



TONBRIDGE RIVERSIDE ROUTE

Stage 4 Lighting Design Statement

Tonbridge and Malling Borough Council

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Table of Contents

1.Introduction	3
2. Lighting Standards, Guidelines and Specifications	5
3. Data received	6
4. Lighting Class Selection	7
5. Lighting Specification	9
6. Lighting Design	11
8.Electric Design	16
9. Constraints and Mitigation	18
10. Indicative Costs	19

1.Introduction

- 1.1 Tonbridge and Malling Borough Council (TMBC) commissioned Project Centre (PC) to undertake the roles of Designer and Principal Designer for the development of a new street lighting system along a designated towpath in Tonbridge, Kent.
- 1.2 As part of the commission, PC has developed a comprehensive RIBA Stage 4 detailed design and technical specification for the installation of new street lighting along Phase 1 of the route. This phase covers the section between Vale Road and the western boundary of the former gasholder site.
- 1.3 The design statement follows lighting feasibility study carried out by PC in April 2025 and developed to support Stage 4 lighting design.
- 1.4 For detailed lighting layout plans relating to the riverside route, refer to drawings 1000010826-4-1300-00-03.
- 1.5 The Phase 1 lighting proposal covers a stretch of approximately 260 metres in length.
- 1.6 The route is regularly used by residents and visitors as an active travel and leisure route between Medway Wharf Road and Vale Road. Currently, the path is unlit at night, with minimal ambient light spill from surrounding areas.
- 1.7 The overarching design objective is to provide a safe and appropriately lit environment for users of the route while ensuring that ecological sensitivity and local wildlife habitats are respected and preserved.
- 1.8 All lighting and electrical infrastructure proposed under this phase has been future-proofed to accommodate future extension including provisions in feeder pillar capacity, and cable routing.
- 1.9 The Stage 4 detailed design has been informed by a comprehensive site survey, undertaken to assess landscape features, existing structures, and spatial constraints. These findings directly influenced the positioning of lighting columns, ducting routes, and the location of the proposed feeder pillar. Further details are provided in Chapter 7 of this report.
- 1.10 The proposed lighting scheme has been coordinated with the planned redevelopment of the former Gas Holder site, to ensure integration and avoid future conflicts.
- 1.11 The street lighting system proposed under this scheme is in accordance with Kent County Council (KCC) lighting specifications. Therefore, all lighting and electrical equipment specified conforms to the current KCC-approved

equipment list. Any deviations from standard KCC specifications are noted and justified in Chapter 5.

1.12 This report aims to:

- Provide the rationale behind the assessed lighting levels;
- Present the proposed lighting scheme for Phase 1;
- Detail the lighting and electrical specifications;
- Outline the decision-making process and justification for selected equipment;
- Identify site-specific constraints and outline mitigation measures;
- Indicative cost of installation of lighting and electrical system.

2. Lighting Standards, Guidelines and Specifications

The RIBA Stage 4 detailed lighting design is based on the following standards, guidelines, and specifications:

- BS 5489-1:2020 Code of practice for the design of road lighting, Part 1: Lighting of roads and public amenity areas
- ILP GN01;2021 Guidance Notes for the reduction of obtrusive light
- ILP GN08-2023 Guidance Note 8 Bats and Artificial Lighting
- BS 7671 - Requirements for Electrical Installations
- Gas holder development plans 15772 – 102
- KCC Street lighting list of Approved Apparatus 2025
- KCC Standard Detail 500 Series
- KCC Standard Detail 1300 Series
- KCC Standard Detail 1400 Series
- 1000010583-PCL-LRP-2-01-D00 Tonbridge Riverside Tow Path Lighting Feasibility Report

3. Data received

TMBC have provided PC with the following information to assist with RIBA Stage 4 Detailed Lighting design.

- OS maps
- Public Right of Way information
- Gas holder development plans 15772 – 102
- Gas Holder Development Ecological survey – 2021
- Land ownership information
- C2 Stats information for Gas, Electric, Water, Virgin and Water.

4. Lighting Class Selection

- 4.1 General guidance on the lighting of highways and public realm areas is provided in BS 5489-1:2020.
- 4.2 Table A.5 of BS 5489-1:2020 outlines lighting parameters for the P lighting classes, which are applicable to pedestrian routes and low-speed traffic areas on subsidiary roads.

Table A.5 — *Lighting classes for subsidiary roads*

Traffic flow	Lighting class		
	E1 to E4 ^(A)	E1 to E2 ^(A)	E3 to E4 ^(A)
	Pedestrian and cyclists only	Speed limit $v \leq 30$ mph	Speed limit $v \leq 30$ mph
Busy ^(B)	P5	P4	P3
Normal ^(C)	P5	P5	P4
Quiet ^(D)	P6	P5	P4

Figure 1- BS 5489-1:2020 Table A.5

- 4.3 PC undertook a lighting class risk assessment, using standard weighted tables to determine the most appropriate lighting class for the riverside route. Refer to the Lighting Class Risk Assessment Report for full details.
- 4.4 Key factors considered in the risk assessment include projected pedestrian traffic flow and the appropriate environmental zone classification for the site.
- 4.5 The riverside path is an established and well-used access route for both residents and visitors. A significant increase in pedestrian footfall is anticipated as a result of the proposed Gas Holder site development, which will provide direct access to the route. Therefore, a high level of pedestrian traffic was assumed in the risk assessment.
- 4.6 The route falls within an E3 Environmental Zone, classified as an area of medium district brightness, in accordance with ILP Guidance Note 01/21. The path runs along a river and is generally dark with limited ambient lighting from surroundings.
- 4.7 While Table A.5 of BS 5489-1:2020 suggests P5 lighting class may be suitable for the route, the outcome of the risk assessment supports an increase to P4 lighting class. This is justified based on the route's current use as a primary pedestrian link, its anticipated rise in usage, and the increased demand for user safety and visibility.
- 4.8 In selecting a higher lighting class, additional consideration was given to the presence of existing tree foliage, which may obstruct luminaires and create localised areas of shadow along the route.

- 4.9 P4 lighting levels provide an average illuminance of 5.00-7.50lux and a minimum illuminance of 1lux.

Lighting Class Benchmark Levels	Lux Range	Lux minimum
P4	5.00-7.50 lux	1.00 lux

Table 1- Bench Mark Lighting Levels

- 4.10 Details on lighting equipment proposed to achieve the benchmark lighting levels will be detailed in Chapter 5.

5. Lighting Specification

- 5.1 The lighting equipment specified for the scheme complies with the Kent County Council (KCC) approved specifications. This was agreed with Tonbridge and Malling Borough Council (TMBC).
- 5.2 The table 2 below show specified lighting columns and luminaires for riverside route.

Lighting Asset	Manufacture	Specifications
Lighting Columns	CU Phosco	<ul style="list-style-type: none"> • 5m column • middle hinged • raise and lower column
Luminaires	CU Phosco	<ul style="list-style-type: none"> • P852k Luminaires

Table 2- Lighting columns and Luminaires Specification

- 5.3 CU Phosco 5 metre, post top, mid-hinged (raise and lower) columns have been specified, in line with KCC's minimum approved column height.
- 5.4 The selection of 5 metre columns provides a balance between adequate lighting coverage and efficient installation. It enables greater spacing between columns, thereby reducing the total number of columns required along the route.
- 5.5 Increased spacing between columns also helps to minimise the potential for conflicts with existing trees, built structures, and underground utilities along the route.
- 5.6 The interface with existing trees due to column height were mitigated by carrying out site visit and adjusting the column locations to avoid clashes.
- 5.7 Mid-hinged (raise and lower) columns were proposed to facilitate maintenance without the need for specialist vehicles such as cherry pickers. This allows luminaires to be safely lowered and maintained at ground level. The folding direction of each column was confirmed during site visits to ensure no obstruction from surrounding trees. Further details are provided in Chapter 7.
- 5.8 Retaining wall structure was identified along the section of riverside route. There is also planned development at Gas Holder Development site. To accommodate potential site constraints and future development interfaces, a flexible column foundation solution was required.
- 5.9 Lighting columns located near the retaining wall and the development boundary (columns PRLC05, PRLC06, PRLC07, PRLC08, and PRLC09) will be installed on NAL retention sockets with duckfoot bends. This allows for easier relocation or adjustment of column positions in the future if required.

- 5.10 The final size and specification of the NAL retention sockets will be confirmed following trial hole investigations.
- 5.11 The selection of appropriate luminaires was a key aspect of the design, given the proximity to the river, local habitats, and ecological sensitivities. The design principle was to minimise environmental impact while providing a cost-effective and sustainable lighting solution.
- 5.12 CU Phosco P852k luminaires have been specified in accordance with KCC requirements. Luminaire details, including optics, are provided in the accompanying table:

Luminaire Detail	Notes
Supplier	CU Phosco
Type	P852k
Optics	C1P
Lamp Flux (klm)	1.95
Wattage	17W
Glare Rating	G4 full cut off
Additional Equipment	Back Shield

Table 3- CU Phosco P852k luminaires specification

- 5.13 The luminaire optics have been selected to minimise backward and forward light spill—particularly into adjacent vegetation and towards the river.
- 5.14 To further reduce backward light spill into vegetation, a back shield option for the luminaire was selected.
- 5.15 The G4 full cutoff optic for luminaire design ensures that upward light is eliminated, thereby reducing sky glow and limiting light pollution.
- 5.16 The selected light source colour temperature is warm white (2700K). This warmer spectral profile is justified as it significantly reduces the blue light content, which is known to attract wildlife species. Reducing blue light content supports biodiversity by minimising disruption to foraging, commuting, and resident species sensitive to artificial light.
- 5.17 The lighting system will operate from dusk to dawn, controlled by photocells mounted on each luminaire. In addition, the system has been future proofed for integration with a Central Management System (CMS), if required.

6. Lighting Design

- 6.1 PC has completed detailed lighting calculations for the riverside route to achieve compliance with P4 lighting class, in accordance with the requirements of BS 5489-1:2020.
- 6.2 The lighting design model includes 9No. 5 metre lighting columns, with spacing varying between 25 and 31 metres.
- 6.3 Lighting columns have been positioned along the edge of the shared path, within the public right of way as confirmed by Tonbridge and Malling Borough Council (TMBC). Each column is located approximately 0.91 metres (3 feet) from the centreline of the tarmac path.
- 6.4 All luminaires are mounted at 0-degree tilt and oriented to face towards the river course.
- 6.5 The lighting design achieves compliance with the P4 lighting class, delivering an average illuminance of 5 to 7.5 lux, with a minimum maintained illuminance of 1 lux. For details refer to calculation report 1000010826-PCL-LCP-4-P01-01-V0. The achieved lighting levels are shown Table 4 below:

Area	Benchmark Lighting Class	Average Lux	Minimum Lux
P4 Riverside route	Eav 5.00-7.50 lux Emin 1.00 lux	6.29	1

Table 4 – Achieved Lighting Levels

- 6.6 The illuminance contour plots were set at 1, 2, 5, 10, 15, 20 and 25 lux to assess the lighting distribution.
- 6.7 On average twilight condition, minimum lighting level 1lux was achieved approximately 8 meters in front of proposed columns towards river course and approximately 4 meters to the back of lighting column. For lighting coverage and contour plans refers to lighting calculation report 1000010826-PCL-LCP-4-P01-01-V0.

7. Site Visit

7.1 An initial site visit was undertaken in March 2025 as part of the lighting feasibility study for the Tonbridge Riverside Towpath. The visit focused on the following key aspects:

- General usage and accessibility of the route
- Existing landscape features
- The presence and extent of retaining wall structures along a section of the Phase 1 route.

7.2 Further details from the initial site observations are documented in the Lighting Feasibility Report 1000010583-PCL-LRP-2-01-D00.

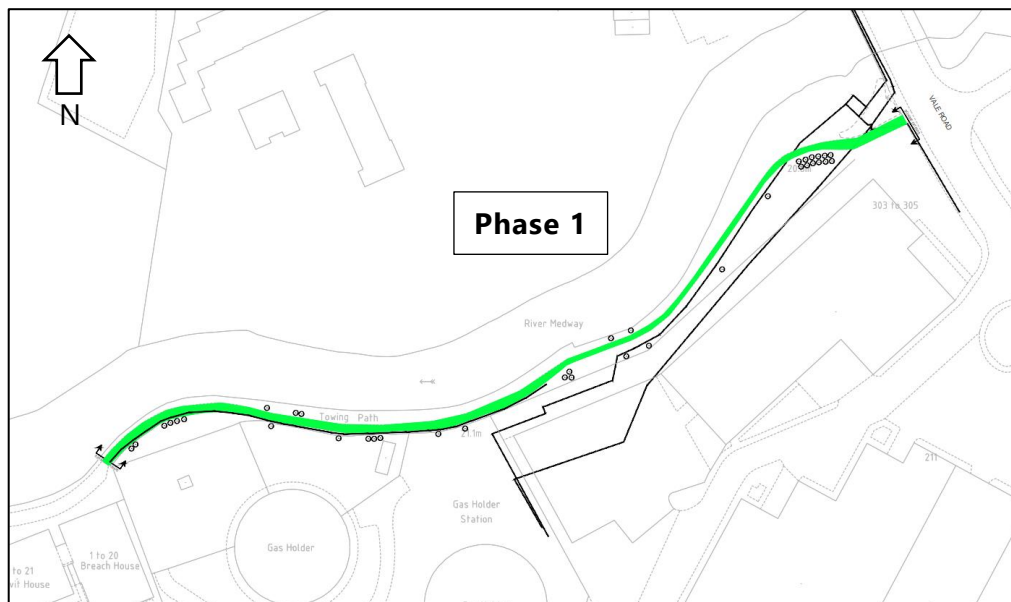


Figure 2 – Overview of riverside route phase 1. Image from Project Centre

7.3 A subsequent site visit was conducted in July 2025 to inform and finalise the detailed lighting design.

7.4 During this visit, the proposed lighting column locations were cross-checked against the locations of mature trees along the route. A measuring wheel was used to accurately assess distances between proposed lighting and electrical assets. The following key elements were assessed:

- Visual assessment of the site
- Potential conflicts of proposed lighting column with existing trees
- Appropriate folding directions for mid-hinged (raise and lower) columns to ensure safe and efficient maintenance.

7.5 Each proposed lighting column location was reviewed and adjusted as necessary based on the site findings and identified constraints.

- 7.6 The new column locations on site were crosschecked and confirmed with the performed lighting design calculation model.
- 7.7 Examples of lighting column positions assessed during the visit are shown below:



Figure 3– Lighting column locations assessed during the site visit. Images from Project Centre

- 7.8 In specific locations, selective tree cutbacks and clearance may be required to prevent obstruction of luminaires and to allow safe folding of the raise-and-lower columns for maintenance access.
- 7.9 The public right of way along the riverside route was confirmed by Tonbridge and Malling Borough Council as extending three feet (0.91m) on either side of the centreline of the existing tarmac path.

- 7.10 On-site measurements were undertaken to confirm that all proposed lighting columns and the private ducting route fall within the confirmed public right of way.



Figure 4 – Public right of way. Images from Project Centre

- 7.11 The proposed lighting column locations were also reviewed in relation to the existing retaining wall structure that runs along part of the route.



Figure 5 – Retaining Wall Structure. Images from Project Centre

- 7.12 Five of the nine proposed lighting columns will interface directly with the retaining wall structure. Lighting column foundation installation using NAL retention sockets, have been adopted to allow flexibility in positioning.

- 7.13 A gas access chamber was identified during the site visit. Further review of C2 utility records revealed the presence of medium and high-pressure gas mains, owned by Scotia Gas Networks (SGN), running along a section of the route.
- 7.14 A clash check was undertaken to assess potential conflicts between proposed lighting columns, electrical duct routes, and existing SGN gas infrastructure. Figure 6 below illustrates the alignment of the gas mains along the riverside route.

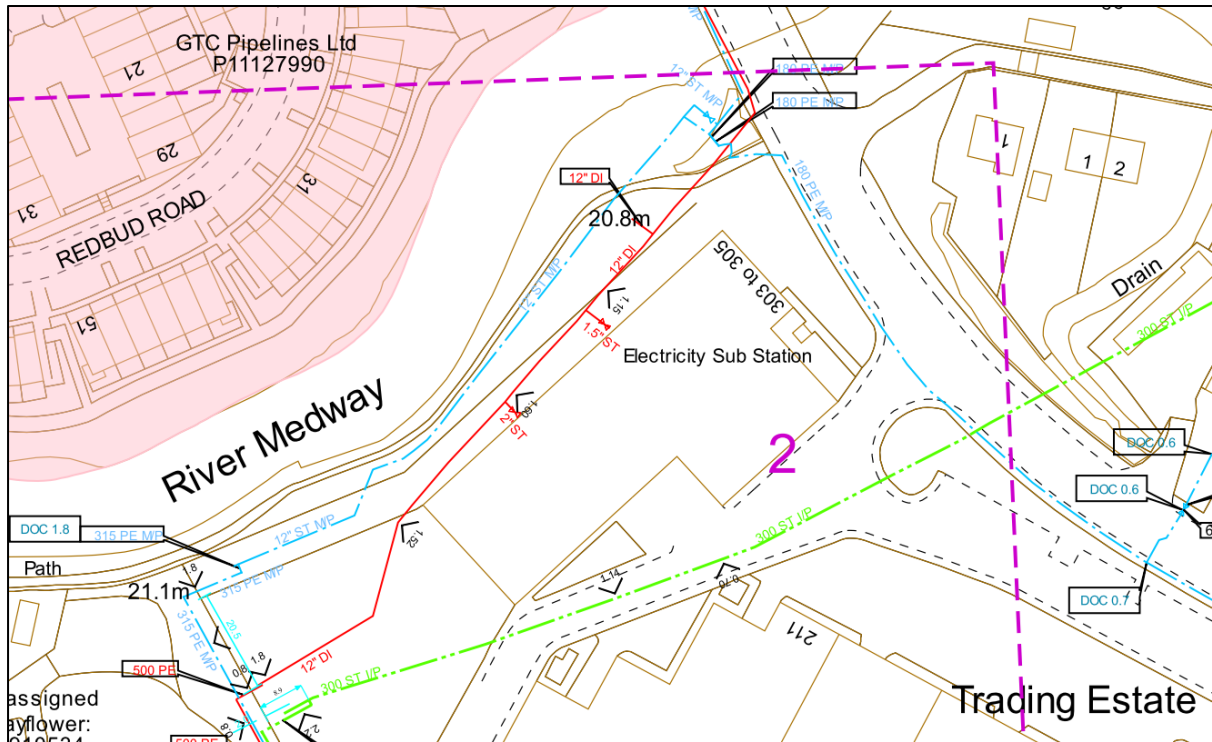


Figure 6 – Gas Network Plan. Plan from Linesearch.

8. Electric Design

- 8.1 The proposed lighting assets will be privately supplied via a single-phase feeder pillar.
- 8.2 A 25A rated, 4-way feeder pillar, manufactured by Charles Endirect, has been specified for the scheme.
- 8.3 The location of the feeder pillar was determined following a review of UKPN C2 utility plans, as shown in Figure 7. Low Voltage (LV) distribution cables were identified along Vale Road, with existing DNO-supplied street lighting columns along the adjacent road, confirming the presence of underground LV infrastructure.

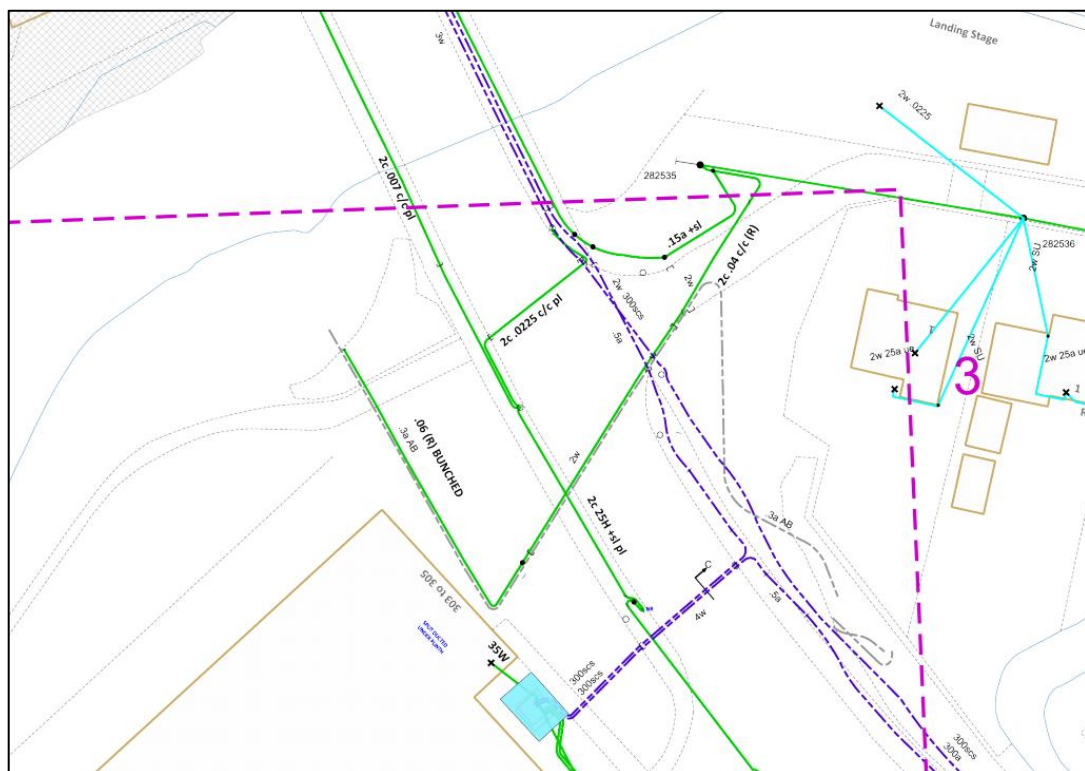


Figure 7 – UKPN Stats Plan Vale Road. Plan from UKPN

- 8.4 Accordingly, the feeder pillar is proposed to be located at the eastern entrance to the riverside route, adjacent to Vale Road, to facilitate the connection to existing LV services.
- 8.5 The feeder pillar will provide private supply to proposed 9No. lighting columns (Additional lighting column as part of future proofing considered). A staggered circuit arrangement is proposed, whereby alternate columns are connected to the same circuit. This ensures that, in the event of a single circuit failure, the entire riverside route is not left unlit.

- 8.6 100mm internal diameter UPVC ducting will be installed in accordance with Kent County Council (KCC) specifications.
- 8.7 Ducting route is proposed running at the edge of tarmac path within the public right of way at 350mm depth.
- 8.8 It is proposed that all trenching for the ducting route be carried out by hand, under the supervision of an arboriculturist, to protect nearby trees and sensitive vegetation from disturbance.
- 8.9 Private cables for the lighting columns will be terminated within access chambers located adjacent to proposed columns PRLC08 and PRLC09, in order to facilitate future connections as part of Phase 2 of the lighting scheme.
- 8.10 Both the feeder pillar and private cable sizing have been future-proofed in terms of their capacity to accommodate future lighting installations. Refer to lighting schematics 1000010826-4-1400-01-02 for further details.

9. Constraints and Mitigation

- 9.1 Developing a lighting system compliant with relevant standards for the riverside route presents several challenges due to site-specific constraints. These constraints were assessed in detail, and appropriate mitigation measures have been proposed as part of the design process.
- 9.2 Numerous mature trees are located along the route. To ensure the protection of these trees and their root systems, further investigation will need to be undertaken through trial holes. This will confirm the viability of proposed lighting column locations and ducting routes without causing damage to tree roots.
- 9.3 All trial holes and trenching works will be carried out by hand, under the supervision of an arboriculturist. This approach avoids the use of mechanical excavation equipment, thereby minimising ground disturbance and reducing the risk of harm to existing vegetation and root structures.
- 9.4 Trial holes will also be necessary at column locations adjacent to the retaining wall structure. These investigations will confirm the orientation and depth of wall footings to avoid any structural conflicts during lighting column installation.
- 9.5 To mitigate risks associated with retaining walls and the proximity of future developments (e.g. the Gas Holder site), lighting columns in these areas will be installed using NAL retention sockets. This installation method allows for future relocation or adjustment of columns without the need for disruptive civil works.
- 9.6 As part of the lighting design process, proposed column locations were carefully reviewed to avoid obstruction by existing trees. Adjustments were made where necessary to optimise column siting. However, certain areas were identified where regular tree cutbacks and vegetation clearance will be required to prevent obstruction of luminaires and ensure ongoing lighting performance.

10. Indicative Costs

10.1 Indicative installation costs for proposed lighting system for Phase 1 riverside route are shown in Table 5.

Description	Unit Price (£)	Allowance	Total (£)
5m middle hinged lighting column, install and supply	£1,500	9 columns	£13,500
NAL Access Chamber /Cover	£1,000	4 units	£4,000
NAL retention socket	£2,500	5 units	£12,500
Private electric works		9 columns	£13,000
LED lantern, install and supply	£1,000	9 units	£9,000
Feeder pillar, install and supply	£1,500	1 unit	£1,500
Trial holes	£330	9 columns	£3,500
Arboriculturist	250/day	2 weeks	£3,500
New DNO metered supply (indicative)	£3,000	1	£3,000
Hand digging trench for lighting (allowance)	£12,000	1	£12,000
Site clearance (Tree foliage, vegetation)	-	-	£3,000
Traffic and pedestrian management	£5,000	1	£5,000
Total			£83,500
Total +12.5% contingency			£93,937.50

Table 5 – Indicative installation costs

10.2 The typical lifespan of a lighting column is approximately 25 years, while a luminaire has an expected operating life of around 100,000 hours. Indicative ongoing maintenance costs are shown in Table 6.

Description	Unit Price (£)	Allowance	Total (£)
Electrical Test for lighting columns 4 times over 25+ year life span of lighting column (9 LCs x 4 tests)	£200	40	£8,000
Structural Test for lighting columns 4 times over 25+ year life span of lighting column (9 LCs x 4 tests)	£400	40	£16,000
Electrical Test for feeder pillar 4 times over 25+ year life span of feeder pillar (9 LCs x 4 tests)	£500	4	£2,000
Total over 25 years			£26,000
Total per year			£1,040

Table 6 – On going maintenance cost

10.3 The high-level estimated annual electricity cost for privately supplying 9No. lighting columns along the riverside route, is approximately £9,500. This estimate is based on the UK average of 4,100 burning hours per column per year, and an electricity rate of £0.256 per kWh.

10.4 Table 7 below provides an indicative summary of the estimated costs associated with the installation, maintenance, and electricity supply for the proposed lighting system along the Riverside Route.

Description	Total (£)	Notes
Installation Cost	£93,937.50	Groundwork, site clearance, supply/installation of lighting and electric assets, DNO connections and traffic/pedestrian management.
On-going maintenance cost (Annually)	£1,040	Based on 4No Inspection over the span of 25 years
Electric supply cost (Annually)	£9,500	Based on 4,100 burning hours per year at £0.256 per kWh

Table 7 – Summary cost

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By adopting our QMS on all aspects of the Company, Project Centre aims to achieve the following objectives:

- Ensure a clear understanding of customer requirements;
- Ensure projects are completed to programme and within budget;
- Improve productivity by having consistent procedures;
- Increase flexibility of staff and systems through the adoption of a common approach to staff appraisal and training;
- Continually improve the standard of service we provide internally and externally;
- Achieve continuous and appropriate improvement in all aspects of the company;

Our Quality Management Manual is supported by detailed operational documentation. These relate to codes of practice, technical specifications, work instructions, Key Performance Indicators, and other relevant documentation to form a working set of documents governing the required work practices throughout the Company.

All employees are trained to understand and discharge their individual responsibilities to ensure the effective operation of the Quality Management System.



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