Construction (Environmental) Management Plan

Hermitage Park, Lepton

Miller Homes

Lapwing House
Peel Avenue
Calder Park
Wakefield
WF2 7UA

Prepared by:

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SLR Project No.: 410.066985.00001

12 May 2025

Revision: 02

Revision Record

Revision	Date	Prepared By	Checked By	Authorised By
01	12 May 2025	DP	NB	NB
01	11 June 2025	DP	GB	NB

Basis of Report

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Executive Summary

The Construction (Environmental) Management Plan (C(E)MP) for the Hermitage Park development in Lepton outlines the principles and procedures to be followed during the construction of 80 residential dwellings and associated infrastructure. The document establishes environmental management practices to mitigate potential impacts on sensitive receptors, including Lepton Great Wood (a Local Wildlife Site containing Ancient Semi-Natural Woodland), Beldon Brook, residents, and protected species such as bats and breeding birds.

Key mitigation measures include the establishment of a 15-metre Biodiversity Protection Zone between the site and Lepton Great Wood, implementation of dust and noise control protocols, proper management of surface water runoff, and specific provisions for the protection of wildlife habitats. The plan also addresses construction traffic management, with particular attention to the constraints of the T-junction access off Rowley Lane and the proximity to Rowley Lane junior and infant school.

The C(E)MP details roles and responsibilities for environmental management, with the Principal Contractor responsible for implementing the plan and an Ecological Clerk of Works overseeing sensitive ecological operations. Construction will be phased over four stages: initial works, enabling and groundworks, superstructure and fit-out, and external works and landscaping. The final development will incorporate sustainable drainage systems, species-rich planting, and other biodiversity enhancements to achieve a targeted 56.26% gain in habitat units and 143.03% gain in hedgerow units.

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Acronyms and Abbreviations

BPZ	Biodiversity Protection Zone
CDM	Construction (Design and Management)
C(E)MP	Construction (Environmental) Management Plan
CIRIA	Construction Industry Research and Information Association
CTMP	Construction Traffic Management Plan
ECoW	Ecological Clerk of Works
EMS	Environmental Management System
HGV	Heavy Goods Vehicle
HSEQ	Health, Safety, Environment and Quality
ILP	Institute of Lighting Professionals
LEAP	Local Equipped Area for Play
PPE	Personal Protective Equipment
RPA	Root Protection Area
SuDS	Sustainable Drainage System
TCC	Temporary Construction Compound
TW	Temporary Works

1.0 Introduction

1.1 Background

This document presents a Construction (Environmental) Management Plan (C(E)MP) for the proposed residential development of 80 dwellings and associated works, located at Land off Hermitage Park, Lepton, Huddersfield, HD8 0JU (the "Site"). The C(E)MP highlights the principles and procedures that will be followed for environmental management during construction.

Outline planning permission for the residential development has been granted by Kirklees Council (KC) under application reference: 2022/60/91735/W. In the interim, Miller Homes Limited (the Developer) has progressed the Site and is seeking to progress with the application for Reserved Matters approval and associated discharge of planning conditions.

Miller Homes Limited have submitted a Section 73 (S.73) application (application reference: 2025/70/90105/W) which seeks a variation to the approved layout, the S.73 application is currently under review from KC.

This C(E)MP has been prepared to meet the requirements of planning condition 16 and forms part of the package of information for the discharge of this condition as follows:

Clause	Report Section
Any phasing of development and timetable of all works;	Section 4.2
Hours of works;	Section 4.1
Details of construction access arrangements;	Section 4.1
Construction vehicle numbers, type and routing;	Section 11.6.1
Methods and times of construction vehicle movements to avoid periods of school pick up/drop off;	Section 4.1, Section 11.6.1
Parking provision for site operatives and visitors;	Section 11.4, Section 11.5
Loading and unloading of plant and materials;	
Storage of plant and materials used in constructing the development;	Section 4.3.4
Lighting during construction works;	Section 8.2
Measures to control emissions, including details of the disposal of surface water run-off containing suspended solids (in accordance with best practice e.g. CIRIA publications);	Section 5.0, Section 5.0, Section 7.0
Measures to control the emission dust dirt during demolition/construction phases including wheel washing facilities for vehicles leaving the site;	Section 6.3.4
A scheme for recycling/disposing waste resulting from demolition/construction works;	Section 6.3
Measures to prevent mud/dirt being deposited on public highway;	Section 6.2
Details for monitoring emission dust dirt during demolition/construction phases.	Section 6.3.4

The C(E)MP is a fluid document that may evolve during the execution of the project. As such, it would be subject to constant review to address:

- Best practice at the time of construction;
- Incorporation of findings from any new or ongoing Site investigations;
- Changes resulting from the construction methods used by the contractor(s); and
- Unforeseen conditions encountered during construction.

1.2 Aims and Objectives

The C(E)MP would be maintained and updated on site and would be augmented by associated design specifications and Construction (Design and Management) (CDM) 2015 Regulations documentation such as the Principal Contractor's Construction Phase Plan.

Where appropriate, the C(E)MP, or plans within the C(E)MP, would form part of the Site induction which would be mandatory for all employees, contractors and visitors attending the site. All employees and contractors would need to familiarise themselves with the relevant contents of the C(E)MP and supporting appendices as directed.

Management practices and mitigation measures have been developed for those aspects of the construction works that could potentially affect the environment.

The objectives of the C(E)MP are to:

- Outline the proposed mechanisms for ensuring the delivery of environmental measures to avoid or reduce environmental effects identified;
- Ensure procedures are in place so that there is a prompt response to effects requiring remediation, including reporting and any additional mitigation measures required to prevent a recurrence;
- Provide an outline of the content that would be supplied in the construction method statements and strategies that would be prepared in order to secure mitigation measures in relation to different design aspects of the proposed development;
- Ensure compliance with legislation and identify where it would be necessary to obtain authorisation from relevant statutory bodies;
- Ensure that appropriate proposed development monitoring and reporting would be in place;
- Provide a framework for reporting, compliance auditing and inspection to ensure environmental aims would be met; and
- Set out the developer's expectations to guide contractors on their requirements with regards to environmental commitments and environmental management.

1.3 Site Setting

The Site is located at Hermitage Park, Lepton, Huddersfield, West Yorkshire, approximately 3 miles to the southeast of Huddersfield town centre. The site has strong links to the A642 and is accessed via a sharp T-junction off Rowley Lane.

The site covers approximately 6.2 hectares in total and consists of several fields currently used for grazing. The development boundaries comprise residential properties to the northwest, open fields to the south, and woodland (Lepton Great Wood) to the east.

The site is characterised by steady contours falling north to south and east to west. A local watercourse (Beldon Brook) is located to the south of the development. There are Phase 2 Site Investigation reports indicating shallow coal seams and potential workings which, if

confirmed on further investigation, will require remedial measures including drilling and grouting.

1.4 Project Description

The proposed project involves the construction of 80 dwellings, comprising 64 private and 16 affordable homes, with an approximate 27-month build duration. The development will include:

- Site preparation, including earthworks to create suitable development platforms;
- A temporary construction compound during the construction period;
- Installation of both temporary and permanent surface water and foul water drainage systems;
- Formation of a new road network to serve the residential properties;
- Provision of utility infrastructure (gas, electricity, water, and communications);
- Construction of homes;
- Incorporation of landscaped public areas and green spaces;
- Installation of sustainable drainage (SuDS) basins and swales to enhance the overall amenity of the development;
- Associated footpaths, car parking, and access arrangements;
- Creation of a Local Equipped Area for Play (LEAP).

1.5 Environmental Considerations

This C(E)MP will take into consideration the following key environmental constraints that could affect the works on site:

- Archaeology: Archaeological assessment indicates a low potential for archaeological deposits on the site;
- Presence of protected species: Notably bats using the site for commuting and foraging;
- Ecology: Including protection of Lepton Great Wood (Local Wildlife Site and Ancient Woodland), semi-improved neutral grassland, hedgerows, tree lines, and mature trees;
- Hydrology and water quality: Including protection of Beldon Brook and appropriate drainage measures;
- Sustainability: Incorporating sustainable design and construction practices;
- Dust Management: Controlling dust during construction to minimise impacts on neighbouring properties;
- Air Quality: Monitoring and mitigating air quality impacts;
- Light pollution: Particularly in relation to bat activity and neighbouring properties;
- Noise Management: Controlling construction noise to minimise disturbance; and
- Waste Management: Implementing appropriate waste management practices.

1.6 Monitoring of the C(E)MP

The Principal Contractor will ensure that:

- The C(E)MP is continually reviewed and updated to ensure that all the requirements set out by the C(E)MP are still valid and being adhered to;
- Future works are reviewed and if required amendments to the C(E)MP are implemented before the works begin; and
- That all HSEQ processes are reviewed and are suitable and effective.

2.0 Implementations

2.1 Implementation and Controls

Compliance with the C(E)MP is the key control measure required during construction to ensure mitigation is appropriately addressed. It documents the principles and processes to be followed to implement all relevant agreed environmental mitigation.

The Principal Contractor would be required to prepare a series of method statements. These method statements would detail how the contractor intends to implement the mitigation set out in the C(E)MP and would be integrated with their detailed Construction Method Statements.

If any significant changes are required due to changing environmental sensitivities, results of pre-construction surveys, unforeseen events or for any other reason, these would be discussed and agreed with statutory bodies in advance of any amended works being carried out.

2.2 Roles and Responsibilities

During construction there would be key responsibilities for each of the involved parties and their teams. Establishing roles and responsibilities in relation to construction would be important to ensure the successful construction of the proposed development, including the implementation of the C(E)MP.

2.3 Health and Safety

The construction works would be undertaken in accordance with primary health and safety legislation, namely:

- Health and Safety at Work Act 1974; and
- Construction (Design and Management) (CDM) Regulations 2015.

The construction works for the proposed development would fall under the CDM Regulations 2015. As such, the Principal Contractor would provide a Construction Phase Plan in accordance with the CDM Regulations. This plan would include (but not limited to) a construction programme, emergency procedure, site layouts and fire plans, method statements and details of the proposed induction programme. This induction programme would include both the Principal Contractor's site-specific rules as well as the Client's requirements.

An induction would be required for all worker (permanent/ temporary/ contractor/ subcontractor), site visitors, applicant representatives or other 3rd parties. Inductions would be documented.

Plant operators and construction staff would adhere to Miller Homes' internal Spills guidance about spill prevention/mitigation measures and procedures and in the use of relevant mitigation material (e.g. spill kits).

Staff and subcontractors employed by the Principal Contractor would be trained and must prove certification for any plant, vehicle or use of specialist equipment such as electrical and hot works.

3.0 Responsibilities

Table 1 – Development Personnel Responsibilities

Position	Areas of Designated Responsibility
Site Manager/ Contracts Manager	Hold and maintain for the duration of the project, an Environmental Management System (EMS) certified to the international standard ISO14001.
	Co-ordination of environmental requirements into construction programmes.
	Support development and submission of Consents, Licences or Authorisations.
	Integrate the environmental design and construction as a key part of the Proposed Development and ensure the core environmental commitments, statutory requirements and measures are implemented on programme and in accordance with the contract.
	Co-ordinating and arranging all the pre-construction, construction and post construction environmental survey and monitoring requirements.
	Check prior to the commencement of any element of the Works that the proposed mitigation measures are consistent with the C(E)MP.
	Co-ordinate the activities and liaise with the Contractor's Environmental Team.
	Incorporate the environmental working group's agenda into the monthly project meetings.
	Discuss suggested changes to the environmental aspects of the works with the Contractor, the Contractor's Designer, environmental specialists and appropriate environmental bodies.
	Ensure integration of the mitigation measures being implemented.
Site Manager	Ensure waste sub-contractors are licensed.
	Ensure waste disposal sites are licensed to accept relevant waste streams.
	Maintain site waste facilities.
	Establish and monitor recycling facilities.
	Establish a scheme for recycling/disposal of waste resulting from demolition and construction works.
	Method for dealing with existing drainage pipework that may include asbestos pipes.
	Method to record the quantity of recovered material (re-used on or off-site)
	Monitor quantities of waste removed from site.
	Maintain waste file.
	Ensure site registered as Hazardous Waste Producer.
	Ensure Site Waste Management Plan is updated as required.
Ecological Clerk of Works (ECoW)	Advise on protecting valued biodiversity features.
	Provide practical, site-specific and proportionate assistance on achieving compliance with environmental legislation.

	Manage ecological operatives engaged in ecological mitigation activities.
	Undertake ecological watching briefs and pre-commencement checks.
	Oversee ecologically sensitive works.
	Advise on any arising ecological issues during construction.

4.0 Construction Staging

4.1 Site Access

Access to the site will be via a sharp T-junction off Rowley Lane. Due to the constraints of this access point, a self-imposed restriction on delivery times will be prudent as the access is subject to heavy street parking for the Rowley Lane junior and infant school.

It will be necessary to engage proactively with neighbours early on to secure an agreement inviting unobstructed access to the site. To demonstrate goodwill, the developer proposes supplying the Hermitage Park Residents Group with grit salt and providing labour for spreading during the winter months. This support is intended to address the challenges posed by a 13-metre incline from the junction to the site access, which could hinder deliveries and visitor access during icy or snowy conditions.

The Miller respect procedure will be implemented at the earliest opportunity to enable neighbours to feedback on any concerns they may have with construction activities.

All construction work and heavy goods vehicle (HGV) movements to and from the site must be limited to the following hours where possible to do so:

- Monday to Friday: 08:00 to 18:00;
- Saturday: 08:00 to 13:00;
- Times corresponding to school hour peaks in the morning and afternoon pending agreement with the local school; and
- No work is permitted on Sundays, bank holidays, or public holidays.

Additionally, no construction deliveries to or from the site will be allowed outside of these specified times.

Parking within Hermitage Park could become problematic if residents choose to park roadside. This issue will be managed through the implementation of appropriate signage and communication with residents.

Staff and contractor parking will be on-site, with vehicles reverse-parked for safety. The Principal Contractor will select, monitor, and enforce a suitable speed limit, ensuring compliance with vehicle load capacities per the Construction Traffic Management Plan (CTMP).

4.2 Construction

The following stages would be taken into consideration for the construction works:

4.2.1 Phase 1 (Initial Works):

- Arrival on site and mobilisation;
- Marking and setting out proposed areas;
- Preparation of access routes and temporary signage;
- Installation of site hoarding, welfare facilities, and security measures;
- Vegetation clearance and general site clearance;
- Protection of non-work areas (e.g., tree protection, fencing);
- Initial drainage works for site entrance;
- Survey and assessment of any existing watercourses or culverts; and

- Building control inspections (as applicable)

4.2.2 Phase 2 (Enabling & Groundworks):

- Earthworks to form development platforms;
- Installation of temporary and permanent drainage systems;
- Formation of temporary and permanent access roads;
- Installation of base and sub-base layers for roadways;
- Installation of packaged plant/pump stations (as necessary);
- Setting out and excavation for foundations;
- Protection of utility corridors (gas, water, electricity, communications);
- Installation of footpaths, driveways, and parking areas;
- Completion of final drainage and sustainable drainage (SuDS) features;
- Hard landscaping (retaining walls, paving, street furniture);

4.2.3 Phase 3 (Superstructure & Fit-Out):

- Construction of foundations and ground floor slabs;
- Erection of buildings;
- Installation of roofing and external finishes;
- First-fix services (mechanical, electrical, and plumbing);
- Second-fix joinery, plastering, and internal finishes; and
- External wall finishes and windows.
- Soft landscaping (turfing, planting, and tree planting);
- Installation of the LEAP; and
- Demobilisation of temporary works and facilities.

4.3 General Construction Good Practice

The proposed development is located in Lepton, near Huddersfield, with existing residential properties in close proximity, particularly to the northwest. During construction, there will be an increase in traffic volumes due to construction vehicles accessing the site via Rowley Lane. The impacts of construction traffic may include noise, general disturbance, dust and potential contamination from vehicles such as fuels/oils and mud/dirt.

4.3.1 Public Engagement

During construction, a relationship with surrounding neighbours will be established. This will be based on the Miller Respect Scheme which entails:

- The Miller Respect Scheme shall be implemented to ensure effective interface and communication with the public, including customers, neighbours, and other stakeholders affected by construction activities, in accordance with the contractor's Corporate Responsibility policy;
- Miller Respect signage will be installed at prominent locations throughout the site, including all site entrances and commencement points of construction works. The

signage will display a National Contact number providing 24-hour, 7-day-a-week access for public enquiries and complaints;

- Prior notification letters will be distributed to affected parties before commencement of works and in advance of potentially disruptive activities such as piling operations. This communication protocol will be maintained throughout the construction programme to ensure ongoing stakeholder engagement and minimise community impact;
- Creating a good impression by running a tidy and efficient site which includes keeping public roads clean; and
- All complaints will be followed up with correspondence and action.

4.3.2 Statutory Consents, Licences and Permits

All operations shall be planned in close liaison with the statutory environmental bodies and other interested bodies where appropriate. The relevant consents, licences and permits shall be applied for as required. All copies of the application forms and consents shall be kept in the site filing system.

4.3.3 Handling of Excavated Materials

The construction of foundations and hardstanding areas as well as the establishment of the construction welfare would require the stripping and excavation of soil and its reuse or temporary storage. Excavations would generate material comprising granular and cohesive made ground.

Excavated soils would be reused as soon as practicable and as close as possible to the area it was excavated from; however, some temporary storage would be required. Soils in areas taken for temporary use will ideally be stockpiled. A material management plan will be developed to guide this process.

4.3.4 Materials Storage

Granular, non-organic material required to be stored temporarily would be compacted, to reduce the potential for erosion and transfer of sediment, then stockpiled in designated areas at least 50m from a watercourse in accordance with guidance. Temporary stockpiles would need to be appropriately sited away from sensitive ecological areas where possible, with the locations agreed in advance and clearly indicated on the relevant drawing.

Where soils could not be transferred immediately to an appropriate restoration area, short term storage would be required. In this case, the following good practice would apply:

- Soil would be stored around the excavation perimeters at a sufficient distance from the cut face to prevent overburden induced failure;
- Local gullies, diffuse drainage lines (or very wet ground) and locally steep slopes would be avoided for storage;
- Stored upper turves (incorporating vegetation) would be reinstated adjacent to similar habitats;
- Monitoring of stockpiles/excavation areas would occur during and following rainfall events; and
- If material is stockpiled on a slope, silt fences shall be utilised to reduce sediment transport in accordance with CIRIA guidance C532. Additional measures may also be necessary to control flow of water and sediment transport on Site in accordance with this guidance.

Silt fences shall be employed in combination with the measures described in 'CIRIA Control of water pollution from construction sites. Guidance for consultants and contractors (C532)' where required to minimise sediment levels in run-off. The silt fencing for all phases is shown in the Pollution Prevention Plans in Appendix A.

All designated areas for waste, parking and storage, will be positioned so as not to affect any sensitive receptors.

5.0 Pollution Prevention Measures

The Principal Contractor would be responsible for developing and implementing an Environmental Incident Response Plan in accordance with GPP21 [16]. The plan would provide reference to procedures to be followed in the event of a specific incident. In general, if an environmental incident was to occur, the following would take place immediately:

- Mitigation would be implemented to stop or reduce impacts from the incident;
- If these were ineffective, work in the area would cease immediately;
- If necessary, monitoring would be undertaken to identify the source of the incident;
- Work would only recommence once it is considered that it would not continue to adversely impact sensitive environmental receptors; and

The Environmental Incident Response Plan would provide:

- A summary of local environmental sensitivities, e.g. environmentally designated areas, protected species or habitats and high amenity areas;
- An outline of the construction works and appropriate references to other environmental plans and construction method statements;
- An inventory of stored materials and emergency response spill kits;
- Details on training requirements, evidence of training of Site staff / plant operators in emergency response procedures including inclusion of Environmental Incident and Response training in Site inductions and tool box talks; and key staff contacts for environmental management and emergency response;
- Detailed procedures to be taken in the event of an incident or emergency (including procedures for positioning and movement of plant) and identification of relevant personnel who would be responsible for implementing such procedures; and
- Contact telephone numbers for the emergency services and Environment Agency Pollution Hotline (0800 80 70 60).

A plan of the Site would also be provided, detailing:

- All areas of potential pollution sources including the locations of car parks, delivery and fuel / chemical storage areas, oil separator equipment, excavations, and any other high-risk areas that could give rise to pollution;
- The location of potential sensitive environmental receptors, including sensitive habitats or species, surface watercourses, drains or culverts where pollution may travel to;
- The location of spill kits and other pollution control or emergency response equipment; and
- The procedures for responding to a major pollution incident would be a regular topic at onsite tool box talks and management meetings in order to ensure that the incident response plan is fully understood by all personnel, and that all involved know their role in it. Any lessons learnt from any response to real incidents would be fed back into the plan to ensure that best practice is followed.

5.1 Refuelling of Vehicles, Plant and Machinery

Generally, refuelling of mobile plant and machinery would be carried out at a designated location within the Site in accordance with PPG 7 [14]. Appropriate signage will be erected to ensure these locations are demarcated and designated to carry out refuelling safely.

Vehicle refuelling would take place either at a dedicated impermeable refuelling pad or by mobile double bunded bowsers at their place of work. The refuelling pad would have an impermeable base and bund with a capacity of 110% with sumps provided such that they do not drain directly into the surface water drains. Where practicable, drainage will be passed through oil interceptors prior to discharge. Refuelling would be carried out using an approved mobile fuel bowser with a suitable pump and hose. Absorbent material (spill kits) would be available onsite and would be deployed to contain drips and small spillages.

All other fuels, oils and potential contaminants, as well as waste oils, would be stored in secure, fit for purpose containers within bunded containment as appropriate and in accordance with Environment Agency guidance GPP 2 [9] and PPG 26 [17]. The bunded containment would have a capacity of 110% of the volume to be stored and would have impervious, secured walls and base.

There would be no fuel storage outside the contractors designated site. Plant would be maintained in good operational order and any fuel/oil leaks recorded for attention. Absorbent pads/granules in the case of an accidental leak/spillage would be available at the temporary construction compound. Maintenance of mobile plant would take place within the construction compounds only and would comply with Environment Agency PPG 7 [14] (The safe operation of refuelling facilities, July 2011).

5.1.1 Spillage

Spillage of fuel, oil and chemicals would be minimised by implementation of the Emergency Spill Control procedures which would be prepared by the Principal Contractor. In the event of any spillage or pollution of any watercourse, emergency spill procedures would be implemented immediately.

5.2 Other Storage

5.2.1 Stockpiled Materials

Stone material stockpiles would generally be limited to within work areas. This material would be transported and deposited directly to the point of use from the storage point. Granular, non-organic material required to be stored temporarily would be compacted, to reduce the potential for erosion and transfer of sediment, then stockpiled in designated areas at least 50m from a watercourse in accordance with GPP5 [12].

Stripped topsoil/superficial soil would be stockpiled in a suitable location away from the area of movement of heavy vehicles, machinery and equipment, to minimise compaction of soil. Stockpiling of excavated material would be managed such that the potential contamination of down slope water supplies and/or natural drainage systems is mitigated/minimised.

Low mound stockpiles would be formed from excavated material, adjacent to construction areas, away from open drains.

Waste storage and raw material would be at the construction works compound and will be suitably stockpiled in a safe manner that prevents any migration of silts/contamination.

5.2.2 Prevention of Mud and Debris on Public Roads

Mud will be prevented from migrating onto public roads primarily through careful on-site management, including stiff broom and jet wash, with regular sweeping and monitoring of traffic routes.

5.2.3 Cement

It is anticipated that typically ready-mixed concrete would be brought onto the construction Site from an offsite source for use as required.

Any bagged cement would be stored within a soil bunded area on pallets above the ground and covered with secured plastic sheeting to minimise the risk of wind-blown cement and uncontrolled washout occurring. Alternatively, cement may be stored in a purpose built silo.

Any spilled cement would be removed by shovelling/excavator and suitably disposed offsite.

5.2.4 Waste and Litter

Waste storage/recycling materials would be segregated into separate skips for different waste streams. Waste will be removed from site by licensed third party waste carriers and recycled/tipped accordingly. The waste carrier is to provide monthly records of all materials removed from site, detailing volumes//number of skips removed and volume of products recycled.

With respect to the control of litter on site, all such waste would be collected and stored within sealed containers within the Site compound and serviced by a registered waste carrier. No disposal of litter would be permitted at other locations.

5.2.5 Hydrocarbons and Chemicals

Plant and machinery would be regularly maintained to ensure that the potential for fuel or oil leaks/spillages is minimised. All maintenance would be conducted on suitable absorbent spill pads to minimise the potential for groundwater and surface water pollution. All machinery would be equipped with drip pans to contain minor fuel spillage or equipment leakage.

All fuels, oils and other chemicals would be stored in secure, fit for purpose containers within bunded containment as appropriate and in accordance with Environment Agency guidance. The bunded containment would have a capacity of 110% of the volume to be stored and would have impervious, secured walls and base.

The bunded area would be underlain by an impermeable ground membrane layer to reduce the potential pathways for contaminants to enter watercourses and groundwater.

6.0 The Management and Movement of Materials

6.1 Accidental Spillage

Appropriately sized spill kit(s) would be provided and maintained onsite, consideration would be given to suitable locations across the active areas of the Site and to having vehicles, including plant, carry a spill kit. This kit would contain materials, such as absorbent granules and pads, absorbent booms and collection bags. These are designed to halt the spread of spillages and would be deployed, as necessary, should a spillage occur elsewhere within the construction compound.

6.2 Vehicle Washing

Wheel washing facilities will be provided near the exit of the site. This must be used by all vehicles that have come into contact with earthworks—whether dry or wet—so as to ensure minimal mud and dust leave the site and are transferred onto public highways. This will be monitored and enforced by the principal contractor. Should any material make its way onto the public highway, a mechanical road sweeper will be required to clear the public highway.

To prevent pollution, it is important that all concrete pours are planned, and specific procedures would be adopted in accordance with Construction Industry Research and Information Association (CIRIA) C532 Control of water pollution from construction sites, document: guidance for consultants and contractors. These procedures would include:

- Ensuring that all excavations are sufficiently dewatered before concrete pours begin and that dewatering continues while the concrete cures. Construction good practice would be followed to ensure that fresh concrete is isolated from the dewatering system;
- Ensuring that covers are available for freshly placed concrete to avoid the surface of the concrete washing away during heavy precipitation; and
- Drainage to have silt traps where appropriate in accordance with environmental procedures.

The excavated area would be backfilled with compacted layers of graded material from the original excavation, where this is suitable, and capped with peat or soil. The finished surface around the base of the foundation, would be capped with crushed aggregate providing a walkway to allow for safe personnel access.

6.3 Surplus and Waste Materials

6.3.1 Waste Management Plan

The Principal Contractor would prepare a Construction Site Waste Management Plan which will identify how waste produced during construction will be managed in accordance with legislation and good practice and will be the responsibility of the Principal Contractor throughout the works. Miller Homes will review and confirm that the plan is in place and accurate.

The contractor will set waste targets from the beginning of the works and continually review the effectiveness to ensure high standards are met and continual improvements are made.

Appropriate waste management, disposal and waste carrier documentation and licences would be obtained (e.g. complete waste transfer notes prior to waste leaving Site, ensure all waste carriers have a valid waste carrier's registration certificate, ensure wastes are

disposed of at a correctly licensed site, complete notification for hazardous waste to the Environment Agency).

Waste streams would include wastes generated by plant, machinery and construction workers over the period of the works, for example waste oils, sewage, refuse (paper, carton, plastic etc.), wooden pallets, waste batteries, fluorescent tubes etc.

Recycling initiatives will be implemented to minimise levels of waste to landfill and encourage re-use where possible. The waste tarmac generated during the construction works will be disposed of in accordance with legislation and good practice, ensuring proper waste management and disposal.

6.3.2 Hazardous and Other Wastes

The following lists some of the waste types that may be generated during the construction works. Although some waste types may be generated across the site such waste materials would be stored within a designated area only, away from any sensitive receptors such as watercourses and ecological constraints. Waste materials generated would be taken to the designated area daily to be managed thereafter.

Table 2 – Common Waste Types

EWC Code	Description
13 01 10*	Used mineral hydraulic oil (non-chlorinated)
13 02 08*	Other waste engine, gear or lube oil
13 02 05*	Waste engine, gear or lube oil (non-chlorinated)
13 02 08*	Other waste engine, gear or lube oil
16 01 07*	Oil filters
20 01 23*	Discarded equipment containing CFCs e.g. waste fridges & freezers
16 06 01*	Lead batteries
16 07 08*	Oily waste from transport and storage tanks
16 10 01*	Hazardous liquid wastes to be treated off-site
20 01 21*	Fluorescent tubes and other mercury-containing waste
20 01 33*	Hazardous batteries and accumulators that are collected separately
15 02 02*	Absorbents, filter materials, wiping cloths, clothing contaminated by dangerous substances
15 01 01	Cardboard or paper packaging
15 01 02	Plastic packaging e.g. toner & ink cartridges, polythene sheeting
15 01 03	Wooden packaging e.g. timber pallets
15 01 04	Metallic packaging e.g. drink cans, paint tins
16 01 03	Tyres
16 01 15	Antifreeze fluids that do not contain dangerous substances e.g. Coolants
16 01 17	Ferrous metal from vehicles e.g. car parts
16 02 14	Non-hazardous waste electricals e.g. washing machines, power tools
16 05 05	Gases in pressure containers i.e. gas cylinders
17 01 01	Concrete
17 02 01	Wood from construction or demolition e.g. timber trusses, supports, frames, doors
17 04 11	Cables that do not contain dangerous substances e.g. electric cabling
20 01 01	Paper & card similar to that from households e.g. office paper, junk mail
20 01 30	Non-hazardous detergent e.g. flushing agent/universal cleaner
20 01 39	Separately collected plastics e.g. plastic containers, bottles
20 03 01	Mixed waste similar to that from households e.g. mixed office, kitchen & general waste
20 03 04	Septic tank sludge

*Denotes Hazardous Waste, as categorised by the European Waste Catalogue.

Foul water from the onsite facilities at the construction works compound would be removed from Site by an appropriately licensed contractor (see also Section 7.5).

6.3.3 Regulatory Compliance

Waste would need to be transferred to a licensed waste management Site or Site with a waste exemption. The Principal Contractor would need to check that the Site is licensed and that the licence permits the Site to take the type and quantity of waste involved. Copies of the waste management licence or waste exemption licence would need to be held on file.

For Hazardous waste, a 'Waste Transfer Note' must be completed by all parties involved and must be retained for a period of two years. Sub-contractors excavating and hauling waste offsite must complete their own Waste Transfer Notes and copy them to the Principal Contractor.

It would be the responsibility of the Principal Contractor to ensure that other parties involved in the transport, storage and disposal of waste were legally entitled to carry out their duties.

6.3.4 Dust Mitigation

Dust mitigation measures are described in *SLR Report 403.065678.00001_ Hermitage Park, Lepton AQ & Dust CEMP Input v2.0 found at* Appendix D.

7.0 Drainage and Surface Water Management

7.1 Introduction

Control of water is of great importance during construction to prevent exposed soils eroding and silting up surrounding drainage channels and downstream watercourses. It is essential that the works have little or no impact on the existing hydrology to minimise potential impact on ecology and environmental quality of the surrounding countryside.

The following principles are intended to demonstrate measures that could be used across the Site to adequately protect hydrological, and related, resources. Detailed proposals for such measures would be documented prior to construction and would provide the same or greater protection for the water environment as those described in this document. The measures are proportionate to the risk and, where greater risk is highlighted at specific locations prior to construction, specific measures would be agreed for those locations.

7.2 Site Induction and Training

All employees and contractors would undergo a Site induction to ensure that they were familiar with the Site rules prior to any work commencing on site. In addition, the Principal Contractor would ensure that all operatives and contractors responsible for handling fuel, oil, concrete or cement or other potential pollutants undergo a thorough induction programme with respect to the relevant proposed pollution control measures. The relevant programme would include, as a minimum, the following:

- Waste management;
- Emergency response procedures;
- Materials management;
- Habitat and species protection,
- Surface water management;
- Potential sources of pollution and their effects on the environment;
- Requirements of the contract and legislation with respect to pollution;
- The Principal Contractor's pollution avoidance plan;
- Traffic management and routing, including areas where access is not permitted; and
- Training in the use of pollution control equipment.

7.3 Site Drainage

During the construction phase of the proposed development, measures would be adopted to prevent silt, chemicals and/or other contaminants from being washed into existing watercourses, especially Beldon Brook to the south of the development site. Areas exposed due to the removal of vegetation are more susceptible to erosion during heavy rainfall so areas would be reinstated as soon as possible to minimise this effect.

This would include specific guidance in relation to drainage (and control of pollution to the water environment) around the following aspects of Site infrastructure:

- Access routes;
- Foundations;
- Hardstanding areas and new structures

The appropriate methodologies to cover water control and the means of drainage from all hard surfaces and structures within the Site are described in the following sections.

7.3.1 Management of Sediment and Surface Waters

Good practice construction techniques would be adopted for the management of sediment and surface water run-off generated during the construction phase of the proposed development. Sustainable Drainage Systems (SuDS) would be used where applicable. The systems would be designed for approval by the Environment Agency prior to the construction phase of the proposed development.

The site has two storm water attenuation basins proposed which will ultimately discharge at an agreed controlled rate into Beldon Brook to the south of the development. Swales proposed along the eastern boundary are designed to collect storm water runoff from the woodland and discharge it into Beldon Brook. Both the basins and swales will be prioritised early in the infrastructure programme to mitigate potential environmental concerns.

In addition, a wet weather protocol would be implemented to manage activities during periods of heavy and prolonged precipitation to be approved by Kirklees Council in consultation with the Environment Agency.

Heavy or prolonged rainfall during construction and operation may lead to sediment transport or vegetation causing blockage to infrastructure drainage channels or watercourse crossing structures. Regular monitoring and prompt maintenance of these assets will ensure that the drainage system continues to function as designed.

7.3.2 Foul Drainage

Effluent and waste from onsite construction personnel would be captured and stored for offsite disposal by licensed third-party waste carriers, , in accordance with Guidance for Pollution Prevention (GPP) 4 [11]: Disposal of wastewater where there is no connection to the public foul sewer.

8.0 Construction Operations Management

8.1 Noise Management

Construction noise on-site is expected to be temporary and will vary in both location and duration as different stages of the project progress. Primary noise sources include large plant and equipment, such as bulldozers, diesel generators, vibration plates, concrete mixer trucks, and rollers. Noise may also increase temporarily due to heightened construction traffic entering and leaving the site. The magnitude of noise generation will depend on the specific construction activities at any given time.

All noise management measures will follow the principles outlined in BS 5228-1:2009 ('Noise Control on Construction and Open Sites; Part 1 – Noise') and adhere to the 'best practicable means' concept defined in Section 72 of the Control of Pollution Act 1974.

The following noise mitigation measures will be implemented where appropriate:

- Consideration will be given to noise emissions when selecting plant and equipment to be used on Site. Where appropriate, quieter items of plant and equipment will be given preference;
- All equipment should be maintained in good working order and fitted with the appropriate silencers, mufflers or acoustic covers where applicable;
- White noise emitters will be used for reversing vehicles (including forklifts) rather than beeping;
- Stationary noise sources shall be sited as far as reasonably possible from residential properties and, where necessary and appropriate, acoustic barriers installed to further reduce the impact;
- The movement of vehicles to and from Site will be controlled; and
- Employees will be instructed to ensure compliance with the noise control measures adopted.

8.1.1 Operational Noise Mitigations

During operational phases, normal residential activity noise is expected. No specific operational noise mitigation measures are required beyond standard building regulations compliance.

8.2 Site Lighting

Temporary Site lighting will be required at the construction compounds for security purposes and to ensure that a safe working environment is provided to construction staff. In addition, temporary lighting may be required to ensure safe working conditions across the site during construction. It is intended that the type of lighting shall be non-intrusive and specifically designed to negate or minimise any effect to local properties and any other environmental considerations.

Given the nature of the tasks, there will be some elements of the work undertaken during periods of the year when natural daylight is limited.

Artificial lighting may, therefore, be required to facilitate the work, such as vehicle and plant headlights, construction and compound lighting, office complex lighting, and localised floodlights/mobile lighting units. There should be limited requirement for artificial lighting in the summer months with natural light during normal working hours. All temporary lighting installations will be downward facing and all lights will be switched off during daylight hours.

Particular attention will be paid to lighting design to minimise impacts on bats, especially along the eastern boundary near Lepton Great Wood.

8.3 Vehicle Storage

Appropriate areas would be provided adjacent to or within the Site compound to allow staff and visitor vehicles to be parked. In addition, appropriate provision would be made for the layover of HGV traffic, to ensure that the adjacent road always remains clear and available for use. The appropriate area must also be away from any sensitive receptors such as watercourses and ecological constraints.

8.4 Security Hoardings

The principal contractor will provide Heras Fencing for the full site and will maintain it as and when required.

8.5 Fire Safety

The principal contractor will ensure that there is strictly no burning of waste or construction materials onsite.

9.0 Construction Phase

9.1 Introduction

The following section provides a more detailed description of the main construction components and their potential impact on the environment. The construction management plan specifies the measures to be taken to minimise the environmental impact of the construction activities.

9.2 Temporary Compound

The works would include the construction of a Temporary Construction Compound (TCC). The Site compound and plant storage area will be hoarded utilising compound fencing.

The extent of the first phase roads and sewers will accommodate access to the permanent onsite compound location, which is located to the east on the centre green. Miller Homes are assured that the siting of the compound on the proposed LEAP for the duration of the project is acceptable.

The temporary construction compound is likely to contain the following:

- Temporary modular building to be used for Site offices, the monitoring of incoming vehicles and welfare facilities including toilets with provision for sealed waste storage and removal;
- Parking for construction staff, visitors and construction vehicles;
- Secure storage for tools and small parts;
- Reception area; and
- Fuelling point, or mobile fuel bowser to comply with Environment Agency PPG 7 [14] (The safe operation of refuelling facilities, July 2011), and GPP 2 [9] (Above ground oil storage tanks, January 2018).

Welfare facilities would be provided for the duration of the construction period in accordance with the Construction (Design and Management) Regulations 2015. Facilities for waste management, refuelling, power, water supply and chemical/material storage would be provided.

Where and when compound lighting is required, it would be designed to minimise light pollution to the surrounding area. All lights would angle downwards and face inwards.

The compound would also be used as a storage compound for various components, fuels and materials required for construction.

Any areas requiring clearing would first involve stripping topsoil or unsuitable layers and regrading, then laying geotextile and an imported stone layer. The stripped topsoil and other materials would be stored adjacent to the compound in a linear bund typically no greater than 2m in elevation. Superficial soil would be stripped and stored separately from the topsoil. This would be stored in a similar manner to the topsoil but would depend on the volume which is required to be excavated.

It is recommended that uncontaminated surface run-off from the compound is accommodated in a swale or soakaway which would be constructed as a perimeter ditch to avoid contamination of watercourses should there be a spillage and from fines washout. All other run-off from the Site would follow natural drainage patterns and newly installed drainage routes.

9.3 Welfare Facilities and Services

Welfare facilities would be provided in accordance with the Construction (Design and Management) Regulations 2015 during the construction period and would include mobile toilets with provision for sealed waste storage and removal. Sewage waste would be tankered offsite by a licensed approved waste contractor. Alternatively, waste water may be connected to the existing public drainage system. Potable water would be imported as bottled water. The water would be used for messing purposes during the construction phase.

The welfare facilities will most likely have a temporary water supply connection.

Electricity would be provided by onsite generators for as little time as possible prior to connection to the local distribution network. All electrical equipment and its installation and maintenance would be undertaken by a qualified and competent person.

9.4 Access Routes

9.4.1 Management of Surface Water

Temporary access routes would be designed to have adequate cross fall or camber to avoid ponding of rainwater and surface run-off. Run-off from the access routes and existing drainage ditches would be directed into temporary swales that would be designed to intercept, filtrate and convey the runoff.

The Principal Contractor would be responsible for the management of all surface water runoff, including the design and management of a temporary drainage scheme compliant with SuDS principles.

9.4.2 Protection of Watercourse Crossings

Watercourse crossings would be appropriately designed so that they do not alter the natural drainage and can accommodate flow. Authorisation from the relevant authorities would be obtained prior to construction of any watercourse crossings.

9.4.3 Loose Granular Material

Loose material would be prevented from entering watercourses by utilising the following measures:

- Silt fences would be erected between areas at risk of erosion and watercourses;
- Silt fences and swales would be inspected daily and cleaned out as required to ensure their continued effectiveness;
- Excess silt would be disposed of in designated areas at least 50m away from any watercourses or drainage ditches;
- Water bars would be implemented on slopes greater than 1 in 20;
- Culverts, swales and drains would be checked after periods of heavy precipitation;
- The inlets and outlets of settlement lagoons, retention basins and extended detention basins would be checked on a daily basis for blockages; and
- The access tracks would be inspected on a daily basis for areas where water collects and ponds.

9.4.4 Onsite Vehicle Movements

During the periods of delivery of large components, the Contractor would use appropriate Site communications and access control techniques to enable safe one-way operation of the

tracks. Internal access routes would also be used to facilitate multiple options for construction traffic movement. This would allow vehicles to move more directly between construction locations and double as passing places.

9.4.5 Signage

Sufficient signage would be employed onsite, for both Site personnel and the public, to clearly define the boundary of the works, to maintain separation and to ensure they do not coincide.

9.5 Soil Storage

Superficial soils would be excavated and stored temporarily. It is anticipated that most of the soil resources within areas directly affected by construction activities would be able to be stored and reinstated as close as possible to where they were excavated, so that the Site would be restored with minimal movement of material from its original location.

Sub-soil and overburden material, not classified as topsoil, are permitted to be stockpiled at a height greater than 2m, however an assessment should be undertaken to determine the safe height and slopes of any stockpile, based on the material type. Superficial soil would then be stripped and stored, keeping this material separate from the topsoil.

The risk of water pollution from excavation works in terms of sediment loss would be prevented/mitigated by the following measures:

- Stripped topsoil/superficial soil would not be stored adjacent or near watercourses, where a construction area requiring soil stripping is close to a watercourse, the soil would be stored a suitable distance from the watercourse;
- Soil would be stored in accordance with best practice to remain intact as the soil would be re-used where possible; and
- Excavated soil would not be placed onto water reservoirs, or placed where it would block established surface or drainage channels.

10.0 Pre-Construction Surveys, Protected Species and Monitoring

10.1.1 Pre-Construction Surveys

Prior to the commencement of the construction of the proposed development, preconstruction habitat and protected/notable species surveys would be required to inform appropriate management and protection plans. Additional surveys for protected species will be undertaken by a suitably qualified Ecologist in tune with the locations and programme of works. Survey outcomes will inform the designers/engineers in selecting appropriate working methods.

10.2 Land Quality

10.2.1 Geo-Environmental Ground Investigations

All contractors are required to maintain a watching brief during groundworks to identify any previously undiscovered contamination. Should any potentially hazardous materials be encountered, works must cease in that location and the matter referred to a suitably qualified environmental specialist for further guidance. This approach ensures that the development proceeds in accordance with best practice and any relevant planning conditions.

10.2.2 Asbestos

If any suspected asbestos-containing material (ACM) is identified during construction, work should stop immediately. The materials must then be assessed and, if necessary, removed by a licensed asbestos contractor. Site personnel must receive asbestos awareness training, wear appropriate personal protective equipment (PPE), and ensure that all handling, transport, and disposal of asbestos or ACMs comply with current legislative requirements.

10.2.3 Archaeology / Heritage

An archaeological desk-based assessment has been undertaken for the site which indicates a low potential for archaeological deposits of local to regional importance to be present on the site. The assessment has revealed a low potential for archaeological deposits to be present as the area is south of the Medieval village and has been historically open fields.

In line with the recommendations, any unexpected discoveries or remains of high importance must be reported immediately and works adjusted as appropriate to safeguard the site's heritage.

10.3 Ecology

10.3.1 Bats

The Ecological Impact Assessment identified that bats use the site for commuting and foraging, particularly along the eastern boundary adjacent to Lepton Great Wood. The lighting strategy for the site will be designed to minimise impacts on bats, in accordance with the Lighting Impact Assessments in Appendix B.

The following measures will be implemented to protect bat commuting and foraging routes:

- Preserving existing hedgerows, tree lines and mature trees which are used by bats for commuting and foraging;

- Using low-level, directional, or cowled lighting to minimise illumination of hedgerows and woodland edges, particularly along the eastern boundary adjacent to Lepton Great Wood;
- Restricting lighting to essential areas only;
- Incorporating features such as wildlife-friendly grasslands or wildflower margins to boost insect abundance; and
- Conducting periodic bat activity surveys to detect any shifts in bat usage.

10.3.2 Breeding Birds

The following measures will be implemented to protect breeding birds:

- Avoid clearing hedgerows, trees, or scrub between March and August (the core nesting bird season);
- If essential works are required during this period, engage the Ecological Clerk of Works (ECoW) to carry out pre-works nest checks within the 24 hours prior to vegetation clearance;
- If an active nest is identified, it would be left in situ until the breeding attempt was concluded and the young had fledged;
- Preserve existing hedgerows and tree lines where feasible; and
- Reinforce hedgerows by introducing additional native shrubs to increase nesting cover and fruiting resources.

10.3.3 Tree Protection

The following measures will be implemented to protect trees on site:

- Root Protection Areas (RPAs) will be established for Lepton Great Wood, which will also overlap with RPAs required for areas of the semi-improved neutral grassland, retained hedgerows, tree lines, mature trees, and trees with potential for roosting bats;
- A minimum 15m buffer/Biodiversity Protection Zone (BPZ) shall be established between the Site and Lepton Great Wood;
- The BPZ shall be planted with a semi-natural transitional habitat comprising individual tree planting, native scrub and woodland, and species-rich meadow planting to safeguard the Root Protection Area of the Ancient Woodland and provide an improved and more natural 'edge habitat';
- Temporary construction Site fencing shall also be installed alongside the planting work to provide a physical barrier for the BPZ; and
- All retained trees, tree lines, and hedgerows, as well as their RPAs, shall be protected by BPZs.

10.3.3.1 Pre-Commencement Measures

- Clearly mark the Root Protection Areas (RPAs) for trees to be retained, as defined in the arboricultural assessment;
- Erect protective fencing or barriers around the RPAs before any site clearance or machinery access. The fencing must be robust (e.g., steel mesh "Heras" panels) and remain in place throughout construction, forming a Construction Exclusion Zone (CEZ);

- Display clear signage on fencing stating "Construction Exclusion Zone – No Access"; and
- Avoid storing materials, machinery, or chemicals within RPAs.

11.0 Construction Traffic Management Plan

11.1 Introduction

During the works, Rowley Lane and the surrounding road network in proximity to the site will experience an increase in traffic volume due to construction-related vehicle movements. This may have temporary impacts on nearby residential properties and businesses, including potential noise, dust, general disturbance, and contamination from construction vehicles. Measures will be implemented to manage and mitigate these impacts, ensuring minimal disruption to the local community and maintaining safe access routes for all road users.

The access for Hermitage Park is a sharp T-junction off Rowley Lane which is subject to heavy street parking for the Rowley Lane junior and infant school. Accordingly, a self-imposed restriction on delivery times will be prudent. Parking within Hermitage Park could become problematic if residents choose to park roadside. Proactive engagement with neighbours will be undertaken to secure an agreement inviting unobstructed access to the site. Temporary traffic cones will be used to prevent the access to the site becoming blocked or unsafe.

11.2 Site Layout

All construction activity will be undertaken within the boundary of the site and not on the public highway. This includes all material storage, vehicle reception, vehicle turning, staff welfare and parking/waiting.

The layout will be managed based on the following principles:

- The site will be fully secured to prevent access by unauthorised people with hazard warning signage at boundaries;
- Pedestrians and vehicles will be segregated on site wherever possible; and
- Welfare facilities will be located away from main construction areas.

11.3 Temporary Construction Compound

As per Section 9.2 of this C(E)MP, the works would include the construction of a Temporary Construction Compound (TCC). The TCC is likely to contain the following:

- Temporary modular building to be used for Site offices, the monitoring of incoming vehicles and welfare facilities including toilets with provision for sealed waste storage and removal;
- Parking for construction staff, visitors and construction vehicles;
- Secure storage for tools and small parts;
- Reception area; and
- Fuelling point, or mobile fuel bowser.

11.4 Parking

During construction, designated parking areas will be provided on-site.

Appropriate areas would be provided adjacent to or within the TCC to allow construction staff and visitor vehicles to be parked. In addition, appropriate provision would be made for the layover of HGV traffic, to ensure that the adjacent road remains clear.

11.5 Construction Operatives Travel Options

11.5.1 Pedestrian Access

The site can be accessed on foot via Rowley Lane, with existing pedestrian infrastructure in the vicinity. However, due to the rural nature of the area, pedestrian access may be limited for construction workers living further afield.

11.5.2 Cycle Access

The site is accessible by bicycle from nearby residential areas, although dedicated cycle infrastructure is limited. The Principal Contractor will provide secure cycle storage facilities for construction workers who choose to cycle to the site.

11.5.3 Public Transport Accessibility

Public transport options in the area are limited. The nearest bus stops are on Wakefield Road, which would require a walk to the site. Construction workers will be encouraged to car-share where possible to reduce the number of vehicle movements to and from the site.

11.6 Site Traffic Management

11.6.1 Control Measures

Measures for control of construction traffic within the site and on the surrounding highway network will include:

- A clear signage strategy will be agreed and implemented to ensure that construction traffic utilises designated routes to minimise the impact on the surrounding road network;
- Each phase will identify the likely vehicle movements and vehicle types, for that phase. HGV movements will be restricted as far as reasonably possible, so as to avoid school drop-off and pick-up times due to the proximity of Rowley Lane junior and infant school;
- A banksman will be designated to control all on-site plant and vehicle movements, particularly where they have a need to reverse. All plant storage areas will be on hard standings;
- All site traffic movements will be in accordance with local authority requirements; and
- Clear instructions will be provided to staff and contractors regarding preferred vehicle routing, both for light vehicles and heavy vehicles/plant, as to minimise the impacts on local residential areas and other sensitive receptors.

11.6.2 Monitoring and Enforcement

- A Site Manager will be appointed by the Principal Contractor and will be responsible for monitoring and enforcing the agreed construction and transport delivery/haulage routes;
- Personnel working on site will be advised of the access routes and parking will be provided within the site compound or where agreed;
- Visitors will be notified in advance on the route that they have to follow to access to the site; and
- The HGV routing plan will be distributed to HGV drivers on site and reinforced by internal signage. This plan is to be found at Appendix C.

11.6.3 Site Induction and Training

As per Section 7.2 of this C(E)MP, all employees and contractors would undergo a Site induction to ensure that they were familiar with the Site rules prior to any work commencing on site. The relevant programme would include traffic management and routing.

11.6.4 Traffic Management

Traffic management will be undertaken in accordance with industry best practice procedures. Consideration must be given to:

- Identification of any hazards;
- Identifying who may be at risk;
- Controlling the risk through effective control measures;
- Recording findings and produce a traffic management plan; and
- Regular reviews.

11.6.5 Monitoring and Enforcement

A Site Manager will be appointed by the Principal Contractor and will be responsible for monitoring and enforcing the agreed construction and transport delivery/haulage routes.

Spot checks will be undertaken on the local highway to ensure that they are free of debris.

Contact details will be provided at the site access gates so that stakeholders can report any feedback/complaints.

12.0 References

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8. Guidance for Pollution Prevention (GPPs)
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10. PPG1 Understanding your environmental responsibilities – good environmental practices: PPG 1, July 2013
11. GPP2 Above Ground Oil Storage Tanks: GPP 2, January 2018
12. PPG3 Use and design of oil separators in surface water drainage systems: PPG 3, April 2006
13. GPP4 Treatment and disposal of wastewater where there is no connection to the public sewer: GPP 4, November 2017
14. GPP5 Works and maintenance in or near water: GPP 5, January 2017
15. PPG6 Working at Construction and Demolition Sites: PPG6, 2012
16. PPG7 Safe Storage – The safe operation of refuelling facilities: PPG 7, July 2011
17. GPP 8 Safe storage and disposal of used oils: GPP 8, July 2017
18. GPP21 Pollution incident response planning: GPP 21, July 2017
19. PPG26 Safe Storage – drums and intermediate bulk containers: PPG 26, March 2011
20. Environment Agency. (2011). PPG 26: Safe Storage – Drums and Intermediate Bulk Containers. Available at: https://www.gov.uk/government/publications/storing-and-handling-drums-and-intermediate-bulk-containers-ppg26.
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13.0 Closure

For queries or questions relating to this document please contact the undersigned.

Regards,

SLR Consulting Limited

Dan Porteous, CEng
Principal Civil Engineer
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Appendix A Pollution Prevention Plans (PPP)

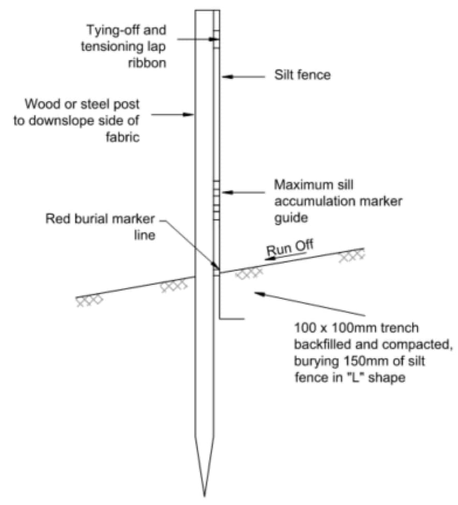
PROPOSED PPP CUT OFF BUND TO PROTECT EXISTING PROPERTIES ALONG WESTERN BOUNDARY
RETURN ON BUND TO BE PROVIDED TO ALLOW FOR AN ELEMENT OF STORAGE IN THIS AREA WHICH IS TO BE OVERPUMPED TO THE SOUTH AS REQUIRED

PROPOSED PPP CUT OFF BUND TO PROTECT EXISTING PROPERTIES ALONG WESTERN BOUNDARY
RETURN ON BUND TO BE PROVIDED TO ALLOW FOR AN ELEMENT OF STORAGE IN THIS AREA WHICH IS TO BE OVERPUMPED TO THE SOUTH OF THE TREE BELT AS REQUIRED

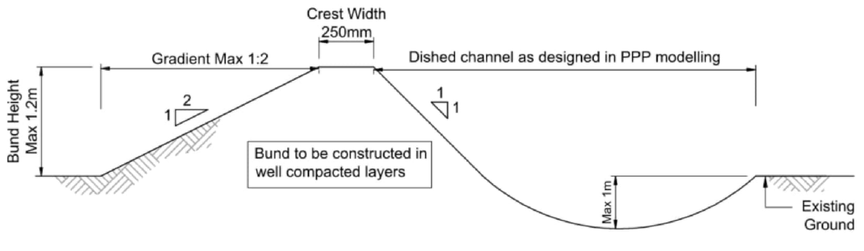
SILT FENCING PROVIDED ALONG THE WESTERN BOUNDARY AS SHOWN. FLOWS ALLOWED TO PASS THROUGH SILT FENCING AND OVERLAND ALONG ADJACENT VEGETATED FIELDS AND INFILTRATE TO GROUND.

KEY:

- PROPOSED TEMPORARY PUMP
- PROPOSED PUMPING HOSE (INDICATIVE)
- PROPOSED SILT FENCE (DETAIL 1)
- PROPOSED BUNDING (DETAIL 2)
- OVERLAND FLOW ROUTE
- PHASE 1 TOPSOIL STRIP
- TOPSOIL TO REMAIN INSITU



DETAIL 1 - SILT FENCING (NTS)



DETAIL 2 - BUND & CHANNEL (NTS)

Rev.	Description	Drawn	Date

miller homes
Miller Homes Ltd - Yorkshire
Lapwing House
Peel Avenue, Calder Park
Wakefield
West Yorkshire, WF2 7UA

Telephone 0870 336 4600
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Project Title
Hermitage Park
Lepton

Drawing Title
Proposed Pollution Prevention Plan
Phase 1

Scale	Drawn By	Checked By	Authorised By
1:500	AC		
	Date May '25	Date	Date

Job No.	Drawing No.	Revision
5611	ENG/PPP/01	-

Original Sheet Size A0

PROPOSED PPP CUT OFF BUND TO PROTECT EXISTING PROPERTIES ALONG WESTERN BOUNDARY
RETURN ON BUND TO BE PROVIDED TO ALLOW FOR AN ELEMENT OF STORAGE IN THIS AREA WHICH IS TO BE OVERPUMPED TO THE SOUTH AS REQUIRED

PROPOSED PPP CUT OFF BUND TO PROTECT EXISTING PROPERTIES ALONG WESTERN BOUNDARY
RETURN ON BUND TO BE PROVIDED TO ALLOW FOR AN ELEMENT OF STORAGE IN THIS AREA WHICH IS TO BE OVERPUMPED TO THE SOUTH OF THE TREE BELT AS REQUIRED
BUND TO BE REMOVED AS ADJACENT DEVELOPMENT AREAS COMPLETE

REFER TO FORTEM ATTENUATION BASIN DETAILS FOR FURTHER DETAIL ON THE PROPOSED BASIN
TEMPORARY BUND FORMED ACROSS BASIN TO 1M HEIGHT USING SITE WON COHESIVE SOILS

SILT FENCING PROVIDED ALONG THE WESTERN BOUNDARY AS SHOWN. FLOWS ALLOWED TO PASS THROUGH SILT FENCING AND OVERLAND ALONG ADJACENT VEGETATED FIELDS AND INFILTRATE TO GROUND.

FLOW CONTROL MANHOLE TO RESTRICT SURFACE WATER FLOWS TO 13.3l/s

SEE INSET FOR CONTINUATION TO OUTFALL

KEY:

- PROPOSED TEMPORARY PUMP
- PROPOSED TEMPORARY PUMP WITH FLOTATION RING
- PROPOSED PUMPING HOSE (INDICATIVE)
- PROPOSED SILT FENCE (DETAIL 1)
- PROPOSED BUNDING (DETAIL 2)
- PROPOSED S104 DRAINAGE INSTALLED
- PROPOSED TEMPORARY 1M BUND ACROSS S104 ATTENUATION BASIN
- PROPOSED FROG ENVIRONMENTAL PIPE REACTOR
- PROPOSED SILT CAPTURE CHANNEL
- OVERLAND FLOW ROUTE
- PHASE 2 TOPSOIL STRIP
- TOPSOIL TO REMAIN INSITU

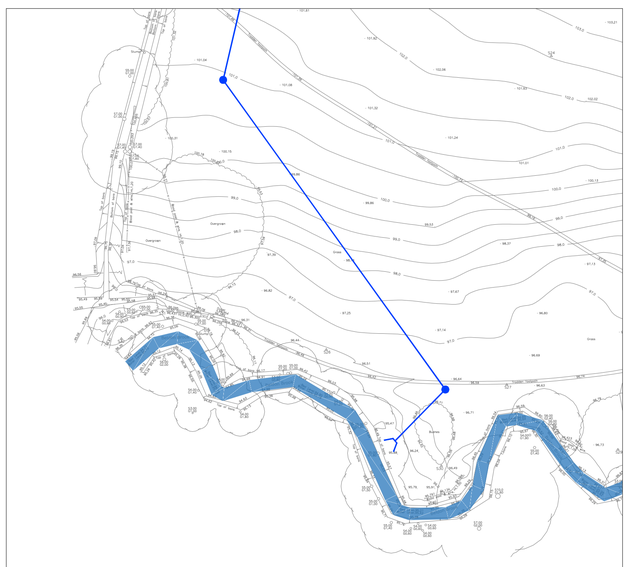
SILT TREATMENT

TO BE POSITIONED AT GROUND LEVEL

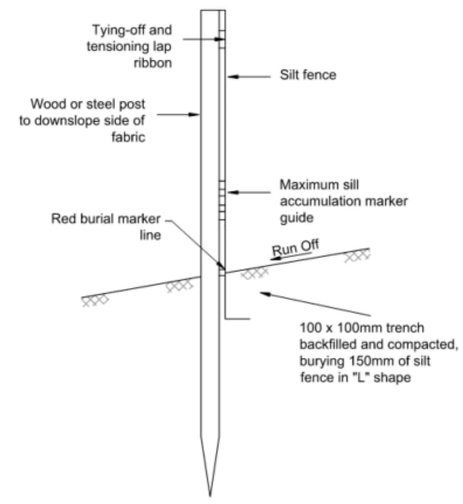
FROG ENVIRONMENTAL PIPE REACTOR AND SILT CAPTURE CHANNEL MAXIMUM ALLOWABLE THROUGH FLOW 13.3L/SEC

TREATMENT MEASURES TO BE CONSTRUCTED DURING PHASE 2 PPP WORKS

FLOW CONTROL MANHOLE TO BE USED AS TEST CHAMBER



INSET 1 - OUTFALL TO BELDON BROOK



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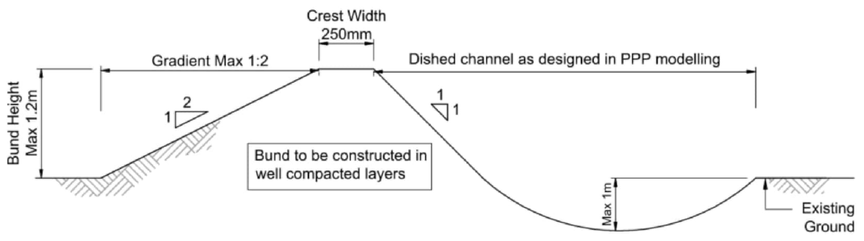

DETAIL 2 - BUND & CHANNEL (NTS)

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Rev.	Description	Drawn	Date

Project Title: Hermitage Park, Lepton

Drawing Title: Proposed Pollution Prevention Plan Phase 2

Scale	Drawn By	Checked By	Authorised By
1:500	AC		
	Date May '25	Date	Date

Job No.	Drawing No.	Revision
5611	ENG/PPP/02	-

Original Sheet Size A0

PROPOSED PPP CUT OFF BUND TO PROTECT EXISTING PROPERTIES ALONG WESTERN BOUNDARY
RETURN ON BUND TO BE PROVIDED TO ALLOW FOR AN ELEMENT OF STORAGE IN THIS AREA WHICH IS TO BE OVERPUMPED TO THE SOUTH AS REQUIRED

PROPOSED PPP CUT OFF BUND TO PROTECT EXISTING PROPERTIES ALONG WESTERN BOUNDARY
RETURN ON BUND TO BE PROVIDED TO ALLOW FOR AN ELEMENT OF STORAGE IN THIS AREA WHICH IS TO BE OVERPUMPED TO THE SOUTH OF THE TREE BELT AS REQUIRED
BUND TO BE REMOVED AS ADJACENT DEVELOPMENT AREAS COMPLETE

REFER TO FORTEM ATTENUATION BASIN DETAILS FOR FURTHER DETAIL ON THE PROPOSED BASIN
TEMPORARY BUND FORMED ACROSS BASIN TO 1M HEIGHT USING SITE WON COHESIVE SOILS.
BUND TO BE REMOVED WHEN PPP MEASURES REMOVED/RELOCATED

AS ROADS IN SOUTHERN PART OF SITE ARE COMPLETED, PIPE REACTOR AND SILT CAPTURE CHANNEL TO BE MOVED ONTO THE PUMP STATION ROAD, WITH FLOWS PUMPED FROM SW MANHOLE THROUGH THE TREATMENT SYSTEM AND ALLOWED TO DRAIN BACK INTO THE FLOW CONTROL MANHOLE VIA GULLY IN LOW SPOT OF ROAD.

FLOW CONTROL MANHOLE TO RESTRICT SURFACE WATER FLOWS TO 13.3l/s

SEE INSET FOR CONTINUATION TO OUTFALL

KEY:

- PROPOSED TEMPORARY PUMP
- PROPOSED TEMPORARY PUMP WITH FLOTATION RING
- PROPOSED PUMPING HOSE (INDICATIVE)
- PROPOSED SILT FENCE (DETAIL 1)
- PROPOSED BUNDING (DETAIL 2)
- PROPOSED S104 DRAINAGE INSTALLED
- PROPOSED TEMPORARY 1M BUND ACROSS S104 ATTENUATION BASIN
- PROPOSED FROG ENVIRONMENTAL PIPE REACTOR
- PROPOSED SILT CAPTURE CHANNEL
- OVERLAND FLOW ROUTE
- TOPSOIL TO REMAIN INSITU

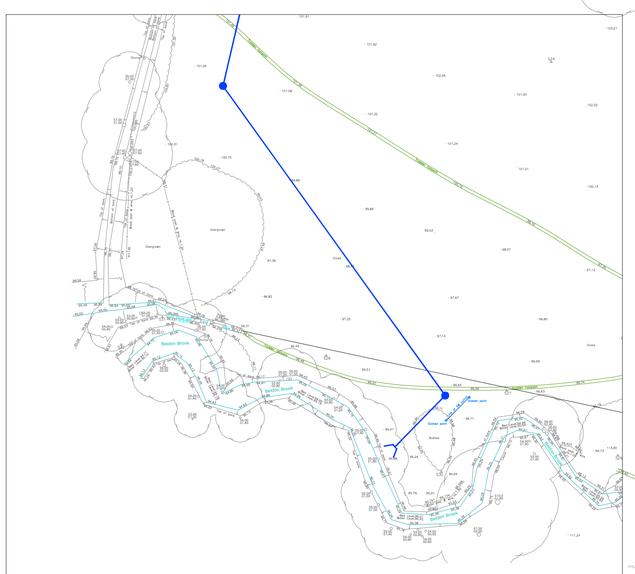
SILT TREATMENT

TO BE POSITIONED AT GROUND LEVEL

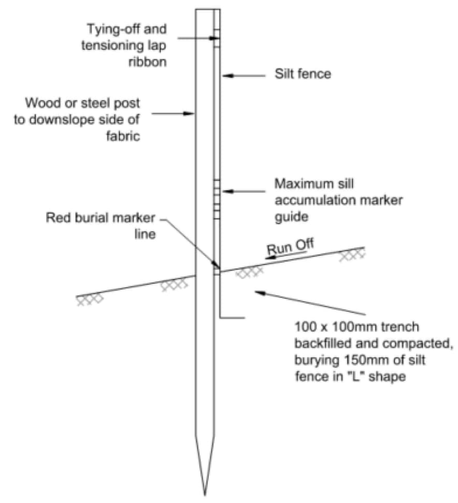
FROG ENVIRONMENTAL PIPE REACTOR AND SILT CAPTURE CHANNEL MAXIMUM ALLOWABLE THROUGH FLOW 13.3L/SEC.

TREATMENT MEASURES TO BE CONSTRUCTED DURING PHASE 2 PPP WORKS

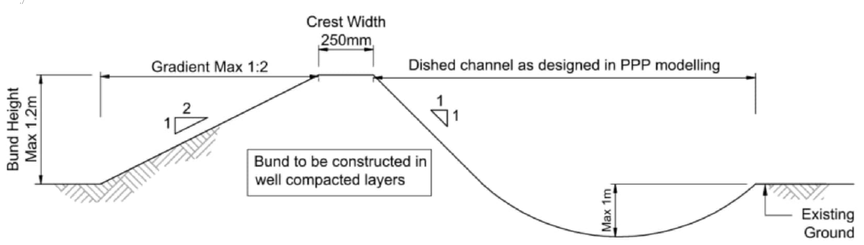
FLOW CONTROL MANHOLE TO BE USED AS TEST CHAMBER



INSET 1 - OUTFALL TO BELDON BROOK



DETAIL 1 - SILT FENCING (NTS)



DETAIL 2 - BUND & CHANNEL (NTS)

Rev.	Description	Drawn	Date

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Project Title
Hermitage Park
Lepton

Drawing Title
Proposed Pollution Prevention Plan
Phase 3

Scale	Drawn By	Checked By	Authorised By
1:500	AC		
	Date May '25	Date	Date

Job No.	Drawing No.	Revision
5611	ENG/PPP/03	-

Original Sheet Size A0

Appendix B Lighting Impact Assessments

BWB
A CAF GROUP COMPANY

BUILDINGS AND BUILT ENVIRONMENT

Miller Homes (Yorkshire) Ltd
Hermitage Park
Lepton
Lighting Impact Assessment

BUILDINGS AND BUILT ENVIRONMENT

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December 2024

DOCUMENT ISSUE RECORD

Document Number:	HPL-BWB-ZZ-XX-E-RP-0001_LIA
BWB Reference:	244698

Revision	Date of Issue	Status	Author:	Checked:	Approved:
P1	02/12/2024	S2	Danny Alasfar	Peter Leonard	Peter Leonard

Notice

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FIGURES

TABLES

APPENDICES

1. INTRODUCTION

Instruction

1.1 BWB Consulting Ltd (BWB) has been appointed by Miller Homes (Yorkshire) Ltd (the Client) to prepare a Lighting Impact Assessment to support the reserved matters planning application for a residential development located at Hermitage Park, Lepton (the 'Site').

Proposed Development

1.2 The proposed development comprises a residential site and associated infrastructure.

1.3 The Proposed Development Masterplan is included within **Appendix 1**.

Objectives

1.4 This report has been produced to identify the proposed lighting strategy and subsequent impact of the external lighting installation on the existing site environment, sensitive ecology and the wider locality.

1.5 The report aims to provide the necessary information to discharge the following Planning Condition:

> *Plans and particulars relating to the Reserved Matters of landscaping, notwithstanding the submitted information, shall include a lighting design strategy. The strategy shall:*
>
> *a) identify those areas / features on site that are particularly sensitive for local species and that are likely to cause disturbance in, or around their breeding sites and resting places, or along important routes used to access key areas of their territory, for example, for foraging; and*
>
> *b) show how and where external lighting will be installed (through the provision of appropriate lighting contour plans and technical specifications) so that it can be clearly demonstrated that areas to be lit will not disturb or prevent the above species using their territory or having access to their breeding sites and resting places.*
>
> *c) With due regard to the requirements of points a and b, detail how appropriate lighting would be installed to mitigate and protect against crime.*
>
> *All external lighting shall be installed in accordance with the specifications and locations set out in the strategy, and these shall be maintained thereafter in accordance with the strategy. Under no circumstances should any other external lighting be installed on dwellings facing either Lepton Great Wood or areas of Public Open Space without prior consent from the local planning authority.*
>
> *Reason: To avoid indirect impacts to bats and other local species in the interest of ecological mitigation, to comply with Policy LP30 of the Kirklees Local Plan.*

1.6 A lighting installation is required to enable users to operate safely and reduce the fear of crime. Lighting is needed for both pedestrians and vehicle drivers. For pedestrians, lighting for good viewing conditions and avoidance of dark areas is necessary. For vehicle drivers the emphasis is on good lighting for vehicle movement and use of roads.

1.7 This report reviews the potential effects of new lighting and reviews methods of lighting the proposed external areas while limiting potentially obtrusive effects to receptors that may have a negative response to a change in their lighting condition. Nearby residential properties and wildlife / habitat which are found on, near or utilising the site are typical receptors considered for analysis.

Scope of Works

1.8 The Scope of work includes:

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

2. RELEVANT POLICY AND GUIDANCE

International guidance

Commission Internationale De L'Eclairage (CIE 150)

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

National guidance

National Planning Policy Framework (2021)

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

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

2.3 The Office of the Deputy Prime Minister (ODPM – now Department for Communities and Local Government) in conjunction with the Countryside Commission published 'Lighting in the Countryside: Towards Good Practice' in July 1997, and a revised issue in 2001. The guidance was developed to 'provide practical advice on the prevention and control of lighting effects through appropriate action by all those involved with lighting in the countryside'. Its objective is 'to identify good practice in the planning and design of lighting in rural areas; and advise on how it can be achieved, using case study examples'. The guide aims to provide an overview and common understanding of all aspects of good lighting practice stating that close co-operation and participation is required for all those involved in planning, designing and installing lighting schemes. The guidance provides valuable information on lighting best practice and the standard methodology outlined in this guidance document has been followed as part of this assessment. Whilst the guidance relates to 'lighting in the countryside', it is considered best practice to adopt many of the principles contained within the guidance to sites of a more urban nature.

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

2.4 The ILP has proposed lighting guidance and criteria for local authorities with a recommendation that they are incorporated at the local plan level. The guidance defines various forms of light pollution and describes a series of environmental zones (similar to the CIE 150 environmental zones). The ILP guidance provides suitable criteria against which the effects of artificial lighting can be assessed and is used in this assessment.

2.5 The ILP Guidance Notes recommends that the immediate environment is classified systematically as shown in **Table 1**. ILP Guidance Notes then make recommendations for limiting obtrusive light according to the environmental zone in which the lighting would be situated. The stringency depends on the capacity to absorb lighting effects, with Zone E0 requiring the strictest level of control and E4 the lowest.

Table 1. Environmental Zones

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

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

Table 2. Obtrusive Light Limitations for Exterior Lighting Installations

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

Institute of Lighting Professionals (ILP) Guidance Note 08 for Bats and artificial lighting in the UK (2023)

2.7 This document is aimed at lighting professionals, lighting designers, planning officers, developers, bat workers/ecologists and anyone specifying lighting. It is intended to raise

awareness of the impacts of artificial lighting on bats, and mitigation is suggested for various scenarios.

British Standards

BS 5489: Code of Practice for the Design of Road Lighting – Part 1: Lighting of Roads and Public Amenity Areas (2021)

2.8 BS 5489-1 provides recommendations on the general principles, aesthetic and technical aspects of road lighting and advises on statutory provisions, operation and maintenance of lighting. The standard provides recommendations for the design of lighting for all types of highways and public thoroughfares, including those specifically for pedestrians and cyclists, and for pedestrian subways and bridges.

2.9 **Table 3** is taken from BS 5489-1 which helps to define the lighting class for subsidiary roads (Class P – subsidiary roads including residential roads). The required lighting performance criteria for each class is defined in BS EN 13201 Part 2: Road Lighting Performance Requirements (2015).

Table 3. Lighting classes for subsidiary roads

Traffic flow	Lighting class		
	E1 to E4 [A]	E1 to E2 [A]	E3 to E4 [A]
	Pedestrian and cyclists	Speed limit <30mph	Speed limit <30mph
Busy [B]	P5	P4	P3
Normal [C]	P5	P5	P4
Quiet [D]	P6	P5	P4

[A] Environmental zone, as given in ILP Guidance Notes (refer to **Table 1**).

[B] Busy traffic flow refers to areas where the traffic usage is high and can be associated with local amenities such as clubs, shopping facilities, public houses, etc.

[C] Normal traffic flow refers to areas where the traffic usage is of a level equivalent to a housing estate access road.

[D] Quiet traffic flow refers to areas where the traffic usage is of a level equivalent to a residential road, and is mainly associated with the adjacent properties or properties on other equivalent roads accessed from this road.

BS EN 13201 Part 2: Road Lighting Performance Requirements (2015)

2.10 This standard defines lighting classes for road lighting according to photometric requirements and aiming at the visual needs of road users. It also considers environmental aspects of road lighting.

2.11 **Table 4** is taken from BS EN 13201-2 which defines the lighting performance requirements for Class P roads.

Table 4. P Lighting class performance requirements

Class	Horizontal illuminance	
	Maintained average (Lux)	Minimum (Lux)
P1	15.0	3.0
P2	10.0	2.0
P3	7.5	1.5
P4	5.0	1.0
P5	3.0	0.6
P6	2.0	0.4

Kirklees Local Plan Strategy and Policies (Adopted 27 February 2019)

2.12 This document is the Kirklees Local Plan. The Local Plan is the statutory development plan and its purpose is to set out the policies necessary to achieve the strategy and how much new development there should be in the district and where it will go. The Local Plan covers the administrative area of Kirklees Council except for that part within the Peak District National Park. The Plan covers the period 2013 – 2031.

Policy LP30 Biodiversity & Geodiversity

"The council will seek to protect and enhance the biodiversity and geodiversity of Kirklees, including the range of international, national and locally designated wildlife and geological sites, Habitats and Species of Principal Importance and the Kirklees Wildlife Habitat Network."

"Development proposals will be required to:-

i. result in no significant loss or harm to biodiversity in Kirklees through avoidance, adequate mitigation or, as a last resort, compensatory measures secured through the establishment of a legally binding agreement;

ii. minimise impact on biodiversity and provide net biodiversity gains through good design by incorporating biodiversity enhancements and habitat creation where opportunities exist;

iii. safeguard and enhance the function and connectivity of the Kirklees Wildlife Habitat Network at a local and wider landscape-scale unless the loss of the site and its functional role within the network can be fully maintained or compensated for in the long term;

iv. establish additional ecological links to the Kirklees Wildlife Habitat Network where opportunities exist; and

v. incorporate biodiversity enhancement measures to reflect the priority habitats and species identified for the relevant Kirklees Biodiversity Opportunity Zone."

Policy LP52 Protection and improvement of environmental quality

"Proposals which have the potential to increase pollution from noise, vibration, light, dust, odour, shadow flicker, chemicals and other forms of pollution or to increase pollution to soil or where environmentally sensitive development would be subject to significant levels of pollution, must be accompanied by evidence to show that the impacts have been evaluated and measures have been incorporated to prevent or reduce the pollution, so as to ensure it does not reduce the quality of life and well-being of people to an unacceptable level or have unacceptable impacts on the environment.

Such developments which cannot incorporate suitable and sustainable mitigation measures which reduce pollution levels to an acceptable level to protect the quality of life and well-being of people or protect the environment will not be permitted.

Where possible, all new development should improve the existing environment."

"Artificial lighting is used for a number of reasons, including work, recreation, security, safety, advertising, display, and to create a pleasant atmosphere where people gather socially. It is important to ensure that it does not become a nuisance to others. Obtrusive light (light pollution) can present serious physiological and ecological problems. Light 'spilling over' onto other property can cause annoyance, distraction and discomfort and may cause driving problems by glaring into drivers' eyes or competing with signs and other traffic signals."

Ecologist Guidance

2.13 The appointed Ecologist has been consulted as part of this assessment. Identification of receptors and mitigation measures are discussed later in this report.

Ecological Impact Assessment (EcIA) (October 2022)

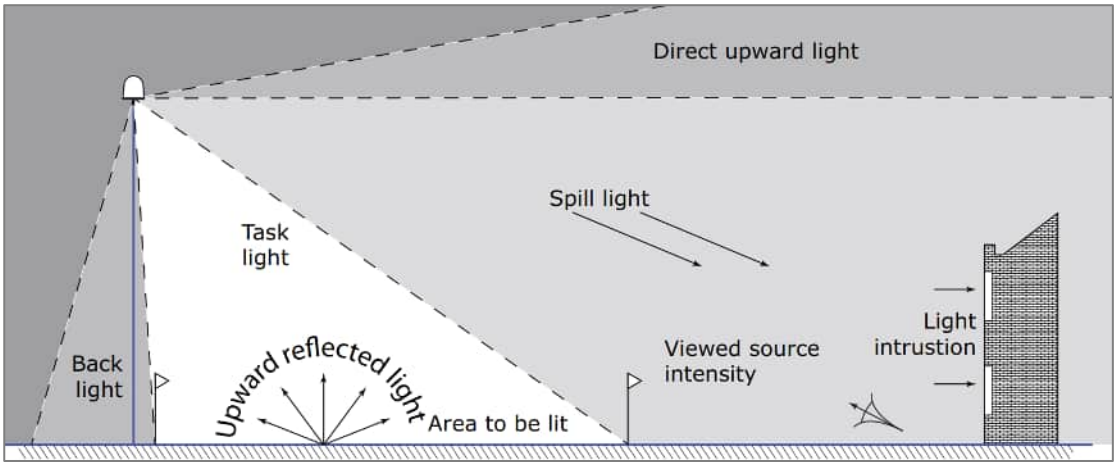
2.14 The purpose of this report is to:

- Describe the baseline data collection and assessment methodologies used;
- Present the results of the Extended Phase 1 Habitat Survey, desk study and Phase 2 protected species surveys (including for the wider survey area, in addition to the application site area itself);
- Identify important ecological receptors, and describe potentially significant ecological effects upon these receptors, if relevant;
- Set out any mitigation measures and sensitive working practices to ensure compliance with nature conservation legislation and to address any potentially significant ecological effects; and
- identify opportunities for ecological enhancement, including via a Metric 3.1 Biodiversity Net Gain assessment, describing how a 10% net gain shall be achieved.

3. LIGHT POLLUTION

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

Figure 1. Types of Light Pollution



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

Types of Light Pollution

Light Spill (Light intrusion, back light)

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

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

Sky Glow (Direct upward light)

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

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

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

3.7 To mitigate sky glow as much as possible, lighting must be accurately targeted and kept to a minimum, and this design principle is incorporated into the Lighting Strategy.

3.8 The magnitude of the impact is a matter of judgement, taking into account the existing night-time view. The magnitude is lessened for those views where an observer is subject to direct illumination from, say, a nearby streetlight, or where light spill from a nearby light source illuminates the foreground, because the observer's vision is not fully dark adapted.

Glare (Viewed source intensity)

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

Design Aspects

Building Luminance

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

Light Levels

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

Light Colour

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

Example Lux Levels

3.13 To give context to the lux levels mentioned to within this report, **Table 5** provides examples of typical lux levels in various scenarios and applications.

Table 5. Example lux levels

Lighting Condition	Lux level
British summer sunshine	50,000
Overcast sky	5,000
Well-lit office	500
Minimum for easy reading	300
Passageway / outside working area	25
Main road lighting	5-20
Sunset	10
Typical side road lighting	5
Minimum security lighting	2
Twilight	1
Clear full moon	0.25 to <1
Typical moonlight / cloudy sky	0.1
Typical starlight	0.001
Poor starlight	0.0001

Source: IPCCTV specialists use-IP Ltd

4. BASELINE

Introduction

4.1 The study area includes the application site, the surrounding areas and any sensitive receptors which may have a direct view towards external lighting proposals and/or which may be affected during the construction and operation of the proposed development. Assessment of designation, use, habitat and external lighting condition dictates the classification of Environmental Zone across the proposed site location and surrounding areas.

4.2 The Site lies on the southern edge of Lepton, circa 4.5km to the south-east of the centre of Huddersfield. It consists predominantly of three large fields and a series of smaller fields or part fields.

4.3 The Site is bound to the north-west and north by existing residential properties within Hermitage Park and along Rowley Lane. Hermitage Park is provided with an assumed 5m high column mounted street lighting installation. Rowley Lane is provided with an assumed 6m high street lighting installation.

4.4 The Site is bound to the east and south-east by Lepton Great Wood, and to the south and southwest by further cattle-grazed fields of grassland, both of which are not provided with an external lighting installation.

4.5 The following categories have been determined as potential sensitive receptors which could be impacted by any external lighting proposals at the Site:

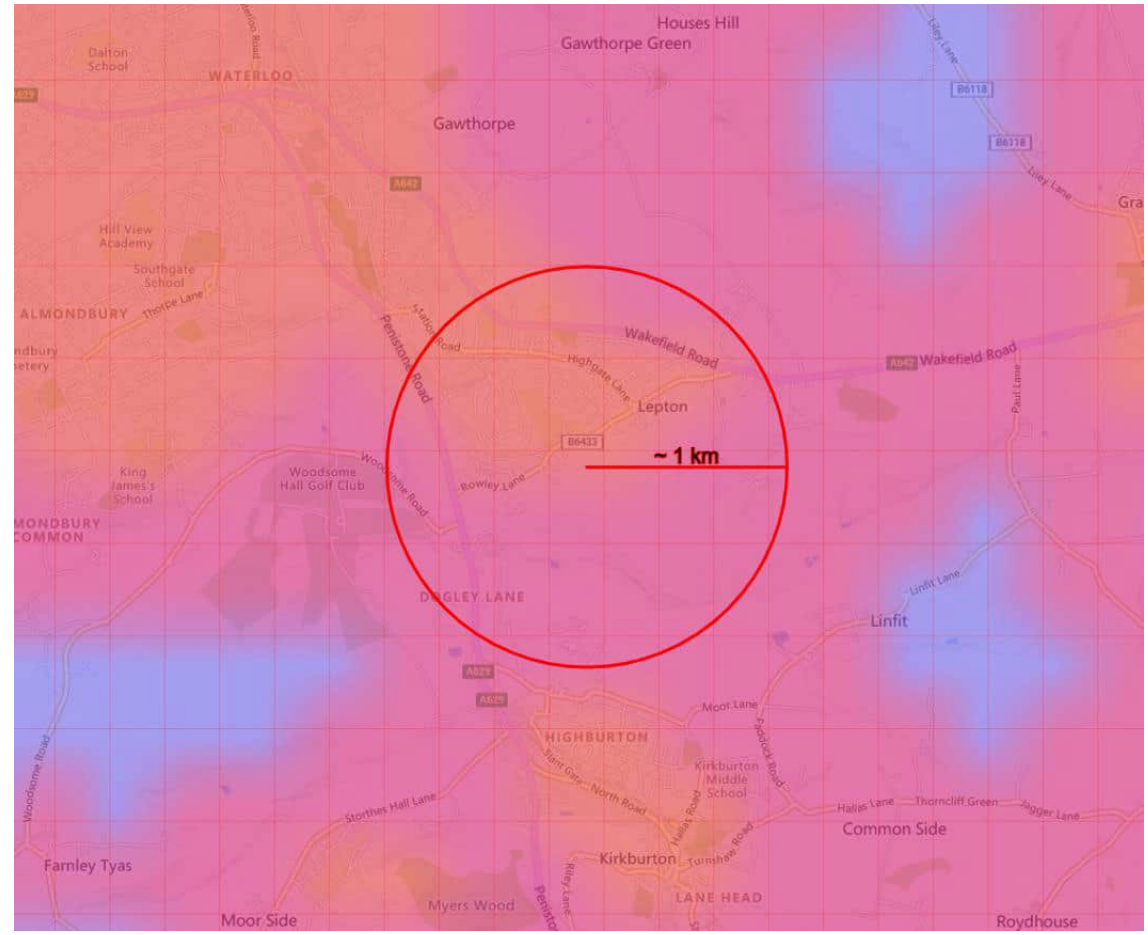
- Ecology;
- Residential properties;
- Natural – direct sky glow; and
- Transport – highway and railway.

Local Radiance

4.6 The Visible Infrared Imaging Radiometer Suite (VIIRS) is a satellite instrument which orbits earth to collect and record radiance data (light emissions). The latest data was recorded in 2023 and is available in visual format. At extract at the Site location is included in **Figure 2**.

4.7 It is important to state that recognised organisations, such as the ILP or CIE, have not calibrated VIIRS radiance data with the Environmental Zones established in **Table 1**. It is also important to note the data should not accurately be relied upon and should be viewed conservatively. The data should be used as one tool to help understand the context of existing light emissions local to the Site.

Figure 2. Radiance, in nanowatts per square centimetre per steradian (nW/cm2/sr)



Mean Radiance, calculated about a 1km radius from the Site:	**4.20 nW/cm2/sr**

Environmental Zone

4.8 With reference to **Table 1** and with consideration of the site context and nature of identified potentially sensitive receptors it is deemed that the Site falls within **Environmental Zone E2**, defined as a Village or relatively dark outer suburban locations.

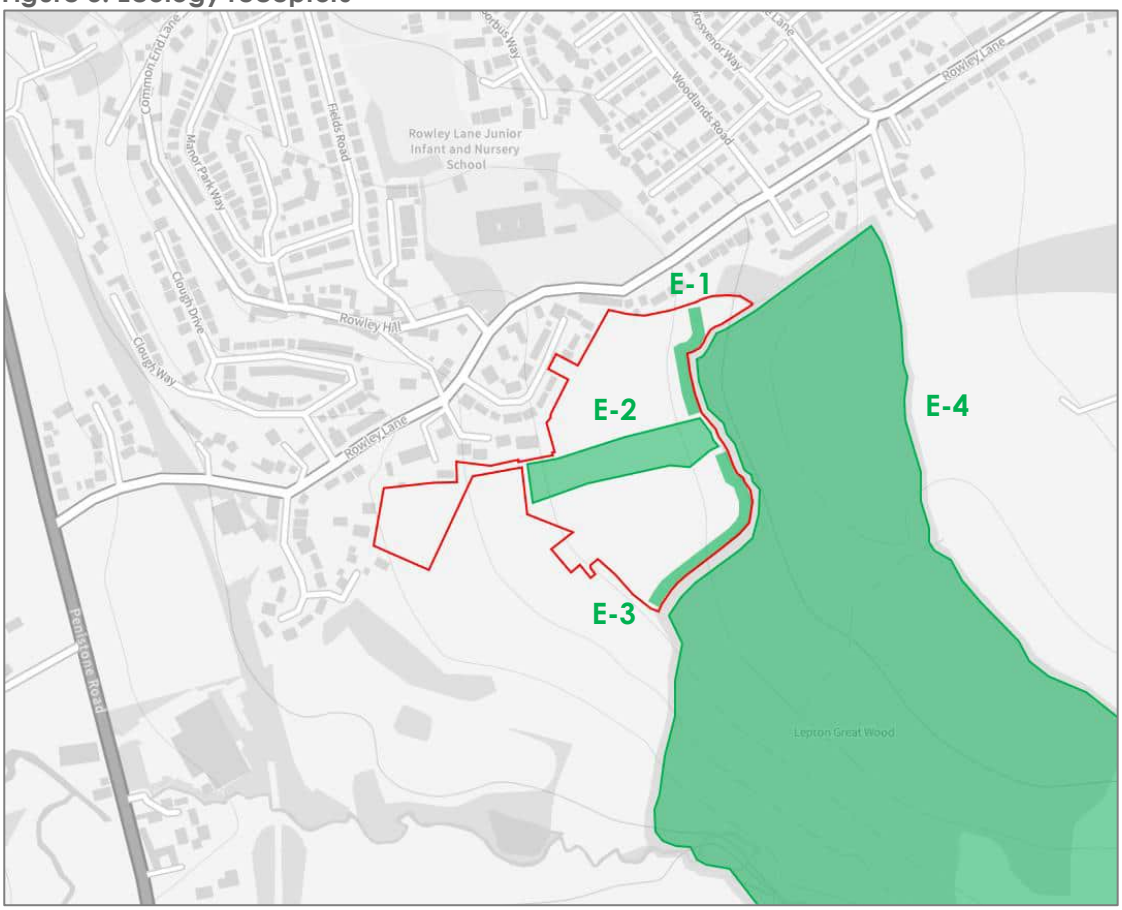
Ecology Receptors

4.9 The appointed Ecologist has been consulted as part of the Lighting Strategy in order to establish all potentially light-sensitive ecology receptors in proximity to the Site.

4.10 Although the Site itself does not contain any non-statutory sites, four Local Wildlife Sites (LWS), occur within the 2km radius of the centre of the Site. Carr Wood, Almondbury Common, and Gawthorpe Lower Wood are considered to lie a sufficient distance from the Site (all over 1km away) such that any lighting proposals will not affect them, and as such they will not be considered as part of this assessment.

4.11 The potentially sensitive ecology receptors surrounding the site have been identified as illustrated in **Figure 3**. Mitigation measures are discussed later in this report.

Figure 3. Ecology receptors



- **E-1** North-east boundary feature. Identified as moderate sensitivity, to be kept as dark as practicable.
- **E-2** Central public open space. Identified as moderate sensitivity, to be kept as dark as practicable.
- **E-3** South-east boundary feature. Identified as moderate sensitivity, to be kept as dark as practicable.
- **E-4** Lepton Great Wood Local Wildlife Site. The woodland forms part of the Kirklees Wildlife Habitat Network. Identified as high sensitivity, to be kept dark.

Residential Receptors

4.12 The residential receptors surrounding the site have been identified based on a desktop study using MAGIC mapping data in conjunction with Google Earth satellite and street view imagery.

4.13 Residential properties within 200m of the Site with a direct view of the Site are considered potentially sensitive.

4.14 Potentially sensitive residential receptors surrounding the site have been identified as illustrated in **Figure 4**. Mitigation measures are discussed later in this report.

Figure 4. Residential receptors

- **R-1** Residential properties off Beldon Brook Green
- **R-2** Residential properties off Rowley Lane (west)
- **R-3** Residential properties off Hermitage Park
- **R-4** Residential properties off Rowley Lane (east)

4.15 The limits for light intrusion (Illuminance in the vertical plane, in this case intrusion through windows) for Environmental Zone E2 are provided in **Table 6**.

Table 6. Maximum values of vertical illuminance on residential properties

Light Technical Parameter	Application Conditions	Environmental Zones				
		E0	E1	E2	E3	E4
Illuminance in the vertical plane (E_v)	Pre-curfew	n/a	2 lx	5 lx	10 lx	25 lx
	Post-curfew	n/a	<0.1 lx	1 lx	2 lx	5 lx

4.16 Curfew is defined as the time after which stricter requirements (for the control of obtrusive light) will apply; often a condition of use of lighting applied by the local authority. Unless otherwise stated this 23:00 – 07:00 is suggested.

Natural – Sky Glow Receptors

4.17 The ILP GN01/21 guidance provides limitations for maximum allowable sky glow percentage for each Environmental Zone as shown in **Table 7**.

4.18 Sky glow is measured as ULR (Upward Light Ratio), the percentage of luminaire flux of a luminaire or a lighting installation that is emitted above the horizontal. Sky glow limitations depend on the Environmental Zone of the lighting installation as set out in the ILP guidance notes. The Environmental Zone categories are previously defined in this report in **Table 1**.

Table 7. Maximum values of upward light ratio (ULR) of luminaires

Light Technical Parameter	Environmental Zones				
	E0	E1	E2	E3	E4
Upward light ratio (ULR) %	0	0	2.5	5	15

Transport Receptors

4.19 The transport receptors surrounding the site have been determined based on a desktop study using MAGIC mapping data in conjunction with Google Earth satellite and street view imagery.

4.20 Highways or railway lines within 200m of the site with a direct view of the Site are considered potentially sensitive.

4.21 Potentially sensitive transport receptors surrounding the site have been identified as illustrated in **Figure 5**. Mitigation measures are discussed later in this report.

Figure 5. Transport receptors

- **T-1** Hermitage Park

5. PROPOSED SITE LIGHTING

Design Parameters

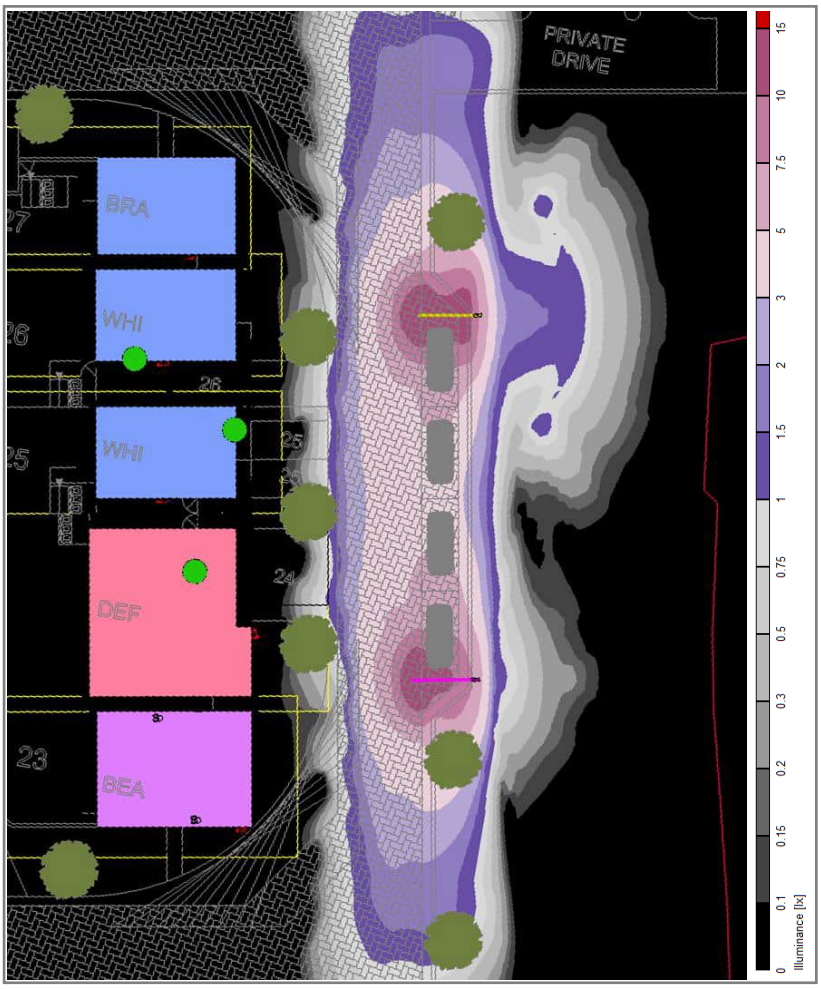
5.1 A street lighting design has been commissioned and undertaken utilising approved Kirklees products, designed to achieve Lighting Class P5, in accordance with **Table 2** and **3**.

5.2 All external lighting has been proposed in accordance with the Kirklees Local Plan Strategy and Policies (Adopted 27 February 2019).

5.3 The proposed luminaires are LED light source to provide optimum energy efficiency and accurate targeting of light output to minimise obtrusive light.

5.4 All luminaires are proposed to be equipped with integrated spill shields, designed to minimise off-site light spill while reducing visibility of light sources. For context a sample pseudo colour plot is included in **Figure 6**, illustrating the improvements in light spill provided by integrated spill shields.

Figure 6. Unshielded vs shielded luminaires



5.5 Column heights have been carefully considered and restricted to 6m in order to minimise obtrusive light. Columns are as low as practicable, at maximum spacing, designed to achieve the performance requirements of the task area while not introducing any tilt angle to the heads. Columns have been positioned to minimise impact on ecology features as far as practicable.

5.6 The final detailed design may deviate from the indicative external lighting design presented but must meet all parameters and criteria as set out in this report and demonstrate equal to or less than the quantity of obtrusive light achieved. An adequate and safe level of lighting must be provided for site tasks, amenity, and security, whilst maintaining acceptable impact on the site surroundings, ecology, and neighbouring properties.

5.7 All luminaires are proposed at 2700K colour temperature in accordance with the recommendations of the appointed ecologist and ILP GN08/23.

Figure 7. Selected colour temperature

5.8 The lighting layout is included in **Appendix 2.** The lux plot layout is included in **Appendix 3.** Literature from the manufacturers of the proposed luminaires type is included in **Appendix 4**.

Performance Requirements

5.9 Illumination shall be provided to meet the minimum recommendations of Lighting Class P5 for a normal traffic residential road in an E2 environmental zone as defined in **Table 4** and **5**.

Table 8. Proposed external lighting design levels

Area	Target	
	Maintained Illuminance Em (Lux)	Minimum Illuminance Em (Lux)
Roads	3.0	0.6

Luminaire Selection

5.10 The luminaires selected for use at the Site must be capable of achieving the design parameters set out in this report.

5.11 All proposed luminaires should be submitted to the Kirklees for review and approval.

Table 9. Street Lighting Luminaire

Specification	Description
Location	Street lighting
Correlated Colour Temperate (CCT)	2700K
Mounting Height	6m
Light source	LED
Example Luminaire	Urbis Axia 3.1
Controls	Astronomical time clock
Notes	All luminaires shall be equipped with integrated rear louvres Refer to Appendix 2, 3, and 4 for further details.
Example Luminaire Image	

Table 10. Example luminaire – Dwelling Lighting

Specification	Description
Location	Dwelling lighting
Correlated Colour Temperate (CCT)	2700K
Mounting Height	1.8m-2.2m
Light source	LED
Example Luminaire	Litecraft Fibo Wall Light
Controls	Manual
Notes	Downward directional In accordance with the Condition, under no circumstances should any external dwelling lighting be installed on dwellings facing either Lepton Great Wood or areas of Public Open Space without prior consent from the local planning authority.
Example Luminaire Image	

Obtrusive Light Assessment

5.12 The lux plot layout, included in **Appendix 3,** has been produced in industry standard lighting calculation software. The lux plot assumes a level, clear site. In practice, the effect of changes in elevation and obstructions such as trees and hedges will contain the light spill further than is shown in the plot.

Light spill (light intrusion)

5.13 As can be seen in **Appendix 4**, light spill will attenuate down to <1 lux before reaching any existing dwelling. Vertical calculations have also been undertaken at property boundaries which demonstrate <1 lux. this level will attenuate further as distance increases toward each dwelling elevation. As illustrated in **Table 2**, the ILP obtrusive light limitation for an area classified as Environmental Zone E2 is 5 lux pre-curfew and 1 lux post-curfew. As such the proposed lighting scheme meets the ILP obtrusive light limitations and is therefore not considered to result in unacceptable light spill impacts on residential properties.

Upward light ratio (ULR)

5.14 The indicative lighting design has been used to calculate the predicted ULR of the proposed external lighting scheme. The model outputs predict a ULR of 0.00%. As illustrated in **Table 2**, the ILP sky glow limitation for an area classified as Environmental

Zone E2 is 2.5% ULR. As such the proposed lighting scheme meets the ILP sky glow limitations and is therefore not considered to result in unacceptable impacts on the dark sky landscape.

Ecology measures

5.15 The proposed external lighting design has been prepared in accordance with the recommendations of the appointed Ecologist. All reasonable steps have been taken to avoid illuminating sensitive receptors as far as practicable while providing the Site with sufficient lighting.

5.16 All luminaires are proposed at 2700K colour temperature in accordance with the recommendations of the appointed ecologist and ILP GN08/23.

5.17 The lighting design has been produced in collaboration with the appointed ecologist. The Ecologist has reviewed and subsequently approved the lighting design presented.

5.18 Any proposed bat boxes should be installed at locations which will not be directly illuminated by the proposed lighting installation.

Climate Change

5.19 The external lighting installation must incorporate highly efficient LED light sources to minimise the required energy while providing the required lighting levels. Typically LED light sources use between 25%-80% less energy than traditional incandescent light sources, reducing the cumulative kilowatt-hours and carbon footprint of the installation. LED technology can last between 3-15 times longer than traditional light sources which also reduces the required manufacture, distribution and installation works needed to routinely replace and dispose of failed luminaires.

5.20 The external lighting installation must utilise luminaires with flat glass components, emitting directional light in order to minimise light pollution and therefore minimise energy lost due to “waste” light.

5.21 An external lighting controls system shall be employed as described above to ensure lighting is energised only when required.

Construction Phase Lighting

5.22 While construction phase lighting is expected to be short term and reversible it is important to define the parameters to minimise light pollution.

5.23 To reduce the effects of lighting during the construction phase on sensitive receptors, a Construction Environmental Management Plan (CEMP) shall be produced which will contain best practice recommendations given by CIE, ILP, CIRIA and Health and Safety Executive (HSE). These should include, but not be limited to, the following:

- Lighting will operate in all external areas used by construction workers after dark in order to provide a safe and secure working environment without over lighting. High quality LED light sources with high colour rendering index (CRI) shall be utilised to maximise visibility with efficient light output.

- Lighting shall be provided to meet the target lux level as set out in BS 12464-2 Lighting of Outdoor Workplaces without over lighting. Luminaires shall be mounted at the lowest practical mounting height, providing lighting only where lighting is required.
- The Contractor shall specify working hours, uses of lighting, location of temporary floodlights and construction compound and agreeing these with the local council to reduce duration of impact.
- Lighting controls should be employed to dim or switch off any lighting that is not needed.
- Lighting that needs to be sited close to the perimeter or ecologically sensitive areas should be fitted with shielding or be switched off or dimmed when not in use.
- Lighting should be controlled in such a way to illuminate high activity, hazardous or high security areas while reducing lighting levels at less pertinent areas.
- The Contractor should act responsibly to adjust any temporary lighting reported as causing nuisance.

6. CONCLUSION

6.1 As part of the lighting strategy a review has been undertaken of the potential impact created by new lighting in relation to the proposed development.

6.2 Legislation, British standards, and good practice guidance recommends the development requires new exterior lighting for purposes of vehicular and pedestrian safety.

6.3 The proposed external lighting installation complies with the recommendations of national and local policy, specifically the following policies which are contained within the Kirklees Local Plan Strategy and Policies (Adopted 27 February 2019):

- Policy LP30 Biodiversity & Geodiversity
- Policy LP52 Protection and improvement of environmental quality

6.4 The proposed external lighting installation has been produced in compliance with, and to satisfy the requirements of, Planning Conditions which is outlined under **Paragraph 1.5** of this report.

6.5 Potentially significant effects from the proposed lighting on sensitive receptors can be managed to create a negligible night-time impact.

6.6 The lighting design strategy presented indicates the potential significant effects from new lighting for the proposed development can be adequately managed and all tested parameters are expected to meet recommended guidance benchmarks.

6.7 The lighting design strategy presented indicates the proposed lighting installation can achieve the required minimum lighting levels and distribution to meet the requirements of the ILP Guidance notes while causing negligible light trespass to the adjoining land and negligible increase in local sky glow.

6.8 The final design may deviate from the indicative external lighting design presented but must meet all parameters and criteria as set out in this report and demonstrate equal to or less than the quantity of light spill achieved. An adequate and safe level of lighting must be provided for site tasks, amenity, and security, whilst maintaining acceptable impact on the site surroundings, ecology, and neighbouring properties.

6.9 The lighting design has been produced in collaboration with the appointed ecologist. Lighting impact to all identified potentially sensitive receptors has been remove or reduced to an acceptable level. The Ecologist has reviewed and subsequently approved the indicative lighting design presented.

6.10 The most noticeable effect due to the proposed street lighting installation expected to remain is a negligible increase in sky glow.

APPENDICES

Appendix 1: Proposed Development Masterplan

ROWLEY LANE

HERMITAGE PARK

BELLOTA BROOK GREEN

BASIN
(RE-ORIENTATED TO EASE PROXIMITY TO KPAS)

POS

BASIN

SK08 / DRAFT FEASIBILITY LAYOUT

SCHEDULE OF ACCOMODATION

MILLER HOMES		SK08	BY		JP	05.07.24

22 5611 - Hermitage Park, Lepton

AFFORDABLE

Ref	Housetype	Type	Parking	Storey	Bed	Sq Ft	No	Total Sq Ft
BAY	Baymont	Semi	PS	2	2	850	4	3400
		End	PS	2	2	850	4	3400
		Mid	PS	2	2	850	2	1700
LOC	Lockton	Semi	PS	2	3	1001	6	6006
					SUB TOTAL		**16**	**14506**

OPEN MARKET

WHI	Whitton	Det	PS	2	2	947	7	6629
BRA	Braxton	Det	PS	2	2	996	8	7968
POR	Portstone	Det	SG	2	3	1212	2	2424
DEN	Denstone	Det	INT	2	3	1368	9	12312
CHE	Cherrystone	Det	INT	2	3	1296	6	7776
BEA	Beauwood	Det	SG	2	4	1379	6	8274
SAN	Sandalwood	Det	SG	2	4	1422	2	2844
HOM	Homesford	Det	DDG	2	5	1568	5	7840
DEF	Denford	Det	INT	2	5	1640	12	19680
GRA	Grayford	Det	SG	2	5	1780	6	10680
			DDG	2	5	1780	1	1780
					SUB TOTAL		**64**	**88207**
					TOTAL		**80**	**102713**

Areas	m2	Acres	Hectares
Gross Area	61275.00	15.14	6.13
Nett Area	24883.00	6.15	2.49
POS	29272.00	7.23	2.93

Sq Ft Per Acre	16705

NET AREAS PLAN

SALES AREA EXTRACT

BOUNDARY TREATMENTS KEY

- 1800mm PIER AND PANEL WALL
- 1800mm TIMBER FENCE
- 1100mm METAL ESTATE RAILING
- 600 MM KNEE HIGH RAIL
- 2000mm ACOUSTIC FENCE

NORTH

1:500 SCALE

10m 50m

Rev	Date	Description	Drawn	Check

Architecture Planning Urban Design Landscape

CLIENT: MILLER HOMES

DRAWING NUMBER: 22:5611:SK08

PROJECT: HERMITAGE PARK, LEPTON

SCALE @ A0: 1:500

DRAWING: DRAFT FEASIBILITY LAYOUT

DRAWN: JP DATE: SEP '24

CHECKED: VS DATE: SEP '24

JRP Associates
14 Mariner Court,
Calder Park, Wakefield, WF4 3FL

T 01924 383322
E info@jrpassoc.co.uk
W jrpassoc.co.uk

Appendix 2: Proposed External Lighting Layout

Notes

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

Legend

- A Urbis Axia 3.1 5266 Optic 8LED 2700K 14W 500mA Equipped with integrated rear louvres Column mounted at 6m
- B Urbis Axia 3.1 5267 Optic 8LED 2700K 21W 750mA Equipped with integrated rear louvres Column mounted at 6m

3 LUX - P5 - ROADS AND FOOTPATHS
Results - Horizontal Illuminance (lux)
Eav= 3.32
Emin= 0.66
Emax= 12.88
Emin/Emax= 0.05
Emin/Eav= 0.20
Emax/Eav= 3.88

Rev	Date	Details of issue / revision	Drw	Rev
P1	27.11.24	Preliminary Issue	GCL	DA

Issues & Revisions

BWB
A GAF GROUP COMPANY
Birmingham | 0121 233 3322
Leeds | 0113 233 8000
London | 020 7407 3879
Manchester | 0161 233 4260
Nottingham | 0115 924 1100
www.bwbconsulting.com

Client

Miller Homes (Yorkshire) Ltd

Project Title

Hermitage Park
Lepton

Drawing Title

Electrical Services
Proposed External Lighting Layout
Proposed Site Plan

Drawn:	G. C. Leeming	Reviewed:	D. Alasfar
BWB Ref:	244698	Date:	27.11.24
Scale@A0:	1:500		

Drawing Status

PRELIMINARY

Project - Originator - Zone - Level - Type - Role - Number	Status	Rev
HPL-BWB-00-XX-DR-E-2300	**S2**	**P1**

Appendix 3: Proposed External Lux Plot Layout

Notes

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

Legend

- A Urbis Axia 3.1 5266 Optic 8LED 2700K 14W 500mA Equipped with integrated rear louvres Column mounted at 6m
- B Urbis Axia 3.1 5267 Optic 8LED 2700K 21W 750mA Equipped with integrated rear louvres Column mounted at 6m
- 3.0 lux
- 0.6 lux

3 LUX - P5 - ROADS AND FOOTPATHS
Results - Horizontal Illuminance (lux)
Eav= 3.32
Emin= 0.66
Emax= 12.88
Emin/Emax= 0.05
Emin/Eav= 0.20
Emax/Eav= 3.88

Rev	Date	Details of issue / revision	Drw	Rev
P1	27.11.24	Preliminary Issue	GCL	DA

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Lepton

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Proposed External Lighting
Lux Plot Layout
Proposed Site Plan

Drawn:	G. C. Leeming	Reviewed:	D. Alasfar
BWB Ref:	244698	Date: 27.11.24	Scale@A0: 1:500

Drawing Status

PRELIMINARY

Project - Originator - Zone - Level - Type - Role - Number	Status	Rev
HPL-BWB-00-XX-DR-E-2301	**S2**	**P1**

Appendix 4: Proposed Luminaire Type

Schréder
Experts in lightability™

ROAD

Axia 3

owlet®

PRO FLEX™

Engineered for performance, designed for the customer experience

With customer feedback playing a critical part in our innovative design process, we developed Axia 3. More than a luminaire, it is a platform delivering sustainability, cost-effectiveness and customer experience all while supporting smart city frameworks. Based on experience from the hundreds of thousands Axia luminaires installed worldwide, this third generation luminaire pushes the boundaries with photometric innovation, ease and speed of installation and FutureProof connectivity.

Available in three sizes, Axia 3 enables towns and cities to maximise efficiency when lighting numerous environments, from bike paths, squares and car parks to residential streets, carriageways, urban roads and large boulevards. This lightweight and compact luminaire combines quality of light with a minimal carbon footprint. It excels in easy installation and carefree maintenance, reducing operating costs.

IP 66 | IK 10

URBAN & RESIDENTIAL STREETS | BRIDGES | BIKE & PEDESTRIAN PATHS | RAILWAY STATIONS & METROS | CAR PARKS | LARGE AREAS | SQUARES & PEDESTRIAN AREAS | ROADS & MOTORWAYS

Concept

Axia 3 is a robust yet compact luminaire, designed with a focus on miniaturisation and superior efficiency. Composed of high-pressure die-cast aluminium, as well as composite materials, Axia 3 is available in three sizes. Thanks to its reduced weight, this road luminaire is easy to handle during installation. The Axia 3.1, which can be fitted with up to 16 LEDs, is perfectly suited to low-height applications, whereas Axia 3.2 and 3.3, with up to 32 or 64 LEDs, are ideal for lighting urban and large roads, carriageways and avenues. The Axia 3 range is equipped with ProFlex™ photometric engines, providing the highest efficiency thanks to their ability to maximise the lumen output and to provide very extensive light distributions.

Axia 3 comes pre-cabled, hence there is no need to open the luminaire. The complete range is available with an integrated universal fixation part adapted for post-top and side-entry mounting on various spigots (Ø32mm with adapter, Ø42-48mm, Ø60mm and Ø76mm). The inclination angle can be adjusted on-site for both post-top (-5°/+15°) and side-entry (-10°/+10°) configurations to optimise lighting, reduce power consumption and control light pollution.

This highly efficient, cost-effective and connected-ready luminaire, offers towns and cities the ideal solution to improve lighting levels, increase safety, generate energy savings and reduce their ecological footprint. Axia 3 is the ideal tool to provide another 25 years of efficiency, sustainability and safety.

The ProFlex™ photometric engine provides the highest efficiency.

The Axia 3 range has a universal fixation part for spigots ranging from Ø32 to Ø76mm.

TYPES OF APPLICATION

- URBAN & RESIDENTIAL STREETS
- BRIDGES
- BIKE & PEDESTRIAN PATHS
- RAILWAY STATIONS & METROS
- CAR PARKS
- LARGE AREAS
- SQUARES & PEDESTRIAN AREAS
- ROADS & MOTORWAYS

KEY ADVANTAGES

- Maximised savings in energy and maintenance costs
- ProFlex™ photometric engines offering high efficiency lighting, comfort and safety
- 3 sizes to provide the most accurate solutions for numerous road and urban applications
- Easy installation: pre-cabled and equipped with universal fixation adapted for side-entry and post-top mounting
- Adjustable inclination for optimised photometry and uniformity
- Connected-ready

The inclination is adjustable on-site for optimised photometry and further energy savings.

Axia 3 is connected-ready and can operate with various sensors and control systems.

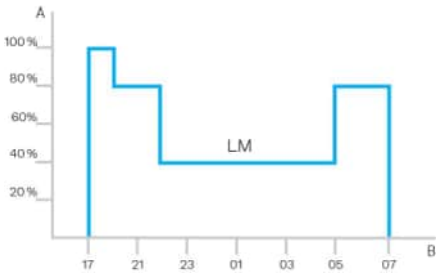
ProFlex™

The ProFlex™ photometric engine integrates the lenses into a polycarbonate protector. This integration increases the output and reduces the reflection inside the optical unit. The polycarbonate used for the ProFlex™ photometric engine offers essential characteristics such as high optical clarity for a superior light transmission, better impact resistance compared to glass and a long life span with UV-stabilisation treatment. The ProFlex™ concept enables a compact design with a thin optical compartment. It provides extensive light distributions so that the spacing between the luminaires can be increased.

Custom dimming profile

Intelligent luminaire drivers can be programmed with complex dimming profiles. Up to five combinations of time intervals and light levels are possible. This feature does not require any extra wiring.

The period between switching on and switching off is used to activate the preset dimming profile. The customised dimming system generates maximum energy savings while respecting the required lighting levels and uniformity throughout the night.



A. Dimming level | B. Time

Daylight sensor / photocell

Photocell or daylight sensors switch the luminaire on as soon natural light falls to a certain level. It can be programmed to switch on during a storm, on a cloudy day (in critical areas) or only at nightfall so as to provide safety and comfort in public spaces.

PIR sensor: motion detection

In places with little nocturnal activity, lighting can be dimmed to a minimum most of the time. By using passive infrared (PIR) sensors, the level of light can be raised as soon as a pedestrian or a slow vehicle is detected in the area.

Each luminaire level can be configured individually with several parametres such as minimum and maximum light output, delay period and ON/OFF duration time. PIR sensors can be used in an autonomous or interoperable network.

Owlet IoT

Owlet IoT remotely controls luminaires in a lighting network, creating opportunities for improved efficiency, accurate real-time data and energy savings of up to 85%.

ALL-IN-ONE

The LUCO P7 CM controller includes the most advanced features for optimised asset management. It also provides an integrated photocell and operates with an astronomical clock for seasonal dimming profile adaptations.

EASY TO DEPLOY

Thanks to wireless communication, no cabling is needed. The network is not subject to physical constraints or limitations.

From a single control unit to an unlimited network, you can expand your lighting scheme at any time.

With real-time geolocation and automatic detection of luminaire features, commissioning is quick and easy.

USER-FRIENDLY

Once a controller is installed on a luminaire, the luminaire automatically appears with its GPS coordinates on a web-based map.

An easy-to-use dashboard enables each user to organise and customise screens, statistics and reports. Users can gain relevant, real-time insights.

The Owlet IoT web application can be accessed at all times from anywhere in the world with a device connected to the Internet. The application adapts to the device to offer an intuitive and user-friendly experience.

Real-time notifications can be pre-programmed to monitor the most important elements of the lighting scheme.

SECURE

The Owlet IoT system uses a local wireless mesh communication networks to control the on-site luminaires combined with a remote control system utilising the cloud to ensure smooth data transfers to and from the central management system.

The system uses encrypted IP V6 communication to protect data transmission in both directions. Using a secure APN, Owlet IoT ensures a high level of protection.

In the exceptional case of a communication failure, the built-in astronomical clock and photocell will take over to switch the luminaires on and off, thus avoiding a complete blackout at night.

EFFICIENT

Thanks to sensors and/or pre-programmed settings, lighting scenarios can be easily adapted to cope with live events, providing the right lighting levels at the right time and in the right place.

The integrated utility grade meter offers the highest accuracy available on the market today, enabling decisions based on real figures.

Accurate real-time feedback and clear reporting ensures that the network operates efficiently and maintenance is optimised.

When LED luminaires are switched on, the inrush current can create problems for the electricity grid. Owlet IoT incorporates an algorithm to preserve the grid at all times.

OPEN

The LUCO P7 CM controller can be plugged onto the standard 7 pin NEMA socket and operates through either a DALI or 1-10V interface to control the luminaire.

Owlet IoT is based on the IPv6 protocol. This method for addressing devices can generate an almost unlimited number of unique combinations to connect non-traditional components to the Internet or computer network.

Through open APIs, Owlet IoT can be integrated into existing or future global management systems.

The Schréder Bluetooth solution consists of 3 main components:

- A Bluetooth dongle plugged into the modular driver of the luminaire (BLE transceiver)
- A Bluetooth antenna fitted on the luminaire
- A smartphone application called Sirius BLE

Easy to use

The Schréder Bluetooth solution is ideal for the on-site configuration of individual outdoor luminaires using Bluetooth. From the ground, the user is able to switch the luminaire on or off, adapt the dimming curve, read diagnostic data and much more. A user-friendly application called Sirius BLE provides an easy and secure access to the control and configuration functions.

Whether you are managing a lighting network in an urban or a residential area, this solution will make it easy to control your outdoor luminaires while simply standing by the pole.

Quick and easy pairing

Get the Sirius App from Schréder. Go to the menu. Press the “SCAN DEVICE (START)” button, to search for the surrounding BLE modules. They will be displayed with a bar graphic (signal intensity) to indicate the closest and the most distant one you can reach. Click on the device you want to connect to and enter your personal access key to control the luminaire.

Defining the settings

Once you are connected to a luminaire, you can set various parameters such as the maximum output current, minimum dimming level and custom dimming profile.

Manual dimming control

The App enables you to do a manual override to adapt the dimming levels instantly. Simply tap on the “Dimming” button in the main menu and adjust the dimming using the wheel and button. Predefined dimming levels can be applied immediately. The corresponding value is displayed on the wheel. This enables you to test the ON / OFF and dimming features of the luminaire paired to the smartphone.

On-site diagnostic

When a luminaire is paired, you can access various diagnostic information: total number of power up events, operation time of LED module and driver, total energy consumption of LED driver... etc. You can also track operating events (short circuits, thermal shutdowns...). The diagnostic values may be the current state or values accumulated to date.

GENERAL INFORMATION

Recommended installation height	4m to 12m | 13' to 39'
Driver included	Yes
CE Mark	Yes
ENEC certified	Yes
ENEC+ certified	Yes
ROHS compliant	Yes
Testing standard	LM 79-08 (all measurements in ISO17025 accredited laboratory)

HOUSING AND FINISH

Housing	Aluminium Composite materials
Optic	Polycarbonate
Protector	Polycarbonate (with integrated lenses)
Housing finish	Polyester powder coating
Standard colour(s)	RAL 7040 window grey RAL 9005 Jet black
Tightness level	IP 66
Impact resistance	IK 10
Vibration test	Compliant with modified IEC 68-2-6 (0.5G)

OPERATING CONDITIONS

Operating temperature range (Ta)	-30 °C up to +45 °C / -22 °F up to 113 °F

· Depending on the luminaire configuration. For more details, please contact us.

ELECTRICAL INFORMATION

Electrical class	Class I EU, Class II EU
Nominal voltage	220-240V – 50-60Hz
Power factor (at full load)	0.9
Surge protection options (kV)	10
Electromagnetic compatibility (EMC)	EN 55015 / EN 61000-3-2 / EN 61000-4-5 / EN 61547
Control protocol(s)	Bluetooth, DALI
Control options	Bi-power, Custom dimming profile, Photocell, Remote management
Socket	NEMA 3-pin (optional) NEMA 6-pin (optional) NEMA 7-pin (optional) Low voltage socket (optional)
Associated control system(s)	Sirius BLE Owlet IoT
Sensor	PIR (optional)

OPTICAL INFORMATION

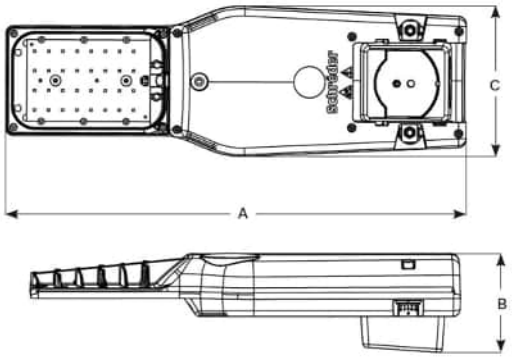
LED colour temperature	3000K (Warm White 730) 4000K (Neutral White 740)
Colour rendering index (CRI)	>70 (Warm White 730) >70 (Neutral White 740)
Upward Light Output Ratio (ULOR)	0%

LIFETIME OF THE LEDS @ TQ 25°C

All configurations	100,000h - L90

DIMENSIONS AND MOUNTING

AxBxC (mm | inch)	AXIA 3.1 - 513x130x191 | 20.2x5.1x7.5 AXIA 3.2 - 585x130x191 | 23.0x5.1x7.5 AXIA 3.3 - 550x130x277 | 21.7x5.1x10.9
Weight (kg | lbs)	AXIA 3.1 - 3.6 | 7.9 AXIA 3.2 - 4.8 | 10.6 AXIA 3.3 - 6 | 13.2
Aerodynamic resistance (CxS)	AXIA 3.1 - 0.03 AXIA 3.2 - 0.03 AXIA 3.3 - 0.04
Mounting possibilities	Side-entry slip-over – Ø32mm Side-entry slip-over – Ø42mm Side-entry slip-over – Ø48mm Side-entry slip-over – Ø60mm Post-top slip-over – Ø60mm Post-top slip-over – Ø76mm



			Luminaire output flux (lm) Warm White 730		Luminaire output flux (lm) Neutral White 740		Power consumption (W)		Luminaire efficacy (lm/W)	
Luminaire	Number of LEDs	Current (mA)	Min	Max	Min	Max	Min	Max	Up to	Photometry
AXIA 3.1	8	300	1000	1000	1100	1100	8.3	8.3	133	
	8	400	1300	1300	1400	1400	10.9	10.9	128	
	8	600	1900	1900	2000	2100	16.3	16.3	129	
	8	700	2100	2200	2300	2400	18.8	18.8	128	
	8	850	2500	2600	2700	2800	22.8	22.8	123	
	16	200	1400	1400	1500	1500	11.1	11.1	135	
	16	300	2000	2100	2200	2300	15.9	15.9	145	
	16	480	3100	3200	3300	3500	25.1	25.1	139	
	16	500	3200	3300	3400	3600	25.8	25.8	140	
	16	600	3800	3900	4000	4200	31	31	135	
	16	700	4300	4500	4600	4800	35.6	35.6	135	
	16	870	5100	5300	5400	5700	44	44	130	

Tolerance on LED flux is ± 7% and on total luminaire power ± 5 %

Luminaire	Number of LEDs	Current (mA)	Luminaire output flux (lm) Warm White 730 Min	Luminaire output flux (lm) Warm White 730 Max	Luminaire output flux (lm) Neutral White 740 Min	Luminaire output flux (lm) Neutral White 740 Max	Power consumption (W) Min	Power consumption (W) Max	Luminaire efficacy (lm/W) Up to	Photometry
AXIA 3.2	24	200	2100	2200	2200	2300	15.3	15.3	150	
	24	300	3100	3200	3300	3400	22.4	22.4	152	
	24	400	4000	4100	4300	4400	29.7	29.7	148	
	24	500	4800	5000	5200	5400	37.2	37.2	145	
	24	590	5600	5800	6000	6200	44	44	141	
	24	700	6400	6600	6900	7100	52.5	52.5	135	
	24	800	7100	7400	7600	7900	60.5	60.5	131	
	24	900	7800	8000	8300	8600	68.5	68.5	126	
	24	1000	8400	8600	9000	9300	76	76	122	
	32	200	2800	2900	3000	3100	19.8	19.8	157	
	32	300	4100	4200	4400	4500	29.5	29.5	153	
	32	450	5900	6100	6300	6500	45.5	45.5	143	
	32	500	6500	6700	6900	7200	48.5	48.5	148	
	32	600	7500	7800	8100	8400	59	59	142	
	32	700	8600	8900	9200	9500	69	69	138	
	32	800	9500	9800	10200	10500	78	78	135	

Tolerance on LED flux is ± 7% and on total luminaire power ± 5 %

			Luminaire output flux (lm) Warm White 730		Luminaire output flux (lm) Neutral White 740		Power consumption (W)		Luminaire efficacy (lm/W)	
Luminaire	Number of LEDs	Current (mA)	Min	Max	Min	Max	Min	Max	Up to	Photometry
AXIA 3.3	48	200	4200	4300	4500	4600	27.9	27.9	165	
	48	300	6100	6400	6600	6800	42	42	162	
	48	400	8000	8300	8500	8900	56	56	159	
	48	550	10400	10900	11200	11600	78	78	149	
	48	600	11200	11700	12000	12500	86	86	145	
	48	700	12600	13200	13500	14100	100	100	141	
	48	800	13900	14500	14900	15500	115	115	135	
	48	880	14900	15500	15900	16600	129	129	129	
	64	200	5600	5800	6000	6200	37.7	37.7	164	
	64	300	8200	8500	8800	9100	56.5	56.5	161	
	64	420	11100	11500	11900	12400	79	79	157	
	64	500	12900	13400	13800	14400	94	94	153	
	64	600	15000	15600	16000	16700	113	113	148	
	64	700	16900	17600	18100	18800	137	137	137	
	64	880	19800	20600	21200	22100	172	172	128	

Tolerance on LED flux is ± 7% and on total luminaire power ± 5 %

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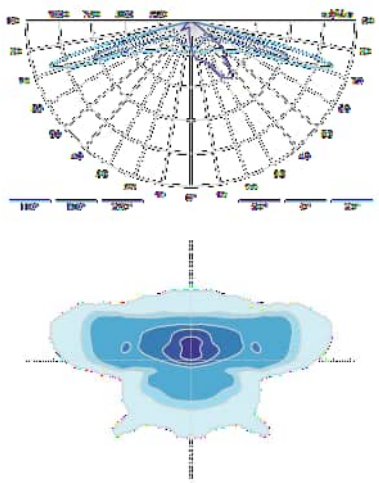

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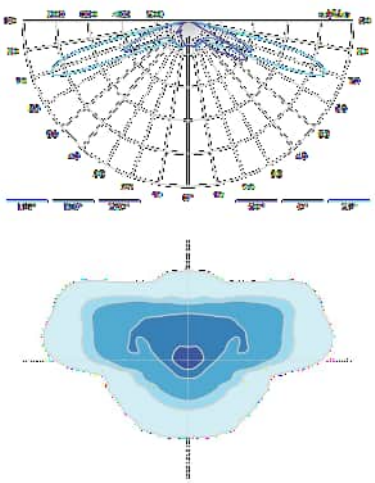

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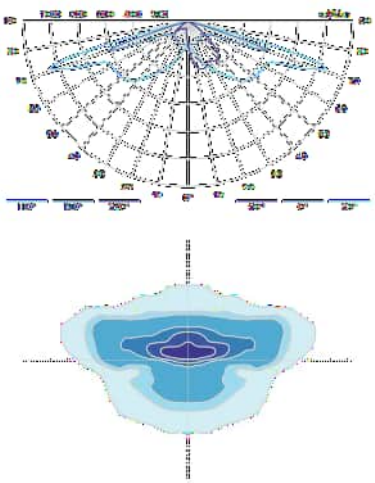

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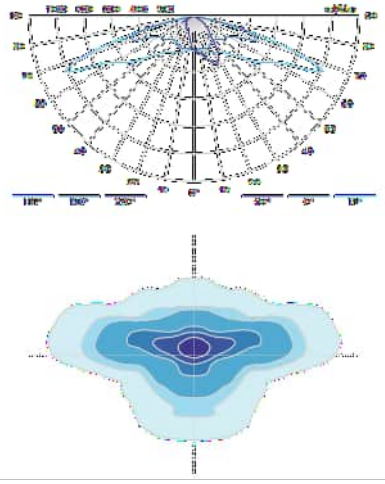

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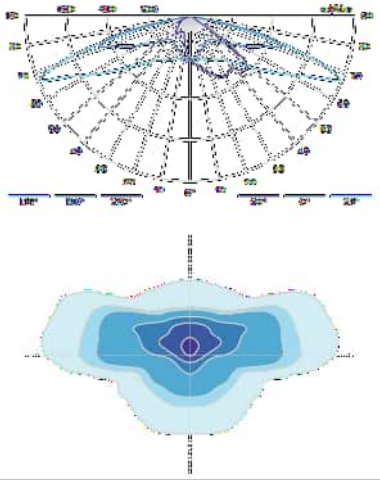

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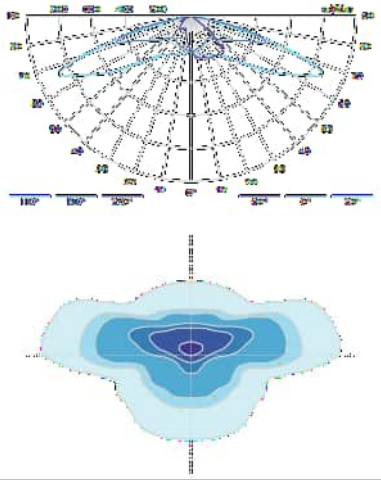

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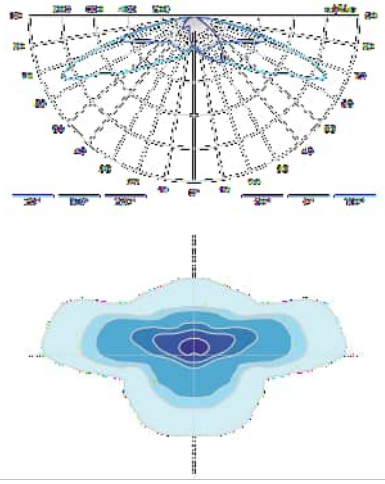

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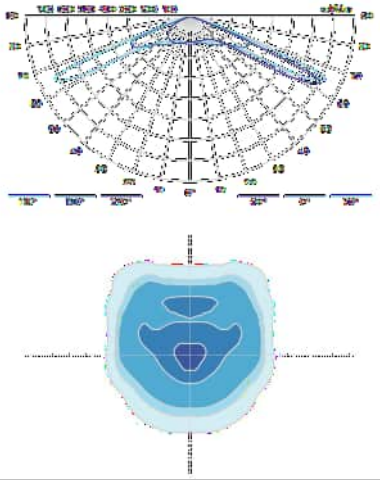

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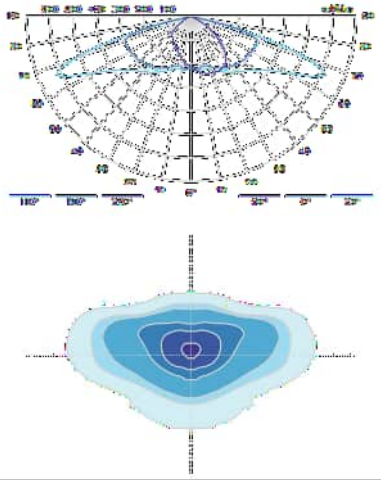

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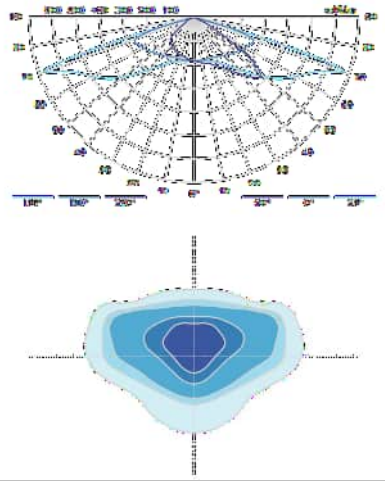

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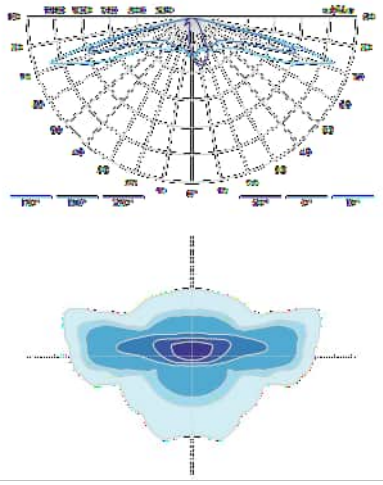

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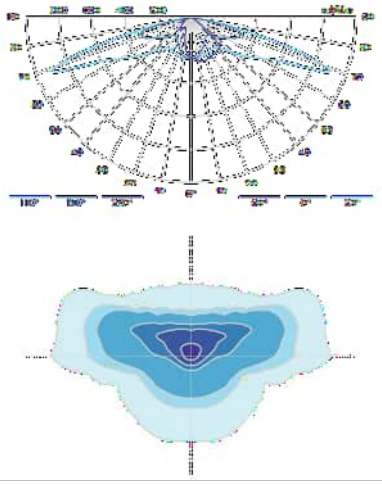


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BUILDINGS AND BUILT ENVIRONMENT

Miller Homes (Yorkshire) Ltd
Hermitage Park
Lepton
Lighting Impact Assessment

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December 2024

DOCUMENT ISSUE RECORD

Document Number:	HPL-BWB-ZZ-XX-E-RP-0001_LIA
BWB Reference:	244698

Revision	Date of Issue	Status	Author:	Checked:	Approved:
P1	02/12/2024	S2	Danny Alasfar	Peter Leonard	Peter Leonard
P2	19/12/2024	S2	Danny Alasfar	Peter Leonard	Danny Alasfar

Notice

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FIGURES

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APPENDICES

1. INTRODUCTION

Instruction

1.1 BWB Consulting Ltd (BWB) has been appointed by Miller Homes (Yorkshire) Ltd (the Client) to prepare a Lighting Impact Assessment to support the reserved matters planning application for a residential development located at Hermitage Park, Lepton (the 'Site').

Proposed Development

1.2 The proposed development comprises a residential site and associated infrastructure.

1.3 The Proposed Development Masterplan is included within **Appendix 1**.

Objectives

1.4 This report has been produced to identify the proposed lighting strategy and subsequent impact of the external lighting installation on the existing site environment, sensitive ecology and the wider locality.

1.5 The report aims to provide the necessary information to discharge the following Planning Condition:

> *Plans and particulars relating to the Reserved Matters of landscaping, notwithstanding the submitted information, shall include a lighting design strategy. The strategy shall:*
>
> *a) identify those areas / features on site that are particularly sensitive for local species and that are likely to cause disturbance in, or around their breeding sites and resting places, or along important routes used to access key areas of their territory, for example, for foraging; and*
>
> *b) show how and where external lighting will be installed (through the provision of appropriate lighting contour plans and technical specifications) so that it can be clearly demonstrated that areas to be lit will not disturb or prevent the above species using their territory or having access to their breeding sites and resting places.*
>
> *c) With due regard to the requirements of points a and b, detail how appropriate lighting would be installed to mitigate and protect against crime.*
>
> *All external lighting shall be installed in accordance with the specifications and locations set out in the strategy, and these shall be maintained thereafter in accordance with the strategy. Under no circumstances should any other external lighting be installed on dwellings facing either Lepton Great Wood or areas of Public Open Space without prior consent from the local planning authority.*
>
> *Reason: To avoid indirect impacts to bats and other local species in the interest of ecological mitigation, to comply with Policy LP30 of the Kirklees Local Plan.*

1.6 A lighting installation is required to enable users to operate safely and reduce the fear of crime. Lighting is needed for both pedestrians and vehicle drivers. For pedestrians, lighting for good viewing conditions and avoidance of dark areas is necessary. For vehicle drivers the emphasis is on good lighting for vehicle movement and use of roads.

1.7 This report reviews the potential effects of new lighting and reviews methods of lighting the proposed external areas while limiting potentially obtrusive effects to receptors that may have a negative response to a change in their lighting condition. Nearby residential properties and wildlife / habitat which are found on, near or utilising the site are typical receptors considered for analysis.

Scope of Works

1.8 The Scope of work includes:

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

2. RELEVANT POLICY AND GUIDANCE

International guidance

Commission Internationale De L'Eclairage (CIE 150)

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

National guidance

National Planning Policy Framework (2021)

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

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

2.3 The Office of the Deputy Prime Minister (ODPM – now Department for Communities and Local Government) in conjunction with the Countryside Commission published 'Lighting in the Countryside: Towards Good Practice' in July 1997, and a revised issue in 2001. The guidance was developed to 'provide practical advice on the prevention and control of lighting effects through appropriate action by all those involved with lighting in the countryside'. Its objective is 'to identify good practice in the planning and design of lighting in rural areas; and advise on how it can be achieved, using case study examples'. The guide aims to provide an overview and common understanding of all aspects of good lighting practice stating that close co-operation and participation is required for all those involved in planning, designing and installing lighting schemes. The guidance provides valuable information on lighting best practice and the standard methodology outlined in this guidance document has been followed as part of this assessment. Whilst the guidance relates to 'lighting in the countryside', it is considered best practice to adopt many of the principles contained within the guidance to sites of a more urban nature.

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

2.4 The ILP has proposed lighting guidance and criteria for local authorities with a recommendation that they are incorporated at the local plan level. The guidance defines various forms of light pollution and describes a series of environmental zones (similar to the CIE 150 environmental zones). The ILP guidance provides suitable criteria against which the effects of artificial lighting can be assessed and is used in this assessment.

2.5 The ILP Guidance Notes recommends that the immediate environment is classified systematically as shown in **Table 1**. ILP Guidance Notes then make recommendations for limiting obtrusive light according to the environmental zone in which the lighting would be situated. The stringency depends on the capacity to absorb lighting effects, with Zone E0 requiring the strictest level of control and E4 the lowest.

Table 1. Environmental Zones

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

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

Table 2. Obtrusive Light Limitations for Exterior Lighting Installations

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

Institute of Lighting Professionals (ILP) Guidance Note 08 for Bats and artificial lighting in the UK (2023)

2.7 This document is aimed at lighting professionals, lighting designers, planning officers, developers, bat workers/ecologists and anyone specifying lighting. It is intended to raise

awareness of the impacts of artificial lighting on bats, and mitigation is suggested for various scenarios.

British Standards

BS 5489: Code of Practice for the Design of Road Lighting – Part 1: Lighting of Roads and Public Amenity Areas (2021)

2.8 BS 5489-1 provides recommendations on the general principles, aesthetic and technical aspects of road lighting and advises on statutory provisions, operation and maintenance of lighting. The standard provides recommendations for the design of lighting for all types of highways and public thoroughfares, including those specifically for pedestrians and cyclists, and for pedestrian subways and bridges.

2.9 **Table 3** is taken from BS 5489-1 which helps to define the lighting class for subsidiary roads (Class P – subsidiary roads including residential roads). The required lighting performance criteria for each class is defined in BS EN 13201 Part 2: Road Lighting Performance Requirements (2015).

Table 3. Lighting classes for subsidiary roads

Traffic flow	Lighting class		
	E1 to E4 A)	E1 to E2 A)	E3 to E4 A)
	Pedestrian and cyclists	Speed limit <30mph	Speed limit <30mph
Busy B)	P5	P4	P3
Normal C)	P5	P5	P4
Quiet D)	P6	P5	P4

A) Environmental zone, as given in ILP Guidance Notes (refer to **Table 1**).

B) Busy traffic flow refers to areas where the traffic usage is high and can be associated with local amenities such as clubs, shopping facilities, public houses, etc.

C) Normal traffic flow refers to areas where the traffic usage is of a level equivalent to a housing estate access road.

D) Quiet traffic flow refers to areas where the traffic usage is of a level equivalent to a residential road, and is mainly associated with the adjacent properties or properties on other equivalent roads accessed from this road.

BS EN 13201 Part 2: Road Lighting Performance Requirements (2015)

2.10 This standard defines lighting classes for road lighting according to photometric requirements and aiming at the visual needs of road users. It also considers environmental aspects of road lighting.

2.11 **Table 4** is taken from BS EN 13201-2 which defines the lighting performance requirements for Class P roads.

Table 4. P Lighting class performance requirements

Class	Horizontal illuminance	
	Maintained average (Lux)	Minimum (Lux)
P1	15.0	3.0
P2	10.0	2.0
P3	7.5	1.5
P4	5.0	1.0
P5	3.0	0.6
P6	2.0	0.4

Kirklees Local Plan Strategy and Policies (Adopted 27 February 2019)

2.12 This document is the Kirklees Local Plan. The Local Plan is the statutory development plan and its purpose is to set out the policies necessary to achieve the strategy and how much new development there should be in the district and where it will go. The Local Plan covers the administrative area of Kirklees Council except for that part within the Peak District National Park. The Plan covers the period 2013 – 2031.

Policy LP30 Biodiversity & Geodiversity

"The council will seek to protect and enhance the biodiversity and geodiversity of Kirklees, including the range of international, national and locally designated wildlife and geological sites, Habitats and Species of Principal Importance and the Kirklees Wildlife Habitat Network."

"Development proposals will be required to:-

i. result in no significant loss or harm to biodiversity in Kirklees through avoidance, adequate mitigation or, as a last resort, compensatory measures secured through the establishment of a legally binding agreement;

ii. minimise impact on biodiversity and provide net biodiversity gains through good design by incorporating biodiversity enhancements and habitat creation where opportunities exist;

iii. safeguard and enhance the function and connectivity of the Kirklees Wildlife Habitat Network at a local and wider landscape-scale unless the loss of the site and its functional role within the network can be fully maintained or compensated for in the long term;

iv. establish additional ecological links to the Kirklees Wildlife Habitat Network where opportunities exist; and

v. incorporate biodiversity enhancement measures to reflect the priority habitats and species identified for the relevant Kirklees Biodiversity Opportunity Zone."

Policy LP52 Protection and improvement of environmental quality

"Proposals which have the potential to increase pollution from noise, vibration, light, dust, odour, shadow flicker, chemicals and other forms of pollution or to increase pollution to soil or where environmentally sensitive development would be subject to significant levels of pollution, must be accompanied by evidence to show that the impacts have been evaluated and measures have been incorporated to prevent or reduce the pollution, so as to ensure it does not reduce the quality of life and well-being of people to an unacceptable level or have unacceptable impacts on the environment.

Such developments which cannot incorporate suitable and sustainable mitigation measures which reduce pollution levels to an acceptable level to protect the quality of life and well-being of people or protect the environment will not be permitted.

Where possible, all new development should improve the existing environment."

"Artificial lighting is used for a number of reasons, including work, recreation, security, safety, advertising, display, and to create a pleasant atmosphere where people gather socially. It is important to ensure that it does not become a nuisance to others. Obtrusive light (light pollution) can present serious physiological and ecological problems. Light 'spilling over' onto other property can cause annoyance, distraction and discomfort and may cause driving problems by glaring into drivers' eyes or competing with signs and other traffic signals."

Ecologist Guidance

2.13 The appointed Ecologist has been consulted as part of this assessment. Identification of receptors and mitigation measures are discussed later in this report.

Ecological Impact Assessment (EcIA) (October 2022)

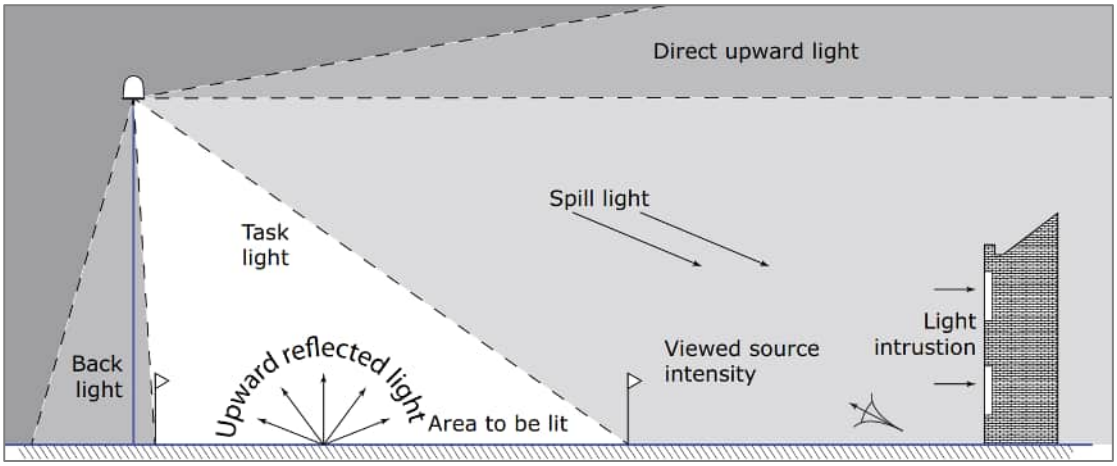
2.14 The purpose of this report is to:

- Describe the baseline data collection and assessment methodologies used;
- Present the results of the Extended Phase 1 Habitat Survey, desk study and Phase 2 protected species surveys (including for the wider survey area, in addition to the application site area itself);
- Identify important ecological receptors, and describe potentially significant ecological effects upon these receptors, if relevant;
- Set out any mitigation measures and sensitive working practices to ensure compliance with nature conservation legislation and to address any potentially significant ecological effects; and
- identify opportunities for ecological enhancement, including via a Metric 3.1 Biodiversity Net Gain assessment, describing how a 10% net gain shall be achieved.

3. LIGHT POLLUTION

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

Figure 1. Types of Light Pollution



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

Types of Light Pollution

Light Spill (Light intrusion, back light)

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

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

Sky Glow (Direct upward light)

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

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

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

3.7 To mitigate sky glow as much as possible, lighting must be accurately targeted and kept to a minimum, and this design principle is incorporated into the Lighting Strategy.

3.8 The magnitude of the impact is a matter of judgement, taking into account the existing night-time view. The magnitude is lessened for those views where an observer is subject to direct illumination from, say, a nearby streetlight, or where light spill from a nearby light source illuminates the foreground, because the observer's vision is not fully dark adapted.

Glare (Viewed source intensity)

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

Design Aspects

Building Luminance

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

Light Levels

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

Light Colour

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

Example Lux Levels

3.13 To give context to the lux levels mentioned to within this report, **Table 5** provides examples of typical lux levels in various scenarios and applications.

Table 5. Example lux levels

Lighting Condition	Lux level
British summer sunshine	50,000
Overcast sky	5,000
Well-lit office	500
Minimum for easy reading	300
Passageway / outside working area	25
Main road lighting	5-20
Sunset	10
Typical side road lighting	5
Minimum security lighting	2
Twilight	1
Clear full moon	0.25 to <1
Typical moonlight / cloudy sky	0.1
Typical starlight	0.001
Poor starlight	0.0001

Source: IPCCTV specialists use-IP Ltd

4. BASELINE

Introduction

4.1 The study area includes the application site, the surrounding areas and any sensitive receptors which may have a direct view towards external lighting proposals and/or which may be affected during the construction and operation of the proposed development. Assessment of designation, use, habitat and external lighting condition dictates the classification of Environmental Zone across the proposed site location and surrounding areas.

4.2 The Site lies on the southern edge of Lepton, circa 4.5km to the south-east of the centre of Huddersfield. It consists predominantly of three large fields and a series of smaller fields or part fields.

4.3 The Site is bound to the north-west and north by existing residential properties within Hermitage Park and along Rowley Lane. Hermitage Park is provided with an assumed 5m high column mounted street lighting installation. Rowley Lane is provided with an assumed 6m high street lighting installation.

4.4 The Site is bound to the east and south-east by Lepton Great Wood, and to the south and southwest by further cattle-grazed fields of grassland, both of which are not provided with an external lighting installation.

4.5 The following categories have been determined as potential sensitive receptors which could be impacted by any external lighting proposals at the Site:

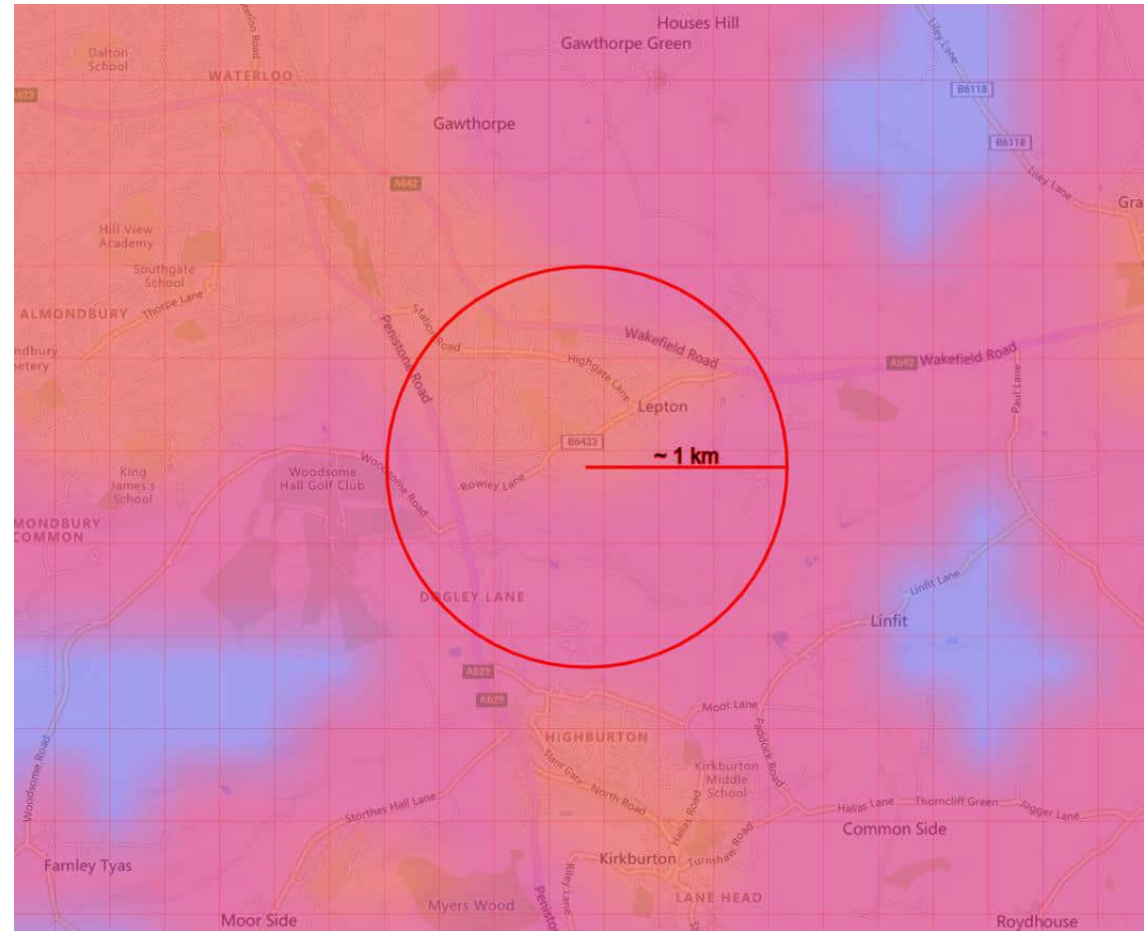
- Ecology;
- Residential properties;
- Natural – direct sky glow; and
- Transport – highway and railway.

Local Radiance

4.6 The Visible Infrared Imaging Radiometer Suite (VIIRS) is a satellite instrument which orbits earth to collect and record radiance data (light emissions). The latest data was recorded in 2023 and is available in visual format. At extract at the Site location is included in **Figure 2**.

4.7 It is important to state that recognised organisations, such as the ILP or CIE, have not calibrated VIIRS radiance data with the Environmental Zones established in **Table 1**. It is also important to note the data should not accurately be relied upon and should be viewed conservatively. The data should be used as one tool to help understand the context of existing light emissions local to the Site.

Figure 2. Radiance, in nanowatts per square centimetre per steradian (nW/cm2/sr)



Mean Radiance, calculated about a 1km radius from the Site:	**4.20 nW/cm2/sr**

Environmental Zone

4.8 With reference to **Table 1** and with consideration of the site context and nature of identified potentially sensitive receptors it is deemed that the Site falls within **Environmental Zone E2**, defined as a Village or relatively dark outer suburban locations.

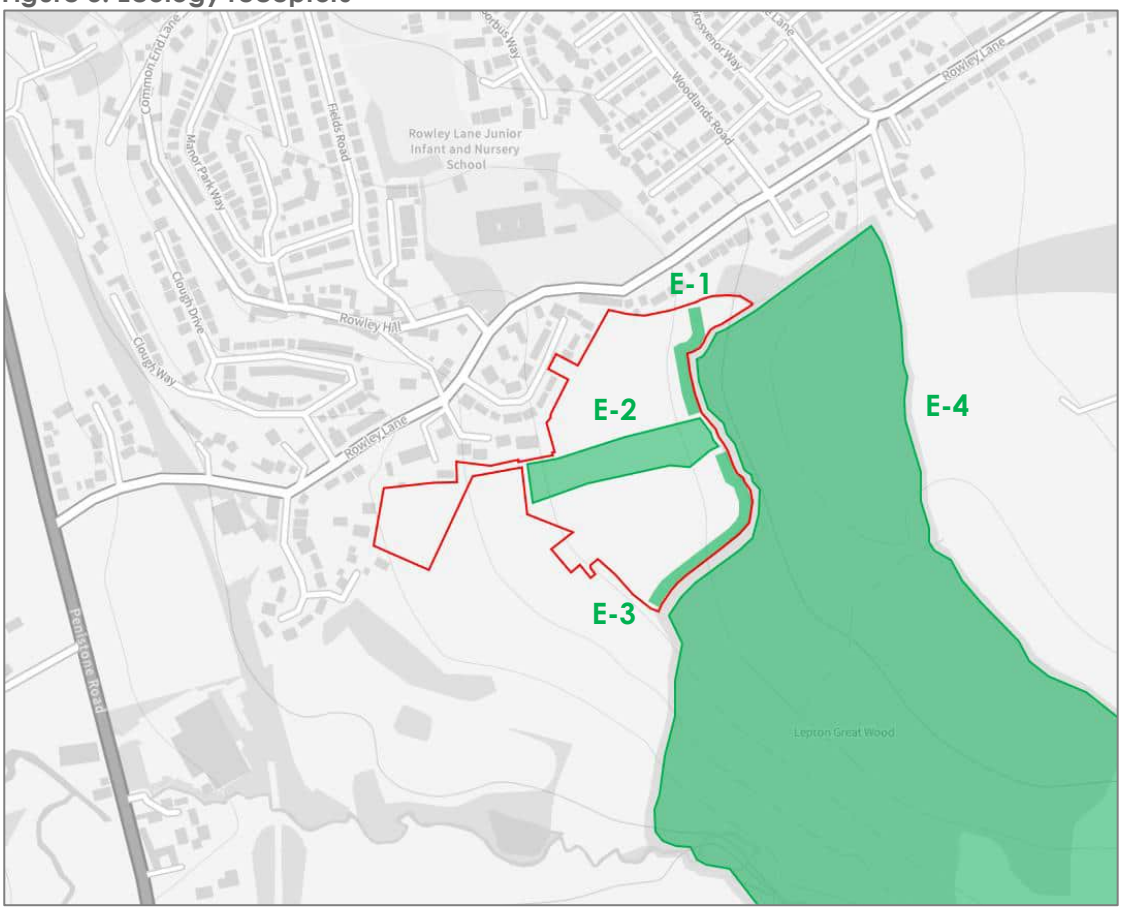
Ecology Receptors

4.9 The appointed Ecologist has been consulted as part of the Lighting Strategy in order to establish all potentially light-sensitive ecology receptors in proximity to the Site.

4.10 Although the Site itself does not contain any non-statutory sites, four Local Wildlife Sites (LWS), occur within the 2km radius of the centre of the Site. Carr Wood, Almondbury Common, and Gawthorpe Lower Wood are considered to lie a sufficient distance from the Site (all over 1km away) such that any lighting proposals will not affect them, and as such they will not be considered as part of this assessment.

4.11 The potentially sensitive ecology receptors surrounding the site have been identified as illustrated in **Figure 3**. Mitigation measures are discussed later in this report.

Figure 3. Ecology receptors



- **E-1** North-east boundary feature. Identified as moderate sensitivity, to be kept as dark as practicable.
- **E-2** Central public open space. Identified as moderate sensitivity, to be kept as dark as practicable.
- **E-3** South-east boundary feature. Identified as moderate sensitivity, to be kept as dark as practicable.
- **E-4** Lepton Great Wood Local Wildlife Site. The woodland forms part of the Kirklees Wildlife Habitat Network. Identified as high sensitivity, to be kept dark.

Residential Receptors

4.12 The residential receptors surrounding the site have been identified based on a desktop study using MAGIC mapping data in conjunction with Google Earth satellite and street view imagery.

4.13 Residential properties within 200m of the Site with a direct view of the Site are considered potentially sensitive.

4.14 Potentially sensitive residential receptors surrounding the site have been identified as illustrated in **Figure 4**. Mitigation measures are discussed later in this report.

Figure 4. Residential receptors

- **R-1** Residential properties off Beldon Brook Green
- **R-2** Residential properties off Rowley Lane (west)
- **R-3** Residential properties off Hermitage Park
- **R-4** Residential properties off Rowley Lane (east)

4.15 The limits for light intrusion (Illuminance in the vertical plane, in this case intrusion through windows) for Environmental Zone E2 are provided in **Table 6**.

Table 6. Maximum values of vertical illuminance on residential properties

Light Technical Parameter	Application Conditions	Environmental Zones				
		E0	E1	E2	E3	E4
Illuminance in the vertical plane (E_v)	Pre-curfew	n/a	2 lx	5 lx	10 lx	25 lx
	Post-curfew	n/a	<0.1 lx	1 lx	2 lx	5 lx

4.16 Curfew is defined as the time after which stricter requirements (for the control of obtrusive light) will apply; often a condition of use of lighting applied by the local authority. Unless otherwise stated this 23:00 – 07:00 is suggested.

Natural – Sky Glow Receptors

4.17 The ILP GN01/21 guidance provides limitations for maximum allowable sky glow percentage for each Environmental Zone as shown in **Table 7**.

4.18 Sky glow is measured as ULR (Upward Light Ratio), the percentage of luminaire flux of a luminaire or a lighting installation that is emitted above the horizontal. Sky glow limitations depend on the Environmental Zone of the lighting installation as set out in the ILP guidance notes. The Environmental Zone categories are previously defined in this report in **Table 1**.

Table 7. Maximum values of upward light ratio (ULR) of luminaires

Light Technical Parameter	Environmental Zones				
	E0	E1	E2	E3	E4
Upward light ratio (ULR) %	0	0	2.5	5	15

Transport Receptors

4.19 The transport receptors surrounding the site have been determined based on a desktop study using MAGIC mapping data in conjunction with Google Earth satellite and street view imagery.

4.20 Highways or railway lines within 200m of the site with a direct view of the Site are considered potentially sensitive.

4.21 Potentially sensitive transport receptors surrounding the site have been identified as illustrated in **Figure 5**. Mitigation measures are discussed later in this report.

Figure 5. Transport receptors

- **T-1** Hermitage Park

5. PROPOSED SITE LIGHTING

Design Parameters

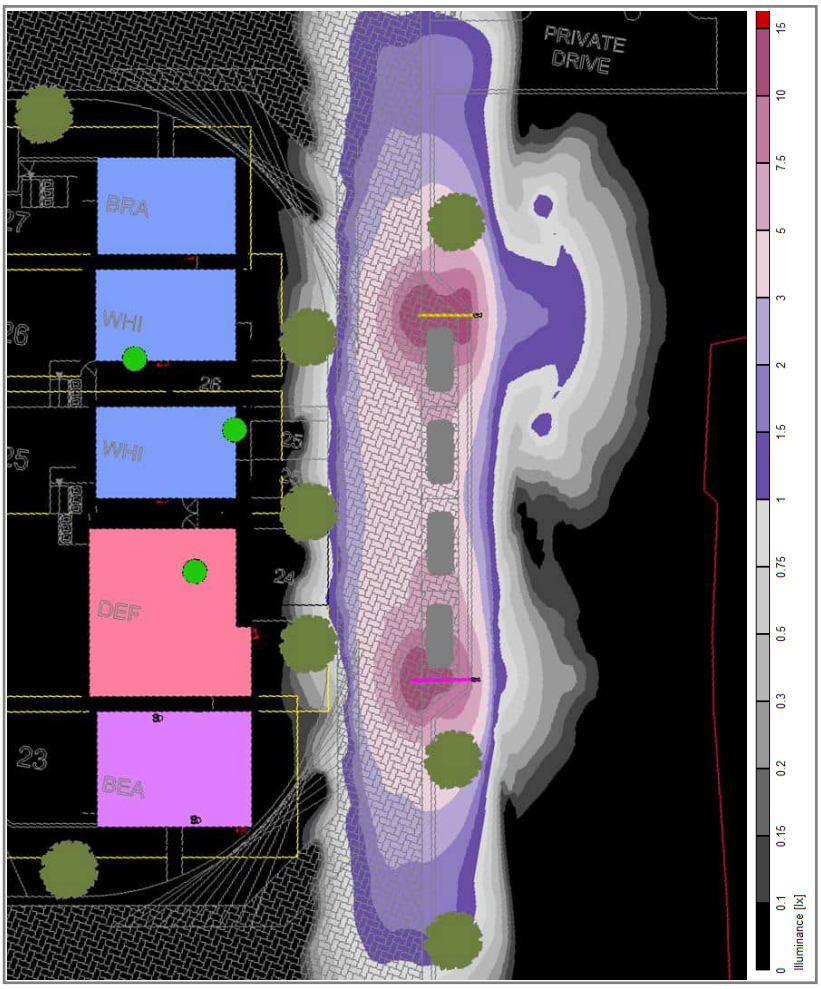
5.1 A street lighting design has been commissioned and undertaken utilising approved Kirklees products, designed to achieve Lighting Class P5, in accordance with **Table 2** and **3**.

5.2 All external lighting has been proposed in accordance with the Kirklees Local Plan Strategy and Policies (Adopted 27 February 2019).

5.3 The proposed luminaires are LED light source to provide optimum energy efficiency and accurate targeting of light output to minimise obtrusive light.

5.4 All luminaires are proposed to be equipped with integrated spill shields, designed to minimise off-site light spill while reducing visibility of light sources. For context a sample pseudo colour plot is included in **Figure 6**, illustrating the improvements in light spill provided by integrated spill shields.

Figure 6. Unshielded vs shielded luminaires

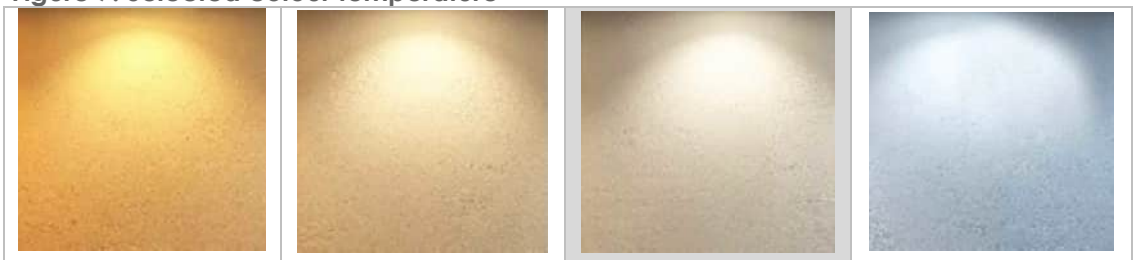


5.5 Column heights have been carefully considered and restricted to 6m in order to minimise obtrusive light. Columns are as low as practicable, at maximum spacing, designed to achieve the performance requirements of the task area while not introducing any tilt angle to the heads. Columns have been positioned to minimise impact on ecology features as far as practicable.

5.6 The final detailed design may deviate from the indicative external lighting design presented but must meet all parameters and criteria as set out in this report and demonstrate equal to or less than the quantity of obtrusive light achieved. An adequate and safe level of lighting must be provided for site tasks, amenity, and security, whilst maintaining acceptable impact on the site surroundings, ecology, and neighbouring properties.

5.7 All luminaires are proposed at 4000K colour temperature in accordance with the requirements of Kirklees Street Lighting.

Figure 7. Selected colour temperature



5.8 The lighting layout is included in **Appendix 2.** The lux plot layout is included in **Appendix 3.** Literature from the manufacturers of the proposed luminaires type is included in **Appendix 4**.

Performance Requirements

5.9 Illumination shall be provided to meet the minimum recommendations of Lighting Class P5 for a normal traffic residential road in an E2 environmental zone as defined in **Table 4** and **5**.

Table 8. Proposed external lighting design levels

Area	Target	
	Maintained Illuminance Em (Lux)	Minimum Illuminance Em (Lux)
Roads	3.0 – 4.5	0.6

Luminaire Selection

5.10 The luminaires selected for use at the Site must be capable of achieving the design parameters set out in this report.

5.11 All proposed luminaires should be submitted to the Kirklees for review and approval.

Table 9. Street Lighting Luminaire

Specification	Description
Location	Street lighting
Correlated Colour Temperate (CCT)	4000K
Mounting Height	6m
Light source	LED
Example Luminaire	Urbis Axia 3.1 (or equal approved)
Controls	Astronomical time clock
Notes	All luminaires shall be equipped with integrated rear louvres Refer to Appendix 2, 3, and 4 for further details.
Example Luminaire Image	

Table 10. Example luminaire – Dwelling Lighting

Specification	Description
Location	Dwelling lighting
Correlated Colour Temperate (CCT)	2700K
Mounting Height	1.8m-2.2m
Light source	LED
Example Luminaire	Litecraft Fibo Wall Light
Controls	Manual
Notes	Downward directional In accordance with the Condition, under no circumstances should any external dwelling lighting be installed on dwellings facing either Lepton Great Wood or areas of Public Open Space without prior consent from the local planning authority.
Example Luminaire Image	

Obtrusive Light Assessment

5.12 The lux plot layout, included in **Appendix 3,** has been produced in industry standard lighting calculation software. The lux plot assumes a level, clear site. In practice, the effect of changes in elevation and obstructions such as trees and hedges will contain the light spill further than is shown in the plot.

Light spill (light intrusion)

5.13 As can be seen in **Appendix 4**, light spill will attenuate down to <1 lux before reaching any existing dwelling. Vertical calculations have also been undertaken at property boundaries which demonstrate <1 lux. this level will attenuate further as distance increases toward each dwelling elevation. As illustrated in **Table 2**, the ILP obtrusive light limitation for an area classified as Environmental Zone E2 is 5 lux pre-curfew and 1 lux post-curfew. As such the proposed lighting scheme meets the ILP obtrusive light limitations and is therefore not considered to result in unacceptable light spill impacts on residential properties.

Upward light ratio (ULR)

5.14 The indicative lighting design has been used to calculate the predicted ULR of the proposed external lighting scheme. The model outputs predict a ULR of 0.00%. As illustrated in **Table 2**, the ILP sky glow limitation for an area classified as Environmental

Zone E2 is 2.5% ULR. As such the proposed lighting scheme meets the ILP sky glow limitations and is therefore not considered to result in unacceptable impacts on the dark sky landscape.

Ecology measures

5.15 The proposed external lighting design has been prepared in accordance with the recommendations of the appointed Ecologist. All reasonable steps have been taken to avoid illuminating sensitive receptors as far as practicable while providing the Site with sufficient lighting.

5.16 The lighting design has been produced in collaboration with the appointed ecologist. The Ecologist has reviewed and subsequently approved the lighting design presented.

5.17 Any proposed bat boxes should be installed at locations which will not be directly illuminated by the proposed lighting installation.

Climate Change

5.18 The external lighting installation must incorporate highly efficient LED light sources to minimise the required energy while providing the required lighting levels. Typically LED light sources use between 25%-80% less energy than traditional incandescent light sources, reducing the cumulative kilowatt-hours and carbon footprint of the installation. LED technology can last between 3-15 times longer than traditional light sources which also reduces the required manufacture, distribution and installation works needed to routinely replace and dispose of failed luminaires.

5.19 The external lighting installation must utilise luminaires with flat glass components, emitting directional light in order to minimise light pollution and therefore minimise energy lost due to "waste" light.

5.20 An external lighting controls system shall be employed as described above to ensure lighting is energised only when required.

Construction Phase Lighting

5.21 While construction phase lighting is expected to be short term and reversible it is important to define the parameters to minimise light pollution.

5.22 To reduce the effects of lighting during the construction phase on sensitive receptors, a Construction Environmental Management Plan (CEMP) shall be produced which will contain best practice recommendations given by CIE, ILP, CIRIA and Health and Safety Executive (HSE). These should include, but not be limited to, the following:

- Lighting will operate in all external areas used by construction workers after dark in order to provide a safe and secure working environment without over lighting. High quality LED light sources with high colour rendering index (CRI) shall be utilised to maximise visibility with efficient light output.
- Lighting shall be provided to meet the target lux level as set out in BS 12464-2 Lighting of Outdoor Workplaces without over lighting. Luminaires shall be mounted at the lowest practical mounting height, providing lighting only where lighting is required.

- The Contractor shall specify working hours, uses of lighting, location of temporary floodlights and construction compound and agreeing these with the local council to reduce duration of impact.
- Lighting controls should be employed to dim or switch off any lighting that is not needed.
- Lighting that needs to be sited close to the perimeter or ecologically sensitive areas should be fitted with shielding or be switched off or dimmed when not in use.
- Lighting should be controlled in such a way to illuminate high activity, hazardous or high security areas while reducing lighting levels at less pertinent areas.
- The Contractor should act responsibly to adjust any temporary lighting reported as causing nuisance.

6. CONCLUSION

6.1 As part of the lighting strategy a review has been undertaken of the potential impact created by new lighting in relation to the proposed development.

6.2 Legislation, British standards, and good practice guidance recommends the development requires new exterior lighting for purposes of vehicular and pedestrian safety.

6.3 The proposed external lighting installation complies with the recommendations of national and local policy, specifically the following policies which are contained within the Kirklees Local Plan Strategy and Policies (Adopted 27 February 2019):

- Policy LP30 Biodiversity & Geodiversity
- Policy LP52 Protection and improvement of environmental quality

6.4 The proposed external lighting installation has been produced in compliance with, and to satisfy the requirements of, Planning Conditions which is outlined under **Paragraph 1.5** of this report.

6.5 Potentially significant effects from the proposed lighting on sensitive receptors can be managed to create a negligible night-time impact.

6.6 The lighting design strategy presented indicates the potential significant effects from new lighting for the proposed development can be adequately managed and all tested parameters are expected to meet recommended guidance benchmarks.

6.7 The lighting design strategy presented indicates the proposed lighting installation can achieve the required minimum lighting levels and distribution to meet the requirements of the ILP Guidance notes while causing negligible light trespass to the adjoining land and negligible increase in local sky glow.

6.8 The final design may deviate from the indicative external lighting design presented but must meet all parameters and criteria as set out in this report and demonstrate equal to or less than the quantity of light spill achieved. An adequate and safe level of lighting must be provided for site tasks, amenity, and security, whilst maintaining acceptable impact on the site surroundings, ecology, and neighbouring properties.

6.9 The lighting design has been produced in collaboration with the appointed ecologist. Lighting impact to all identified potentially sensitive receptors has been remove or reduced to an acceptable level. The Ecologist has reviewed and subsequently approved the indicative lighting design presented.

6.10 The most noticeable effect due to the proposed street lighting installation expected to remain is a negligible increase in sky glow.

APPENDICES

Appendix 1: Proposed Development Masterplan

01 / SITE LAYOUT

SCHEDULE OF ACCOMODATION

AFFORDABLE

Ref	Housetype	Type	Parking	Storey	Bed	Sq Ft	No	Total Sq Ft
DEL	Delmont	End	PS	2	2	758	2	1516
		Mid	PS	2	2	758	1	758
BAY	Baymont	Semi	PS	2	2	850	4	3400
		End	PS	2	2	850	2	1700
		Mid	PS	2	2	850	1	850
LOC	Lockton	Semi	PS	2	3	1001	6	6006
					SUB TOTAL		**16**	**14230**

OPEN MARKET

WHI	Whitton	Det	PS	2	2	947	7	6629
BRA	Braxton	Det	PS	2	2	996	8	7968
POR	Portstone	Det	SG	2	3	1212	2	2424
DEN	Denstone	Det	INT	2	3	1368	9	12312
CHE	Cherrystone	Det	INT	2	3	1296	6	7776
BEA	Beauwood	Det	SG	2	4	1379	6	8274
SAN	Sandalwood	Det	SG	2	4	1422	2	2844
HOM	Homesford	Det	DDG	2	5	1568	5	7840
DEF	Denford	Det	INT	2	5	1640	12	19680
GRA	Grayford	Det	SG	2	5	1780	6	10680
			DDG	2	5	1780	1	1780
					SUB TOTAL		**64**	**88207**
					TOTAL		**80**	**102437**

SALES AREA EXTRACT

PLANNING LAYOUT LAYERS KEY

- 1800mm PIER AND PANEL WALL
- 1800mm TIMBER FENCE
- 2000mm ACCOUSTIC FENCE
- 600mm KNEE HIGH RAIL
- 1200mm POST & RAIL
- 1500mm RAILING WITH HEDGE BEHIND
- EXISTING STONE WALL TO BE REPAIRED
- APPLICATION BOUNDARY
- LOCKABLE GATE
- AFFORDABLE / AFFORDABLE RENT
- AFFORDABLE / SHARED OWNERSHIP
- AFFORDABLE / FIRST HOMES
- TREES
- VISIBILITY SPLAYS
- CARS (VISITOR PARKING)
- BIN COLLECTION POINT
- BINS
- CYCLE SHEDS
- BLOCK PAVING (SHARED SURFACES)
- BLOCK PAVING (RAISED TABLE)

NORTH

1:500 SCALE

10m 50m

Rev	Date	Description	Drawn	Check
D	27.11.24	LAYOUT UPDATED IN RESPONSE TO ARBORICULTURAL IMPACT ASSESSMENT & CLIENT COMMENTS. DEVELOPMENT PUSHED FURTHER FROM 10M WOODLAND BUFFER.	JP	VS
C	13.11.24	MAINTENANCE ACCESS GATE MOVED IN LINE WITH CLIENT REQUEST.	JP	VS
B	11.11.24	LAYOUT UPDATED IN RESPONSE TO PRE-APP COMMENTS.	JP	VS
A	17.07.24	AFFORDABLE TENURE UPDATED IN LINE WITH CLIENTS REQUEST.	JP	VS

Architecture Planning Urban Design Landscape

CLIENT:
MILLER HOMES

DRAWING NUMBER:
22:5611:01 D

PROJECT:
HERMITAGE PARK, LEPTON

SCALE @ A0:
1:500

DRAWING:
SITE LAYOUT

DRAWN: JP DATE: OCT '24
CHECKED: VS DATE: OCT '24

JRP Associates
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Calder Park, Wakefield, WF4 3FL
T 01924 383222
E info@jrpassoc.co.uk
W jrpassoc.co.uk

Appendix 2: Proposed External Lighting Layout

Notes

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

Legend

- C Urbis Axia 3.1 5266 Optic 8LED 4000K 14W 500mA Equipped with integrated rear louvres Column mounted at 6m
- E Urbis Axia 3.1 5267 Optic 8LED 4000K 21W 750mA Equipped with integrated rear louvres Column mounted at 6m

3 LUX - P5 - ROADS AND FOOTPATHS
Results - Horizontal Illuminance (lux)
Eav= 3.32
Emin= 0.66
Emax= 13.05
Emin/Emax= 0.05
Emin/Eav= 0.20
Emax/Eav= 3.93

Rev	Date	Details of issue / revision	Drw	Rev
P2	19.12.24	Preliminary Issue	GCL	DA
P1	27.11.24	Preliminary Issue	GCL	DA

Issues & Revisions

BWB
A GAF GROUP COMPANY

- Birmingham | 0121 233 3322
- Leeds | 0113 233 8000
- London | 020 7407 3879
- Manchester | 0161 233 4260
- Nottingham | 0115 924 1100

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Client

Miller Homes (Yorkshire) Ltd

Project Title

Hermitage Park
Lepton

Drawing Title

Electrical Services
Proposed External Lighting Layout
Proposed Site Plan

Drawn:	G. C. Leeming	Reviewed:	D. Alasfar
BWB Ref:	244698	Date: 27.11.24	Scale@A0: 1:500

Drawing Status
PRELIMINARY

Project - Originator - Zone - Level - Type - Role - Number	Status	Rev
HPL-BWB-00-XX-DR-E-2300	S2	P2

Appendix 3: Proposed External Lux Plot Layout

Notes

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

Legend

- C Urbis Axia 3.1 5266 Optic 8LED 4000K 14W 500mA Equipped with integrated rear louvres Column mounted at 6m
- E Urbis Axia 3.1 5267 Optic 8LED 4000K 21W 750mA Equipped with integrated rear louvres Column mounted at 6m
- 3.0 lux
- 0.6 lux

3 LUX - P5 - ROADS AND FOOTPATHS
Results - Horizontal Illuminance (lux)
Eav= 3.32
Emin= 0.66
Emax= 13.05
Emin/Emax= 0.05
Emin/Eav= 0.20
Emax/Eav= 3.93

P2	19.12.24	Preliminary Issue	GCL	DA
P1	27.11.24	Preliminary Issue	GCL	DA
Rev	Date	Details of issue / revision	Drw	Rev

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Client

Miller Homes (Yorkshire) Ltd

Project Title

Hermitage Park Lepton

Drawing Title

Electrical Services
Proposed External Lighting
Lux Plot Layout
Proposed Site Plan

Drawn:	G. C. Leeming		Reviewed:	D. Alasfar	
BWB Ref:	244698	Date:	27.11.24	Scale@A0:	1:500

Drawing Status

PRELIMINARY

Project - Originator - Zone - Level - Type - Role - Number	Status	Rev
HPL-BWB-00-XX-DR-E-2301	S2	P2

Appendix 4: Proposed Luminaire Type

Schréder
Experts in lightability™

ROAD

Axia 3

owlet®

PRO FLEX™

Engineered for performance, designed for the customer experience

With customer feedback playing a critical part in our innovative design process, we developed Axia 3. More than a luminaire, it is a platform delivering sustainability, cost-effectiveness and customer experience all while supporting smart city frameworks. Based on experience from the hundreds of thousands Axia luminaires installed worldwide, this third generation luminaire pushes the boundaries with photometric innovation, ease and speed of installation and FutureProof connectivity.

Available in three sizes, Axia 3 enables towns and cities to maximise efficiency when lighting numerous environments, from bike paths, squares and car parks to residential streets, carriageways, urban roads and large boulevards. This lightweight and compact luminaire combines quality of light with a minimal carbon footprint. It excels in easy installation and carefree maintenance, reducing operating costs.

IP 66 | IK 10

URBAN & RESIDENTIAL STREETS | BRIDGES | BIKE & PEDESTRIAN PATHS | RAILWAY STATIONS & METROS | CAR PARKS | LARGE AREAS | SQUARES & PEDESTRIAN AREAS | ROADS & MOTORWAYS

Concept

Axia 3 is a robust yet compact luminaire, designed with a focus on miniaturisation and superior efficiency. Composed of high-pressure die-cast aluminium, as well as composite materials, Axia 3 is available in three sizes. Thanks to its reduced weight, this road luminaire is easy to handle during installation. The Axia 3.1, which can be fitted with up to 16 LEDs, is perfectly suited to low-height applications, whereas Axia 3.2 and 3.3, with up to 32 or 64 LEDs, are ideal for lighting urban and large roads, carriageways and avenues. The Axia 3 range is equipped with ProFlex™ photometric engines, providing the highest efficiency thanks to their ability to maximise the lumen output and to provide very extensive light distributions.

Axia 3 comes pre-cabled, hence there is no need to open the luminaire. The complete range is available with an integrated universal fixation part adapted for post-top and side-entry mounting on various spigots (Ø32mm with adapter, Ø42-48mm, Ø60mm and Ø76mm). The inclination angle can be adjusted on-site for both post-top (-5°/+15°) and side-entry (-10°/+10°) configurations to optimise lighting, reduce power consumption and control light pollution.

This highly efficient, cost-effective and connected-ready luminaire, offers towns and cities the ideal solution to improve lighting levels, increase safety, generate energy savings and reduce their ecological footprint. Axia 3 is the ideal tool to provide another 25 years of efficiency, sustainability and safety.

The ProFlex™ photometric engine provides the highest efficiency.

The Axia 3 range has a universal fixation part for spigots ranging from Ø32 to Ø76mm.

TYPES OF APPLICATION

- URBAN & RESIDENTIAL STREETS
- BRIDGES
- BIKE & PEDESTRIAN PATHS
- RAILWAY STATIONS & METROS
- CAR PARKS
- LARGE AREAS
- SQUARES & PEDESTRIAN AREAS
- ROADS & MOTORWAYS

KEY ADVANTAGES

- Maximised savings in energy and maintenance costs
- ProFlex™ photometric engines offering high efficiency lighting, comfort and safety
- 3 sizes to provide the most accurate solutions for numerous road and urban applications
- Easy installation: pre-cabled and equipped with universal fixation adapted for side-entry and post-top mounting
- Adjustable inclination for optimised photometry and uniformity
- Connected-ready

The inclination is adjustable on-site for optimised photometry and further energy savings.

Axia 3 is connected-ready and can operate with various sensors and control systems.

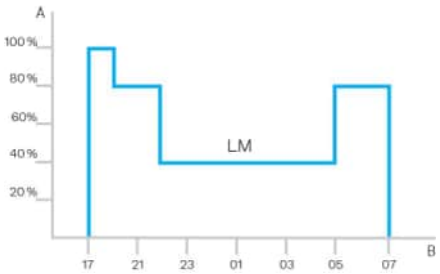
ProFlex™

The ProFlex™ photometric engine integrates the lenses into a polycarbonate protector. This integration increases the output and reduces the reflection inside the optical unit. The polycarbonate used for the ProFlex™ photometric engine offers essential characteristics such as high optical clarity for a superior light transmission, better impact resistance compared to glass and a long life span with UV-stabilisation treatment. The ProFlex™ concept enables a compact design with a thin optical compartment. It provides extensive light distributions so that the spacing between the luminaires can be increased.

Custom dimming profile

Intelligent luminaire drivers can be programmed with complex dimming profiles. Up to five combinations of time intervals and light levels are possible. This feature does not require any extra wiring.

The period between switching on and switching off is used to activate the preset dimming profile. The customised dimming system generates maximum energy savings while respecting the required lighting levels and uniformity throughout the night.



A. Dimming level | B. Time

Daylight sensor / photocell

Photocell or daylight sensors switch the luminaire on as soon natural light falls to a certain level. It can be programmed to switch on during a storm, on a cloudy day (in critical areas) or only at nightfall so as to provide safety and comfort in public spaces.

PIR sensor: motion detection

In places with little nocturnal activity, lighting can be dimmed to a minimum most of the time. By using passive infrared (PIR) sensors, the level of light can be raised as soon as a pedestrian or a slow vehicle is detected in the area.

Each luminaire level can be configured individually with several parametres such as minimum and maximum light output, delay period and ON/OFF duration time. PIR sensors can be used in an autonomous or interoperable network.

Owlet IoT

Owlet IoT remotely controls luminaires in a lighting network, creating opportunities for improved efficiency, accurate real-time data and energy savings of up to 85%.

ALL-IN-ONE

The LUCO P7 CM controller includes the most advanced features for optimised asset management. It also provides an integrated photocell and operates with an astronomical clock for seasonal dimming profile adaptations.

EASY TO DEPLOY

Thanks to wireless communication, no cabling is needed. The network is not subject to physical constraints or limitations.

From a single control unit to an unlimited network, you can expand your lighting scheme at any time.

With real-time geolocation and automatic detection of luminaire features, commissioning is quick and easy.

USER-FRIENDLY

Once a controller is installed on a luminaire, the luminaire automatically appears with its GPS coordinates on a web-based map.

An easy-to-use dashboard enables each user to organise and customise screens, statistics and reports. Users can gain relevant, real-time insights.

The Owlet IoT web application can be accessed at all times from anywhere in the world with a device connected to the Internet. The application adapts to the device to offer an intuitive and user-friendly experience.

Real-time notifications can be pre-programmed to monitor the most important elements of the lighting scheme.

SECURE

The Owlet IoT system uses a local wireless mesh communication networks to control the on-site luminaires combined with a remote control system utilising the cloud to ensure smooth data transfers to and from the central management system.

The system uses encrypted IP V6 communication to protect data transmission in both directions. Using a secure APN, Owlet IoT ensures a high level of protection.

In the exceptional case of a communication failure, the built-in astronomical clock and photocell will take over to switch the luminaires on and off, thus avoiding a complete blackout at night.

EFFICIENT

Thanks to sensors and/or pre-programmed settings, lighting scenarios can be easily adapted to cope with live events, providing the right lighting levels at the right time and in the right place.

The integrated utility grade meter offers the highest accuracy available on the market today, enabling decisions based on real figures.

Accurate real-time feedback and clear reporting ensures that the network operates efficiently and maintenance is optimised.

When LED luminaires are switched on, the inrush current can create problems for the electricity grid. Owlet IoT incorporates an algorithm to preserve the grid at all times.

OPEN

The LUCO P7 CM controller can be plugged onto the standard 7 pin NEMA socket and operates through either a DALI or 1-10V interface to control the luminaire.

Owlet IoT is based on the IPv6 protocol. This method for addressing devices can generate an almost unlimited number of unique combinations to connect non-traditional components to the Internet or computer network.

Through open APIs, Owlet IoT can be integrated into existing or future global management systems.

The Schréder Bluetooth solution consists of 3 main components:

- A Bluetooth dongle plugged into the modular driver of the luminaire (BLE transceiver)
- A Bluetooth antenna fitted on the luminaire
- A smartphone application called Sirius BLE

Easy to use

The Schréder Bluetooth solution is ideal for the on-site configuration of individual outdoor luminaires using Bluetooth. From the ground, the user is able to switch the luminaire on or off, adapt the dimming curve, read diagnostic data and much more. A user-friendly application called Sirius BLE provides an easy and secure access to the control and configuration functions.

Whether you are managing a lighting network in an urban or a residential area, this solution will make it easy to control your outdoor luminaires while simply standing by the pole.

Quick and easy pairing

Get the Sirius App from Schréder. Go to the menu. Press the “SCAN DEVICE (START)” button, to search for the surrounding BLE modules. They will be displayed with a bar graphic (signal intensity) to indicate the closest and the most distant one you can reach. Click on the device you want to connect to and enter your personal access key to control the luminaire.

Defining the settings

Once you are connected to a luminaire, you can set various parameters such as the maximum output current, minimum dimming level and custom dimming profile.

Manual dimming control

The App enables you to do a manual override to adapt the dimming levels instantly. Simply tap on the “Dimming” button in the main menu and adjust the dimming using the wheel and button. Predefined dimming levels can be applied immediately. The corresponding value is displayed on the wheel. This enables you to test the ON / OFF and dimming features of the luminaire paired to the smartphone.

On-site diagnostic

When a luminaire is paired, you can access various diagnostic information: total number of power up events, operation time of LED module and driver, total energy consumption of LED driver... etc. You can also track operating events (short circuits, thermal shutdowns...). The diagnostic values may be the current state or values accumulated to date.

GENERAL INFORMATION

Recommended installation height	4m to 12m | 13' to 39'
Driver included	Yes
CE Mark	Yes
ENEC certified	Yes
ENEC+ certified	Yes
ROHS compliant	Yes
Testing standard	LM 79-08 (all measurements in ISO17025 accredited laboratory)

HOUSING AND FINISH

Housing	Aluminium Composite materials
Optic	Polycarbonate
Protector	Polycarbonate (with integrated lenses)
Housing finish	Polyester powder coating
Standard colour(s)	RAL 7040 window grey RAL 9005 Jet black
Tightness level	IP 66
Impact resistance	IK 10
Vibration test	Compliant with modified IEC 68-2-6 (0.5G)

OPERATING CONDITIONS

Operating temperature range (Ta)	-30 °C up to +45 °C / -22 °F up to 113 °F

· Depending on the luminaire configuration. For more details, please contact us.

ELECTRICAL INFORMATION

Electrical class	Class I EU, Class II EU
Nominal voltage	220-240V – 50-60Hz
Power factor (at full load)	0.9
Surge protection options (kV)	10
Electromagnetic compatibility (EMC)	EN 55015 / EN 61000-3-2 / EN 61000-4-5 / EN 61547
Control protocol(s)	Bluetooth, DALI
Control options	Bi-power, Custom dimming profile, Photocell, Remote management
Socket	NEMA 3-pin (optional) NEMA 6-pin (optional) NEMA 7-pin (optional) Low voltage socket (optional)
Associated control system(s)	Sirius BLE Owlet IoT
Sensor	PIR (optional)

OPTICAL INFORMATION

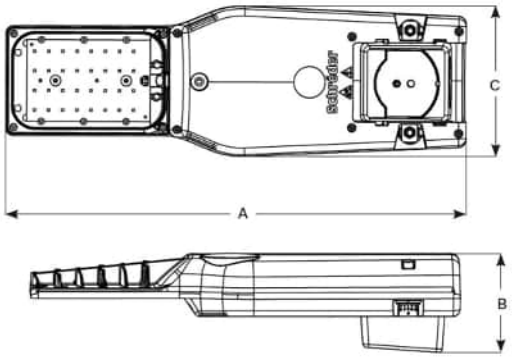
LED colour temperature	3000K (Warm White 730) 4000K (Neutral White 740)
Colour rendering index (CRI)	>70 (Warm White 730) >70 (Neutral White 740)
Upward Light Output Ratio (ULOR)	0%

LIFETIME OF THE LEDS @ TQ 25°C

All configurations	100,000h - L90

DIMENSIONS AND MOUNTING

AxBxC (mm | inch)	AXIA 3.1 - 513x130x191 | 20.2x5.1x7.5 AXIA 3.2 - 585x130x191 | 23.0x5.1x7.5 AXIA 3.3 - 550x130x277 | 21.7x5.1x10.9
Weight (kg | lbs)	AXIA 3.1 - 3.6 | 7.9 AXIA 3.2 - 4.8 | 10.6 AXIA 3.3 - 6 | 13.2
Aerodynamic resistance (CxS)	AXIA 3.1 - 0.03 AXIA 3.2 - 0.03 AXIA 3.3 - 0.04
Mounting possibilities	Side-entry slip-over – Ø32mm Side-entry slip-over – Ø42mm Side-entry slip-over – Ø48mm Side-entry slip-over – Ø60mm Post-top slip-over – Ø60mm Post-top slip-over – Ø76mm



			Luminaire output flux (lm) Warm White 730		Luminaire output flux (lm) Neutral White 740		Power consumption (W)		Luminaire efficacy (lm/W)	
Luminaire	Number of LEDs	Current (mA)	Min	Max	Min	Max	Min	Max	Up to	Photometry
AXIA 3.1	8	300	1000	1000	1100	1100	8.3	8.3	133	
	8	400	1300	1300	1400	1400	10.9	10.9	128	
	8	600	1900	1900	2000	2100	16.3	16.3	129	
	8	700	2100	2200	2300	2400	18.8	18.8	128	
	8	850	2500	2600	2700	2800	22.8	22.8	123	
	16	200	1400	1400	1500	1500	11.1	11.1	135	
	16	300	2000	2100	2200	2300	15.9	15.9	145	
	16	480	3100	3200	3300	3500	25.1	25.1	139	
	16	500	3200	3300	3400	3600	25.8	25.8	140	
	16	600	3800	3900	4000	4200	31	31	135	
	16	700	4300	4500	4600	4800	35.6	35.6	135	
	16	870	5100	5300	5400	5700	44	44	130	

Tolerance on LED flux is ± 7% and on total luminaire power ± 5 %

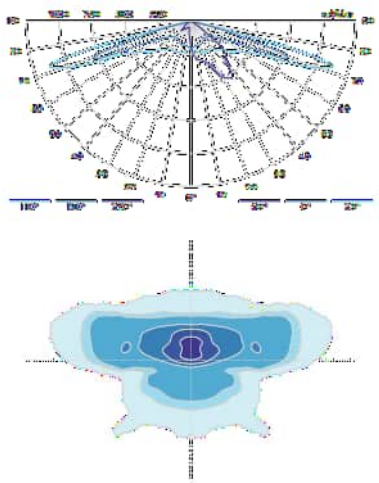
Luminaire	Number of LEDs	Current (mA)	Luminaire output flux (lm) Warm White 730 Min	Luminaire output flux (lm) Warm White 730 Max	Luminaire output flux (lm) Neutral White 740 Min	Luminaire output flux (lm) Neutral White 740 Max	Power consumption (W) Min	Power consumption (W) Max	Luminaire efficacy (lm/W) Up to	Photometry
AXIA 3.2	24	200	2100	2200	2200	2300	15.3	15.3	150	
	24	300	3100	3200	3300	3400	22.4	22.4	152	
	24	400	4000	4100	4300	4400	29.7	29.7	148	
	24	500	4800	5000	5200	5400	37.2	37.2	145	
	24	590	5600	5800	6000	6200	44	44	141	
	24	700	6400	6600	6900	7100	52.5	52.5	135	
	24	800	7100	7400	7600	7900	60.5	60.5	131	
	24	900	7800	8000	8300	8600	68.5	68.5	126	
	24	1000	8400	8600	9000	9300	76	76	122	
	32	200	2800	2900	3000	3100	19.8	19.8	157	
	32	300	4100	4200	4400	4500	29.5	29.5	153	
	32	450	5900	6100	6300	6500	45.5	45.5	143	
	32	500	6500	6700	6900	7200	48.5	48.5	148	
	32	600	7500	7800	8100	8400	59	59	142	
	32	700	8600	8900	9200	9500	69	69	138	
	32	800	9500	9800	10200	10500	78	78	135	

Tolerance on LED flux is ± 7% and on total luminaire power ± 5 %

			Luminaire output flux (lm) Warm White 730		Luminaire output flux (lm) Neutral White 740		Power consumption (W)		Luminaire efficacy (lm/W)	
Luminaire	Number of LEDs	Current (mA)	Min	Max	Min	Max	Min	Max	Up to	Photometry
AXIA 3.3	48	200	4200	4300	4500	4600	27.9	27.9	165	
	48	300	6100	6400	6600	6800	42	42	162	
	48	400	8000	8300	8500	8900	56	56	159	
	48	550	10400	10900	11200	11600	78	78	149	
	48	600	11200	11700	12000	12500	86	86	145	
	48	700	12600	13200	13500	14100	100	100	141	
	48	800	13900	14500	14900	15500	115	115	135	
	48	880	14900	15500	15900	16600	129	129	129	
	64	200	5600	5800	6000	6200	37.7	37.7	164	
	64	300	8200	8500	8800	9100	56.5	56.5	161	
	64	420	11100	11500	11900	12400	79	79	157	
	64	500	12900	13400	13800	14400	94	94	153	
	64	600	15000	15600	16000	16700	113	113	148	
	64	700	16900	17600	18100	18800	137	137	137	
	64	880	19800	20600	21200	22100	172	172	128	

Tolerance on LED flux is ± 7% and on total luminaire power ± 5 %

PRO FLEX™ 5266



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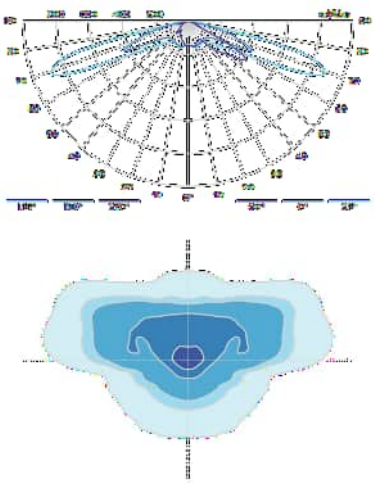

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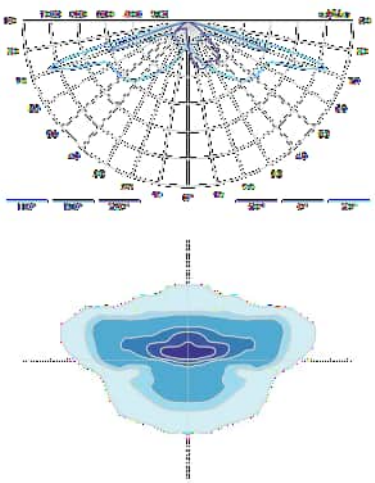

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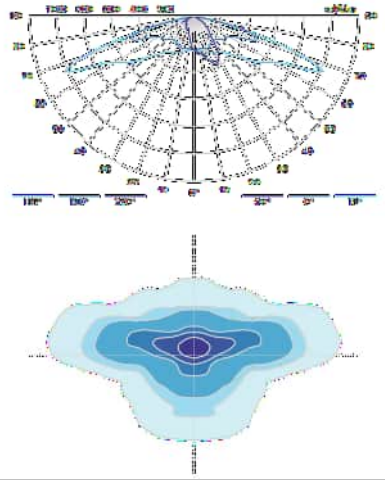

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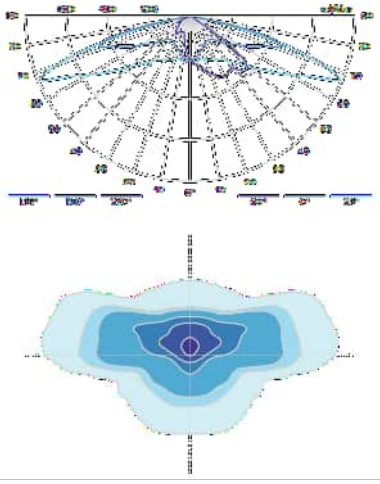

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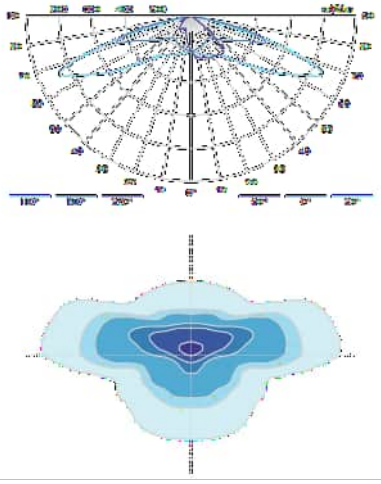

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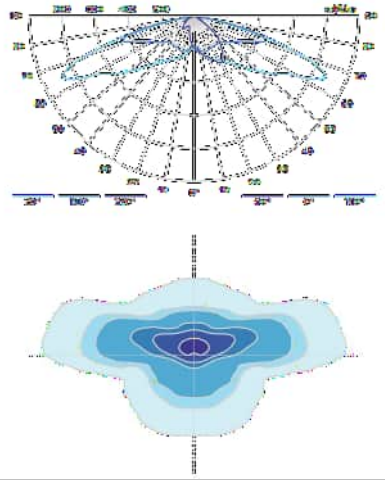

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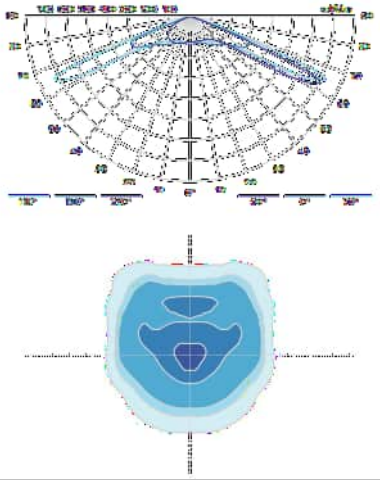

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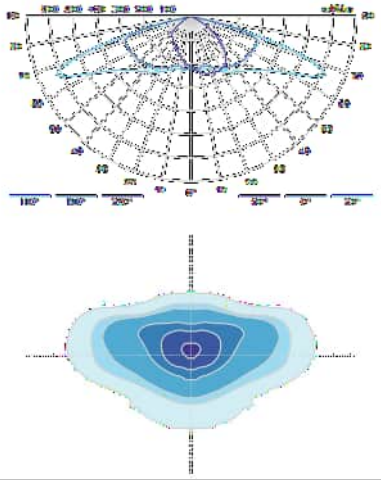

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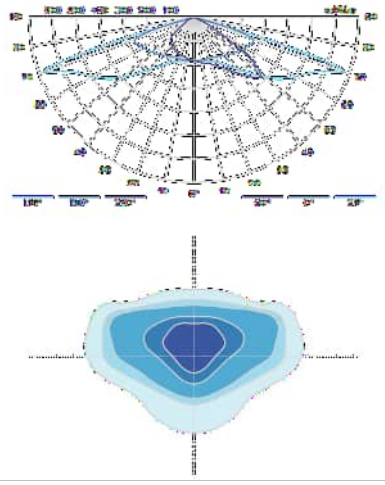

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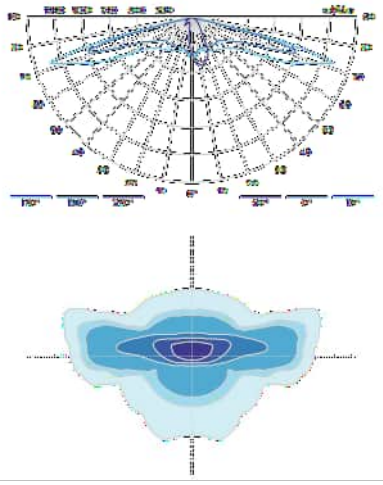

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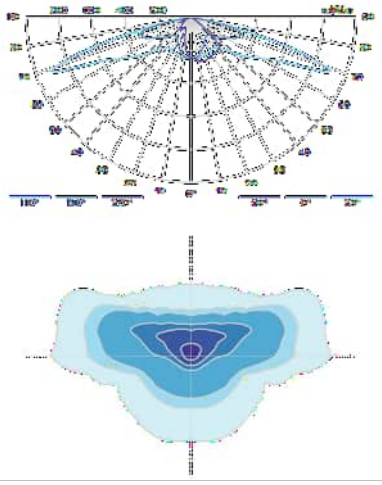


BWB
A CAF GROUP COMPANY

Appendix C Heavy Goods Vehicle Routing Plan

Key Legend

Site Boundary

HGV Route

Notes

All Heavy Good Vehicles to approach site via Penistone Road where possible.

Rev.	Description	Drawn	Date

miller homes

Miller Homes Ltd - Yorkshire
Lapwing House
Peel Avenue, Calder Park
Wakefield
West Yorkshire, WF2 7UA

Telephone 0870 336 4600
Fax 0870 336 4602
www.millerhomes.co.uk

Project Title

Hermitage Park,
Lepton

Drawing Title

HGV Routing Plan

Scale	Drawn By	Checked By	Authorised By
NTS	JW	-	-
	Date Jun' 25	Date -	Date -

Job No.	Drawing No.	Revision
-	-	-

Original Sheet Size A3

Appendix D Dust Management Plan

Hermitage Park, Lepton

Condition 10 / 16: Construction Dust Assessment, and Air Quality and Dust Input into C(E)MP

Miller Homes Limited

Lapwing House, Peel Avenue Calder Park, Wakefield, WF2 7UA

Prepared by:

SLR Consulting Limited

3rd Floor, Brew House, Jacob Street, Tower Hill, Bristol, BS2 0EQ

SLR Project No.: 403.065678.00001

Client Reference No: 035260

25 February 2025

Revision: 2.0

Revision Record

Revision	Date	Prepared By	Checked By	Authorised By
1.0	18 November 2024	LT	GB	GB
2.0	25 February 2025	LT	GB	GB

Basis of Report

This document has been prepared by SLR Consulting Limited (SLR) with reasonable skill, care and diligence, and taking account of the timescales and resources devoted to it by agreement with Miller Homes Limited (the Client) as part or all of the services it has been appointed by the Client to carry out. It is subject to the terms and conditions of that appointment.

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Tables in Text

Figures in Text

1.0 Introduction

SLR Consulting Ltd (SLR) has been commissioned by Miller Homes Limited to provide a Construction Dust Assessment as Air Quality and Dust input to the Construction (Environmental) Management Plan (C(E)MP) in support of the discharge of pre-commencement conditions associated with an outline consented residential development (the 'Development') on land off Hermitage Park, Lepton, Huddersfield, HD8 0JU (the 'Site'). The Development was approved in outline by Kirklees Council (KC) under application reference: 2022/60/91735/W. Miller Homes Limited have submitted a Section 73 (S.73) application (application reference: 2025/70/90105/W) which seeks a variation to the approved layout, the S.73 application is currently under review from KC.

1.1 Background

Application reference 2022/60/91735/W was granted outline consent by KC on 10th November 2023, subject to a number of conditions, including Conditions 10 & 16 relating to air quality / dust which state:

> ***"Condition 10:***
>
> *The development (construction phase) shall be undertaken and completed in accordance with the mitigation measures to control fugitive dust emissions detailed in table 8-1 page 32 of the Air Quality Assessment by SLR (ref: 410.10429.00003) (version: rev 3) (dated: February 2022), which shall be retained for the duration of the construction period.*
>
> *Reason: To safeguard the amenities of the occupiers of nearby properties in accordance with LP52 of the Kirklees Local Plan."*
>
> ***"Condition 16:***
>
> *Prior to development commencing (including demolition, ground works, vegetation clearance), a Construction (Environmental) Management Plan (C(E)MP) shall be submitted to and approved in writing by the Local Planning Authority. The C(E)MP shall include details of:*
>
> *• […] Measures to be taken to minimise the deposit of mud, grit and dirt on public highways by vehicles travelling to and from the site, including the provision of adequate wheel washing facilities within the site;*
>
> *• Street sweeping;*
>
> *• Measures to control and monitor the emission of dust and dirt during construction; […]*
>
> *The development shall be carried out strictly in accordance with the C(E)MP so approved throughout the period of construction and no change therefrom shall take place without the prior written consent of the Local Planning Authority.*
>
> *Reason: In the interests of amenity, to ensure the highway is not obstructed, in the interests of highway safety, to ensure harm to biodiversity is avoided, and to accord with Policies LP21, LP24, LP30 and LP52 of the Kirklees Local Plan. This pre-commencement condition is necessary to ensure measures to avoid obstruction to the wider highway network, to avoid increased risks to highway safety, and to prevent or minimise amenity and biodiversity impacts are devised and agreed at an appropriate stage of the development process."*

In the interim, Miller Homes Limited has progressed the Site and is seeking to progress with the application for Reserved Matters approval and associated discharge of planning conditions.

1.2 Scope of Assessment

It is noted the layout for the Development was previously approved in outline under application reference 2022/60/91735/W. However, Miller Homes Limited have submitted a S.73 application[1] which seeks a variation to the approved layout. This Air Quality and Dust input to the C(E)MP is provided to assess potential dust impacts, and requirements for mitigation in relation to the Miller Homes Limited S.73 layout. The identified dust mitigation measures are intended to provide a replacement to those referred[2] to within Condition 10.

In line with the requirements specified in Conditions 10 & 16, the Air Quality and Dust input into the CEMP aims to ensure a proactive approach for the effective management of Air Quality and Dust during the Site works. The Air Quality and Dust input into the C(E)MP utilises the latest information, available at the time of writing, to assess the short-term impacts of the construction phase on sensitive receptors located close to the Site and provide mitigation measures to minimise these impacts.

The approach adopted in this assessment is based on the West Yorkshire Air Quality & Emissions Technical Planning Guidance (TPG)[3], adopted by KC, and the Institute of Air Quality Management (IAQM) Guidance on the Assessment of Dust from Demolition and Construction[4].

The following scope of work has been undertaken:

- Construction Phase Dust Assessment; and
- Detailed Mitigation Measures.

The Air Quality and Dust inputs into the C(E)MP incorporates:

- A review of the Site location with respect to sensitive receptors;
- A review of potential dust sources and any required demolition and construction works;
- An assessment of impacts arising from dust associated with demolition and construction activities;
- Suitable measures to control dust releases;
- A supporting monitoring framework to continually evaluate the efficacy of the Air Quality and Dust input to the C(E)MP; and
- The on-site management actions and responsibilities.

[1] KC planning application reference: 2025/70/90105/W.

[2] Table 8-1 Construction Dust Mitigation Measures as presented within: Rowley Lane, Lepton. Proposed Residential Development. Air Quality Assessment, prepared for KCS Developments Ltd. SLR report reference: 410.10429.00003 Rev3 dated February 2022.

[3] Air Quality & Emissions, Technical Planning Guidance, Part of the West Yorkshire Low Emissions Strategy.

[4] IAQM, Guidance on the Assessment of Dust from Demolition and Construction v2.2, 2024.

2.0 Background Context

2.1 Legislation

A dual set of regulations, applicable to National and Local Government separately are currently operable within the UK.

2.1.1 National Obligations

The Air Quality Standards Regulations 2010[5] (AQSR) transpose both the EU Ambient Air Quality Directive (2008/50/EC), and the Fourth Daughter Directive (2004/107/EC) within UK legislation. The AQSR includes Limit Values which are legally binding ambient concentration thresholds, however, must be assessed at specific locations (micro and macroscale sampling points). Carriageways or central reservations of roads and any location where the public do not have access (e.g. industrial sites) are exempt. If the sampling point does not comply with the siting locations (Schedule 1: AQSR), then strict comparison cannot be made.

The responsibility of achieving the AQSR (and European equivalent Directives) is a national obligation for Central Government and Devolved Administrations who undertake assessments on an annual basis. Local Authorities have no responsibility to achieve the AQSR or the European equivalent Directives, unless otherwise instructed to assist Central Government under Ministerial Direction.

2.1.1.1 Environment Targets (Fine Particulate Matter) Regulations

The Environmental Targets (Fine Particulate Matter) (England) Regulations 2023[6] introduced an annual mean concentration target of 10µg/m^3 to be met across England by 2040. Central Government and Devolved Administrations is responsible for meeting this target, however not until 2040. Local Authorities have no responsibility to achieve this target.

2.1.2 Local Obligations

Part IV of the Environment Act 1995 (as amended by the Environment Act 2021) requires the Secretary of State to review the national Air Quality Strategy (AQS) every five years and modify this if necessary. It also established the system of Local Air Quality Management (LAQM) for Local Authorities to regularly review and assess air quality within their respective administrative areas.

The Air Quality (England) Regulations 2000 (as amended) provide the statutory basis for the Air Quality Objectives Local Authorities must adhere to under LAQM in England. $PM_{2.5}$ is not currently part of the LAQM framework; however, as per the national AQS, Local Authorities are required to work towards reducing $PM_{2.5}$.

The Air Quality Objectives apply at locations where members of the public are regularly present and might reasonably be expected to be exposed to pollutant concentrations over the relevant averaging period (referred to as 'relevant exposure'). Table 2-2 provides an indication of those locations. Where any of the prescribed Air Quality Objectives are not likely to be achieved, the authority must designate an Air Quality Management Area (AQMA). For each AQMA, the local authority is required to prepare an Air Quality Action

[5] The Air Quality Standards Regulations (England) 2010, Statutory Instrument No 1001, The Stationary Office Limited.

[6] The Environmental Targets (Fine Particulate Matter) (England) Regulations 2023. UK Statutory Instruments 2023 No. 96.

Plan (AQAP), which details measures the authority intends to introduce to deliver improvements in local air quality in pursuit of the objective.

The latest AQS for England was published in 2023[7]. The AQS provides the delivery framework for air quality management across England for local authorities and summarises the air quality standards and objectives operable within England for the protection of public health and the environment.

The ambient air quality standards of relevance this assessment (collectively termed Air Quality Assessment Levels (AQALs) throughout this report) are provided in Table 2-1. These are based upon the Air Quality Objectives Local Authorities are responsible for achieving – reflective of the Local Planning Authority's duties.

Table 2-1: Relevant Ambient AQALs

Pollutant	AQAL (µg/m^3)	Averaging Period
Particles (as PM_{10})	40	Annual mean
	50	24-hour mean (not to be exceeded on more than 35 occasions per annum)
Particles (as $PM_{2.5}$)	20	Annual Mean

Table 2-2: Human Health Relevant Exposure

AQAL Averaging Period	AQALs should apply at	AQALs should not apply at
Annual mean	Building facades of residential properties, schools, hospitals etc.	Facades of offices Hotels Gardens of residences Kerbside sites
24-hour mean	As above together with hotels and gardens of residential properties	Kerbside sites where public exposure is expected to be short term

2.1.2.1 Clean Air Strategy

The 2019 Clean Air Strategy[8] sets out the Government's proposals aimed at delivering cleaner air in England and indicates how devolved administrations intend to make emissions reductions. It sets out the comprehensive action that is required from across all parts of government and society to deliver clean air.

2.1.2.2 Environmental Improvement Plan 2023

The 2023 Environmental Improvement Plan[9] is the first revision of the UK Government's 25 Year Environment Plan (25YEP) – planned on a five-year rolling cycle. This document sets out the 5-year delivery plan to improve the natural environment. The 2023 Environmental Improvement Plan builds on the 2019 Clean Air Strategy by setting environmental targets and commitments to reduce air pollution.

[7] Air Quality Strategy: Framework for Local Authority Delivery, Department for Environment Food and Rural Affairs, April 2023.

[8] The Clean Air Strategy, Defra. January 2019.

[9] Environmental Improvement Plan 2023, Defra. 2023.

2.1.3 Environmental Protection Act 1990

The Environmental Protection Act 1990[10] sets out provisions for the regulation of statutory nuisances. Section 79 sets out this statutory nuisance as: *"any dust, steam, smell or other effluvia arising on industrial, trade or business premises and being prejudicial to health or a nuisance*".

Section 79 requires that, where a complaint of a statutory nuisance is made to it by a person living within its area, a Local Authority must take steps as are reasonably practicable to investigate the complaint and decide whether the odour is prejudicial to health or a nuisance. Proposed developments which result in the introduction of future sensitive receptors are however subject to the Agent of Change principle to ensure potential interactions with the existing environment and operations are assessed and mitigated to minimise restrictions being placed on existing businesses.

Fractions of dust greater than 10µm (i.e. greater than PM_{10}) in diameter typically relate to nuisance effects as opposed to potential health effects and therefore are not covered within the UK AQS. In legislation there are currently no numerical limits in terms of what level of dust deposition constitutes a nuisance.

2.2 Policy

2.2.1 National Policy

2.2.1.1 National Planning Policy Framework

The December 2024 update to the National Planning Policy Framework[11] (NPPF) sets out planning policy for England. The NPPF states that the planning system should contribute to and enhance the natural and local environment, by preventing new development from contributing to or being adversely affected by unacceptable concentrations of air pollution and development should, wherever possible, help to improve local environmental conditions such as air quality.

In specific relation to air quality policy, the document states:

> ***"Chapter 15 – Conserving and Enhancing the Natural Environment***
>
> *Para 199. Planning policies and decisions should sustain and contribute towards compliance with relevant limit values or national objectives for pollutants, taking into account the presence of Air Quality Management Areas and Clean Air Zones, and the cumulative impacts from individual sites in local areas. Opportunities to improve air quality or mitigate impacts should be identified, such as through traffic and travel management, and green infrastructure provision and enhancement. So far as possible these opportunities should be considered at the plan-making stage, to ensure a strategic approach and limit the need for issues to be reconsidered when determining individual applications. Planning decisions should ensure that any new development in Air Quality Management Areas and Clean Air Zones is consistent with the local air quality action plan."*

The NPPF is accompanied by web based supporting Planning Practice Guidance (PPG) which includes guiding principles on how planning can take account of the impacts of new development on air quality. In regard to air quality, the PPG states:

[10] The Environmental Protection Act 1990. Available at http://www.legislation.gov.uk/ukpga/1990/43/contents.

[11] National Planning Policy Framework, Ministry of Housing, Communities & Local Government, 2024.

"The Department for Environment, Food and Rural Affairs carries out an annual national assessment of air quality using modelling and monitoring to determine compliance with relevant Limit Values. It is important that the potential impact of new development on air quality is taken into account where the national assessment indicates that relevant limits have been exceeded or are near the limit, or where the need for emissions reductions has been identified."

"Whether air quality is relevant to a planning decision will depend on the proposed development and its location. Concerns could arise if the development is likely to have an adverse effect on air quality in areas where it is already known to be poor, particularly if it could affect the implementation of air quality strategies and action plans and/or breach legal obligations (including those relating to the conservation of habitats and species). Air quality may also be a material consideration if the proposed development would be particularly sensitive to poor air quality in its vicinity."

The PPG sets out the information that may be required within the context of a supporting air quality assessment, stating that "*Assessments need to be proportionate to the nature and scale of development proposed and the potential impacts (taking into account existing air quality conditions), and because of this are likely to be locationally specific.* […] *Mitigation options will need to be locationally specific, will depend on the proposed development and need to be proportionate to the likely impact*".

2.2.2 Local Policy

2.2.2.1 Kirklees Local Plan Strategy and Policies

KC adopted its Local Plan in February 2019[12]. The Borough Plan sets out the KC's policies and proposals to support development across its administrative area up to 2031. The following policies are deemed relevant to Conditions 10 & 16:

*"**Policy LP30 – Biodiversity and Geodiversity***

[…]

Local Designated Sites & Important Local Ecological Features

Proposals having a direct or indirect adverse effect on a Local Wildlife Site or Local Geological Site, Ancient Woodland, Veteran Tree or other important tree, will not be permitted unless the benefits of the development can be clearly shown to outweigh the need to safeguard the local conservation value of the site or feature and there is no alternative means to deliver the proposal. In all cases, full compensatory measures would be required and secured in the long term.

[…]

Biodiversity and Development

Development proposals will be required to:-

(i) result in no significant loss or harm to biodiversity in Kirklees through avoidance, adequate mitigation or, as a last resort, compensatory measures secured through the establishment of a legally binding agreement;"

*"**Policy LP52 – Protection and improvement of environmental quality***

Proposals which have the potential to increase pollution from noise, vibration, light, dust, odour, shadow flicker, chemicals and other forms of pollution or to increase pollution to soil or where environmentally sensitive development would be subject to significant

[12] Kirklees Council, Kirklees Local Plan, Kirklees Local Plan Strategy and Policies, adopted 27th February 2019.

levels of pollution, must be accompanied by evidence to show that the impacts have been evaluated and measures have been incorporated to prevent or reduce the pollution, so as to ensure it does not reduce the quality of life and well-being of people to an unacceptable level or have unacceptable impacts on the environment.

Such developments which cannot incorporate suitable and sustainable mitigation measures which reduce pollution levels to an acceptable level to protect the quality of life and well-being of people or protect the environment will not be permitted.

Where possible, all new development should improve the existing environment."

2.3 Relevant Guidance

This assessment has been carried out in accordance with the following principles contained within the guidance documents below.

- WYLES: Air Quality & Emissions TPG[3]; and
- IAQM: Guidance on the Assessment Dust from Demolition and Construction[4] (the 'IAQM guidance').

3.0 Assessment Methodology

3.1 Construction Phase Dust Assessment

The assessment of potential dust / particulate matter (PM_{10}) in relation to the Development's construction phase has been undertaken qualitatively in accordance with the IAQM guidance, as referenced within the TPG.

The assessment of risk is determined by considering the risk of dust effects arising from four activities in the absence of mitigation:

- Demolition;
- Earthworks;
- Construction; and
- Trackout.

The assessment methodology considers three separate dust impacts with account being taken of the sensitivity of the area that may experience these effects:

- Annoyance due to dust soiling;
- The risk of health effects due to an increase in exposure to PM_{10}; and
- Harm to ecological receptors with account being taken of the sensitivity of the area that may experience these effects.

The first stage of the assessment involves a screening review to determine if there are sensitive receptors within threshold distances of the Site activities associated with the construction phase of the scheme. A detailed assessment is required where a:

- Human receptor is located within 250m of the Site, and/or within 50m of routes used by construction vehicles, up to 250m from the Site entrance(s); and/or
- Ecological receptor is located within 50m of the Site, and/or within 50m of routes used by construction vehicles, up to 250m from the Site entrance(s).

The dust emission class (or magnitude) for each activity is determined on the basis of the guidance, indicative thresholds and professional judgement by a technically competent assessor. The risk of dust effects arising is based upon the relationship between the dust emission magnitude and the sensitivity of the area. The risk of impact is then used to determine the appropriate mitigation requirements, whereby through effective application, residual effects are considered to be 'not significant'.

4.0 Baseline Environment

4.1 Location

The Site is located in the administrative boundary of KC, at the approximate National Grid Reference (NGR): x419220, y414720. The Site is bounded by:

- Residential dwellings to the north-west, and the Rowley Lane Junior, Infant, and Primary School with associated playing fields are located approximately 100m to the north;
- Lepton Great Wood (Ancient Woodland (AW)) immediately to the eastern border of the Site, with agricultural fields beyond;
- Agricultural fields to the south; and
- Residential dwellings to the west in addition to agricultural fields.

Vehicular access to the Site will be via Hermitage Park, a cul-de-sac located directly north-west of the Site.

4.2 Defra Mapped Background Concentrations

Defra maintains a nationwide model of existing and future background air quality concentrations at a 1km grid square resolution which is routinely used to support LAQM requirements and air quality assessments[13]. The data sets include annual average concentration estimates for air pollutants including PM_{10} and $PM_{2.5}$ using a base year of 2021 (the year in which comparisons between modelled and monitored concentrations are made).

The Defra mapped background concentrations for the current year and the earliest considered proposed opening year (2025) are presented in Table 4-1 for the 1km grid squares which cover the Site.

All of the mapped background concentrations presented are well below their respective annual mean AQALs.

Table 4-1: Defra Mapped Background Pollutant Concentrations

Grid Square (X, Y) (m)	Year	Annual Mean Concentration (µg/m^3)	
		PM_{10}	$PM_{2.5}$
419500, 414500	2025	10.3	6.0
AQAL		***40***	***20***

[13] https://uk-air.defra.gov.uk/data/laqm-background-home, accessed February 2025.

5.0 Construction Dust Assessment

This section presents the potential air quality impacts and effects associated with the construction of the Development on nearby sensitive receptor locations.

Where figures relating to area and volume of the Site, approximate number of construction vehicles or distances to receptors are given, these relate to thresholds as defined in the IAQM guidance to guide the assessor to define the dust emissions magnitude and sensitivity of the area.

5.1 Assessment Screening

There are existing 'human receptors' within 250m of the Site and designated habitat sites within 50m of the Site boundary or within 50m of roads anticipated to witness construction traffic movements up to 250m of the Site entrance(s). Therefore, an assessment of construction dust on human and ecological receptors is required.

5.2 Potential Dust Emission Magnitude

5.2.1 Demolition

The Site currently comprises of open green space with no structures that require demolition. As such, consideration of impacts associated with demolition have been scoped out of assessment.

5.2.2 Earthworks

The total Site area is approximately 54,000m^2. Site earthworks are therefore required over an area between 18,000m^2 – 110,000m^2. Given the size of the area requiring earthworks, it is considered 5 – 10 heavy earth moving vehicles could be active at any one time.

The dust emission magnitude for earthworks is therefore considered to be 'medium'.

5.2.3 Construction

The Development comprises construction of 80 dwellings. The total building volume is expected to be >75,000m^3, however due to the phasing of the Development it is considered the total building volume under construction is expected to be <75,000m^3 at any given time. Material to include stone and/or reconstituted stone rather than brick will be used for walls, with standard roof tiling. No concrete batching will be undertaken.

The dust emission magnitude for construction is therefore considered to be 'medium'.

5.2.4 Trackout

Trackout refers to dust emissions generated by construction vehicles which have travelled over unpaved ground collecting dirt and dust which has then been deposited and resuspended on the roads as the vehicle leaves (i.e. tracked out from the Site). The maximum unpaved road length at any time is anticipated to be 50m – 100m, as the haul road is expected to be hardstanding and/or made ground towards the Site boundary. There are expected to be 20 – 50 HDV outward movements. The Site access will be from Hermitage Park.

The dust emission magnitude for trackout is therefore considered to be 'medium'.

5.2.5 Summary

A summary of the potential dust emission magnitude for each of the activities is displayed in Table 5-1.

Table 5-1: Potential Dust Emission Magnitude

Activity	Dust Emission Magnitude
Earthworks	Medium
Construction	Medium
Trackout	Medium

5.3 Sensitivity of the Area

5.3.1 Dust Soiling Impacts

There are 10 – 100 existing residential (highly sensitive) receptors within 20m of the Site. In addition, assuming construction vehicles travel along the access off Hermitage Park, there are >10 residential (high sensitivity) receptors within 20m of the access routes up to 250m from the Site exit.

The sensitivity of the area with respect to dust soiling effects on people and property in relation to earthworks, construction and trackout is therefore considered to be ‘high’.

5.3.2 Human Health Impacts

The maximum background PM_{10} concentration for the $1km^2$ grid squares which cover the Development is estimated to be 9.6µg/m³, based upon 2024 mapped background estimates (i.e. falls into the <24µg/m^3 class).

Given the above information regarding the number and nature of surrounding receptors within specified distances of the Site boundary and identified trackout routes, the sensitivity of the area with respect to human health impacts in relation to earthworks, construction and trackout is considered to be ‘low’.

5.3.3 Ecological Impacts

Lepton Great Wood AW (Site ID:37055) is located within 20m of the Site Boundary, running alongside the east of the Site, as illustrated in Figure 5-1. The AW is located >50m from the identified trackout route. In line with IAQM guidance the AW is classified as ‘low’ sensitivity. The sensitivity of the area with respect to ecological impacts in relation earthworks and construction is therefore considered to be ‘low’.

5.3.3 Summary

A summary of the sensitivity of the area defined for each potential impacts is displayed in Table 5-2.

Table 5-2: Sensitivity of the Area

Potential Impact	Sensitivity of the Surrounding Area		
	Earthworks	Construction	Trackout
Dust Soiling	High	High	High
Human Health	Low	Low	Low
Ecological	Low	Low	N/A

5.4 Risk of Impacts (Unmitigated)

The outcome of the assessment of the potential 'magnitude of dust emissions', and the 'sensitivity of the area' are combined below (Table 5-3) to determine the risk of impact which is used to inform the selection of appropriate mitigation.

Table 5-3: Risk of Dust Impacts (Unmitigated)

Potential Impact	Earthworks	Construction	Trackout
Dust Soiling	Medium Risk	Medium Risk	Medium Risk
Human Health	Low Risk	Low Risk	Low Risk
Ecological	Low Risk	Low Risk	N/A

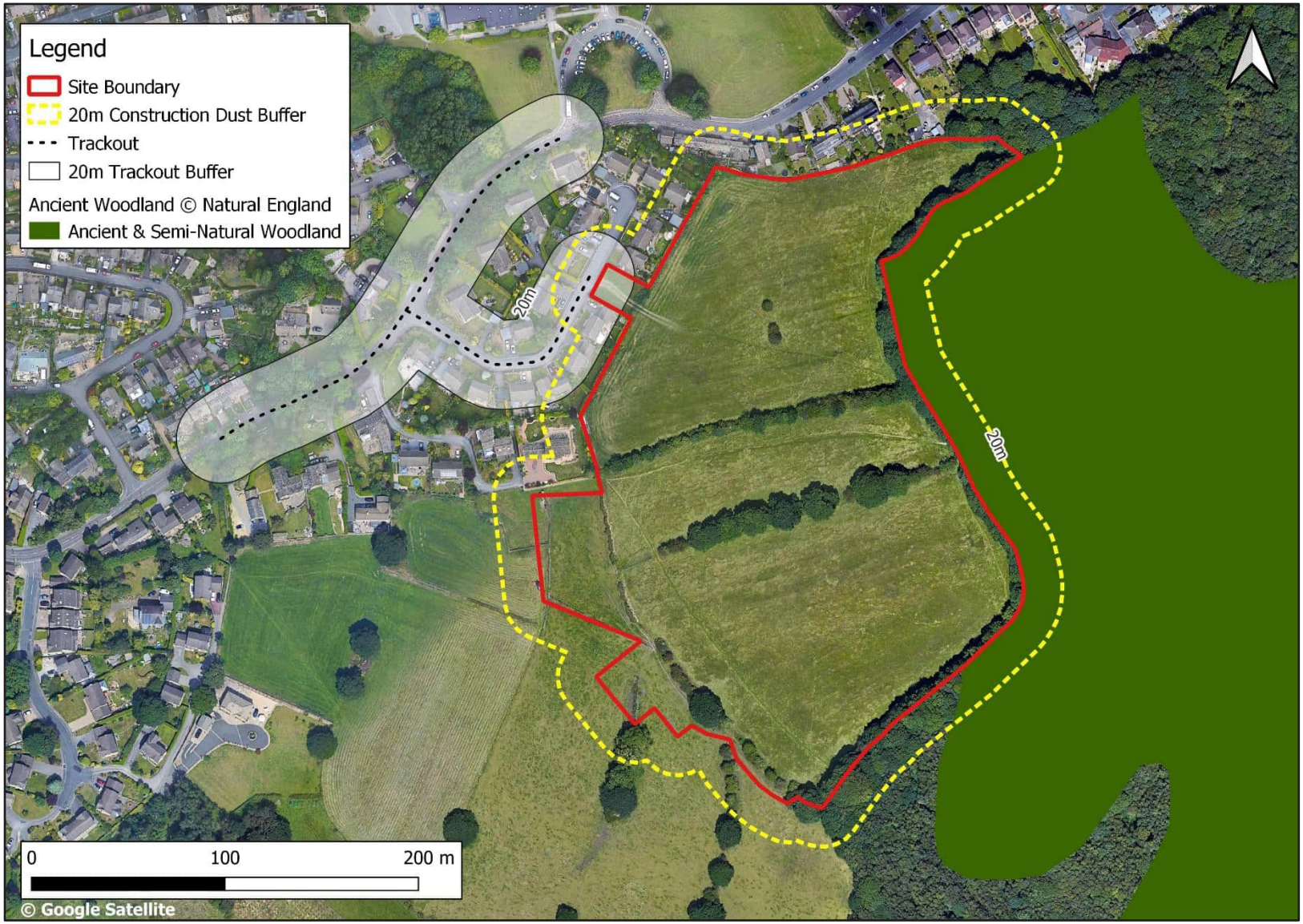


Figure 5-1: Construction Dust Buffers

6.0 Construction Phase Mitigation

As discussed in Section 5.0, construction impacts associated with the Development would result in the generation of dust and PM_{10}. The IAQM guidance outlines a number of site-specific mitigation measures based on the assessed site risk, discussed below.

6.1 Mandatory Mitigation Measures

Potential dust effects during the construction phase considered to be temporary in nature. The impacts are determined to be temporary as they will only potentially occur throughout the construction phase and short-term because these will only arise at particular times when certain activities and meteorological conditions for creating the level of magnitude predicted combine.

With the effective application of the dust mitigation measures it is considered that the overall effect at all receptors will be 'not significant'.

Table 6-1: Mandatory Construction Dust Mitigation Measures

Site Application	Mitigation Measures
Communications	Nearby residents to be notified through a mail drop, prior to onsite works commencing.
	The Site Manager's contact details will be displayed on the Site Boundary and within the resident's mail drop. The Site Manager is the nominated point of contact to address air quality / dust issues.
	Display the head or regional office contact information.
Construction	Ensure sand and other aggregates are stored in bunded areas and are not allowed to dry out, unless this is required for a particular process, in which case ensure that appropriate additional control measures are in place.
Monitoring	Undertake on-site inspection, where receptors (including roads) are nearby, to monitor dust and make the log available to the local authority when asked. Any issues that arise can be logged using the Miller Respect scheme.
	Carry out regular site inspections to monitor compliance with the DMP, record inspection results.
	Increase the frequency of site inspections by the person accountable for air quality and dust issues on site when activities with a high potential to produce dust are being carried out and during prolonged dry or windy conditions.
Operating Vehicle/Machinery and Sustainable Travel	Ensure all vehicles switch off engines when stationary - no idling vehicles, as far as practical.
	Avoid the use of diesel or petrol powered generators and use mains electricity or battery powered equipment where practicable.
	Impose a maximum-speed-limit of 10mph on surfaced and 10mph on unsurfaced haul roads and work areas (if long haul routes are required these speeds may be increased with suitable additional control measures provided, subject to the approval of the nominated undertaker and with the agreement of the local authority, where appropriate). For example, Miller Homes forklifts are restricted to 10 mph.
	Produce a Construction Management Plan to manage the sustainable delivery of goods and materials.
	Implement a Travel Plan that supports and encourages sustainable travel (public transport, cycling, walking, and car-sharing).

Site Application	Mitigation Measures
Operations	Only use cutting, grinding or sawing equipment fitted or in conjunction with suitable dust suppression techniques such as water sprays or local extraction, e.g. suitable local exhaust ventilation systems.
	Ensure an adequate water supply on the site for effective dust/particulate matter suppression/mitigation, using non-potable water where possible and appropriate.
	Minimise drop heights from conveyors, loading shovels, hoppers and other loading or handling equipment and use fine water sprays on such equipment wherever appropriate.
	Ensure equipment is readily available on site to clean any dry spillages, and clean up spillages as soon as reasonably practicable after the event using wet cleaning methods.
Preparing and Maintaining the Site	Plan site layout so that machinery and dust causing activities are located away from receptors, as far as is possible.
	Avoid site runoff of water or mud.
	Remove materials that have a potential to produce dust from site as soon as possible, unless being re-used on site. If they are being re-used on-site cover as described below.
	Blade-off stockpiles to seal.
Site Management	Record all dust and air quality complaints using the Miller Respect scheme, identify cause(s), take appropriate measures to reduce emissions in a timely manner, and record the measures taken.
	Make the complaints log and Miller Respect scheme information available to the local authority when asked.
	Record any exceptional incidents that cause dust and/or air emissions, either on- or offsite, and the action taken to resolve the situation in the log book.
Trackout	Use water-assisted dust sweeper(s) on the access and local roads, to remove, as necessary, any material tracked out of the site.
	Avoid dry sweeping of large areas.
	Ensure relevant vehicles such as tippers entering and leaving sites are covered to prevent escape of materials during transport.
	Inspect on-site haul routes for integrity, as required, and instigate necessary repairs to the surface as soon as reasonably practicable.
	Install hard surfaced haul routes, which are regularly damped down with mobile sprinkler systems, or mobile water bowsers and regularly cleaned.
	Implement a wheel washing system (prior to leaving the site where reasonably practicable).
	Ensure there is an adequate area of hard surfaced road between the jet wash facility and the site exit, wherever site size and layout permits.
	Access gates to be located at least 10m from receptors where possible.
Waste Management	Avoid bonfires and burning of waste materials.

With the application of the above dust control and mitigation measures it is considered that impacts at all receptors will result in a ‘not significant’ effect in accordance with the IAQM guidance.

6.2 Desired Mitigation Measures

Table 6-2 lists the relevant desired measure, which should be employed *as required* following the monitoring framework outlined in Section 7.0 i.e. reactive mitigation, in the event that any complaints occur.

Table 6-2: Desired Construction Dust Mitigation Measures

Site Application	Mitigation Measures
Construction	Avoid scabbling (roughening of concrete surfaces) if possible.
	Ensure bulk cement and other fine powder materials are delivered in enclosed tankers and stored in silos with suitable emission control systems to prevent escape of material and overfilling during delivery.
	For smaller supplies of fine power materials ensure bags are sealed after use and stored appropriately to prevent dust.
Earthworks	Ensure stockpiles are all sealed.

6.3 Cumulative Effects

There is the potential for cumulative dust effects when the construction activities of more than one scheme overlap at an affected receptor location.

Where the construction phase of a development occurs either concurrently or sequentially with the Development, and within the relevant screening distances, there is the potential for a cumulative construction phase dust effect to occur. However, it is noted that other development will also be required to implement good-practice mitigation and dust control measures – as identified by an IAQM construction dust assessment. All individual developments would subsequently conclude to result in a not significant effect based upon commensurately identified mitigation.

As such, the risk of concurrent / sequential construction dust effects associated with other developments are considered to be ‘not significant’.

7.0 Monitoring Framework

Implementation of the mandatory measures presented in Table 6-1 is considered to be sufficient for controlling dust arising from construction activities and minimising potential impacts.

Notwithstanding the above, a proactive approach will be taken to ensure the potential for fugitive dust emissions is minimised throughout the construction phase, rather than pursuing a reactionary approach when a complaint is made.

Furthermore, the effectiveness of the C(E)MP is reliant on compliance with the measures and procedures set out within Table 6-1. To audit this, the contractor shall nominate a suitable person (i.e. Contractor's Site Manager) to undertake Site inspections as set out in Table 6-1 as a minimum requirement for the working area of the Site.

In addition to the Site inspections, monitoring of dust deposition will be undertaken by the nominated person as follows:

- Carry out regular site inspections to monitor compliance with the DMP, record inspection results;
- Increase the frequency of site inspections by the person accountable for air quality and dust issues on site when activities with a high potential to produce dust are being carried out and during prolonged dry or windy conditions; and
- Undertake on-site inspection, where receptors (including roads) are nearby, to monitor dust and make the log available to the local authority when asked. Any issues that arise can be logged in line with the Miller Respect scheme.

If the above routine inspections identify the need to implement further controls, i.e. if the levels of dust deposition are seen to increase significantly during the inspections, further dust controls will be implemented as appropriate – as outlined in Section 6.2. If upon further inspection dust impacts remain persistent, further review of the dust generating activities and effectiveness of the control measures are required.

8.0 Dust Control Responsibilities

8.1 Implementation

The responsibility for ensuring the C(E)MP is adhered to lies with the Site Manager. There shall be a competent person on Site during working hours responsible for the dust management measures. Responsibilities are allocated to specific personnel to ensure dust generation is effectively controlled.

8.2 Roles and Responsibilities

The Site Manger (or persons nominated) is responsible for the tasks outlined below:

- Responsible for the implementation of this plan and preparing reports to the client and the stakeholders as required;
- Responding to complaints and informing the relevant stakeholders where necessary of the complaint, the source of the complaint and any action that was taken;
- Ensure mitigation measures are in place and that the measures within the C(E)MP are being followed, in line with the monitoring framework (Section 7.0); and
- Responding to complaints, assisting with the investigation as to the causes of complaints, and ensuring appropriate mitigation measures are being used or employ further measures if required in consultation the local authority. Dialogue with Local Authority will be supported by Miller Homes Limited Technical Team.

8.3 Training

All employees, contractors and staff working on Site will undergo Site induction training, which will include environmental awareness training, including an understanding of air quality and dust management issues and subsequently sign up to the dust management scheme imposed.

The training will provide specific instructions about:

- Requirement for dust suppression at all times;
- How to avoid and suppress dust across worksite;
- Available dust suppression options;
- Work methods to prevent dust generation;
- Covering trucks loads;
- Sensitive areas / receptors;
- Potential for condition changes and response strategies in windy conditions; and
- The importance of equipment maintenance.

Plant and equipment operators will be trained and experienced in the plant that they operate. Certification will be held on-site and available for inspection.

The importance of working to the requirements of the C(E)MP will be communicated at staff inductions and during daily activity briefings when activities that may create dust are to be undertaken.

9.0 Communication, Complaints and Updating the C(E)MP

9.1 Communication

The measures in this plan should be adhered to at all times. Should any additional measures be required these should be discussed with the Environment Manager before they are implemented.

As noted in Table 6-1 the following measures are mandatory, relating specifically to communication, and are the responsibility of the Contractor's Site Manager and Principal Contractor.

- Display the name and contact details of person(s) accountable for air quality and dust issues on the construction Site boundary. The location of these signs will be on fencing adjacent to the dust sensitive receptors; and
- Display the head or regional office contact information.

9.2 Liaison with the Community and Regulators

The Contractor's Site Manager (or nominated representative) will act as liaison with the regulator and local community for issues relating to dust nuisance. This role being enabled by the communication measures detailed in Section 9.1.

A stakeholder communications plan will be implemented prior to the commencement of work and include community engagement measures. Proactive community liaison will then be maintained, keeping local residents informed of the type and timing of works involved, paying particular attention to potential evening and night-time works (if required) and activities which may occur in close proximity to receptors.

The nominated representative shall respond promptly to all complaints by undertaking an investigation into the dust event, including weather conditions, operations on-site and mitigation measures in place at the time of the complaint. Complainants will be informed of the outcomes of the investigation.

9.3 Complaints Procedure

In order that dust complaints can be substantiated, it is imperative that the Site is immediately informed either by the complainant themselves or the local authority. In accordance with the Miller Respect scheme, signage is to be displayed at prominent positions, this includes a national contact number with service available on a 24/7 basis. Local residents should be encouraged to contact the Site and/or local authority in the event of dust soiling.

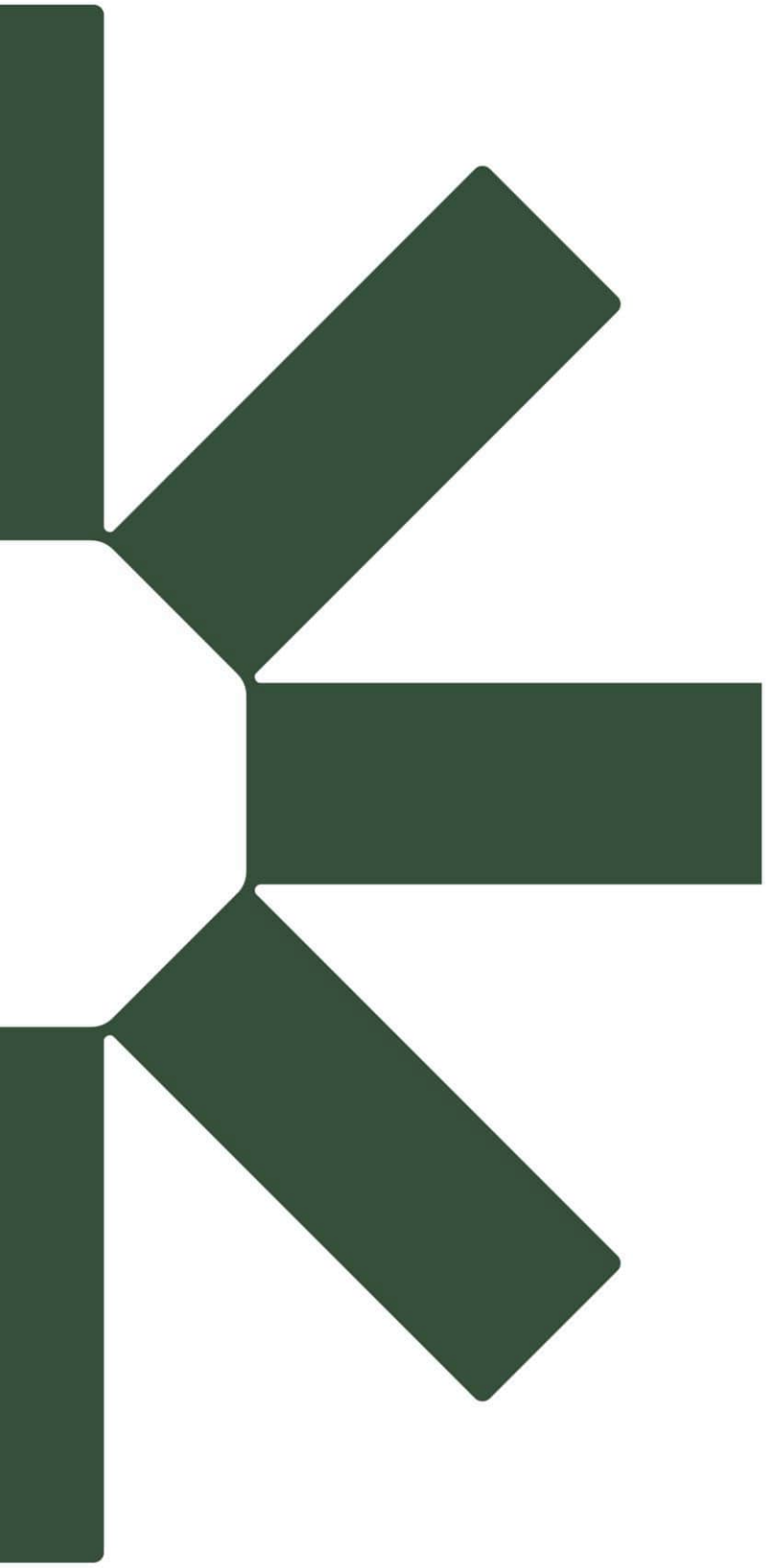
In all instances, upon receipt of the dust complaint at the Site, the details will be recorded in the Site Dust Log. Each complaint should be assigned a discrete complaint number in the Dust Log. In the event of a complaint the stepwise approach to dust complaints should be followed:

- Inform the Site Manager;
- Investigate Site actions and determine whether Site activities are responsible:
    - Note the prevailing weather conditions, operations on-site and mitigation measures in place at the time of the complaint; and

    - If Site activities are responsible, review the efficacy of existing mitigation and apply supplementary controls (see Section 6.2) to minimise and supress the generation of dust. Cease works until rectified, if required.

- Record details of the complaint in the Dust Log and assign a discrete complaint number; and
- Inform the complainant and KC of the above outcomes and necessary action taken (if applicable).

The Dust Log will be held centrally on Site, as part of the Miller Respect scheme, and made available to KC upon request.



Making Sustainability Happen