additional surround lighting

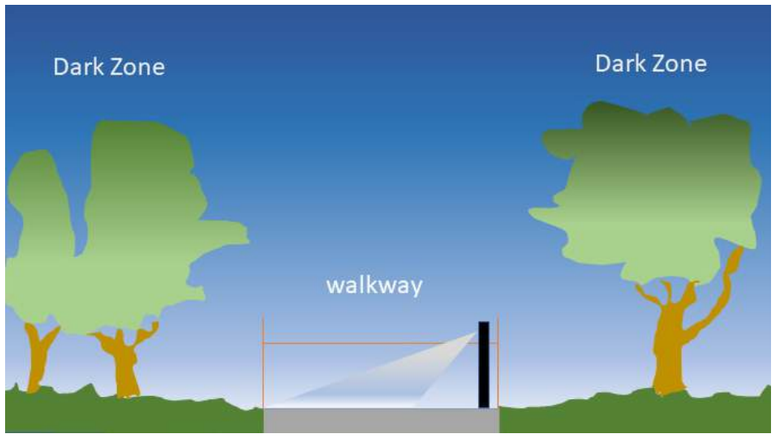


Figure 1-14 Contained walkway lighting.

Emergency Lighting

Park lighting maybe required to provide external emergency lighting for buildings or entertainment venues created within parks and openspaces. This lighting must be considered by the building or entertainment venue project design team. Their client or event organiser must also provide an emergency lighting risk assessment covering the external emergency lighting that considers all external escape routes to a place of safety. It should be noted that use of the separate electrical supplies between park and openspace lighting and the building lighting is the preferred method of dealing with this requirement. Guidance should be sought from BS 5266 and SLL Guide LG12.

4.0 Lighting Equipment

Lighting Equipment Divider Photo. Meadows at night | Shutterstock

Lighting Equipment

General

The choice of lighting equipment is one of the key decisions that the LDT's will be making. The appropriate choice of lighting equipment will influence all aspects of the lighting design performance from concept right through to disposal and replacement with the next lighting installation.

Light Sources

Light-Emitting Diodes (LEDs) have become the predominant light source within the public realm including parks, as their size, light colour, longevity, efficacy and energy consumption make them particularly suitable for most external applications. It is assumed that all light sources within parks and openspaces will be solid state electronic LEDs in the commonly manufactured forms for professional or municipal lighting. It should be noted, however, that, unlike traditional incandescent and discharge light sources, the quality range of LEDs is vast and the design of the enclosing luminaire is also more important in governing the light output of the LEDs. The luminaire design is critical to the optical and thermal performance of the LEDs. LED metrics are described in detail in SLL factsheet Factfile 18 Lifetime Metrics for LED luminaires.

It should be noted that artificial lighting can have adverse effects on fauna and flora. It is understood that ultraviolet (UV) and blue light content is the main concern with regards to light spill affecting flora and fauna, as it can interrupt circadian rhythms and encourage plant growth at an unnatural rate. It should be noted where there are specific botanical or biological concerns, then specialist advice may need to be sought on the spectral content of LEDs. To mitigate this, it is recommended that luminaires use a Warm White LED light source with a correlated colour temperature (CCT) greater than 3000K. This will reduce the amount of blue light emitted by the luminaire compared to a more standard Cool White LED solution employed in earlier LED luminaire versions. Overall, UV output of the LEDs (below 400nm) is extremely low as shown in the Figure 1-15.

It is highly recommended that all light sources within parks and openspaces contain LEDs with a maximum CCT of 3000K. LDTs shall take particular note of the UV and infrared (IR) parts of the spectrum and seek to minimise output in these wavebands. It is expected that manufacturer's datasheets will identify the LED manufacturer and the spectral output of the LEDs to be used. This is especially important in environmentally sensitive areas of parks and openspaces and data must be provided in line with any requirements identified by ecologists within relevant Environmental Impact Assessments (EIAs).

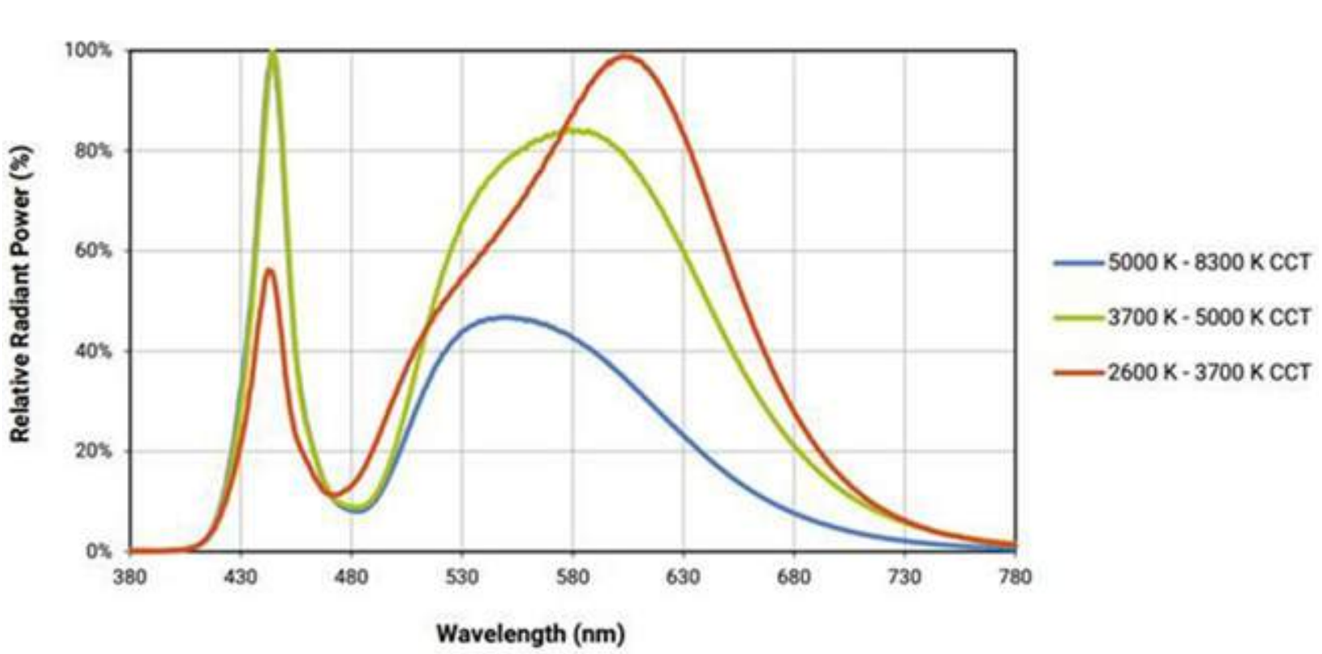


Figure 1-15 Relative Spectral Power Distribution.

LED Performance

The following performance criteria are expected for all LED light sources with the exception of Organic Light-Emitting Diodes (OLEDs), which will be considered separately and will require a specialised submission by the LDT should they be considered for a project.

Longevity	**All LEDs shall achieve a minimum longevity of L80 B50 @15 deg C for a period of 100,000 hrs**
Efficacy (Delivered Luminaire lumens LLM/W)	95
Correlated colour temperature	≤3000 K
Colour stability (MacAdam ellipses)	3
Extended Colour rendering Ra 14	90 R9 85 min

Table 1-8 LED performance criteria.

It should be noted that the failure characteristics of LEDs is not the same as traditional light sources as LEDs tend to decay rather than fail catastrophically. This results in the LEDs continuing to emit light long after the required lighting criteria have failed to be met. It is therefore imperative that a planned maintenance procedure be adopted to maintain or replace LEDs to ensure they operate at their optimum level.

Luminaires

A luminaire is the housing and optics that encase the light source and distribute the light in a particular manner (known as the luminaire photometrics). The luminaire is also responsible for providing the correct micro-environment for the light source to function to the published lighting criteria provided by the LED manufacturer. The luminaire may also include the electronics to provide power to the LEDs (commonly called the driver). If the driver is not within the luminaire, then it must be housed within an enclosure suitable for the performance of the driver.

When considering the design of a luminaire within a low brightness environment it is important to consider the following factors:

1. The relative volume of the lit environment to be created.

2. The brightness of the luminaire within the general brightness of the surrounding environment.

3. Viewing angles of the luminaire optical surfaces at normal viewing angles.

4. The transition of light from the lit area to the immediate surrounding areas, and then to the background ambient areas.

5. Position and mounting of the luminaire within the normal field of view of the expected users of the lit environment.

Posts and Poles

Column, Wall-mounted (Above 3m) and Post-mounted Luminaires

Column, post-top, and pole-mounted luminaires include road lanterns, floodlights, and heritage lanterns. For parks and openspaces, it is envisaged that column-mounted lighting will not exceed 5m in height with the exception of sports ground floodlighting. There will be a natural reduction in height of lighting as the use of the routes become more ecologically important or the lighting criteria reduces, or both.

Pole-top luminaires | BEGA

Route Type	Maximum height of luminaires
Primary routes	Up to 5m unless on adopted vehicular route
Secondary routes	Up to 5m
Tertiary routes	Up to 2m
Nature pathways	Up to 1m
Winding paths	All wayfinding lighting up to 1m

Table 1-9 Typical heights of luminaires by route type.

Luminaires shall be full cut-off luminaires with no upward lighting component. Adjustable luminaires shall have a maximum tilt of no more than 5 degrees above the horizontal plane. Luminaires that are wall-mounted shall have strongly asymmetrical distribution to reduce any hotspot on the wall immediately beneath the luminaire.

Sports Ground Floodlights

Sports ground floodlighting will be chosen on the basis of the sports that are to be played and the level of competition expected. It is expected that public sports facilities within parks would be lit to Class II lighting (club-standard). Further guidance should be sought from BS EN 12193 and SLL LG4 Sports Lighting.

Sport lighting | Abacus

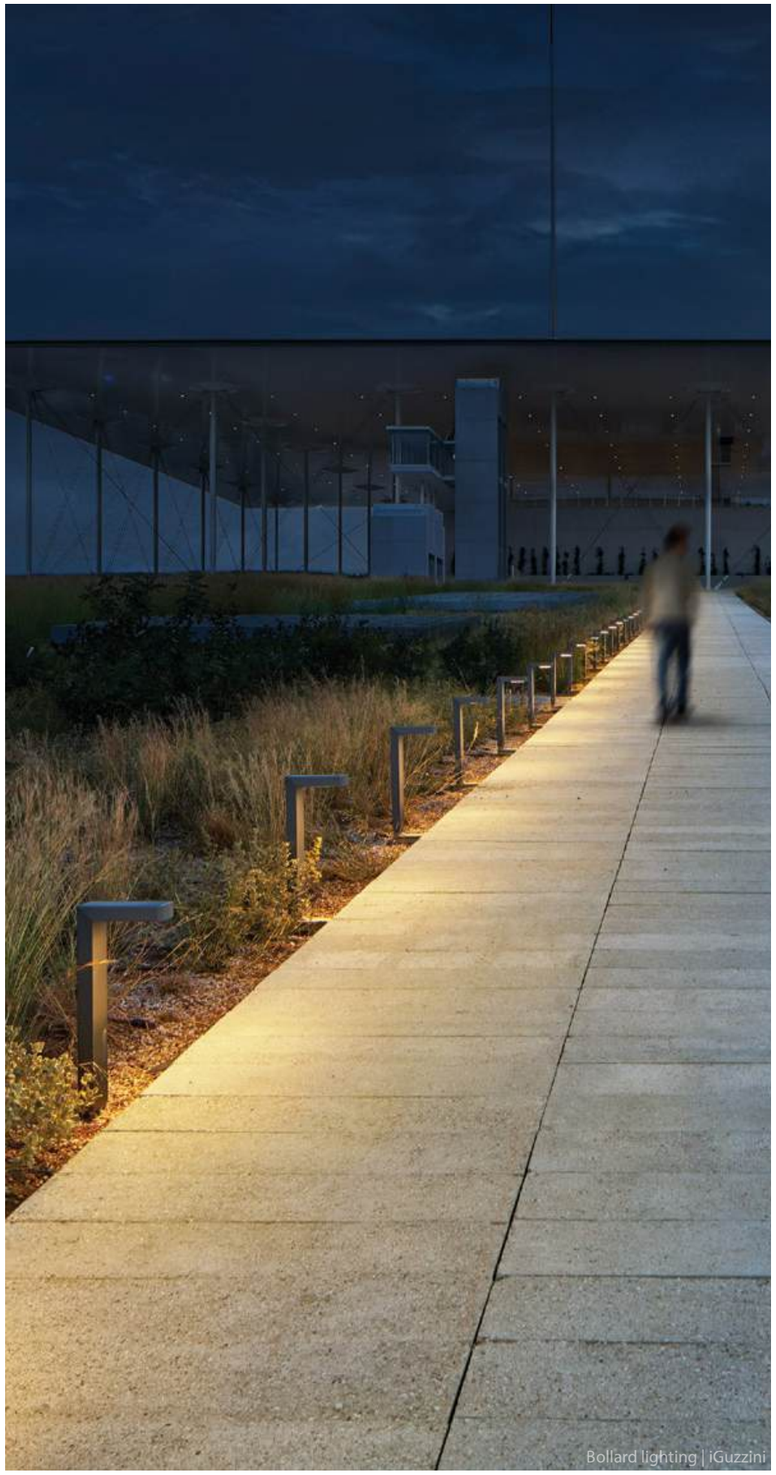
Sport lighting | Abacus

Bollard Luminaires and Short-column Luminaires

Bollard luminaires and short-column luminaires are to be used for the tertiary routes where lighting levels are low and only pedestrians are expected to use the pathway.


Bollard lighting | iGuzzini


Bollard lighting | Stoane Lighting


Bollard lighting | iGuzzini

Pillar and Ground-mounted Luminaires

Low level lighting (below 500 mm) should only be considered as wayfinding lighting, as it is very difficult and expensive to create recognised levels of luminance or illuminance on the pathway surface with these low mounting heights.


Pillar luminaires | BEGA


Pillar luminaires | BEGA

Low-level Wall Luminaires and Handrail Lighting

Lighting incorporated into landscape structures can be utilised near buildings and in areas where there are steps and raised planters etc. Further guidance on external steps staircases and ramps can be found within BS5489-1 and SLL LG 16. It should be noted that special guidance on ramps and entrances to buildings is contained within BS 8300-1.


LED illuminated handrail | DW Windsor


Low wall mounted luminaire | BEGA

Inground Luminaires

Inground luminaires should be carefully considered in terms of their position and brightness as they can be a hazard to persons with visual disorders or from a neurodiversity standpoint. Preventing water ingress can also be troublesome.


In ground luminaire | iGuzzini


In ground luminaire | BEGA


In ground luminaire | iGuzzini

Decorative Tree-mounted Luminaires

Lighting of trees (e.g. festoon lighting) has been common place since the introduction of LEDs. This style of lighting only contributes modestly to the functional lighting within an area. By its nature, it is almost impossible to calculate its effectiveness all year round.


Southbank London Eye | Belle Connell


Outdoor floor lamp | Artemide


Decorative luminaire | Lumenpulse


LED lighting system | iGuzzini

Decorative Luminaires

Decorative luminaires can create focal points and increase the desire to use a park or openspace during darkness hours. There is a vast range of both decorative luminaires and non-decorative luminaires that create decorative lighting effects. Luminaires for decorative lighting must be chosen to comply with the same standards as the luminaires for functional lighting.


Decorative luminaire | Lumenpulse


Outdoor lamp | Artemide

Lighting Maintenance

The specification of the quality of the luminaire is critical in meeting the maintenance aspirations of the City of Edinburgh Council. Lighting maintenance includes the following aspects: lumen depreciation, cleaning intervals, electrical safety checks, and IP and IK ratings of luminaires.

This document is aligned with the maintenance strategies expected for the street lighting, as identified in the City of Edinburgh Council's Street Lighting Management Arrangements. The lighting maintenance approach should be discussed with the Council's Street Lighting section at an early point within the design process and where possible comply with the appropriate maintenance policies. Where possible, lighting equipment should be chosen to be compatible with the lighting Central Management System (CMS), either by luminaire-mounted control accessories or by remote control equipment.

The lighting equipment shall be chosen to respond to the circular economy principle. This document is aligned with principles of the circular economy requirements of CIBSE TM65 and TM66, and a CEAM rating of 65 is expected.

It is acknowledged that lighting in parks and openspaces can be innovative and provide opportunities to trial new or different lighting approaches. Any new or experimental lighting approach should be evaluated carefully and lessons learned relating to maintenance considered before rolling out to other locations.

Edinburgh Old Town | Tom Duffin

5.0 Environmental Aspects

Environmental Aspects Divider Photo. Meadows at night | Andy Sweet

General

Environmental affects have been an increasing concern for external lighting since the millennium. In Scotland, obtrusive light is a Statutory Nuisance as part of Part III of the Environmental Protection Act 1990, as introduced by the Public Health etc. (Scotland) Act 2000. This legislation has led to guidance documents being produced to cover the design of external lighting to mitigate the effects of obtrusive light. The core document is the CIE recommendations in CIE150, which has been taken up by the ILP in the latest version of ILP GN01/21. Appendix 2 of the aforementioned guidance should be consulted to establish the baseline criteria applicable and the appropriate mitigation measure.

Further ecological external recommendations are identified in the Bat Conservation Trust/ILP document ILP GN08/23 Bats and Artificial Lighting at Night. Guidance should also be taken from the International Dark Sky website https://darksky.org/resources/guides-and-how-tos/

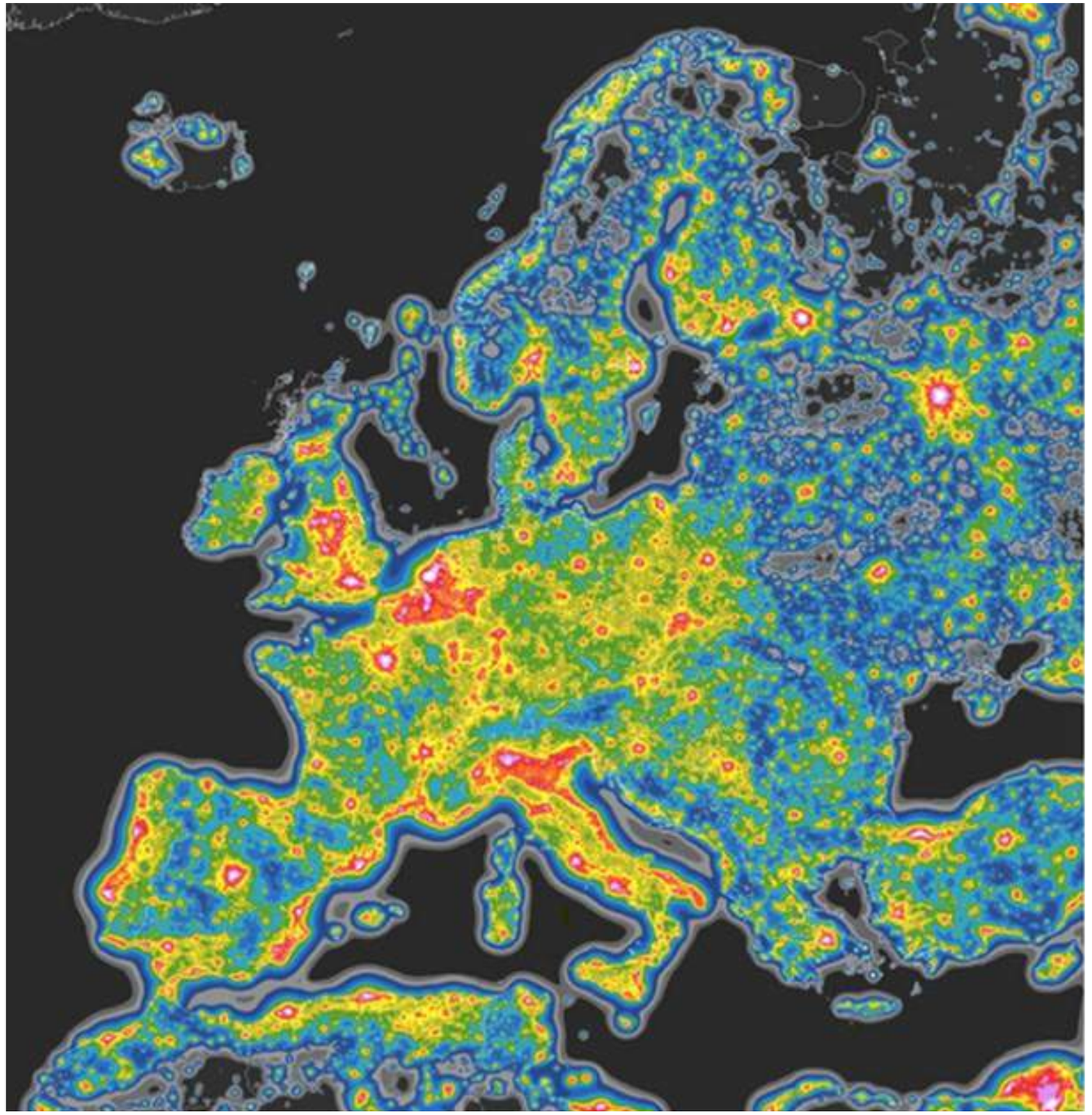


Figure 1-16 A map of night sky brightness over Europe, where black is pristine sky and red areas are 5-10 times brighter - The dark side of light: how artificial lighting is harming the natural world (nature.com)

Obtrusive Light

Obstructive light (light pollution) is effectively any light emitted in a direction or manner in which it is not required that can be considered detrimental to others. It can take the form of light intrusion (or light spillage); sky glow (light directing upward); back light (where light galls directly behind the light column behind the area to be lit); and glare (uncomfortable brightness of a source of light against a dark background). Good design decisions should limit the impact of light pollution from artificial light on local amenity.

Ecological Concerns

LDTs will be required to undertake an obtrusive lighting assessment of their design. This will include working to the guidance and methodology identified in the ILP GN01/20. The methodology would be expected to include the following: -

- A desktop study of the project to establish the environmental zoning and extent and type of sensitive receptors likely to be affected
- A daytime survey of the receptors to establish that they are receptors (with substantiating photographs)
- A night-time survey to establish the current obtrusive lighting environment for the receptors (with substantiating photographs)
- An obtrusive lighting report covering:
  - Existing obtrusive lighting conditions
  - Mitigation measures to be used to constrain the obtrusive lighting effects of the proposed lighting
  - Design parameters for the construction lighting (if required during the project), design information on the proposed equipment and mitigation measures to be used

It has been increasingly shown that external lighting has significant effects on the night time biodiversity of an area. This is not limited to animals and insects, but also plants, fish, etc. It is important to note that to create an ecological sustainable night time environment, the first action is to establish the ambient light levels within the area. It is impossible to create a dark environment within a park or openspace if there are already high levels of ambient light entering from the surrounding area. Therefore, a baseline survey of the ambient lighting conditions will be required as well as an ecological survey to determine which species of flora and fauna are present within the park or openspace under consideration.

Flora and Fauna

Light disturbance is a particular type of obstructive light that is primarily concerned with electric light, which alters the habitat of flora and fauna. Both predator and prey species need to be considered, as alterations in the behaviour of either can have significant effects on ecosystems. There are specific recommendations for bats contained in ILP GN08/23. Other particularly sensitive species are fish and invertebrates. Where there are specific ecological areas of interest, care must be taken in determining whether lighting should be installed.

Calton Hill | The City of Edinburgh Council

Energy Use and Power Supplies

The availability of electric power within parks and openspaces is a particular concern and, in some places, may be a limiting factor to the scope of lighting solution that can be considered.

Traditional Power Supplies

The supply of electrical power to lighting can be a significant part of the capital and running costs of a lighting solution. In a large number of cases, there will be little need for electrical power for other services. Public electrical power supplies could be from either of the 2 main sources:

- A private metered supply
- A public Distribution Network Operator (DNO) unmetered supply, paid for by the Council, and installed and operated by the DNO.

If an unmetered DNO power supply is to be considered, early liaison with the City of Edinburgh Council's Street Lighting section is recommended.

It is important to consider the availability of electrical supplies at the inception of the project and to agree a power supply approach in line with scope of the project by the end of concept design stage.

Innovative Sustainable Local Power Supplies

The use of innovative sustainable local power supplies can be considered in parks and openspaces as part of Edinburgh becoming more sustainable and help it reach its ambitious target to become a net zero city by 2030.

Solar power

Solar power is currently not considered a robust technology for any route that is used by motorised vehicles. Solar power could be considered for pedestrian and cycle routes but a whole life costing and embodied carbon study should be provided before specifying solar power. Battery technologies should be carefully chosen to ensure the correct level of power storage and installation methodology.

It should be noted that carefully designed solar powered lighting may prove attractive for remote locations where the absence of local electrical power supply may mean that lighting would be expensive to install and maintain. Solar arrays could be incorporated into park structures to provide an on site power supply for solar lighting.

Wind Power

Wind power is an alternative to solar power or can be combined to form a hybrid solution. Wind has similar concerns to solar in terms of availability and battery storage.

Energy generating swing | Yanko Design


Play equipment | Playground Energy


Solar bench | Playground Energy

Hydropower or Water Turbines

Free-flow turbines can generate electricity in flowing water in rivers and man-made channels in parks and openspaces. Environmental impacts will need to be considered but micro-hydropower may be considered a renewable and indigenous power source with minimal environmental impact if it is well-designed. A license from SEPA may be required.

Kinetic Powered Lighting

Several alternative power systems are available that generate power using ambient kinetic energy, such as footfall. These systems would be useful for creating dynamic lighting displays rather than functional lighting. Lighting powered by footfall has been used several locations. More esoteric power supplies include lighting driven by children's play.

Non-electrical light sources

There are several innovative non-electrical power light sources that maybe worth considering for remote areas or as particular eye-catching solutions to create wonder. Most of these solutions are based around products that have photoluminescence properties. The materials are charged by daylight and emit light during darkness hours. They will not be suitable for functional lighting requirements but could be used for wayfinding and decorative lighting effects. The light spectrum of the products will need to be considered for ecologically sensitive areas.


Solar tree | Artemide


Swing | Playground Energy


Kinetic pavement | Pavegen


House benches | Playground Energy


Outdoor gym | Playground Energy

6.0 Stakeholders Consultation

Stakeholders, 3rd Parties and Public Consultation Divider Photo. The Mound during winter festival | The City of Edinburgh Council

Stakeholders Consultation

A consultation between AtkinsRéalis and the following council officers and park stakeholders was carried out on 28 February 2024:

- Parks, Openspace Development and Visitor Services Manager
- Street Lighting Engineers
- Natural Heritage Officers
- Parks Development Officers
- Equally Safe Edinburgh Committee Lead Officer
- Parks & Openspace Development Officer
- Greenspaces Project Development Officer (Ecology)
- Green Spaces Project Development Officer
- Trees and Woodlands Officer
- Parks Technical Manager

The stakeholders consultation included discussion regarding this Parks and Openspace Lighting Guidance document as well as on the topics of lighting for people and nature. The discussions have been summarised in the following pages.

It is worth noting that site visits and stakeholder engagements for Hailes Quarry Park had also been carried out. Outcomes from these visits and engagements have been documented separately in Appendix 3.2.

Lighting for People

What Gets Lit and What Doesn't?

- The decision on what areas to light involves a delicate balance.
- If an incident occurs in an unlit area, there may be pressure to extend the lighting scheme or install CCTV for monitoring.
- However, if a route is inherently unsafe, merely adding lights may not be the solution. Other measures are necessary to activate the space and enhance safety.
- Engagement with park users is crucial. Glasgow Parks Safety and Lighting Placemaking Project is a good example that show how public engagement can help reveal how local communities feel about their parks, what they like and do not like about the parks, specific routes that they think should be lit, and what they think could be done, apart from lighting, that would help improve the feeling of safety in the park.

Perception of Safety:

- Research shows no direct correlation between light levels and crime rates. However, lighting has been identified to impacts people's perception of safety.
- Other factors may also impact people's perception of safety, for example, a pressure of having to share a small but otherwise well-lit path at night with other people (who could be drunk or behaving antisocially) may impact the person's perception of safety of that path. This is especially a concern for women. Women's Safety in Public Places Consultation report illustrates various factors that impact women's perception of safety.
- If a particular space was historically perceived as unsafe, changing public perception will take time and would require holistic intervention beyond lighting.

Lighting Levels:

- Lighting level must balance safety with other considerations such as wildlife or aesthetics.
- The intention of the lighting scheme could be misunderstood and incorrectly interpret by the community as well as the wider society if not properly managed. A lighting scheme that has been designed to minimise impact on bats could be interpret as priotising bats over women's safety, for example. Therefore, the lighting scheme should cleary identify the objectives and priorities of the scheme, especially when the objectives could be conflicting. Engagement with local community can also help identify and manage these conflicting expectation.

Innovation, and Sustainability:

- The concepts of having feature lighting to enhance the character of the space as well as utilisation of alternative power supplies were welcomed by the stakeholders.

Lighting and Nature

Balancing Darkness and Wildlife Impact:

- Previous community engagements have revealed dual recurring concerns: safety and nature. Therefore, striking a balance between these two is challenging but necessary.
- Lighting should balance safety while preserving natural darkness. Low-level luminaires could be used for routes along dark areas of the parks.
- Light curfew could be a good approach to balance the need of lighting and impact to wildlife

Sites Not to Be Lit:

- It is essential to identify areas where darkness is intentional, for example, for wildlife habitats and stargazing.
- No-lighting policy help demonstrate commitment to nature preservation.
- Designated “no lighting” zones could be proposed for light-sensitive areas of the nature parks and these areas could be bordered by routes with low-level lighting.

Species Sensitivity to Lighting:

- Wildlife is impacted by lighting, especially during hunting hours (dawn and dusk). This mean that for certain species, lighting during fully dark hours may have less impact on them than lighting during dawn or dusk.
- The assessment should be made to determine the presence of species onsite and species-specific requirements should be considered.

Challenges:

- The development of professional lighting standards, requirements and guidance (for example, ILP Guidance Note) often involved ecologists but not always local groups or law enforcement. Therefore, early engagements with park stakeholder, local community and local law enforcement are crucial in agreeing the lighting requirements and ensuring that the lighting scheme will benefit both people and nature.

In summary, the stakeholder consultation emphasises the importance for lighting scheme to take a holistic approach, considering safety, nature, and community perspectives. The lighting scheme should offer solutions that enhance safety, respect nature, and create inviting spaces for all.

Appendices

Appendices Divider Photo. Meadows | Shutterstock

Appendices

1.1 Glossary

1.2 Reference Documents

1.3 Image References and acknowledgements

2.1 LDT Design Check lists

3.1 Case Studies

3.2 Case Study: Hailes Quarry Park

1.1 Glossary

Term or Acronym	Description
BSI	British Standards Institute
BS	British Standard
BS EN	Combined British Standard and Euronorm
CCT	Correlated Colour Temperature
CEAM	Circular Economy Assessment Method
CEC	The City of Edinburgh Council
CIBSE	Chartered Institute of Building Services
CMS	Control and Management System
CTA	Cycle traffic Accident
DNO	Distribution Network Operator
E(No)	Environmental Zone
ILP	Institute of Lighting Professional
Illuminance (lux)	Quantity of luminous flux /m2
K (e.g. 3000K)	Kelvin, a unit of measurement for light source colour temperature
LED	Light Emitting Diode
Luminance (cd/m2)	Brightness of a surface in a prescribed direction.
Luminaire	An item which contains a light source and produces a prescribed light distribution
LDT	Parks Technical, Parks Development, and Street Lighting Design Teams
RIBA	Royal Institute of British Architects
RTA	Road Traffic Accident
SLL	Society of Light and Lighting
TM	Technical Memoranda
UV	Ultra-Violet
UNESCO	United Nations Education and Science Organisation

1.2 Reference Documents

- BS EN 12464-2:2014 Light and Lighting. Part 2: The Lighting of Workplaces - Outdoor Workplaces
- BS 5489-1:2020 Design of Road Lighting. Part 1: Lighting of Roads and Public Amenity Areas - Code of Practice
- BS 5266-1:2016 Emergency Lighting. Code of Practice for the Emergency Lighting of Premises
- BS 8300-1:2018 Design of an Accessible and Inclusive Built Environment. External environment. Code of Practice
- BS EN 13201-2:2015 Road Lighting. Part 2: Performance Requirements
- CIBSE/SLL Lighting Guide LG4/2023: Sports Lighting
- CIBSE/SLL Lighting Guide LG06/2016: The Exterior Environment
- CIBSE/SLL Lighting Guide LG12/2022: Emergency Lighting
- CIBSE/SLL Lighting Guide LG16/2017: Lighting for Stairs
- CIBSE/SLL Lighting Guide 21: Protecting the Night-time Environment
- CIBSE/SLL TM66 2021: Creating a Circular Economy in the Lighting Industry (including CEAM – Circular Economy Assessment Method)
- CIE 126:1997 Guidelines for Minimizing Sky Glow
- CIE 136:2000 Guide to the Lighting of Urban Areas
- CIE 150:2017 Guide on the Limitation of the Effects of Obtrusive Light from Outdoor Lighting Installations
- ILP GN 01/21: Guidance Note 1 for the Reduction of Obtrusive Light
- ILP GN 08/23: Guidance Note 8 for Bats and Artificial Lighting
- ILP PLG 04 2013: Guidance on Undertaking Environmental Lighting Impact Assessments
- Nuisance provisions of the Public Health etc (Scotland) Act 2008: guidance and its Appendix 2
- APPG Dark Skies 2021: Ten Dark Sky Policies for the Government
- Glasgow Parks Safety and Lighting Placemaking Project Report – February 2023
- Women's Safety in Public Places: Interim Analysis of public consultation held between July – September 2022
- What Makes A Park Feel Safe Or Unsafe?: The Views of Women, Girls and Professionals in West Yorkshire
- Safer Parks: Improving Access for Women and Girls

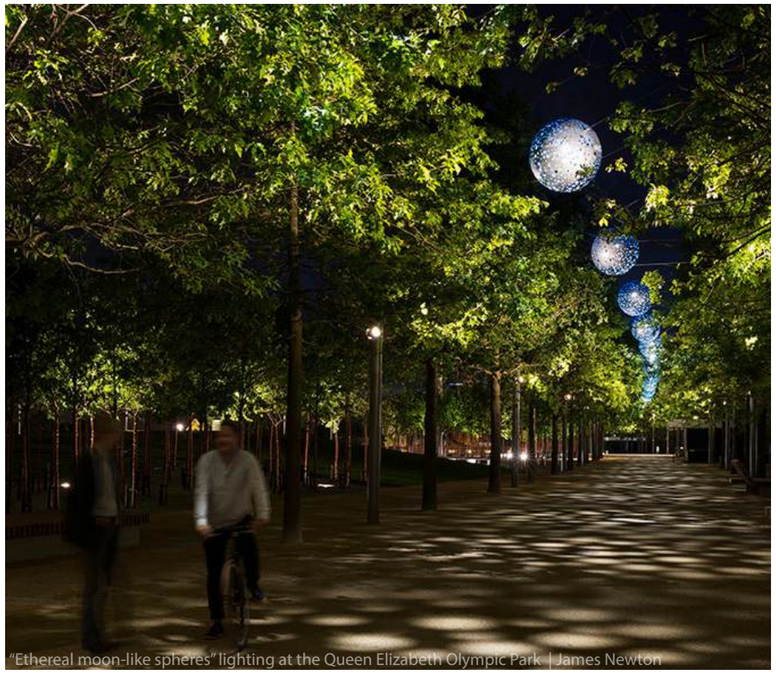
2.1 LDT Design Check List

RIBA stage	Typical **Park Design Teams lighting duties**	Comments
1,0	• Establish the need for lighting and write lighting masterplan/ feasibility study. • Establish the local and city lighting stakeholders that are specific to the park. • Agree categorisation of routes and the general lighting criteria. • Identify environmental areas and agree lighting parameters.	Establishing the need for lighting or no lighting is key to project success and ensuring that the client /stakeholder aspirations are understood.
2.0	• Consult with local stakeholders establish lighting brief and concept. • Establish heritage lighting requirements • Undertake lighting risk assessment and establish lighting classes (road lighting). • Establish the environmental zone. • Engage with Environmental team and undertake obtrusive lighting studies. • Establish an electric power strategy. Prepare lighting concepts and identify typical luminaire types. • Agree lighting control strategies and the use of lighting curfews. • Prepare budget costs for each luminaire type. • Consult with planning authorities over lighting planning conditions that may be applied	Assessing the lighting opportunities and briefing the client of the lighting opportunities and constraints ids fundamental to a successful project.
3.0	• Prepare initial lighting calculations identify input into Planning application. • Show compliance with obtrusive lighting requirements and mitigation measures. • Undertake mock ups of decorative lighting effects and demonstrate to stakeholders. • Prepare lighting chapter as part of the Design Access Statement for planning and demonstrate that all planning conditions have been met.	At this stage all client requirements should be known and the development of the proposed light scheme should known and options finalised.
4.0	• Prepare final lighting calculation and lighting equipment schedule include alternative products if possible. • Finalise controls strategy	Clear and concise tender information will always give a more accurate indication of costs and reduce project risks.
5.0	• Review contractors' proposals and working drawings. • Ensure that final controls strategies meet with stakeholder requirement. • Witness commissioning of lighting especially display and decorative lighting	There will always be a need to assess alternatives offered by the contractor to save money however it is important to inform the client of any reduction in lighting performance or increase in maintenance costs.
6.0	• Handover to the client and demonstrate the lighting effects to client and stakeholders	It is key that all parties agree that the project is finished and there are no outstanding issues.
7.0	• Provide ongoing support and management of lighting events	This applies to scheme that may have an element of temporary lighting or be used as an entertainment venue

3.1 Case Studies

Queen Elizabeth Olympic Park, London

Developed by Spiers + Major with Michael Grubb Studio, the new lighting scheme for the Queen Elizabeth Olympic Park in London features 'ethereal moon-like spheres' that are hung over the main walkway. Other lighting elements gently highlight the street furniture and the surrounding landscape. The light levels in the park were carefully considered to keep them as low as possible, while still enabling wayfinding and ensuring safety.



"Ethereal moon-like spheres" lighting at the Queen Elizabeth Olympic Park | James Newton

Swing seats at the Queen Elizabeth Olympic Park | James Newton

Queen Elizabeth Olympic Park | James Newton

Green Park in London

Like several other parks in London, Green Park still features gas lighting. The lamps require frequent mantle checks as well as a weekly wind-up to secure the timer, which is controlled by a clockwork mechanism. This is a good example of where heritage is maintained in an urban park setting.


Green Park | Urban 75


Gas lamp | Urban 75


Green Park | Urban 75

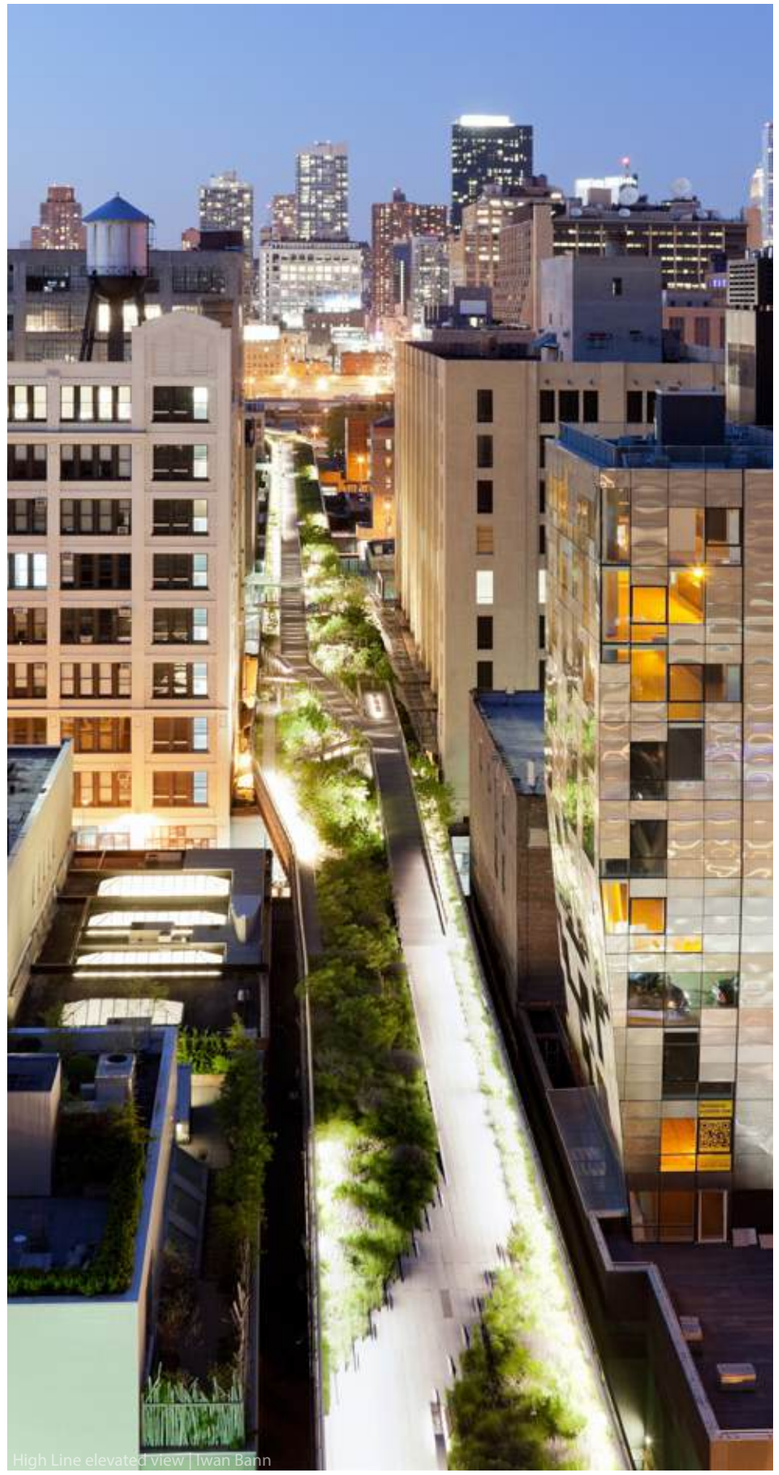
High Line, New York City

The former railway tracks have been transformed into an elevated linear park that was designed in collaboration with James Corner Field Operations, Diller Scofidio + Renfro and Piet Oudolf.

The overall lighting strategy is a low level plane of light that lights and floats the High Line over the city beneath. The soft light marks and silhouettes the walkway for pedestrians, creating a unique night-time experience. As all light sources are kept at or below eye level, they do not obstruct the night sky or the vistas around the High Line, keeping it safe, visible, and unobtrusive at night.

High Line seating | Andrew Frasz

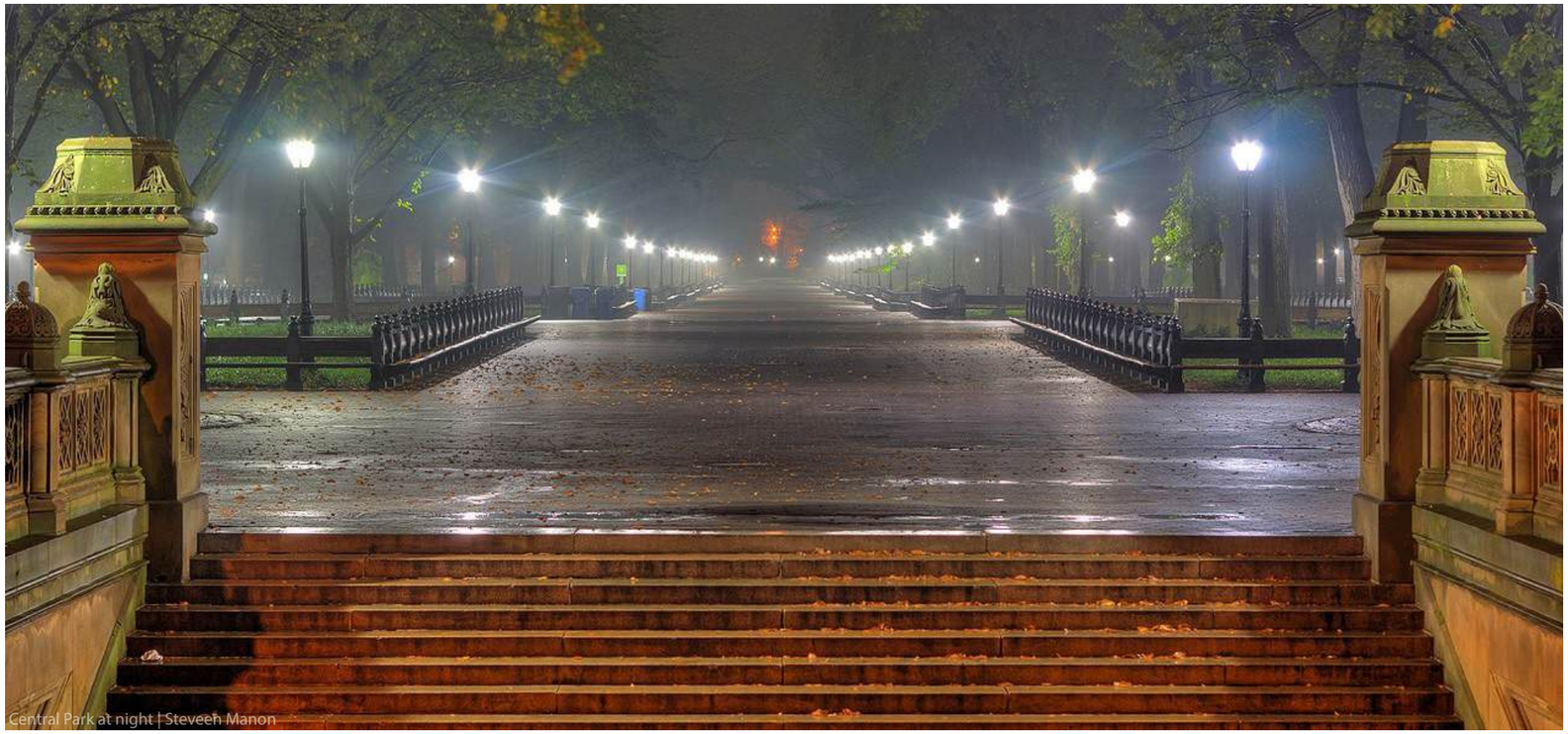
High Line | Iwan Bann



High Line elevated view | Iwan Bann

Central Park, New York City

Visitors from all over the world come to Central Park to experience its unique design. New York City holds the patent for the lighting fixtures used in Central Park, and the products installed are exclusive to the park. The Spring City's luminaires were the ideal option due to their custom design features in addition to the new LED technology.



Central Park at night | Steveen Manon

Central Park lamp posts | Spring City

Central Park lamp posts | Spring City

Brunnsparken, Sweden

The tall trees and poor lighting in Gothenburg's oldest park contributed to residents' perceptions of this location as dark and dangerous. The goal of the city of Gothenburg was to devise a strategy for making Brunnsparken a more open and secure area. The plan was created by White Arkitekter's landscape architect Niels de Bruin with input from nearby residents. February 2020 marked the park's reopening.

A strip of lighting that shines from beneath the seating edges illuminates the park's main paths at night, bringing them to life. The architects specifically requested that this particular aspect be designed with the lighting concealed behind the steel.

The historic lantern lighting returned in the early summer, and the planting was finished. The park is now a pleasant and safe place to stay at night, in part because of the lighting.

Gotheborg's oldest park | Landezine

Gotheborg's oldest park | Landezine

Gotheborg's oldest park | Landezine

Castle of Gorizia, Italy

The opportunity to re-evaluate this region of the city, which serves as Gorizia's best-known symbol, has been provided by the revitalization project for the "Borgo di Castello", the historic village that surrounds the castle. The primary objective was to transform this "fossilised" area of the city into a location suitable for a variety of purposes and occasions, providing residents and tourists alike with a novel experience.

Castle of Gorizia redevelopment | Massimo Crivellari

Castle of Gorizia at night | Massimo Crivellari

Castle of Gorizia grounds at night | Massimo Crivellari

Gardens by the Bay, Singapore

The three waterfront gardens that make up the 250-acre park, which was built on reclaimed land, aims to make more green space available in Singapore, the third-most populous country in the world. The requirement was to provide energy-efficient, colour-mixing replacements for the existing metal halide fixtures. More than 400 fixtures were provided for the project.

In addition to the other aspects of the fixtures, the Red, Green, Blue, White (RGBW) multi-chip's colour mixing capabilities were crucial in the creation of spectacular visual effects that continue to awe visitors each night. At 7:45 p.m. and 8:45 p.m., an orchestrated light and music show called "Garden Rhapsody" brings the Supertree Grove to life.

Garden Rhapsody | Anolis Lighting

Supertrees | Will Truettner

Supertrees at night | Hu Chen

Lyon Meadows, France

The “Prés de Lyon” is a city park on the outskirts of Troyes in the town of La Chapelle St-Luc. It was designed in the 1970s after the “English garden” model. The town council decided to hire landscape architects to improve this park’s accessibility and aesthetics because of its numerous degradations. BASE’s work included restoring earthworks, pathways, entrances, and the majority of planted plots. It also suggested several play areas, the majority of which were designed for children. The structure and pontoons have integrated lighting.


Lighting features | Base


Skatepark | Base


Lighting features on the elevated footpath | Base


Lighting features | Base

Ilawa Forest, Poland

Through the safe use of space that is provided for a wide range of users, including walking, jogging, cycling, and single-track biking, the project aims to revive neglected urban nature areas. The wayfinding system is designed to accommodate the requirements of people with disabilities, and the path slopes are gentle, making the interventions accessible to people of all ages and physical abilities.

The educational component of the project is just as important as the landscape architectural interventions, which include a system of cycling and walking paths, a viewing platform, street furniture, and a lighting and wayfinding system. The signage system tells a complete story and encourages visitors to the forest to experience the woodlands by using all of their senses. The narrative depicted on the sign brings to life issues pertaining to ecology, preservation of natural resources, forest diversity, and the significance of death in nature.

Lamp posts | Aleksandra Matyas

Stud lighting | Aleksandra Matyas

Novo Nordisk Nature Park, Denmark

The park's overall design is based on great thinkers like Sven Kierkegaard and Friedrich Nietzsche, who came up with their best ideas while walking. Modern research has shown that when people are outside, they are more relaxed, creative, and open to new ideas. This is especially true when they walk in wild, untamed, natural, and diverse nature.

The nature park's design also includes lighting in some way. The paths' gleaming white concrete will be illuminated by the sunlight during the day, allowing the foliage and vegetation to create intricate shadows. The landscape is illuminated at night by precisely aligned white tones that emphasise and enhance the natural colours and movements of the vegetation. Variable Gobo light projections create the atmosphere of shifting moonlight that illuminate some biotopes from within.

Light posts | Torben Petersen

The nature park at night | Torben Petersen

Ambient lighting | Torben Petersen

Tivoli Gardens, Denmark

In the Gardens and various light installations, visitors can see the glow of thousands of twinkling lights. Stardust that changes colour based on a person's height will be sprinkled all over the Main Walk of the Tivoli Gardens. LED lighting makes the twinkling lights eco-friendly and long-lasting. All of the lights at Winter in Tivoli are LEDs, and the new installations for the season were also made with LEDs. Since all of the light chains from Winter in Tivoli are reused, the same chains will be used again the following year. Jesper Kongshaug, the lighting designer at Tivoli, places a high value on the fact that each LED light has a particular quality that allows it to last for a longer period of time.

Gardens at night | European Traveler

Lighting Installation | Little Sun

Tivoli's entrance walkway | Daderot

3.2 Case Study: Hailes Quarry Park

Introduction

Hailes Quarry Park is a Community Park on the west side of Edinburgh bordered by the Union Canal to the south, the Kingsknowe estate to the east, the Dumbryden mixed use estate to the west and the Lothian Bus Depot to the north.

The park is a relatively open piece of land with wooded areas centrally and on all the boundaries as shown in Figure 1-17. The park also has wetland areas located centrally and is traversed by a boardwalk. There is a group of buildings in the southwest corner of the park, which consist of a Youth club and Kurdish Community Centre with associated car parking. The park forms part of major cycle and pedestrian routes to Kingsknowe station. There are also open-air gymnasium, children's playground, and some sculptures (located within the central wood area) within the park.

Figure 1-17 Location plan of Hailes Quarry Park.

Figure 1-18 Boundaries of Hailes Quarry Park.

Visual Survey

Visual surveys were conducted by AtkinsRéalis between 10-11 January 2024. The first visit was carried out on 10 January between 4-6pm. The second visit was on 11 January from 11am to 3pm.

From the visual surveys, it was found that, while footfall was not particularly large, the park was frequently in use and visited by local residents both during the day and after dark during the visits. The park was found to be popular among local communities as a space for recreational activities, for example, dog walking and strolling, as well as an Active Travel route.

Figure 1-19 Plan showing survey photo locations taken at Hailes Quarry Park on 10 January 2024

Figure 1-20 Visual survey photos taken between 4-6pm on 10 January 2024

Figure 1-21 Plan showing daytime survey photo locations taken at Hailes Quarry Park on 11 January 2024

Figure 1-22 Visual survey photos taken between 11am - 12pm on 11 January 2024

Figure 1-23 Visual survey photos taken between 11am - 12pm on 11 January 2024

Figure 1-24 Visual survey photos taken between 11am - 12pm on 11 January 2024

Stakeholder Engagement

Consultations between AtkinsRéalis and the following Council officers and park stakeholders were carried out between 10-11 January 2024:

- Parks & Greenspace Officer
- Street Lighting Engineers
- Ward Councillor SNP
- Friends of Hailes Quarry Park representatives
- Longstone Community Council representative

Findings from the engagement can be summarised as follows:

Issues/Lessons Learned

- Vandalism is a major concerned as the park is surrounded by populous housing estate areas.
- Perception of safety can also be impacted by other factors, for example, trimming of trees allowing people to see into the wooded areas.
- From Murrayburn Road entrance, floodlights from the bus depot next door are very bright, contrasting with the darkness of the park making the park appears even darker.

Suggestions/Feedback on Lighting Requirement

- The main cyclist/pedestrian paved paths from Murrayburn Road entrance in the North to Longstone Road entrance in the East are the priority route for additional lighting columns to be installed.
- The cyclist and pedestrian route on the West side of the park running from Murrayburn Road entrance to Dumdryden Drive West entrance is a popular route.
- There is preference for solar studs to continue from the path along the canal into the park. Stakeholders would like to have inground solar studs along the main cyclist and pedestrian route on the West side of park that runs from the canal in the South to Murrayburn Road entrance in the North. Another route stakeholders would like to have inground solar studs is the diagonal path running East-West north of woodland; this route is frequently used by students to travel to school.
- Lighting to open-air gym is not a priority as there are existing lighting columns along the South walkway that provide some lighting.
- Children playground is not a priority area to be lit as it is usually used during the day only.
- Stakeholders agreed that the wetland and woodland area should be left unlit and that darkness in areas of the park is appreciated by the locals e.g. for stargazing.
- Southwest route leading to the Youth Centre on Dumdryden Drive is mainly used by car; pedestrian usually access the park from the Dumdryden Road Southwest entrance (from canal bridge); therefore, additional lighting column here may not make much impact for pedestrian.
- Standard luminaires and columns are preferred as the Council is trying to standardise their lighting units.
- An approach to achieve a balance between lighting scheme requirement versus maintainability could be through using standard luminaires but with customised mounting/fixing.
- Lighting could have a time-sensitive control or there could be a light curfew e.g. lighting to be switched off at midnight.
- Lighting maintenance is carried out by Street Lighting team.
- Existing lighting columns are controlled via CMS with remote photocell connected to the CMS.

Lighting Strategy

From site visits and stakeholder engagement, two main desire lines have been identified for Hailes Quarry Park:

1. Main cyclist and pedestrian route running East-West from Murrayburn Road to Longstone Place.
2. Main cyclist and pedestrian route running parallel to the southern boundary of the park, starting at Dumbryden Road and running East passing the open-air gym up to the Kingsknowe Estate via the steps. This route eventually leads to Kingsknowe Station. This route is currently lit by 5m post-top lanterns with a symmetrical distribution.

The secondary cyclist and pedestrian routes were also identified. Figure 1-25 shows the main desire lines, the secondary routes in context with the park entrances.

The lighting approach has taken into consideration concerns and recommendations from stakeholder engagements and aims to satisfy the following lighting objectives:

- Improve light levels along the identified main desire lines
- Improve wayfinding along the primary and secondary routes in the park
- Keep glare to a minimum
- Preserve darkness in wetland and woodland areas

Key

Zone	Lighting Provision	Symbol
Main cyclist and pedestrian route	Lighting to cycle path standards	
Secondary cyclist and pedestrian route	Indication light	
Entrance portal/ sign	Signage lighting	
Protected zone	No light	

Figure 1-25 Hailes Quarry Park lighting approach plan.

The proposed lighting approach is to leave the majority of the park unlit with only the two major desire lines lit to cycle path standards. The remaining parts of the perimeter paved paths are to be lit by low level stud lights with solar power aiding in wayfinding.

The lighting scheme is recommended to be as follows:

- Lighting to entrance signs - this can be achieved through spotlights mounted at adjacent lighting column to illuminate the signage.
- Lighting columns to main pedestrian and cyclist routes (desire lines).
- Wayfinding lighting at each junction - this can be provided by using a lighting column. Wayfinding lighting aims to help people identify which route to take and guides people through the park. It should be noted that this technique of wayfinding lighting does not aim to increase visibility along the whole routes.
- Low level solar stud lights to continue from the canel path into the park running along the secondary pedestrian and cyclist routes. It should be noted that stud lights aim to provide indication of the route for wayfinding purposes only and they are not for the purpose of providing illumination on the footway.
- An additional lighting column to illuminate the staircase leading to Kingsknowe Estate.
- 2-3 additional lighting columns to continue from the currently lit South desire line along the canal to Dumdryden Road

Lighting Control

All luminaires will be controlled by photoelectric sensors located on the power feeder pillars. All luminaire LED drivers shall be Telnsa and/or DALI. Luminaires are also to be compatible with existing CMS control. A light curfew is recommended for lighting to be switched off at midnight.

Environmental Considerations

The park is considered to be on the borders of E2 and E3 classifications due to it being a relatively dark area within an E3 Suburban. The sensitive receptors are limited to residential properties within the Kingsknowe Estate and the residential properties on Dumbryden Gardens.

As there is no environmental impact assessment, the flora and fauna lighting requirements have been assumed and that the environmental area and the wooded area will remain as dark areas with no lighting within their boundaries.

Social and Personal Security Considerations

From stakeholder consultation, there is a concern for anti-social behaviours but there has been few occurrences in recent years with minimal known police interventions. Lighting columns are recommended to be steel columns to match existing columns within the park.

Lighting Equipment

Lighting Columns

Lighting columns along the South desire line are recommended to match existing columns. Lighting columns to the North desire line can match existing columns or can have different specifications. Lighting columns to the main desire lines are recommended to be 5m high. Wayfinding lighting column at each junction can have lower height. The lumen output of these wayfinding columns can also be lower than the output of the columns along the main desire lines.

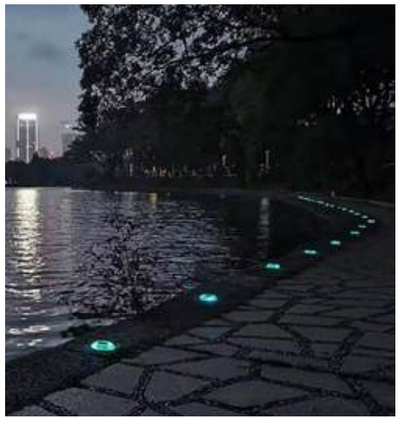


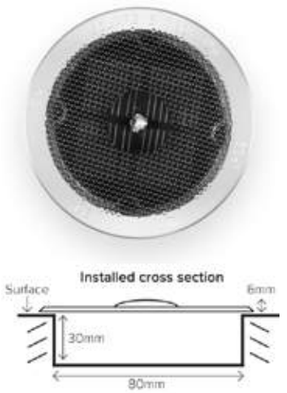



Lighting column examples

Low Level Solar Stud Light

Solar stud lights should be selected based on the quality of material, protection rating and ease of installations. This is due to performance of the solar stud lights is heavily impacted by how well the studs are installed onsite.



Solar stud light examples

Spotlight to Signage

Spotlights can be added to a nearby lighting column near signage to illuminate the signage. Spotlights should be selected based on their protection rating, size and beam control.





Column-mounted spotlight examples