



SILVERTOWN TUNNEL

DOCUMENT TITLE:

Lighting Management Plan – Planning

DOCUMENT NUMBER:

ST150030-RLC-ZZZ-ZZ-ZZ-PLN-EN-0002

PURPOSE OF ISSUE	For Acceptance	DOCUMENT SUITABILITY	S3 - For Review & Comment	TOTAL PAGES (Including this page)	11
-------------------------	----------------	-----------------------------	---------------------------	--	----

Prepared by	Checked by	Approved by	Date	Revision
[Redacted]	[Redacted]	[Redacted]	21/02/2020	P01
CJV Environmental Manager	CJV Consents Manager	CJV Project Director		

Issue and Revision Control

Document uncontrolled when printed.

Revision History			
Rev No	Date	Summary of Changes	Section & Number
P01	21/02/2020	First Issue	

Contents

1. Overview	4
1.1 Introduction	4
1.2 Purpose	4
1.3 Project Details	4
2. Planning	5
2.1 Code of Construction Practice Requirements	5
2.2 Environmental Statement	5
2.3 Legislation and Guidance	5
2.4 Receptors	6
2.5 Roles and Responsibilities	6
2.6 Training and Awareness	7
2.7 Communication	8
3. Operational Control	9
3.1 Site Layout	9
3.2 Lighting Direction	9
3.3 Working Hours	9
3.4 Control of Marine Lighting	9
3.5 Other Considerations	10
3.6 Community	10
4. Checking	11
4.1 Monitoring and Compliance	11
4.2 Review	11

1. Overview

1.1 Introduction

The Silvertown Tunnel (STT) scheme involves the construction of a twin bore road tunnel providing a new connection between the A102 Blackwall Tunnel Approach on the Greenwich Peninsula (Royal Borough of Greenwich) and the Tidal Basin roundabout junction on the A1020 Lower Lea Crossing / Silvertown Way (London Borough of Newham). The project was formally granted development consent through a Development Consent Order (DCO) issued by the Department of Transport in May 2018. STT will be approximately 1.4km long and able to accommodate large vehicles including double-decker buses. It will include a dedicated bus, coach and goods vehicle lane, enabling TfL to provide additional cross-river bus routes. The scheme also includes the introduction of free-flow user charging on both the Blackwall Tunnel (northern portal located in London Borough of Tower Hamlets) and the new Silvertown Tunnel.

Transport for London (TfL) have entered into a Project Agreement with the Project Company Riverlinx (Project Co) who are responsible for the detailed design, construction, financing and maintenance of the tunnel and supporting infrastructure. A 5 year period of design and construction will be followed by a further 25 years of operation and maintenance. The Project Co has appointed Riverlinx CJV as the Design and Construction (D&C) Contractor responsible for undertaking the detailed design and construction of the STT scheme all in accordance with the constraints and parameters of the Development Consent Order (DCO), TfL specifications and other commitments made by TfL to stakeholders. Riverlinx CJV is a joint venture formed between Ferrovial Agroman (UK) Ltd, BAM Nuttall and SK Engineering and Construction Co Ltd.

1.2 Purpose

The purpose of the Lighting Management Plan (LMP), prepared by Riverlinx CJV, is to detail how Riverlinx CJV will approach the management of artificial site lighting in order to avoid undue light intrusion on local residents, the operation of the Docklands Light Railway (DLR), passing road users, navigation lights for air or water traffic, wildlife and adjacent habitats during the construction of STT. It is to be noted that this plan does not seek to control matters of lighting associated with the operation of the STT once construction has ceased.

1.3 Project Details

The tunnel will cause changes to the existing road network on both sides of the River Thames. On the south side of the river, on the Greenwich Peninsula, the following changes to the A102 Blackwall Tunnel approach will be needed; widening the A102 Blackwell Tunnel approach to create space for STT approach lanes, building a new flyover for the southbound traffic from the Blackwall Tunnel to cross above the Silvertown Tunnel approach lanes and introducing new signage to direct traffic. On the north side of the river, in Silvertown, the following changes will occur; modification of the existing Tidal Basin Roundabout to connect the STT approach roads with Dock Road, realigning the Dock Road so that it links with the modified roundabout and introducing new pedestrian and cycle facilities within the modified roundabout.

2. Planning

2.1 Code of Construction Practice Requirements

The Code of Construction Practice (CoCP) requires the following;

- Adoption of appropriate industry standard procedures to be implemented at all worksites. Lighting shall be designed, positioned and directed so as not to unnecessarily intrude on adjacent buildings and so as to prevent unnecessary interference with local residents, the DLR, passing motorists, the navigation lights for air or water traffic, wildlife breeding seasons and adjacent habitats that may be used by foraging and commuting bats.
- Site specific lighting measures to minimise the adverse impacts on adjacent buildings, wildlife sites and land uses will be taken from and applied in accordance with the 'Guidance Notes for the Reduction of Obtrusive Light GN01:2011' (published by the Institution of Lighting Professionals).
- Use of cowling, reflectors and other measures where practicable on the temporary jetty to avoid excessive light pollution to surrounding areas.

2.2 Environmental Statement

The STT Environmental Statement (ES) established that the current baseline lighting levels across the STT order limits would be categorised as "high district brightness area" under the Guidance Notes for the Reduction of Obtrusive Light (ILE, 2005) stating; "The Environmental Zone which is considered to best describe the areas in which the Scheme will be built and operated (both sides of the River Thames) have been identified as E4 (high district brightness areas, e.g. town/city centres with high levels of night-time activity)" nonetheless there are receptors that could be affected by temporary lighting emanating from Riverlinx CJV site activities that will require the application of site specific mitigation.. In addition, the ES also states "Construction activities associated with the Scheme, namely the movement of plant and vehicles, creation of compounds, and material stockpiles, would introduce temporary elements within views. These activities, with exception of crane use, would generally only be perceived in close proximity of the worksites and are similar in nature to industrial activities currently undertaken in the locality of the Scheme. Use of cranes would not be out of character with the locality given other tall structures, including operational docklands wharf-side cranes and the Emirates Airline.

2.3 Legislation and Guidance

All works will planned to adhere to the following legislation and guidance:

- Environmental Protection Act 1990
- Clean Neighbourhoods and Environmental Act 2005
- Wildlife & Countryside Act 1981
- Conservation (Natural Habitats etc.) Regulations 1994
- The Merchant Shipping (Distress Signals and Prevention of Collisions) Regulations 1996
- DEFRA Lighting in the Countryside: Towards Good Practice 2001
- Guidance Notes for the Reduction of Light Pollution, 2000
- Interim Guidance: Artificial lighting and wildlife - Recommendations to help minimise the impact of artificial lighting
- Guidance Notes for the Reduction of Obtrusive Light (ILE, 2005)
- Silvertown Tunnel Code of Construction Practice (CoCP)
- Silvertown Tunnel Development Consent Order (DCO)

In accordance with current Guidance Notes for the Reduction of Obtrusive Light (ILE, 2005) the following definitions are used to describe lighting effects. Riverlinx CJV will employ best practice to obtrusive light through a number of means described in Section 4 below.

- Sky glow: The upward spill of light into the sky which can cause a glowing effect and is often seen above cities when viewed from a dark area.
- Light spill: The unwanted spillage of light onto adjacent areas which may affect sensitive receptors, particularly residential properties and ecological sites.
- Glare: The uncomfortable brightness of a light source against a dark background which results in dazzling the observer, which may cause nuisance to residents and a hazard to road users.

2.4 Receptors

Artificial lighting deriving from construction operations have the potential to impact upon a range of receptors, these are summarised in Table 1 below. The receptors listed within the table are likely to be present in the vicinity of some or all the areas Riverlinx CJV will be working within and therefore shall be considered when establishing temporary lighting.

Receptor	Impact
Bats	Artificial lighting is known to have a detrimental effect on a wide range of mammals; however, it is believed to be most clearly seen in bats. Light falling on a bat roost exit point, regardless of species, will delay bats from emerging, shortening the amount of time available to them for foraging. As the main peak of nocturnal insect abundance occurs at and soon after dusk, a delay in emergence means this vital time for feeding is missed. At worst, the bats may feel compelled to abandon the roost. Lighting can be particularly harmful if it illuminates important foraging habitats such as river corridors, woodland edges and hedgerows used by bats. Artificial lighting also impacts upon bat's prey - lamps with a high ultraviolet (UV) content can "hoover" up to 75% of the insects from a habitat. This is called the vacuum effect. Around one third of these insects will die.
Invertebrates	Disruption to natural light patterns disrupts invertebrate feeding, breeding and movement. Invertebrates such as moths are attracted to the light which can cause disorientation and confusion consequently making them vulnerable to predators. The polarisation of light by reflective surfaces attracts insects, particularly egg laying females away from water. Reflected light has the potential to attract pollinators and impact on their populations, predators and pollination rates.
Aquatic species	Direct lighting onto watercourses can inhibit the movement of photophobic species such as eel (Anguilliformes). Ultra-violet lighting can have an adverse impact on phytoplankton populations.
Occupants of nearby buildings	Potential for artificial lighting to cause nuisance to occupants of nearby residential and commercial properties. Could affect sleep and potentially impact upon health and wellbeing of those around the site.
Pedestrians	Potential for site hoarding(s) to cast a shadow on footpaths and create poorly lit, dark areas which could lead to security and/or safety issues.
Vehicular and river traffic	Glare from site lighting could potentially disturb road and river users and affect vision and/or concentration.

Table 1 Light sensitive receptors

2.5 Roles and Responsibilities

The Riverlinx CJV Project Director is ultimately responsible for the implementation of the LMP during the construction of STT however many members of the Riverlinx CJV shall have responsibility for elements of lighting management appropriate to their function, experience and seniority. The Riverlinx CJV Environmental Manager will lead on lighting management and act as the key advisor on all related matters including compliance with the plan.

Table 2 provides details of the personnel working on the project with specific responsibilities in relation to lighting management.

Role Title	Responsibilities
Project Director	<ul style="list-style-type: none"> • Provide adequate environmental resources and support to effectively deliver the requirements of this plan
Environmental Manager	<ul style="list-style-type: none"> • Develop and implement the LMP • Identify and maintain compliance with the requirements and principles of the LMP during construction • Assist lead auditors in auditing the LMP • Identify, develop and provide environmental training as required specific to the LMP • Approve method statements and consider LMP requirements • Advise and instruct construction teams in the event of incidents and complaints • Liaise/meet with external stakeholders
Environmental Advisors	<ul style="list-style-type: none"> • Inspections on compliance with the LMP requirements • Brief LMP requirements to relevant teams • Advise and guide project team in the implementation of lighting controls • Identify ideas for improvement to environmental manager for consideration. • Report best practice across the project • Assist in incident investigations and reporting • Encourage near miss reporting and identify trends
Ecologist	<ul style="list-style-type: none"> • Provide guidance on lighting arrangements to ensure that the ecological impact of lighting associated with the project is minimised.
Section Manager	<ul style="list-style-type: none"> • Ensure site lighting is established in accordance with the LMP • Ensure staff are aware of the requirements of the LMP • Ensure site documentation (method statements and environmental risk assessments) include lighting arrangements. • In conjunction with the environment team deliver regular training to the site team
Community Construction Liaison Manager	<ul style="list-style-type: none"> • Liaise with the environmental manager to report and mitigate complaints relating to environmental nuisance
All Personnel	<ul style="list-style-type: none"> • Carry out the works in accordance with agreed methods and briefings. • Report anything that deviates from agreed processes. • Report all identified lighting incidents and examples of best practice to section managers • Attend environmental training.

Table 2 Riverlinx CJV LMP Roles and Responsibilities

2.6 Training and Awareness

The Riverlinx CJV Environmental Team will provide training to staff and operatives at all levels (and, when appropriate, to others involved in or affected by work activities) to achieve and maintain a high standard of environmental awareness and risk control. The construction team will be briefed on the requirements of the LMP, with a focus on higher risk phases of work including tunnel boring operations undertaken on a 24 hour basis, winter months when daylight is shortened and artificial lighting needs increase and prior to the commencement of river working on the appropriate mitigation that accords with the principles of the LMP. Environmental information on lighting management will be displayed in offices, site cabins and at sensitive locations to increase awareness of specific lighting issues. All those working for Riverlinx CJV or on behalf of Riverlinx CJV shall undertake an

induction that includes an introduction to the key aspects of environmental management on the project including information on the LMP. In addition, all Riverlinx CJV personnel will undertake the bespoke Environmental Awareness training session that will introduce personnel to how to manage site environment risks relevant to STT and provide practical guidance for specific topics including lighting. The Environmental Team and the Riverlinx CJV construction team will deliver lighting themed toolbox talks to site teams making use of best practice materials from parent companies and organisations such as CIRIA.

2.7 Communication

External communication on environmental matters will occur in a number of ways. The Riverlinx CJV Environmental Manager, Consents Manager and members of the Environmental Team will meet local authorities at appropriate and agreed intervals to keep them apprised of lighting matters. The Riverlinx CJV Community Relations representative will seek to maintain dialogue with local communities and associations by various means including the Helpdesk. Should lighting incidents occur due to CJV construction activities, Riverlinx CJV will report details to the relevant authorities.

3. Operational Control

3.1 Site Layout

The extent of areas that will be required to be lit varies during the different stages of construction and according to security and health and safety requirements. Before new works commence, the requirements for the levels of lighting required will be assessed to ensure that lighting is kept to the correct (and safe) levels to avoid unnecessary lighting impacts. Lighting will be positioned away from receptors and lighting arrangements will be designed, positioned and directed so as not to unnecessarily intrude onto adjacent buildings, wildlife sites and land uses. Method statements will include lighting arrangements and any mitigation measures that will be adopted to minimise light obtrusion. Riverlinx CJV's ecologist will be consulted (as necessary) as site layouts and lighting designs are being planned to prevent lighting having adverse impacts upon ecological receptors at each site. Bat roosts and nesting bird areas will not be directly illuminated or any other dark vegetated areas that may have the potential to contain them. Lighting will also be positioned to prevent interference with local residents, road traffic signals and signage, passing motorists or navigation lights for air or water traffic. Each area and phase of works will be reviewed as the project evolves to ensure that the site layout meets the standards set out in this plan. Screening will be used on site, where practicable, to limit any unavoidable impacts arising from light spill, sky glow and visibility from nearby residential receptors. It will also be used as a last resort where directed lighting is not practicable. Existing vegetation shall be retained as far as possible to provide a natural screen to site activities.

3.2 Lighting Direction

Lighting will only be directed towards areas required to be lit to ensure its efficient use. Lighting will be downward facing to minimise any light spill (typically at an angle of approximately 70°, thereby reducing spill and glare) unless there is a particular safety requirement. Glare can also be reduced by ensuring that lighting column heights are as low as possible to reduce beam angles. Where appropriate, lighting baffles and cowling measures will be used to prevent light spilling beyond site boundaries and glare onto the public highway. Light trespass onto the public highway will be prevented to ensure that road users are not affected. Precautions will be taken to avoid shadows cast by the site hoarding on surrounding footpaths, roads and amenity areas. Where appropriate, lighting to site boundaries will be provided and will be sufficient to provide for the passing public.

3.3 Working Hours

It is anticipated that sites will only be lit at night if required for security. Otherwise, the presumption will be that site lighting is turned off when the site is secured. Riverlinx CJV will predominantly conduct construction activities during normal working hours of 08:00 to 18:00 Monday to Friday and 08:00 to 13:00 on Saturday with no work taking place on Sundays or bank/public holidays. To maximise productivity within the core hours, Riverlinx CJV will require a period of up to one hour before and up to one hour after normal working hours for start-up and close down of activities. Where practicable activities will be undertaken by use of natural light and will be supplemented with artificial light during the winter. Riverlinx CJV will undertake tunnel boring works and associated supporting activities on a 24 hour, seven day a week basis. Associated supporting activities will include above ground works such as lifting operations into and out of the TBM launch/reception chambers, movement and manufacture/fabrication of materials required for tunnelling (including segments) on site, movement of tunnel spoil using conveyors, HGVs and barges, production/treatment and transportation of concrete and slurry for use in the tunnels, dewatering activities, and any other works required to ensure the continued safe operation of the tunnelling works. All these activities will require substantial lighting however the principles about minimising and avoiding light obtrusion where possible will be applied.

3.4 Control of Marine Lighting

Foreshore and aquatic lighting are an essential feature for the safety and security of site personnel and river users. The control measures stated above will apply to lighting for foreshore and river-based activities and will be followed as much as is reasonably practicable. Due to the sensitivity of the aquatic environment and the potential adverse

impact caused by lighting, lighting will be kept to a minimum and only used when essential. Lighting on the river berthing facility will be designed to minimise light levels in the marine environment. The lighting of the berth (proposed to be located within the London Borough of Newham) would have the lamps facing out to the watercourse, to facilitate unimpeded loading and unloading operations. Reflectors, that avoid excessive light pollution to surrounding areas, will be used. Lighting of the berth will be switched off or reduced when not in use for barge loading or unloading.

3.5 Other Considerations

Where practicable, the following measures will be implemented to minimise the environmental impact of lighting:

- Avoid light sources emitting ultra-violet and aim for lighting that peaks higher than 550 nm as much as is reasonably practicable. UV lighting has the potential to impact upon phytoplankton populations within the river. White LED lights do not emit UV but can potentially disturb slow flying bat species.
- Avoid reflective surfaces under lighting to ensure that light does not reflect onto or have an adverse impact upon sensitive receptors in the vicinity of a site.

3.6 Community

As part of Riverlinx CJV's commitment to ensuring its operations do not impact on local residents, a community contact number will be provided on the site hoardings and publicly distributed material. This will allow local residents to contact the project helpline should they feel the need to. Any complaints or enquiries received from local residents will be investigated and dealt with in a timely manner.

4. Checking

4.1 Monitoring and Compliance

During the construction phase Riverlinx CJV will monitor the effectiveness of the LMP. This will be undertaken by the Environmental Team and Section Managers and will include inspections and audits to confirm compliance with the plan. Any findings or non-conformances will be addressed, and further action will be taken where deemed appropriate. Environmental incidents will be recorded, and near miss reporting will be encouraged through the use of observation cards which will assist with identifying trends and the need for additional training.

4.2 Management Review

The Environmental Manager will meet with senior team members, including the Project Director, Quality Manager, and Engineering Manager, at least annually for formal management reviews. The annual review will include specific focus on the LMP. These reviews will not preclude more frequent intermediate reviews, as required. At the management reviews improvement plans and related actions will be developed if required. The Environmental Manager will issue all review attendees with a report including the following items before the meeting:

- Adequacy of environmental resourcing
- Training undertaken and planned
- Analysis of site inspections, audits, incidents and non-conformities
- Recurring issues and time taken to complete actions
- Follow-up actions from previous management review
- Recommendations for improvement.