

Appendix 12-5 Part 1 Lighting Assessment

East Reading Mass Rapid Transit Scheme

Lighting Assessment

On behalf of



Reading
Borough Council

Project Ref: 28791 | Rev: 01 | Date: June 2017



Document Control Sheet

Project Name: East Reading Mass Rapid Transit Scheme

Project Ref: 28791

Report Title: Lighting Assessment

Doc Ref: 3011

Date: June 2017

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Revision	Date	Description	Prepared	Reviewed	Approved
Draft	8 th June	Draft	AS	NY	JR
Final	29 ^h June	Final	AS	NY	JR

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Contents

1	Introduction	1
1.1	Background	1
1.2	Site Location and Context	1
1.3	Proposed Development.....	1
1.5	Lighting Assessment Approach.....	2
2	Legislation, Planning Policy and Guidance	4
2.1	Introduction	4
2.2	Legislation	4
2.3	Planning Policy.....	4
2.4	Guidance	5
2.5	Local Planning Policy	6
2.6	Planning Application Validation Checklist	6
2.7	Reading Borough Council	7
2.8	Wokingham Borough Council.....	9
3	Baseline Conditions.....	11
3.1	Introduction	11
3.2	Existing Lighting	11
3.5	Future Baseline	14
5	Lighting Requirements	16
5.1	Introduction	16
5.2	Construction Lighting Requirements	16
5.3	Operational Lighting Requirements.....	16
6	Assessment of Lighting Proposals	19
6.1	Introduction	19
6.2	Construction	19
6.3	Operation.....	19
7	Conclusions and Recommendations	23

Tables

Table 3.1: Lighting Conditions Surrounding the Site - Sensitive Receptors	12
Table 6.1: Lighting Characteristics of Site.....	19
Table 6.2: Impact of Proposed Lighting Design on Identified Sensitive Receptors	21

Appendices

Appendix A	Site Location Plan
Appendix B	Proposed Site Context Plan
Appendix C	ILP Obtrusive Light Limitations for Exterior Lighting Installations
Appendix D	WSP Design and Access Statement for TV P&R
Appendix E	Site Photographs & Location Plan
Appendix F	East MRT Lighting Design Drawing

1 Introduction

1.1 Background

- 1.1.1 Peter Brett Associates LLP has been requested to prepare a Lighting Assessment on behalf of Reading Borough Council Highways and Transport Department (RBC) to support full planning application for the East Reading Mass Rapid Transit (East MRT) public transport route to the east of Reading.

1.2 Site Location and Context

- 1.2.1 A site location plan is provided at **Appendix A** and is located between the approximate Ordnance Survey (OS) National Grid References (NGR) of 472553(E) 173856(N) to the west and 473579(E) 173891(N) to the east.
- 1.2.2 The proposed development straddles the administrative areas of RBC and Wokingham Borough Council (WBC), the boundary of which is defined by the River Kennet.
- 1.2.3 The site is located to the south of the River Thames and to the north of the Great Western Main Line Railway that is raised on an embankment. The western end of the site is located south of a retail superstore and its car park and the eastern end is immediately to the west of the Thames Valley Business Park.
- 1.2.4 The western area of the site (within Reading Borough) where the proposed development would connect with Napier Road is characterised by a retail superstore with associated fuel filling station and parking. Further west is residential tower blocks at Luscinia View.
- 1.2.5 The central area of the site where the proposed development crosses the River Kennet is characterised by the confluence of the River Thames and the River Kennet. There is an existing railway bridge over the River Kennet and a footbridge allowing access over the River Kennet for the Thames Path National Trail. To the south of the railway, there is a gas storage facility.
- 1.2.6 The eastern area of the site (within Wokingham Borough) where the proposed development would connect with the proposed 'Thames Valley Park and Ride' (TVP P&R) to the west of Thames Valley Business Park would be on undeveloped flood plain adjacent to the River Thames. The Thames Valley Park Rowing Club and Wokingham Waterside Canoe & Kayak Centre are in close proximity to the north-east. There are also temporary moorings along the western bank of the River Thames. The Thames and Kennet Marina and Redgrave and Pinsent Rowing Lake are located approximately 100 m to the north on the opposite side of the River Thames.

1.3 Proposed Development

- 1.3.1 This Lighting Assessment has been prepared in respect of a planning application associated with the following: Construction of a segregated fast-track public transport, pedestrian and cycle bridge, comprising concrete bridge structure with a river span of 59.5 m and a land span of 316 m, supported by concrete columns and reinforced soil embankment, with associated footpath links, junction improvements and landscaping.
- 1.3.2 The route will be graded up to the height of the bridge structure crossing over the River Kennet. The new route is approximately 0.9 km in length.
- 1.3.3 The Proposed Site Context Plan for the proposed development is included in **Appendix B**.
- 1.3.4 The East MRT scheme offers a segregated fast track public transport, pedestrian and cycle route that will support enhanced accessibility and continued sustainable growth in Reading,

Wokingham Borough and the wider area. The overall purpose of the East MRT scheme is to improve the attractiveness of travelling more sustainably, therefore reducing private car trips, easing forecast congestion and air quality along the existing highway network, particularly on the A4 corridor.

1.3.5 As the proposed development straddles the two Local Planning Authority areas of RBC and WBC, the planning application will be submitted to both RBC and WBC for determination.

1.3.6 The proposed development will include:

- creation of a new route for public transport only, including cycle path and footway between Napier Road and the A3290 at Thames Valley Park proposed Thames Valley Park and Ride;
- the erection of a new bridge over the River Kennet;
- formation of a new T-junction with Napier Road;
- connection to the proposed Thames Valley Park, Park & Ride;
- development of new and improved footpath links to Tesco and the towpath; and
- associated infrastructure and landscaping.

1.3.7 The East MRT scheme is a segregated fast track public transport, pedestrian and cycle route that will support enhanced accessibility and continued sustainable growth in Reading, Wokingham Borough and the wider area.

1.4 Aims and Objectives

1.4.1 The key aims and objectives of this lighting assessment are to:

- identify national and local planning policy and guidance as relevant to lighting for the proposed development;
- establish the minimum lighting levels required to construct and operate a safe, secure and energy efficient development;
- assess the potential effects of exterior artificial lighting required for the proposed development; and
- establish design objectives for the lighting design to minimise obtrusive light to within guideline levels.

1.5 Lighting Assessment Approach

1.5.1 The purpose of the assessment is to establish the potential effects of obtrusive light from external lighting associated with the proposed development on existing and future sensitive receptors within and surrounding the site.

1.5.2 A concept external lighting design has been prepared and the ground level illuminance levels modelled to allow a quantitative assessment of obtrusive light to sensitive receptors.

1.5.3 The modelled illuminance levels from the concept lighting design have been reviewed against the obtrusive lighting limitations set out in the Institute of Lighting Professionals (ILP) *"Guidance on the Reduction of Obtrusive Light"* (2011) and Bat Conservation Trust (BCT) *Guidance: "Bats and Lighting in the UK (2009)"*

- 1.5.4 It should be noted that the terms 'light pollution' and 'obtrusive light' are used interchangeably to mean light shining where it is not intended or wanted.

2 Legislation, Planning Policy and Guidance

2.1 Introduction

- 2.1.1 This Chapter sets out the relevant legal, planning policy and guidance in relation to obtrusive light that will influence the approach and scope of the lighting assessment.

2.2 Legislation

Clean Neighbourhoods and Environment Act, 2005

- 2.2.1 The Clean Neighbourhoods and Environment Act 2005 (CNEA) amended Section 79 of the Environmental Protection Act 1990 by extending the statutory nuisance regime to include light nuisance, by stating the following:

“(fb)...artificial light emitted from premises so as to be prejudicial to health or a nuisance...”

- 2.2.2 It should be noted that street lighting is not likely to qualify as Statutory Nuisance as street lights are not located on a ‘premises’. Nevertheless, they can cause adverse effects and are therefore considered during the planning process.

2.3 Planning Policy

National Planning Policy Framework, 2012

- 2.3.1 At the national level, the need to consider the potential effects of artificial lighting is embodied in the wording of the National Planning Policy Framework (NPPF) and should be considered during the planning application process to reduce the potential for un-necessary delays owing to unacceptable (unknown) potential effects on local amenity and nature conservation.
- 2.3.2 Paragraph 125 of the NPPF states: *“By encouraging good design, planning policies and decisions should limit the impact of light pollution from artificial light on local amenity, intrinsically dark landscapes and nature conservation (Paragraph 125, page 29).”*

National Planning Practice Guidance, 2014

- 2.3.3 The UK Government’s National Planning Practice Guidance (NPPG) (March, 2014) for England presents specific guidance on light pollution in Paragraphs 001 – 006 of ID 31. **Table 2.1** sets out how these paragraphs are relevant to the impact assessment of the development, and how each has been considered.

Table 2.1: Review of National Planning Policy Guidance ID31

NPPG ID 31 Paragraph	Relevance to the development
Paragraph 1: When is light pollution relevant to planning? (Reference ID: 31-001-20140306)	There is potential for light from the proposed development to be obtrusive to people and wildlife or detract from the enjoyment of the night sky. Therefore, obtrusive light from the proposed development has been considered further within this assessment.

NPPG ID 31 Paragraph	Relevance to the development
Paragraph 2: What factors should be considered when assessing whether a development proposal might have implications for light pollution? (Reference ID: 31-002-20140306)	This assessment considers where, when and how the light shines as the development has the potential to adversely affect the use or enjoyment of nearby buildings or open spaces. The assessment considers the impact of artificial light on sensitive receptors.
Paragraph 3: What factors are relevant when considering where light shines? (Reference ID: 31-003-20140306)	This assessment considers the potential for light intrusion effecting receptors outside the site boundary which can lead to annoyance to people, compromise existing dark landscapes and affect natural systems.
Paragraph 4: What factors are relevant when considering when light shines? (Reference ID: 31-004-20140306)	This assessment considers the potential effects of when lighting is required for the proposed development. This can minimise obtrusive light that can affect wildlife and enjoyment of the night sky.
Paragraph 5: What factors are relevant when considering how much the light shines? (Reference ID: 31-005-20140306)	This assessment considers the minimum requirements to construct and operate the proposed development safely and securely. The Environmental Zone of the site is established to ensure there is an appropriate level of lighting for the ambient lighting conditions. Due to the type of development, attention should be given to particular groups (e.g. the safety of pedestrians and cyclists).
Paragraph 6: What factors are relevant when considering possible ecological impact? (Reference ID: 31-007-20140306).	This assessment specifically considers the effects obtrusive lighting may have on wildlife.

2.4 Guidance

- 2.4.1 Relevant guidance on obtrusive light, ecology and British Standards has been set out below and considered as part of the Lighting Assessment.

Design

- ILP TR23 Lighting of Cycle Tracks.
 - Sustrans guidance on lighting cycle routes.
- 2.4.2 Both standards were reviewed within the lighting design approach for guidance purposes, although adoption of the British Standards were used as a priority.

Obtrusive Light

- 2.4.3 Guidance on obtrusive light is set out within the Institution of Lighting Professionals (ILP) Guidance Notes for the Reduction of Obtrusive Light, 2011 and further details are provided in **Appendix C**.

Ecological

- 2.4.1 Guidance on obtrusive light in relation to bats as issued by the Bat Conservation Trust is listed below, further detail is provided in **Appendix C**:
- Bat Conservation Trust – Bats and Lighting in the UK (May, 2009);
 - Statement on the Impact and Design of Artificial Light on Bats (May, 2011);
 - Landscape and Urban Design for Bats and Biodiversity (2012); and
 - Artificial Lighting and Wildlife Interim Guidance: Recommendations to Help Minimise the Impact of Artificial Lighting (2014).

British Standards

- 2.4.2 BS EN 5489-1:2013 Code of Practice for the design of road lighting – Part 1: Lighting of roads and public amenity areas; defines lighting classes for road lighting aimed at the visual needs of road users, and it considers environmental aspects of road lighting.

2.5 Local Planning Policy

Development Plan

- 2.5.1 The site is predominantly located within the administrative area of RBC where the adopted development plan comprises:
- Core Strategy (adopted January 2008, altered January 2015);
 - Proposals Map (adopted October 2012);
 - Reading Central Area Action Plan (adopted January 2009); and
 - Sites and Detailed Policies Document (adopted October 2012, altered January 2015).
- 2.5.2 The site is also partially located within Wokingham Borough Council where the adopted development plan comprises:
- Core Strategy (adopted January 2010); and
 - Managing Development Delivery (MDD) Local Plan (adopted February 2014).

2.6 Planning Application Validation Checklist

Reading Borough Council

- 2.6.1 All proposals involving the provision of publicly accessible developments, in the vicinity of residential property, a Listed Building or a Conservation Area, Local Wildlife Site, green link or watercourse where external lighting would be provided or made necessary by the development require details on external lighting.

2.6.2 Details should include the following as relevant:

- hours of operation;
- an isolux contour map showing light spillage to 1 lux;
- light levels;
- column heights; layout plan with beam orientation,
- a schedule of equipment
- a description of the measures such as hoods and cowls that have been provided to avoid glare;
- impact on nearby dwellings or roads and use of planting to mitigate effect

Wokingham Borough Council

2.6.3 Proposals involving the provision of publicly accessible developments, in the vicinity of residential property, a listed building or a conservation area, sensitive natural area or the open countryside, where external lighting would be provided or made necessary by the development, should be accompanied by details of external lighting and the proposed hours when the lighting would be switched on. These details shall include a layout plan with beam orientation and a schedule of the equipment in the design.

2.7 Reading Borough Council

Local Transport Plan

2.7.1 RBC's Local Transport Plan (2011 – 2026) provides the following detail with regards to their Transport Vision for Connecting Reading:

2.7.2 *"Transport in Reading will better connect people to the places that they want to go: easily, swiftly, safely, sustainably and in comfort. We will meet the challenges of a dynamic, low-carbon future to promote prosperity for Reading. Whichever way you choose to travel, by foot or bicycle, motorcycle, bus, rail, car or boat whether to work or education, to leisure or the services you need, our transport system will help you get there."*

2.7.3 The LTP provides a number of Area Action Plans (AAP's) for the different areas across the borough, with each of these supporting the implementation of East MRT through 'Opportunities for Addressing Challenges'.

2.7.4 The LTP states that RBC should "... work with Wokingham Borough Council to deliver an East Reading Transport Link and associated Park & Ride facilities"

2.7.5 The LTP notes that: *"An East MRT system must be designed to meet a set of standards above and beyond a quality local bus route. The long-term vision incorporates a network that expands the public transport offer rather than replacing existing networks, and it will be branded as such. The East MRT network extends beyond Reading to offer public transport and interchange options to the wider travel to work area. The Park and Ride objectives and policies support the East MRT and interchange options, aiming to reduce private transport mileage and improve journey times and air quality on some of Reading's busiest roads."*

Core Strategy

- 2.7.6 RBC's Core Strategy sets out the key policies in the area. It was adopted in 2008, and revised in January 2015. The RBC Core Strategy includes the following policy, addressing issues around lighting and Pollution/ Water Resources Development.

Policy CS34: Pollution and Water Resources Development

- 2.7.7 Policy CS34 details that development will only be permitted where:

[...]

- it will not be damaging to the environment through air, land, noise or light pollution;
- 2.7.8 Proposals for development that are sensitive to the effects of air, noise or light pollution will only be permitted in areas where they will not be subject to high levels of such pollution, unless adequate mitigation measures are provided to minimise the impact of such pollution.

Reading Central Area Action Plan

Adopted in January 2009, this action plan sets out the policies in the centre of Reading. The proposed development is situated to the east of this area, and the policies that relate to lighting are in reference to the tall buildings in the Centre of Reading, therefore are not applicable.

Sites and Detailed Policies Document

- 2.7.9 Adopted in 2015, this document provides detailed policies for the borough. The following policies are of relevance to lighting.

DM4: Safeguarding Amenity

- 2.7.10 Development will not cause a significant detrimental impact to the living environment of existing or new residential properties, in terms of:

- Visual dominance and overbearing effects of a development;
- Artificial lighting; and
- Crime and safety.

DM16: Provision of Open Space

- 2.7.11 The provision of open space shall satisfy the most urgent need in terms of the type of open space to be provided in a particular location having regard to the size of the site and shall be subject to considerations of particular site specific deficiencies. New open space should:

- Be accessible to the general public and be designed so as to feel that it is part of the public and not the private realm; and
- Create a safe environment, appropriately considering lighting and layout to reduce the fear of crime.

2.8 Wokingham Borough Council

Local Transport Plan

- 2.8.1 Wokingham's third Local Transport Plan (LTP) provides details of how the Council intends to improve transport and accessibility over the period 2011-2026.
- 2.8.2 Within the document Policy PT8 Park & Ride states that: *"The council will promote the use of Park & Ride services and will support the future introduction of new sites in the borough where feasible."*
- 2.8.3 The document specifically identifies a number of supported schemes including: *"Park & Ride located in Thames Valley Park to complement the high quality express bus services or mass rapid transit along the A4 or A329 corridors into central Reading."*
- 2.8.4 Policy SP1: Support for Major Infrastructure states that: *"The Council will actively support development of suitable major transport projects that are necessary to support the future growth and success of the Borough."*
- 2.8.5 The document supports the policies within the Core Strategy and the projects detailed within those policies, including: *"High quality express bus services or mass rapid transit along the A4 and A329 corridors"*

Core Strategy

- 2.8.6 WBC's Core Strategy was adopted in January 2010 and sets the key strategic policies for the district. Whilst there are no particular policies relating to lighting for new developments, although one policy relates to sustainable development:

CP1 – Sustainable development

- 2.8.7 Policy CP1 states that planning permission will be granted for development proposals that:
- maintain or enhance the high quality of the environment; and
 - minimise the emission of pollutants into the wider environment;

Sustainable Design and Construction: Supplementary Planning Document (SPD) (May 2010)

- 2.8.8 The SPD contains 'Sustainability Issue 9: Air, Noise and Light Pollution and Land Affected by Contamination' which states: *"Where significant impacts from pollution to or from the proposed development is likely or probable, an assessment of existing levels of pollution will be required to be submitted alongside the planning application"*.
- 2.8.9 The existing levels of light pollution are to be addressed through this lighting assessment for the proposed development.
- 2.8.10 Measures to reduce light pollution are discussed within the SPD including:
- provision of lighting only where necessary;
 - directing light downward, minimising the upward spread of light beyond horizontal;
 - ensuring the main beam angle of lights - directed towards a potential observer - is below 70 degrees;

- uniform lighting, avoiding bright and dark spots which interfere with visibility and can cause glare; and
- ensuring lighting systems are energy efficient, by considering energy demand and automated controls.

Managing Development Delivery Local Plan

- 2.8.11 The Managing Development Delivery (MDD) local plan was adopted in 2014. There are no specific policies relating to lighting.
- 2.8.12 Appendix 3 of the MDD Local Plan refers to strategic transport projects indicated on Figure 24 of the Local Transport Plan, which includes a proposed highway scheme connecting west into Reading Borough from Thames Valley Park and the proposed Park & Ride facility. Supporting text to Policy SAL09 of the MDD Local Plan (Paragraphs 4.68-4.69) requires development proposals to have regard to the 'Cross Town Link' proposals from Thames Valley Park being pursued by RBC.

3 Baseline Conditions

3.1 Introduction

- 3.1.1 This section of the report establishes the existing external lighting conditions of the site and the surrounding area that form the 'baseline conditions'.

3.2 Existing Lighting

Desk Based Study

- 3.2.1 A desktop review of the site and surrounding area was undertaken to identify potential light sensitive receptors (see Section 3.3) and to establish the Environmental Zone classification for the site in accordance with the ILP's Guidance Notes for Obtrusive Light (2011).
- 3.2.2 The following sources of publically available information were reviewed:
- Google Street View (September 2016)
 - Ordnance Survey Mapping (accessed March 2017)
 - Aerial photography (March 2017)
- 3.2.3 Although the desk based information enables a framework to be established for the assessment, the aerial photography and Street View are not up to date and therefore cannot be relied upon as being definitive. In addition, the majority of the site is away from the highway network and therefore Street View is not available.
- 3.2.4 Therefore, in order to have a definitive understanding of the existing lighting conditions of the site a lighting survey was undertaken.

Lighting Survey

- 3.2.5 A lighting survey was undertaken to establish the existing lighting conditions of the site. The lighting survey recorded night time views in a series of photographs from pre-determined viewpoints. The viewpoint locations were chosen to represent light sensitive receptors and were based on a selection of the locations established in the Landscape and Visual Assessment (see Chapter 12 Landscape and Visual). A location plan of the viewpoints taken for the lighting survey is included as **Appendix E**.
- 3.2.6 At each viewpoint, the view was studied to record the principle lighting features, obtrusive light and comment on any other light sources not visible in the photographs but relevant to the assessment.
- 3.2.7 The night-time survey was undertaken on Thursday 20th April 2017 between approximately 19:00 and 22:30. The moon phase at the time of the survey was Last Quarter with some cloud coverage and temperatures at 8°C.
- 3.2.8 A summary of the existing lighting conditions within and surrounding the site is provided in **Table 3.1**.

Table 3.1: Lighting Conditions Surrounding the Site - Sensitive Receptors

Viewpoint No.	Location	Description of Lighting Conditions
1	River Kennet South / Cholmeley Road	Column mounted Light emitting diode (LED) lighting was located along the Kennet & Avon Canal path (approx. 5 m in height) to illuminate the footpath/cycle path. Light intrusion was observed into the River Kennet channel. LED lighting is visible in the distance in a northerly direction along the Thames Path. See photo Location 1 in Appendix E .
2	Thames Path West of River Kennet Mouth	The level of light is low at this location, due to tree canopy screening light from sources of light along the River Thames from moored boats and Thames Valley Park. Low level amenity lighting on moored boats across the river was visible, along with column mounted LED luminaires on the distant footpath. Column mounted High Pressure Sodium (HPS) road lights were visible at the Thames Valley Park. Passing trains on the Great Western Mainline provide intermittent light at this location. See photo Location 2 in Appendix E .
3	Thames Path East of River Kennet Mouth	A single LED luminaire, column mounted at approximately 6 m in height is the primary light source at this location, providing concentrated, white light on the Thames Path. Light intrusion was observed into the River Thames. Beyond the site location in a westerly direction was sky glow over Reading Town Centre. See photo Location 3 in Appendix E .
4	Thames Path North of Tesco Extra	Minimal lighting was observed from within the site. The car park/retail store lighting from the Tesco Extra is fully screened by vegetation along the River Thames. HPS lighting was visible in the distance (eastwards) from Thames Valley Park Drive. Red signage lighting was visible from Oracle's office building in distance, as part of the Thames Valley Park. Orange sky glow was visible from the urban area looking eastwards which is likely to be from the East Reading area. See photo Location 4 in Appendix E .
5	Thames Meadow East of Waterside Centre	Thames Valley Park Drive is lit by HPS column street lighting, approximately 10 m in height. The light from these columns intrude onto the Thames Valley floodplain. Car park lighting illuminates the Wokingham Waterside Centre which is directly to the east of the site. In the distance to the west, The Blade Office building in Reading Town Centre can be seen, providing a source of white office lighting. Above this, sky glow is visible above Reading town centre. See photo Location 5 in Appendix E .

3.3 Sensitive Receptors

- 3.3.1 Sensitive receptors within and immediately around the site that have been considered during the assessment are presented in [Table 3.2](#).

Table 3.2: Sensitive Receptors

Sensitive Class	Receptors and sensitivity
Existing residents	There are no residential properties in direct proximity to the site. Residents at Luscina View, to the west of Tesco/ Napier Road junction are located approximately 10 m from the site and are sensitive to light intrusion, glare and sky glow. Residents on Liverpool Road and Cholmeley Road are within approximately 130 m of the site although are screened by trees, a gas storage facility and the Great Western Mainline are therefore scoped out of the lighting assessment.
Motorist, cyclists & pedestrians	The following receptors have been identified that are sensitive to the effects of glare: - Napier Road; - A3290/Thames Valley Park Drive; - Users of Thames Path National Cycle Route/Trail; - Users of Kennet & Avon Canal National Cycle Route/ footpath; - River users on River Thames/ River Kennet; and - Future users of the East MRT.
Railway	Users of the Great Western Mainline Railway are sensitive to the effects of glare.
Heritage	A Grade II Listed Railway Bridge is located approximately 10 m from the site but is not sensitive to obtrusive light and therefore has been scoped out of the assessment.
Wildlife	The Coal, Kennetmouth and Kings Meadow Local Wildlife Site (LWS), a non-statutory area of nature conservation importance. Bat Assemblage: at least eight species of bat use the site, whilst activity levels are highest along the River Thames and Kennet and adjacent woodland/tree lines. Soprano pipistrelle and common pipistrelle were the most common species of bat recorded. The river corridors are an important foraging/commuting habitat for bats. Due to the semi-urban setting, the majority of bats are fairly light tolerant although some are not tolerant so light intrusion should be kept to a minimum.

3.4 Environmental Zone

- 3.4.1 The Institution of Lighting Professionals (ILP) Guidance Notes for the Reduction of Obtrusive Light (GN01:2011) sets out exterior lighting controls for Environmental Zones. The Environmental Zone classifications are presented in **Table 3.3**.
- 3.4.2 The Environmental Zone classification for the site has been undertaken drawing on a desk study of the site and evidence gathered during the site visit. The site is on the fringes of an industrial/suburban area with each section characterised by different zones, and therefore has been split accordingly.

- 3.4.3 It is therefore considered that the development western part of the site, (within RBC's boundary) between the Tesco/ Napier Road Junction and the Kennet Mouth can be classified to be within **Environmental Zone E3**, suburban, medium district brightness. The eastern section of the site (within WBC's boundary) from the Kennet Mouth to the Thames Valley Park roundabout can be classified within **Environmental Zone E2**, village or relatively dark outer suburban locations.
- 3.4.4 The ILP provides limitations for obtrusive light for each Environmental Zone in terms of the upward lighting ratio; light intrusion and luminaire intensity (see **Appendix C**).

Table 3.3: Environmental Zones for Exterior Lighting Control as Described in the ILP Guidance, 2011

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

3.5 Future Baseline

- 3.5.1 The TVP P&R is already permitted development and therefore is likely to be constructed before the East MRT. Future baseline conditions therefore consider the conditions when the TVP P&R has been constructed and is operational.
- 3.5.2 The expected operational hours of the TVP P&R will be 07:00-19:00, and the proposed lighting will only be turned on during these hours of operation. The lighting is expected to be mounted on 5 m columns with warm light in accordance with PD CEN/TR 13201-1:2004 Road Lighting – Part 1: Selection of Lighting Classes.
- 3.5.3 The operating hours of the footway and cycleway within the East MRT are expected to be 24 hours therefore the lighting will be turned on at all times, to maximise safety and security of the users of this route.

4 Thames Valley Park & Ride

4.1 Introduction

- 4.1.1 Planning permission has been granted for a TVP P&R facility to the west of the River Kennet, though a separate application to East MRT. The proposed TVP P&R facility is located adjacent to the eastern section of the East MRT, and therefore has similar lighting design considerations and environmental constraints. Planning permission was granted on 10th November 2016 (application Ref: 161596).

4.2 Lighting Design

- 4.2.1 Lighting classes for the TVP P&R are proposed to be designed according to 'PD CEN/TR 13201-1:2004 Road Lighting – Part 1: Selection of Lighting Classes' and 'Institute of Lighting Engineers Guidance'. It will use 5 m lighting columns and warm LED lighting where possible. Some of the key design principles of relevance are:

Lighting / Security – A lighting strategy should be implemented to enable vehicles and pedestrians to travel in and around the site safely. Similarly measures such as CCTV should be included to increase the overall security of the site.

Minimise Visual Impact – Use existing landscaping and provide additional areas where possible to help screen the facility and minimise visual impact.

Maintain Ecology and Environment – Develop proposals sensitive to the existing environment. Protected trees to be maintained and as much of the existing landscaping screening the frontage of the site retained.

4.3 Impact of TVP P&R

- 4.3.1 A design and access statement prepared by WSP Parsons Brinkerhoff to support the TVP P&R Facility (June 2016) outlined the main considerations in this report that also has relevance to the East MRT application. The design and access statement is attached as **Appendix D** and the key issues are outlined below:

Concerns about the riverside towpath

The TVP P&R site would not involve the removal or alteration of the Thames riverside towpath.

Loss of amenity space

The existing site is largely overgrown and difficult to access – the Thames riverside would be undeveloped and remain usable as amenity space.

Visual impact on the riverside

Mitigation measures would be employed to screen the TVP P&R site from the riverside, including planting and landscaping as is deemed necessary to protect riverside views.

Site would block the proposed road to Tesco

The car park access road would retain an alignment option for the East MRT should this be developed in future. The development of the TVP P&R does not jeopardise the potential development of the East MRT.

5 Lighting Requirements

5.1 Introduction

- 5.1.1 This chapter sets out the external lighting requirements of the proposed development during construction and operation.
- 5.1.2 Two standards have been used for the lighting design of the proposed development: British Standard EN 5489-1:2013 class C3, for the road junction and car park aspect of the development, and British Standard EN 5489-1:2013 class P5 for the East MRT footway and cycleway lighting.

5.2 Construction Lighting Requirements

- 5.2.1 There will be no night time working outside of agreed standard working hours unless agreed with RBC and WBC. Working during darkness may however be required during winter months when the days are shorter and lighting is required.
- 5.2.2 The general lighting requirement is predictable for fixed elements of the construction works such as the site office, compound, welfare facility. Future construction compound locations will be established through the development process. A potential location for construction compounds have been considered at the Tesco car park and on the TVP P&R sites, whilst cranes are required temporarily to construct the bridge.
- 5.2.3 A lighting strategy should be implemented to enable vehicles and pedestrians to travel in and around the site safely. Similarly measures such as CCTV should be included to increase the overall security of the site.
- 5.2.4 Task specific lighting to maintain safety around excavation areas, water management areas, and other specific activities will vary according to weather conditions, programme and the particular tasks being undertaken. Areas in proximity to the rivers near the site may require additional lighting to maintain safety.

5.3 Operational Lighting Requirements

Overview

- 5.3.1 Operational lighting is required throughout the proposed development to complete activities safely and reduce the fear of crime.
- 5.3.2 Given the scale and nature of the development operational lighting is required along the length of the site, varying in type and location depending on the lighting requirements and sensitive receptors. The operational lighting requirements have been divided into the following three sections of the scheme: Tesco/Napier Road Junction; Tesco Car Park; East MRT cycleway/footway; and the East MRT busway.
- 5.3.3 For the entirety of the scheme, column mounted LED lighting will be provided in accordance with RBC standards and to complement the limited existing LED lighting columns at locations along the Thames Path. Additional benefits of installing LED lighting is that it is directional and reduces obtrusive light, and uses less energy when compared to high pressure sodium luminaires.
- 5.3.4 **PBA Drawing 28791/2009/CIV/011** illustrates the proposed lighting design for the proposed development, which includes isolux contours, location of lighting columns and light levels attached as **Appendix F**. Additional details including column heights, mitigation measures to

limit light intrusion, beam orientation and a schedule of equipment is included in the following section.

Tesco/Napier Road Junction

- 5.3.5 The lighting design in this section of the development will be designed in accordance with British Standard EN 5489-1:2013 class C3, due to its nature as a road junction. This section extends to a proposed pedestrian crossing at the western end of the site, where the East MRT route joins the Tesco/Napier Road Junction.
- 5.3.6 This section of highway is currently illuminated by High Pressure Sodium (SON) columns.
- 5.3.7 Since this section of the site is located within RBC public highway, all external lighting will be linked to the Mayflower central management system to support the operation of lighting when required and therefore reduces energy consumption. Lighting will remain switched on during the hours of darkness to maintain safety and security of users of this junction.
- 5.3.8 The height of new columns along the proposed road junction will be 6 m as specified within the RBC Street Lighting Specification. Columns to be installed along the footway and cycleway of the East MRT will be similar to those specified in BS EN ISO 1461. New luminaires for the street lighting design of the junction are proposed to be Holophane VMAX luminaires.
- 5.3.9 Beam orientation will focus towards the road junction to reduce the amount of light spill into the surroundings of Napier Road.
- 5.3.10 Operational hours of the lighting for Napier Road will follow the existing operational hours, as the new luminaires will be linked to the Mayflower CMS, RBC will be able control all new columns installed at the road junction.
- 5.3.11 The illustrative drawing attached in **Appendix F** shows back spill light onto the ecological receptors to the west of the River Kennet. Shields are proposed on the column heads to mitigate this which limits light intrusion to 1 lux. The light shields can be attached to the front and back of the column heads and differ in sizes between the standard depth of 15 mm and can increase in size of 15 mm increments up to a maximum of 60 mm in depth. The shields can also be retrofitted to the luminaire after the columns are installed.

Tesco Car Park

- 5.3.12 This section is owned and managed by Tesco plc and therefore external lighting has been designed to replicate the existing car parking strategy to complement the existing car park lighting.
- 5.3.13 As the supermarket is a 24 hour operated store, it is expected that the car parking lighting will be utilised in line with the opening hours of Tesco, to maximise safety and security of staff and customers. This means car park lighting will be reduced when the store is closed.
- 5.3.14 The proposed lighting will light the realigned access road into the Tesco car park including the realigned bays. This design will maintain consistency of the proposed lighting levels with the existing conditions.
- 5.3.15 The height of columns for the Tesco car park design are proposed to be 6 m. All new luminaires are proposed to be Holophane VMAX while the existing spherical luminaires will be retained in the car park.
- 5.3.16 Beam orientation will face into the access road and new car parking bays and reduce the amount of spill into the surrounding environment.

- 5.3.17 To reduce the impact of the car park lighting to the MRT footway and cycleway and other light sensitive areas, light shields can be attached to the column heads. The light shields can be attached to the front and back of the new column heads and differ in sizes between the standard depth of 15 mm and can increase in size of 15 mm increments up to a maximum of 60 mm in depth. The shields can also be retrofitted to the luminaire after the columns are installed.

East MRT footway and cycleway

- 5.3.18 This element of the proposed development; a dedicated footway and cycleway runs for almost the entire length of the site. It extends from the Tesco Supermarket/Napier Road Junction in the west to the proposed TVP P&R facility in the east. It will be illuminated with column mounted LED luminaires, similar to that of the Tesco Junction.
- 5.3.19 The height of new columns along the proposed footway and cycleway will be 6 m as specified within the RBC Street Lighting Specification. Columns to be installed along the footway and cycleway be similar to BS EN ISO 1461. New luminaires for the street lighting design of the junction are proposed to be Holophane VMAX luminaires.
- 5.3.20 Beam orientation will face towards the footway and cycleway as to reduce light spill to the surroundings.
- 5.3.21 Operational hours of lighting for the East MRT footway and cycleway will be controlled by RBC made available from the Mayflower CMS. It is assumed that the lighting will be operational 24 hours a day to maximise safety and security of users of the footway and cycleway.
- 5.3.22 The lighting will be designed in accordance with British Standard EN 5489-1:2013 class P5, a pedestrian class to support safe and secure access for pedestrians. This specification is designed so that facial recognition could be used, should CCTV be used in the future at the proposed development.
- 5.3.23 The illustrative drawing attached in **Appendix F** shows back spill light onto the conservation area to the west of the River Kennet. Shields are proposed on the column heads to mitigate this which limits light spill to 1 lux. The light shields can be attached to the front and back of the column heads and differ in sizes between the standard depth of 15 mm and can increase in size of 15 mm increments up to a maximum of 60 mm in depth. The shields can be retrofitted to the luminaire after the columns are installed.
- 5.3.24 Similarly, where the East MRT route crosses the River Kennet, light spills into the river channel, up to 1 lux. Front shields are proposed on the lighting columns to limit frontal spill into the river, details on the light shields have been described above. It is expected that the bridge parapet will reduce light spill further. This additional benefit has not been modelled due to the limitations of the lighting assessment software.
- 5.3.25 All lighting along the East MRT footway and cycleway will be linked to the Mayflower central management system in RBC to operate when required therefore reducing energy consumption. Lighting will remain switched on during hours of darkness to maintain safety and security of users of this junction.

East MRT Busway

- 5.3.26 Although lighting is provided to accommodate for the footway and cycleway, the East MRT bus carriageway will not be lit. This is to minimise the impact on the surrounding area and it is considered that professional bus driver's judgement and on board bus lighting is sufficient for safety on this route. This would be confirmed through further road safety audits. Furthermore, spill from the footway and cycleway lighting will partially illuminate the East MRT route.

6 Assessment of Lighting Proposals

6.1 Introduction

- 6.1.1 This chapter summarises any potential effects from the exterior lighting which will be required for the proposed development (as identified in **Chapter 4**), on sensitive receptors (identified in **Chapter 3**).

6.2 Construction

- 6.2.1 Generally, construction lighting tends to lead to more obtrusive lighting than operational lighting because of its temporary nature, and the type of lighting equipment used. For ease of deployment and use, construction lighting tends to be mobile, and focus on providing the widest coverage of light from the fewest possible units – in order to minimise time spent maintaining and installing the equipment. This, along with the fact that it is often poorly directed or installed, can result in temporary effects of glare, light intrusion and sky glow if good practice measures are not employed.
- 6.2.2 As outlined in **Chapter 4**, night working will be avoided in the construction phase of the development to minimise the effects on the surrounding area and sensitive receptors, whilst winter months with shorter daylight hours will inherently require more artificial lighting.
- 6.2.3 It is anticipated that any potential effects from obtrusive light associated with the construction phase lighting, can be mitigated through employment of appropriate good practice measures by the contractor.

6.3 Operation

Conformity with ILP Guidance

- 6.3.1 The proposed external lighting for Tesco/Napier Road junction, Tesco car park and East MRT footway and cycleway of the proposed development is more likely to create obtrusive light and therefore has been modelled to confirm the obtrusive light limitations applicable to Environmental Zone E2/Environmental Zone E3 are met.
- 6.3.2 The drawing in **Appendix F** shows the modelled ground level horizontal illuminance contours associated with the design of lighting for the Tesco/Napier Road junction, Tesco car park and East MRT footway. **Table 6.1** demonstrates the characteristics of each area in relation to the requirements in terms of sky glow, light intrusion and luminaire intensity. No lighting is proposed to be mounted to buildings and therefore building luminance pre-curfew has not been assessed.

Table 6.1: Lighting Characteristics of Site

Location	Environmental Zone	Light Intrusion (into Window) Ev (lux)	Luminaire Intensity I [candelas]	Building Luminance pre -curfew
Tesco/ Napier Road Junction	E3	7.6	G4	N/A
Tesco Car Park	E3	N/a	G3	

Location	Environmental Zone	Light Intrusion (into Window) Ev (lux)	Luminaire Intensity I [candelas]	Building Luminance pre -curfew
East MRT/ Footway and Cycleway	E2	N/a	G4	

- 6.3.3 As illustrated in **Table 6.1**, light intrudes into the windows of Luscinia View to a level of 7.6 lux, which is explained in more detail below. The other two aspects of the site are not located within close proximity to residential property and therefore do not need to be considered further.

Tesco/Napier Road Junction

- 6.3.4 For the Napier Road/Tesco Junction, in all cases the 1 lux contour (delineated by the red line on the lighting plan in **Appendix F**) for light intrusion does not approach existing bedroom windows of Luscinia View apartments and therefore would not exceed the post-curfew limit of 2 lux associated with Environmental Zone E3.
- 6.3.5 However, as indicated in **Table 6.1**, the light intrusion into the windows of the apartments at Luscinia View does not exceed the pre-curfew limit of 10 lux, but does exceed the post-curfew limit of 2 lux, with 7.6 lux entering the bedroom windows here. This however is in absence of any mitigation measures such as shields which could be installed here to significantly reduce light intrusion from the rear of these luminaires. It is not possible to model the decrease in lux level from the shield but due to the directional nature of LED lights, it is expected that it would limit light intrusion to within acceptable levels. Any light intrusion would also be limited by the existing vegetation planted in this area.
- 6.3.6 The proposed LED lighting that will illuminate the access junction are angled downwards to the achieve the outcomes presented in **Table 6.1**. These will therefore meet the upward light limitations required for Environmental Zone E3, referenced in **Appendix C**.

Tesco Car Park

- 6.3.7 The spherical lighting proposed at the eastern side of the Tesco car park results in a 5 lux spill into the neighbouring wildlife reserve in places (depicted in **Appendix F**). This style of lighting, described previously is proposed to have shields to limit light intrusion into this sensitive receptor, however due to the intensity of lighting required to sufficiently illuminate the car park area it is difficult to mitigate this any further, with the exception of light intrusion limitation by the existing vegetation.

East MRT Footway and Cycleway

- 6.3.8 The western section of the footway and cycleway (to the River Kennet) is lit to British Standard P5 and as such the 1 lux contour does not approach the Great Western Mainline to the south, or the wildlife reserve to the north of the East MRT route. As the bridge crosses the River Kennet, the 1 lux contour does minimally approach into the river. However, the lighting would not exceed the post curfew limit of 2 lux associated with Environmental Zone E3.
- 6.3.9 The eastern section of the footway and cycleway is located within Environmental Zone E2 and therefore ILP post curfew limit reduces to 1 lux. The 1 lux contour does not approach any sensitive areas in this section and is therefore acceptable. Minor spill occurs on the bridge over the River Kennet (1 lux) although this is in the absence of any front or rear shields on the luminaires, which will be installed and will restrict light intrusion and minimise any effects on this sensitive receptor.

Assessment of Sensitive Receptors

- 6.3.10 The lighting design for the scheme once operational will include the following measures to minimise any adverse significant effects are experienced as a result of external lighting required for the East MRT development, as outlined above:
- The bus route has no lighting requirements;
 - Lighting columns along the northern extent of the route only;
 - Lighting columns to provide directional lighting to face away from the more sensitive areas (including The Coal, Kennetmouth and Kings Meadow East LWS and Henley Road Pit LWS);
 - Lighting has the capacity to be control through RBC's Mayflower centralised management system; and
 - Inclusion of a shield on the back of lighting columns to further reduce any light backspill. Where there are areas which light spills along the southern side of the viaduct, front light shields will also be installed.
- 6.3.11 **Table 6.2** outlines the impact that the proposed lighting design will have upon existing and proposed receptors identified in **Table 3.1**.

Table 6.2: Impact of Proposed Lighting Design on Identified Sensitive Receptors

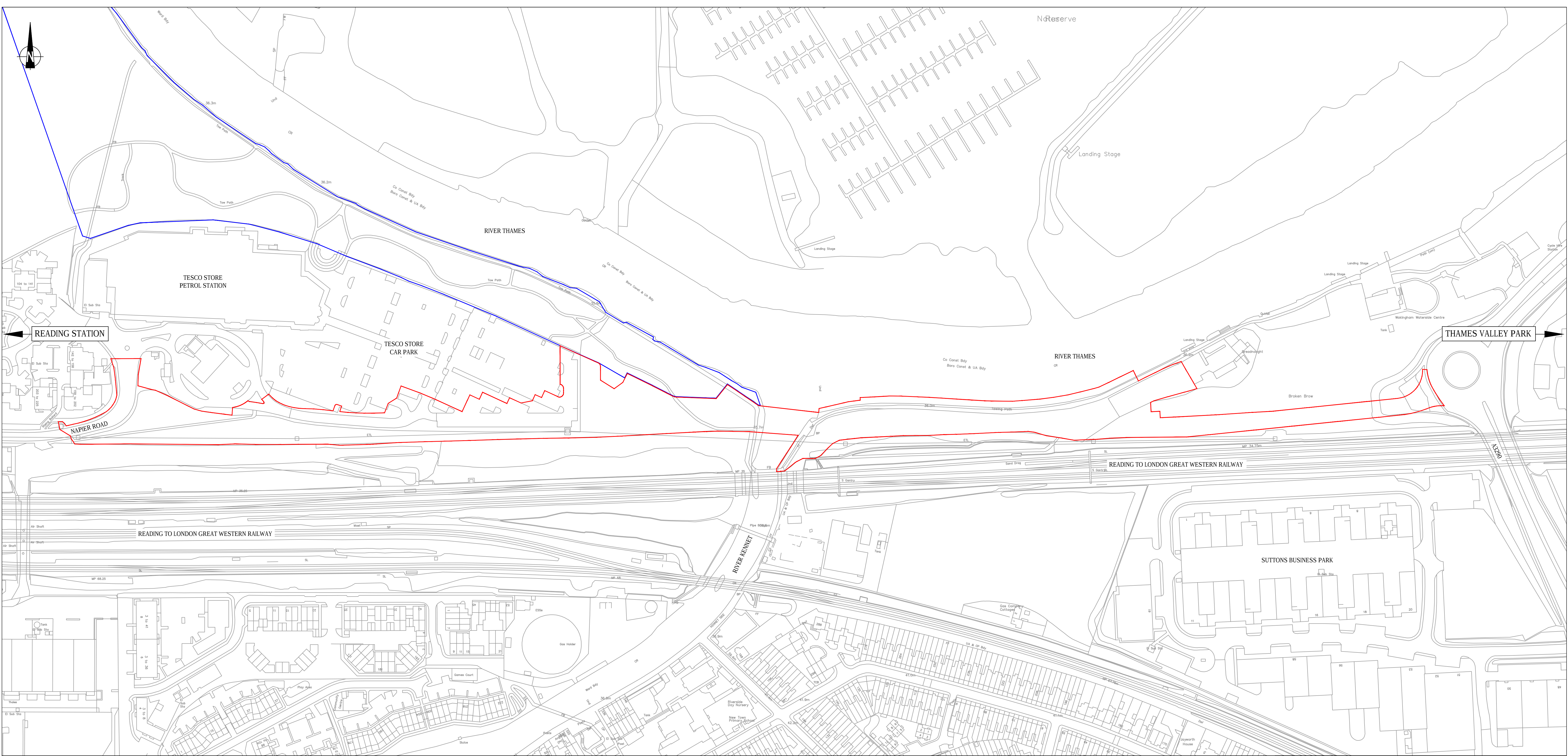
Sensitive Receptors	Impact of Proposals
Existing residents	The bedroom windows on Luscinia View that face the access junction for the development onto Napier Road are already affected by light intrusion from existing street lighting. Lighting is in place on the western side of the Tesco/Napier Road junction. Lighting columns along this section are proposed to be in the same location as they existing, therefore the impact on the neighbouring apartments at Luscinia View will be negligible. The proposed development requires lighting in the same locations as existing lighting, therefore no additional adverse impact is to be expected for the residents of these apartments. SON variety columns will be replaced with LED lighting. This also include the use of lighting shields to reduce lighting impacts below Environmental Zone 3 limits. The residential properties on Liverpool Road and Cholmeley Road are of sufficient distance away from the development that no lighting obtrusion is likely to reach them. They are also already adequately screened.
Great Western Mainline	There is potential for glare to train drivers and users during the development's operation. However, the Great Western Mainline is raised at a greater height than the height of the luminaires installed on the bridge and so vertical glare is not expected to occur. The luminaires proposed have also been designed in accordance with RBC specifications and have an installed intensity class of G4 (in accordance with BS EN 13201-2:2015) in order to restrict glare and control obtrusive light to observers.

Sensitive Receptors	Impact of Proposals
Motorist, cyclists & pedestrians	Existing receptors have been identified that are sensitive to the effects of glare: - Napier Road. - A3290/Thames Valley Park Drive. - Users of Thames Path National Cycle Route/Trail. - Users of Kennet & Avon Canal National Cycle Route/ footpath. - River users on River Thames/ River Kennet e.g. boat owners, rowers etc. - Future users of the East MRT The street lighting has been designed to RBC standards to reduce adverse impacts of glare to users of Napier Road and the A3290. There would be an overall benefit associated with lighting to motorist, cyclists and pedestrians due to street lighting. Footway and cycle way users will have a well-lit route which forms an improvement on current conditions where the route is not lit between the Tesco Supermarket and the eastern boundary of the site. Pedestrians and cyclists will have a significantly safer and more secure route than exists currently. The proposed development will include a more direct crossing of the River Kennet especially for cyclists, and divert away from the poorly lit Thames Path. River users unlikely to be using river at night, also no light was observed to spill into River Thames from the lighting modelling undertaken. Future users of the footway/cycle way will have conditions improved compared to existing lighting conditions. Greater lighting will be adequately positioned to maximise safety and security.
Wildlife	Light from the eastern end of Tesco Car park has been predicted to intrude into the ecological receptors. The 5 lux contour is shown in Appendix F. However, this light intrusion has been minimised through specifying shields on the proposed luminaires. Due to the limitations of the design process, the light intrusion levels do not include the effect of shielding on the luminaires, but this is expected to reduce intrusion into the wildlife reserve to acceptable levels. The proposed lighting results in light intrusion into the River Kennett. However, the level of luminance is under 1 lux at ground level therefore acceptable in relation to BCT guidance – limiting the impact and design of artificial light on bats. Changes in lighting levels will result in a temporary, negative ecological impact, caused during construction only. This impact will occur in areas where compounds are located and / or night works take place and as such, will be of small magnitude and easily reversible following construction works.

7 Conclusions and Recommendations

- 7.1.1 The proposed development will introduce new light sources into a site determined as having two levels of district brightness. These are ILP Environmental Zone 3 (Suburban) for the western section of the site and ILP Environmental Zone 2 (Rural) for the eastern section of the site.
- 7.1.2 The aspiration of the applicant is to specify high lighting standards for the scheme that is efficient, safe and secure for people utilising the East MRT route for walking and cycling, and bus drivers using the proposed junctions onto Napier Road and Thames Valley Drive.
- 7.1.3 The luminaires required for the proposed development have been modelled to determine levels of obtrusive light (lighting intrusion, glare and sky glow) and to determine mitigation measures for sensitive receptors such as local residents, the ecological receptors, users of the existing Thames Path and train drivers on the Great Western Mainline.
- 7.1.4 During the construction period lighting for construction will be phased through the development to target only temporal effects. Night time working will be avoided where possible to minimise effects on receptors.
- 7.1.5 It is anticipated that any potential effects from obtrusive light associated with the construction phase lighting, can be mitigated through employment of appropriate good practice measures by the contractor.
- 7.1.6 An assessment of the proposed lighting design for the East MRT has been undertaken, and has concluded that there is likely to be minimal light intrusion to the identified receptors. Lighting shields will be utilised to support the reduction of the potential for impact to identified receptors below guidance levels.
- 7.1.7 Based on the modelling undertaken, lighting levels for the proposed external lighting associated with the East MRT footway and cycleway, Tesco/ Napier Road Junction and Tesco Car Park is demonstrated to be within the design limitations set out for Environmental Zone E3/E2, with the exception of one location. Where standards are not met, mitigation measures can be undertaken to bring the lux levels below the design limitations.
- 7.1.8 The proposed development is not expected to have a material impact on the identified receptors.

Appendix A Site Location Plan



- NOTES:
- 1. DO NOT SCALE FROM THIS DRAWING, IF IN DOUBT PLEASE REQUEST FURTHER INFORMATION.
 - 2. ALL DIMENSIONS ARE IN METRES UNLESS OTHERWISE SHOWN.

KEY:

PLANNING APPLICATION RED LINE BOUNDARY

OTHER LAND IN APPLICANTS CONTROL

Mark	Revision		Date	Drawn	Chkd
					Appd

SCALING NOTE: Do not scale from this drawing. If in doubt, ask.
UTILITIES NOTE: The position of any existing public or private sewers, utility services, plant or apparatus shown on this drawing is believed to be correct, but no warranty to this is expressed or implied. Other such plant or apparatus may also be present but not shown. The Contractor is therefore advised to undertake his own investigation where the presence of any existing sewers, services, plant or apparatus may affect his operations.

Drawing Issue Status

FOR PLANNING

EAST READING MASS RAPID TRANSIT

SITE LOCATION PLAN

Client



Reading
Borough Council
Working better with you

Date of 1st Issue
22.06.2017

Designed
LC

Drawn
SF

A1 Scale
1:1500

Checked
SE

Approved
SM

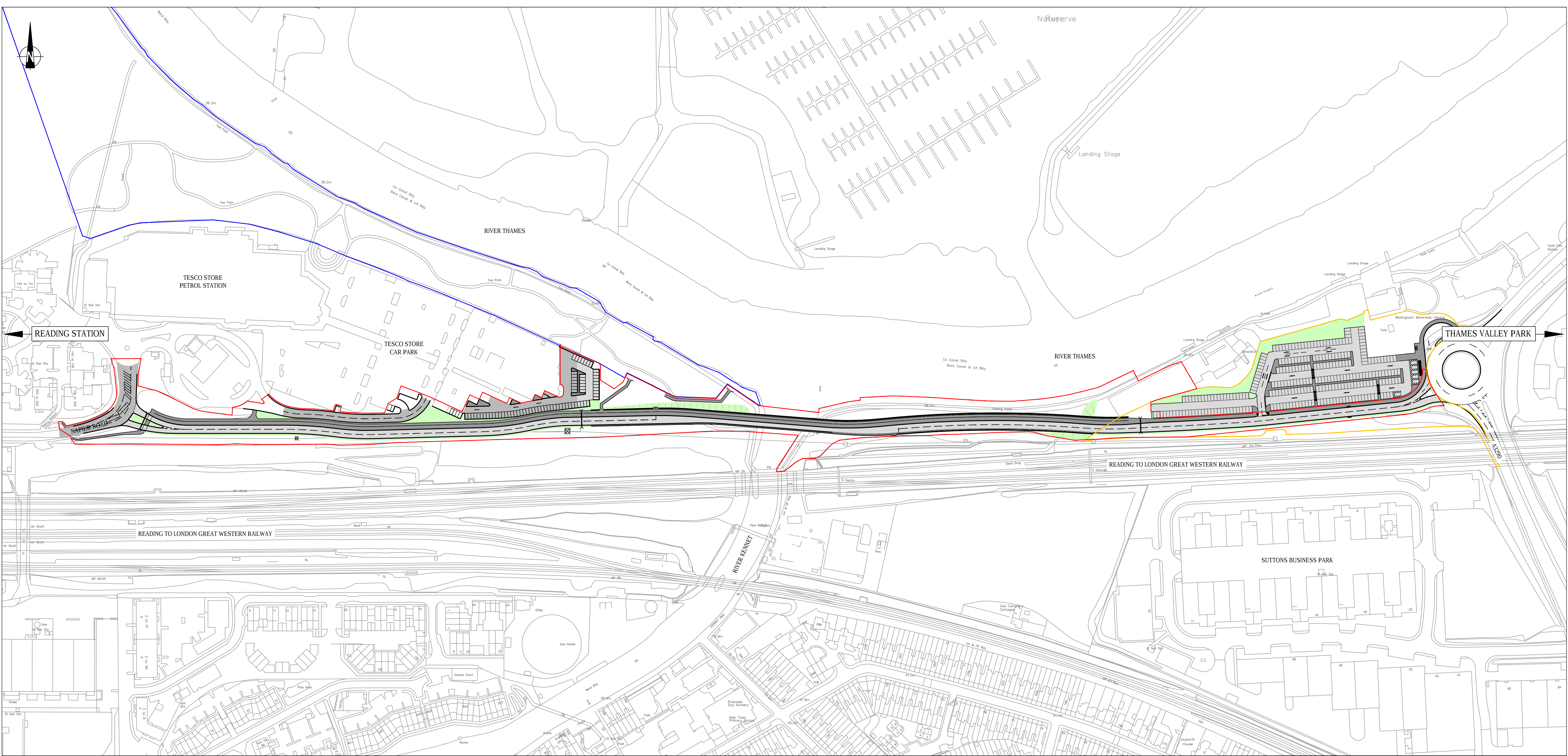
Drawing Number
28791/2009/CIV/002

Revision
-



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Appendix B Proposed Site Context Plan



NOTES:

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- ALL DIMENSIONS ARE IN METRES UNLESS OTHERWISE SHOWN.

KEY:

- PLANNING APPLICATION RED LINE BOUNDARY
- OTHER LAND IN APPLICANTS CONTROL
- PLANNING APPLICATION BOUNDARY (WOKINGHAM BOROUGH COUNCIL PROPOSED PARK AND RIDE DEVELOPMENT)

Mark	Revision		Date	Drawn	Chkd

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Drawing Issue Status
FOR PLANNING

**EAST READING MASS RAPID TRANSIT
PROPOSED SITE CONTEXT INCLUDING
PROPOSED PARK AND RIDE DEVELOPMENT**

Client					
Date of 1st Issue	30.05.2017	Designed	LC	Drawn	SF
A1 Scale	1:1500	Checked	SE	Approved	SM
Drawing Number	28791/2009/CIV/015	Revision	-	© Peter Brett Associates LLP READING Tel: 0118 950 0761	

Appendix C ILP Obtrusive Light Limitations for Exterior Lighting Installations

Table C-1: Obtrusive Light Limitations for Exterior Lighting Installations – General Observers

Environmental Zone	Sky Glow ULR [Max%]	Light intrusion (into Windows) Ev [Lux]		Luminaire Intensity I [candelas]		Building Luminance pre-curfew
		Pre Curfew	Post Curfew	Pre Curfew	Post Curfew	Average L [cd/m ²]
E0	0	0	0	0	0	0
E1	0	2	0(1*)	2500	0	0
E2	2.5	5	1	7500	500	5
E3	5.0	10	2	10,000	1,000	10
E4	15	25	5	25,000	2,500	

Definitions

ULR = Upward Light Ratio of the Installation is the maximum permitted percentage of luminaire flux for that goes directly into the sky.

Ev = Vertical Illuminance in Lux and is measured flat on the glazing at the centre of the window

I = Light Intensity in Cd

L = Luminance in Candelas per Square Metre Cd/m²

Curfew = 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 planning authority.

(1) Upward Light Ratio – Some lighting schemes will require the deliberate and careful use of upward light – e.g. ground recessed luminaires, ground mounted floodlights, festive lighting – to which these limits cannot apply. However, care should always be taken to minimise any upward waste light by the proper application of suitably directional luminaires and light controlling attachments.

(2) Light Intrusion (into Windows) – These values are suggested maxima and need to take account of existing light intrusion at the point of measurement. In the case of road lighting on public highways where building facades are adjacent to the lit highway, these levels may not be obtainable. In such cases where a specific complaint has been received, the Highway Authority should endeavour to reduce the light intrusion into the window down to the post curfew value by fitting a shield, replacing the luminaire, or by varying the lighting level.

(3) Luminaire Intensity – This applies to each source in the potentially obtrusive direction, outside of the area being lit. The figures given are for general guidance only and for some sports lighting applications with limited mounting heights, may be difficult to achieve.

(4) Building Luminance – This should be limited to avoid over lighting, and related to the general district brightness. In this reference building luminance is applicable to buildings directly illuminated as a night-time feature as against the illumination of a building caused by spill light from adjacent luminaires or luminaires fixed to the building but used to light an adjacent area.

Reproduced from the ILP Publication: Guidance Notes for the Reduction of Obtrusive Light – ILP, GN01:2011

Table C-2: Obtrusive Light Limitation for Exterior Lighting Installations – Road Users

Road Classification (1)	Threshold Increment (TI)	Veiling Luminance (Lv)
No road lighting	15% based on adaptation luminance of 0.1cd/m ²	0.04
ME6/ME5	15% based on adaptation luminance of 1cd/m ²	0.25
ME4/ME3	15% based on adaptation luminance of 2cd/m	0.40
ME2/ME1	15% based on adaptation luminance of 5cd/m ²	0.84
TI = Threshold Increment is a measure of the loss of visibility caused by the disability glare from the obtrusive light installation Lv = Veiling Luminance is a measure of the adaptation luminance caused by the disability glare from the obtrusive light installation (1) = Road Classifications as given in BS EN 13201 – 2: 2003 Road lighting Performance requirements. Limits apply where users of transport systems are subject to a reduction in the ability to see essential information. Values given are for relevant positions and for viewing directions in path of travel. For a more detailed description and methods for determining, calculating and measuring the above parameters see CIE Publication 150:2003.		

Appendix D WSP Design and Access Statement for TV P&R

70012699-DAS

THAMES VALLEY PARK PARK AND RIDE

DESIGN AND ACCESS STATEMENT

JUNE 2016

THAMES VALLEY PARK PARK AND RIDE

DESIGN AND ACCESS STATEMENT

Wokingham Borough Council

Project no: 70012699
Date: June 2016

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QUALITY MANAGEMENT

ISSUE/REVISION	FIRST ISSUE	REVISION 1	REVISION 2	REVISION 3
Remarks	Issue			
Date	June 2016			
Prepared by	G. Sutton			
Signature				
Checked by	T. Beck			
Signature				
Authorised by	S. Reed			
Signature				
Project number	70012699			
Report number				
File reference				

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TABLE OF CONTENTS

1	INTRODUCTION	2
2	ASSESSMENT	3
2.1	SITE LOCATION	3
2.2	PLANNING POLICY CONTEXT	3
2.3	EXISTING PARK AND RIDE FACILITIES.....	6
2.4	SITE ANALYSIS	6
3	INVOLVEMENT	9
3.1	PRE-APPLICATION ADVICE	9
3.2	COMMUNITY ENGAGEMENT	9
3.3	KEY ISSUES AND RESPONSES	9
3.4	SAFER PARKING SCHEME.....	10
4	EVALUATION - ISSUES AND CHALLENGES.....	12
4.1	EVALUATION.....	12
5	DESIGN AND APPEARANCE	16
5.1	DESIGN – CONCEPT AND KEY PRINCIPLES.....	16
5.2	DESIGN – APPEARANCE AND MATERIALS.....	17
6	ACCESS	19
6.1	ACCESS - BUSES.....	19
6.2	ACCESS - CAR AND MOTORCYCLE.....	19
6.3	ACCESS - WALKING AND CYCLING.....	19
6.4	ACCESS - BLUE BADGE HOLDERS.....	19
6.5	ACCESS - WIDER CONTEXT	19

1 INTRODUCTION

- 1.1.1 This Design and Access Statement has been produced to assist Wokingham Borough Council (WBC) in its consideration of the planning application for a Park and Ride site at Thames Valley Park (TVP).
- 1.1.2 This document aids the planning application being submitted for the TVP Park and Ride Site and has been prepared by WSP| Parsons Brinckerhoff in accordance with the CABE guidance document.
- 1.1.3 The proposal of the TVP Park and Ride will include 277 car parking spaces (including disabled spaces), motorcycle parking, covered cycle parking and bus shelters.

2 ASSESSMENT

2.1 SITE LOCATION

- 2.1.1 The proposed Park and Ride facility is to be located north of Suttons Business Park, A3290 and the Reading to London Paddington Railway line. It will also be south of the River Thames and west of Thames Valley Park.

Figure 2-1 Site Location Map



- 2.1.2 The site has been chosen as an ideal location for a Park and Ride due to its proximity to the A4 and A3290. The aim is to remove traffic off the major roads into Reading town centre.

2.2 PLANNING POLICY CONTEXT

- 2.2.1 A planning statement has been prepared in support of this planning application and should be referred to in terms of policy.

NATIONAL PLANNING POLICY FRAMEWORK (NPPF)

- 2.2.2 TVP Park and Ride development aids the Government's National Planning Policy Framework (NPPF) by promoting sustainable transport and sustainable development as it states "*plans should protect and exploit opportunities for the use of sustainable transport modes for the movement of goods or people*" which buses and a park and ride facility will help increase sustainable transport particularly between Reading and Wokingham.

2.2.3 Furthermore the NPPF states *“The transport system needs to be balanced in favour of sustainable transport modes, giving people a real choice on how they travel.”* This Park and Ride facility will provide a sustainable alternative to the car by providing a frequent public transport link to Reading/Wokingham as well as a traffic free route to cycle or walk to Reading town centre via the Thames Path. You can also hire ‘Readybikes’ close to the site to cycle to your destination.

2.2.4 In addition, the proposal supports many of the objectives of NPPF, for example: *“proactively drives and supports sustainable economic development to deliver the homes, business and industrial units, infrastructure and thriving local places that the country needs; promotes mixed use developments, and encourage multiple benefits from the use of land in urban and rural areas, recognising that some open land can perform many functions....and actively manage patterns of growth to make the fullest possible use of public transport, walking and cycling, and focus significant development in locations which are or can be made sustainable”.*

2.2.5 Additionally the NPPF states *“Local authorities should work with neighbouring authorities and transport providers to develop strategies for the provision of viable infrastructure necessary to support sustainable development”.* This park and ride scheme supports collaboration and joint working with WBC and RBC. Although this will be led by WBC, RBC has played a huge role in the future links and aspirations for the TVP Park and Ride.

THAMES VALLEY BERKSHIRE LEP STRATEGIC ECONOMIC PLAN

2.2.6 The TVP Park and Ride has been prioritised within the ‘TVB Implementation Plan’ as it will *“enhance urban connectivity.”* The scheme is numbered 2.13.

2.2.7 In the ‘TVB Evidence Base’ document it notifies Reading as a large urban area amounting to 370,000 people which is *“certainly large enough to justify significant investment in public transport systems.”*

WOKINGHAM BOROUGH COUNCIL (WBC) POLICY

CORE STRATEGY

2.2.8 Policy CP10 Improvements to the Strategic Transport Network states the need for *“High quality express bus services...via the park and rides.”*

LOCAL TRANSPORT PLAN

2.2.9 Policy PT8 states that *“the Council will promote the use of Park and Ride services and will support the future introduction of new sites in the Borough where feasible.”* The benefits of park and ride facilities includes *“enhancing the economic viability of town centres, reducing congestion and promoting sustainable travel.”*

2.2.10 Policy PT8 also states:

1. *“Over the life of this plan and the development of the adopted core strategy will work with Reading Borough Council and Bracknell Forest Councils to deliver and retain Park and Ride at the following locations:*
2. *Near to Coppid Beech Roundabout on the A329 in Wokingham;*
3. *Park and Ride in the vicinity of the M4 junction 11 (MereOak);*
4. *Relocation or retention of the Park and Ride at Winnersh; and*
5. *Park and Ride located in Thames Valley Park to complement the high quality express bus services or mass rapid transit along the A4 or A329 corridors into central Reading.”*

READING BOROUGH COUNCIL (RBC) POLICY

CORE STRATEGY

- 2.2.11 Policy CS21 'Major Transport Projects' states *"As a regional transport hub, priority will be given to the implementation of the priority transport projects identified in the Local Transport Plan, particularly the upgrading of Reading Station interchange, Park and Ride Sites, Mass Rapid Transit, road improvements, Quality Bus Routes and associated transport improvements. Land needed for the implementation of priority transport projects will be safeguarded from development, to enable their future provision."*
- 2.2.12 In addition, RBC has a Reading 2020 vision to manage parking spaces in the centre of Reading to *"improve the quality of life of those who live, work or visit Reading."* The Park and Ride development will help reduce congestion in the city centre and improve 'Accessibility' which RBC notes as a *"prime requirement of sustainable communities."*

LOCAL TRANSPORT PLAN

- 2.2.13 Reading Borough Council has Area Action Plans (AAP's) including an Eastern Local Action Plan which notices that the *"A329(M) and the A4...suffer congestion during peak periods at Sutton Seeds Roundabout, which is attributed to the conflicting movements at the roundabout and the bottleneck at Cemetery Junction"*.
- 2.2.14 The Eastern Local Action Plan has plans for the future which do relate to park and ride facilities:
- *"To work with Wokingham Borough Council to progress the implementation of a long term Park and Ride strategy, considering alternative sites to Loddon Bridge, including the possible use of Broken Brow at the northern end of the A329(M);*
 - *To work with neighbouring authorities to deliver an enhanced interurban public transport network;*
 - *To work with the private sector and Wokingham Borough Council to innovate and secure delivery of integrated transport choices associated with new development proposed within Wokingham Borough; and*
 - *To work with Wokingham Borough Council to deliver an East Reading Transport Link and associated Park and Ride facilities."*

2.3 EXISTING PARK AND RIDE FACILITIES

- 2.3.1 There are two other Park and Ride sites that serve the area, one at Mere oak (on the A33 south of Reading) and the other at Winnersh Triangle Station (on the A329 (M) south east of Reading). Both sites have been funded through the Local Sustainable Transport Fund (LSTF).

2.4 SITE ANALYSIS

SITE DESCRIPTION

- 2.4.1 The National Grid reference for the centre of the site is SU 73463 73895. The site is located adjacent to Thames Valley Park, south of the River Thames, as shown in Figure 1-1.
- 2.4.2 To the south of the site is the Reading to London Paddington Railway line and Suttons Business Park.
- 2.4.3 The site is triangular in shape and is approximately 1.35ha in size.
- 2.4.4 Currently there is no car parking facilities in this location, however north east of the site there is a 40-50 space car park for the Wokingham Waterside Centre. This car park will not be connected to the Park and Ride facility and will continue to operate separately.
- 2.4.5 The landscape currently is grassland and woodland. The site is bounded by the railway line to the south which is protected by trees and fencing.
- 2.4.6 The surrounding area is mainly formed of commercial properties as well as some recreational areas, including the Thames Path and woodland to the north east.

TOPOGRAPHY

- 2.4.7 A topographical survey was conducted of the site in 2013 is located at TS13-022M. The topographical survey indicates that the highest points at the Application Site are at the centre of the southern boundary, and the lowest points are in the centre of the northern boundary of the site. In general the site slopes towards the north. However, the centre of the site at present is undulating and due to the dense vegetation some parts of the site were not surveyed.

SURFACE WATER DRAINAGE

- 2.4.8 A Flood Risk Assessment was conducted by WSP | Parsons Brinckerhoff in March 2016. The Application Site is wholly located within Flood Zone 1. Land in Flood Zone 1 has a less than 0.1% annual probability of river or sea flooding. The flood risk to the site from coastal and tidal sources is considered negligible, and the risk from fluvial, sewer and artificial sources is classified as low.

TRANSPORT

- 2.4.9 The A3290 and A4 are two of the major links into Reading and towards Wokingham, particularly during peak periods.
- 2.4.10 The bus service for the TVP Park and Ride will be the current TVP shuttle service that runs to Reading Town Centre and Thames Valley Park via the A4. Monitoring of this service will occur to determine whether additional buses are required or frequency and destinations are to change.

AIR QUALITY

- 2.4.11 IAQM assessment methodology has been used to determine the potential dust emission magnitude for the construction phase dust and PM₁₀ sources. There are currently no significant buildings or structures present within the Application Site that will require demolition.

GROUND CONDITIONS

- 2.4.12 A land contamination assessment was undertaken by WSP | Parsons Brinckerhoff in October 2015. The assessment found that in the context of redevelopment for a park and ride facility, a potential risk exists to human health and controlled waters (the River Thames and underlying aquifers). The risks to human health are considered likely to be low across the majority of the site, but localised higher risks may exist, and the risks to controlled waters are considered to be low to moderate.

LANDSCAPE AND VISUAL IMPACT

- 2.4.13 A landscape and visual impact assessment was undertaken by WSP | Parsons Brinckerhoff in January 2016.
- 2.4.14 The Site is located at a level of around 40m AOD, being surrounded to the north by the flat landscape of Reading Marina and the River Thames. Land rises slightly to the east and south-east towards Earley, with a high point of around 62m AOD some 1.4km away to the south-east (Woodlands Avenue/ University of Reading Campus) and 62m AOD some 1.4km away to the east (Water Tower at Little Gogs), beyond Thames Valley Business Park. Land to the north, west and south-west are located at a similar level to the Site, being located along the River Thames flood plain.
- 2.4.15 The thick vegetation within and surrounding the Site helps to create a sense of enclosure, limiting some views out and creating a rural character. The trees within the Site also contribute to local views, with tree canopies creating the skyline of many views. Views are typically disrupted to the south by railway infrastructure, large electricity pylons and glimpses beyond the railway infrastructure of the large gas cylinders.

CIRCULATION

- 2.4.16 The site is located to the west of the roundabout junction of the A3290 and Thames Valley Park Drive. Currently there is no vehicular access to the site.
- 2.4.17 There are no public rights of way crossing the site. Continuous footways runs along the both sides of the A3290 and Thames Valley Park Drive.

ECOLOGY

- 2.4.18 An ecological survey was undertaken by CA Ecology in November 2015. The assessment found that the site can be considered significant at the local level for bats. The site supports a medium population of slow-worms, and that there is a low possibility that badgers use the site. A more detailed summary is provided in the Environmental Appraisal Summary.

ARBORICULTURE

- 2.4.19 An arboricultural assessment was undertaken by Bosky Trees in December 2015. The Site is currently a large area of scrub-land with many young self-sown trees. There are a few mature trees on the northern and eastern boundaries, these are situated between young tree groups that have developed from a past planting scheme. Several self-sown trees are situated on the edge of the railway embankment immediately beyond the southern boundary of the Site.

UTILITIES AND SERVICE INFRASTRUCTURE

- 2.4.20 A gas main and electric cables currently run under the site. Discussions have commenced with both Southern Gas Networks (SGN) and Scottish Southern Energy (SSE) for protection/relocation.

ARCHAEOLOGY

- 2.4.21 A desk-based historic environment assessment was undertaken by WSP | Parsons Brinckerhoff in October 2015. The assessment found that no designated heritage assets or their setting will be affected by the proposed Scheme, and that there is potential for archaeological assets to be present on site. Mitigation measures are proposed, including consideration of a programme of archaeological works in areas unaffected by gravel extraction.

LIGHTING

- 2.4.22 There is currently no lighting provision on the site. The A3290 and Thames Valley Park Drive, adjacent to the site, are lit.

3 INVOLVEMENT

3.1 PRE-APPLICATION ADVICE

- 3.1.1 Pre- application advice was sought by previous consultant Peter Brett Associates in 2013 and subsequently by WSP| Parsons Brinckerhoff. This was to understand the policy position, issues relating to the proposed development, the approach and documentation required for a planning application.
- 3.1.2 Discussions on the proposal were carried out in April 2015 with WBC Planning Department. More detailed discussions with WBC Ecologists took place in August and December 2015.

3.2 COMMUNITY ENGAGEMENT

- 3.2.1 A public consultation for the proposed scheme was held between 4th November and 4th December 2015; this comprised of three main elements to inform relevant stakeholders and members of the public about the proposal:
- A four page consultation leaflet
 - Two public exhibitions
 - An online consultation survey.
- 3.2.2 In total 100 people responded to the consultation questionnaire and approximately 40 individuals attended the two public exhibitions at the Wokingham Waterside Centre.

KEY ISSUES AND RESPONSES

- 3.2.3 **Questionable need for the Park and ride**
The park and ride site would provide a new alternative means of reaching Reading town centre from the east. Cemetery Junction suffers from congestion, and the park and ride will allow some working in Reading to park their vehicle on the outskirts of the town, and use the bus to reach the town centre. Doing so will help to relieve pressure on car parking facilities in town, and on the local road network. Subject to agreement, the TVP shuttle bus will be used as a means of travelling into town – at present, daytime services into reading are largely empty, as are evening services coming out of town.
- 3.2.4 **Duplicate of existing park and ride sites**
The TVP park and ride would provide a park and ride option for those visiting from along the A4 corridor (Twyford and Henley on Thames) which is not currently served by the park and ride sites at Mere oak and Winnersh Triangle. The site at Winnersh Triangle would necessitate driving away from Reading to use the bus – this may put some drivers off using this option. The TVP park and rides site therefore serves a new market along the A4 corridor, and does not duplicate existing park and ride facilities.
- 3.2.5 **Why not extend existing park and ride sites**
Extending the park and ride site at Winnersh Triangle would involve adding another tier to the car park, increasing its visual intrusion, and would presently be uneconomical. Furthermore, expansion of existing sites would fail to serve the potential new user market along the A4 corridor.
- 3.2.6 **Concerns about the effect on the existing TVP shuttle bus service**
Subject to agreement, the TVP shuttle bus would call at the park and ride site going into town on a morning and coming out of town on an evening. This would have minimal impact on journey

times, and would enable the bus to be used in the opposite direction to its current peak passenger flows.

3.2.7 **Concerns about the riverside towpath**

The park and ride site would not involve the removal or alteration of the Thames riverside towpath.

3.2.8 **Loss of amenity space**

The existing site is largely overgrown and difficult to access – the Thames riverside would be undeveloped and remain usable as amenity space.

3.2.9 **Visual impact on the riverside**

Mitigation measures would be employed to screen the park and ride site from the riverside, including planting and landscaping as is deemed necessary to protect riverside views.

3.2.10 **Site would block the proposed road to Tesco**

The car park access road would retain an alignment option for the East Reading Mass Transit Route (MTR) should this be developed in future. The development of the park and ride does not jeopardise the potential development of the East Reading MTR.

3.2.11 **Development is a way of enabling development of East Reading MTR**

The East Reading MTR is a separate project from the park and ride proposal and is not part of this consultation programme. Any future proposals to develop the East Reading MTR will be subject to a separate consultation exercise.

3.2.12 **Traffic from TVP will increase**

Detailed traffic modelling has been undertaken as part of the planning application, and show that the park and ride site would remove car trips from the main link between the A3290 and Cemetery Junction. Any increases in traffic flow would be due to factors beyond the park and ride development.

3.2.13 **Wokingham Waterside Centre Car Park may be used for park and ride**

It is expected that car parking at the park and ride site will be charged at a rate of £6 per day – with the TVP shuttle bus being free to use. Park and ride users would have their parking ticket checked on boarding, and those without a parking ticket would not be permitted to use the service. This should discourage park and ride users from parking at the Wokingham Waterside Centre. A further option is that a refundable parking charge may be introduced for users of the Waterside Centre.

3.3 **SAFER PARKING SCHEME**

3.3.1 The Safer Parking Scheme, an initiative of the Association of Chief Police Officers, aims to reduce crime and the fear of crime in parking facilities, aligning with the policy objective set out by the LSTF Strategy. The scheme is managed by the British Parking Association (BPA) on behalf of Secured By Design and is supported by both the Home Office and Government.

3.3.2 Safer Parking status, Park Mark, is awarded to parking facilities that have met the requirements of a risk assessment conducted by the Police considering design and management aspects. As part of the scheme, the following factors should be suitable considered and incorporated into the design:

- Appropriate Lighting
- Effective Surveillance
- Clean Environment
- Boundary Treatment

3.3.3

The scheme design will aim to achieve Park Mark accreditation. Achieving this accreditation will promote the use of the facility, providing users with the confidence to use the service.

4 EVALUATION - ISSUES AND CHALLENGES

4.1 EVALUATION

SITE LOCATION

- 4.1.1 The site is well located to serve a Park and Ride facility as a consequence of its location at the termination of the A3290, a main route into the area from the south and east. Drivers will therefore not be required to significantly deviate from their route into Reading in order to use the park and ride facility, increasing patronage as a result.

PLANNING POLICY

- 4.1.2 The provision of a Park at Ride site at TVP is supported by all the significant policies nationally, regionally and locally. More information is provided in the Planning Statement.

TOPOGRAPHY

- 4.1.3 The site will require some earthworks to provide a level parking area. Along the southern edge of the access road and on the western and southern edges of the campsite area retaining structures will be provided up to 1.5m in height as developed area will be lower than existing topography at this points.
- 4.1.4 The flat profile of the proposed layout will provide increased security, with no areas of the car park obscured from the bus stop as a result of the topography, giving passengers alighting at the bus stop a clear view of the route to their car. This increased security can encourage greater use of the site.

SURFACE WATER DRAINAGE

- 4.1.5 The risk of this Proposed Development exacerbating flood risks from pluvial / overland flood sources is assessed as being moderate. To mitigate this risk a SuDS management train for surface water drainage will be implemented in accordance with the SuDS Manual.
- 4.1.6 For the proposed surface water drainage strategy onsite attenuation storage will be provided by permeable paving and geocellular storage tank prior to discharge to either the River Thames or surface water highway sewer at a controlled rate.
- 4.1.7 The Proposed Development will have a maximum discharge of 5.8l/s for the 1% annual probability rainfall event including an allowance for climate change for the proposed discharge to the River Thames. The maximum discharge to the surface water highway sewer will be 5.0l/s
- 4.1.8 In light of the above mitigation measures the risk of the Proposed Development exacerbating flooding to neighbouring property from pluvial / overland flow is considered to be low.

TRAFFIC CONGESTION / COLLISIONS

- 4.1.9 No existing traffic capacity or road safety issues have been identified in the vicinity of the site. Whilst there will be a localised increase in traffic flows, the site access roundabout is forecast to operate within its capacity, and the Park and Ride facility will reduce congestion across the wider network by diverting current journeys into Reading town centre to the site.

AIR QUALITY

- 4.1.1 The key air quality issues relate to the construction phase Measures to mitigate the air quality impacts during this phase include:
- the implementation of a Dust Management Plan;
 - regular monitoring of the site and any issues recorded;
 - planning the site so that machinery and dust causing activities are located away from receptors;
 - erecting solid screens or barriers around dusty activities or the site boundary that are at least as high as any stockpiles on site;
 - avoiding off-site run-off;
 - ensuring vehicle engines are switched off when stationary;
 - avoiding burning of waste materials; and
 - ensuring vehicles leaving the site are covered and the wheels are washed.
- 4.1.2 The scheme itself aims to reduce private car journeys and congestion within the town centre, which will in turn lead to general improvements in air quality within the town. No further mitigation is therefore recommended for the operational phase.

GROUND CONDITIONS

- 4.1.3 It is suggested that intrusive ground investigations across the site will be required by planning conditions/reserved matters to confirm the underlying ground conditions and to characterise the potential risks to human health and controlled waters, in particular from ground gases.

LANDSCAPE AND VISUAL IMPACT

- 4.1.4 The Site has the potential to affect or alter the following:
- The local undulating topography, albeit localised and surrounded by man-made features;
 - Setting of listed buildings;
 - Local visual amenity for users of surrounding PRoW network, river, marina, rowing lakes, Wokingham waterside Centre and Thames Valley Park;
 - Local visual amenity for users of surrounding offices, businesses and highways; and
 - The landscape character of identified Berkshire landscape character areas (area B4 Hurley Thames) primarily at construction, through change in an area of wooded green space to hard-surfaced construction/ infrastructure.
- 4.1.5 Opportunities to avoid or minimise landscape and visual effects include the following:

- The addition of stands of trees within/ around the Park and Ride site or the introduction of new boundary hedging with hedgerow trees can limit views of new infrastructure and enhance or at least maintain the sense of a more rural waterside landscape;
- Retention of mature trees around the boundaries and/ or within the Site wherever possible, particularly of high value trees;
- The design for the Park and Ride site should be accompanied by a landscape design plan to indicate proposed and retained planting; and
- Lighting should be in keeping with the existing minor road network to minimise light spill and glare.

4.1.6 Recommendations for further studies and surveys include the following:

- The identified landscape character assessment for the Site area (Character Area B4 Hurley Thames) is not wholly representative of the Site and therefore more detailed local landscape character assessments should be undertaken to understand the potential change to the local landscape character of the site. This should be done as part of more comprehensive landscape appraisal and / or LVIA to identify key views and areas for potential landscape mitigation planting;
- Production of a landscape mitigation planting plan.

4.1.7 The site will include a 3m wide shared footway and cycleway along the site frontage at the roundabout junction with the A3290 and Thames Valley Road, ensuring that the continuous connection currently provided is maintained.

ECOLOGY

- 4.1.8 If direct impacts cannot be avoided, dusk emergence surveys of the Waterside Centre and the adjacent storage shed will be undertaken to ascertain the presence or likely absence of roosting bats. Appropriate mitigation will be provided to retain suitable commuting and foraging habitat for bats.
- 4.1.9 The hedgerow, woodland and calcareous grassland represent habitats of Principal Importance and are listed on the Wokingham Borough Council Biodiversity Action Plan; it is proposed to avoid removal or loss of these habitats and where removal is unavoidable, it will be replaced on a like-for like basis. The area of calcareous grassland along the railway to the south of the site will be retained with a retaining wall.
- 4.1.10 The bat activity surveys confirmed that the site is regularly used by common and widespread species with the less common Myotis bats and Nathusius' pipistrelle bats also recorded using the site occasionally. The site can be considered significant at the local level for bats and without mitigation there would be a low negative impact on the local bat population. As the area immediately surrounding the water sports centre will be retained along with the storage shed further surveys for bats in these buildings will not be necessary. Following discussions with the biodiversity team at Wokingham Borough Council it is proposed to retain the majority of broadleaved woodland on site and create a planted buffer which is a minimum of 2m wide along the northern edge of the site between the scheme and the river maintain connectivity and creating a buffer from noise and light.
- 4.1.11 No badger setts or regularly used paths were recorded on site but a single scat was recorded on one occasion. However a sustained period of monitoring over the winter period revealed no further use of the site by badgers. The risk of a badger set being discovered on site during site clearance is low – negligible. As the site will need to be cleared in a carefully managed way under a watching brief (due to the presence of other protected species) the risk of killing or injuring any badgers or disturbing their setts is negligible.

- 4.1.12 The reptile survey confirmed that the site supports a medium population of slowworms as such there would be a high risk of killing, injury during site clearance and associated habitat loss resulting in a significant impact at the local level and without mitigation there would be a low – medium negative impact on the local population. Following discussions with Wokingham Borough Council Biodiversity team it was confirmed that there is scope to provide area of onsite connectivity and provide receptor areas created by enhancing some of the pockets of land surrounding the site. Reptiles can then be trapped and translocated to these areas. By taking this approach it should be possible to maintain the conservation status by retaining the population in-situ.
- 4.1.13 The habitat on site is suitable to support great crested newts during their terrestrial phase. The nearest pond (close to Oracle offices) has a HSI score of Good. However, the biodiversity team at Wokingham Borough Council have said the pond in question has been tested and has no evidence of great crested newts.
- 4.1.14 The surveys also identified that a range of other protected and notable species could be present including: hedgehogs, stag beetles and cinnabar moths. Rabbits also use the site extensively although rabbits are not a protected species they are protected from unnecessary suffering meaning measures to prevent this during site clearance will need to be taken. It is proposed to produce an Ecological Mitigation and Monitoring Plan for the site and include recommendations for other species of conservation concern, so that a cohesive approach can be defined and followed.

ARBORICULTURE

- 4.1.15 Six trees will need to be removed in order to construct the Proposed Development, these include four B-grade trees and two C-grade trees. 11 C-grade tree-groups will also need to be removed. Furthermore, parts of one other B-grade group and another three C-grade groups will need to be removed to make space for the new scheme.
- 4.1.16 The trees that will need to be removed have little merit as individuals and they are not of sufficient value to constrain site development. Young trees will be planted to complement the new site layout. A planting specification has yet to be produced but it is intended that this is to be provided after planning permission has been achieved. This will be in accordance with British Standard 5837:2102, in particular Annex B.

NOISE POLLUTION

- 4.1.17 An initial noise assessment has been undertaken and the increase in noise resulting from the Park and Ride is negligible because of the high levels of traffic noise generated by the A3290.

UTILITY AND SERVICE INFRASTRUCTURE

- 4.1.18 The site infrastructure must be designed with appropriate clearances in place to ensure that the existing utility infrastructure running through the site is adequately protected.

LIGHTING

- 4.1.19 Lighting classes to be designed according to PD CEN/TR 13201-1:2004 Road Lighting – Part 1: Selection of Lighting Classes and Institute of Lighting Engineers Guidance using 5m columns and warm lighting where possible.

5 DESIGN AND APPEARANCE

5.1 DESIGN – CONCEPT AND KEY PRINCIPLES

5.1.1 The overall design concept was to create a suitable Park and Ride facility to serve the area. In order to achieve this, key concepts and principles were considered and are highlighted below. In addition, the information provided by Wokingham Borough Council's Design Guidance was also frequently referred to and a variety of other technical sources. This helped ensure that designs would comply with all relevant legislation. We have also sought guidance with Thames Valley Police to ensure that the site will achieve a 'Park Mark' status.

5.1.2 The following design principles have been used in developing the proposals;

- Provision of Blue Badge Bays – Provide blue badge bays, sized in accordance with local authority standards, with bays located within close proximity to the bus stop.
- Cycle/Motorcycle Provision – Provision for cyclists and motorcyclists to further promote sustainable modes of transport, with bays provided in close proximity to the bus interchange.
- Legibility / Integration – The layout must be clear to encourage vehicular circulation around the facility.
- Segregation of Cars/Buses – Bus and car traffic should be segregated to increase operational efficiency.
- Operating Efficiency – Bus interchanges should be appropriately sited to enable efficient bus routes to decrease journey times and enable safe access into the interchange area.
- Dedicated Pedestrian Routes – Pedestrian walkways should be strategically designed to ensure user safety and help direct pedestrians to and from the bus stops.
- Sheltered Waiting Area – Provide a sheltered area for users whilst waiting for bus services.
- Scale – The proposed car park has been designed to maximise the number of parking spaces on the site, but working within the constraints. This brings the greatest benefit for the operation of the Park and Ride and will help to ensure its success when combined with the various other aspects noted.
- Lighting / Security – A lighting strategy should be implemented to enable vehicles and pedestrians to travel in and around the site safely. Similarly measures such as CCTV should be included to increase the overall security of the site.
- Minimize Visual Impact – Use existing landscaping and provide additional areas where possible to help screen the facility and minimize visual impact.
- Maintain Ecology and Environment – Develop proposals sensitive to the existing environment. Protected trees to be maintained and as much of the existing landscaping screening the frontage of the site retained.

5.2 DESIGN – APPEARANCE AND MATERIALS

Car Park

5.2.1 The layout of the car park is shown on planning application drawing TVP/SK/006 Rev C.

- The car park surface will consist of grey tarmac and gravel.
- Footways will be constructed using paving slabs in silver or grey.
- Kerbs will be made of concrete and will be light grey in colour.

Landscaping

5.2.2 A landscaping plan will be produced to accompany the scheme. This will balance the retention of existing trees coupled with the inclusion of new planting to enhance the scheme. For security and safety reasons, planting within the car park will generally be low level and low maintenance.

5.2.3 Along the southern edge of the access road and on the western and southern edges of the campsite area retaining structures will be provided up to 1.5m in height as developed area will be lower than existing topography at this points. It is proposed that the retaining structure is made of either Precast Concrete Sections or interlocking blocks (such as the Porcupine Wall System).

Height Barrier

5.2.4 As part of the site security measures there will be a height barrier at the entrance that will deter access by unauthorized vehicles entering the site.

Cycle and Motorcycle Parking

5.2.5 Provision is being made within the car park for cycle and motorcycle parking. In both cases, there will be secure lockable hoops to allow bikes to be left safely on site.

Signage

5.2.6 Within the car park there will be clear directional signage for people accessing and egressing. This will ensure that circulation around the car park is clearly identified and people can find parking spaces and the exit quickly. Signage will also clearly indicate the entrance for cars.

5.2.7 Beyond the extent of the site, there will be a regime of directional signage that will clearly identify the presence and the exact location of the Park and Ride facility. All of these signs will be located within the public highway and will therefore comply with the requirements of the Traffic Signs and General Directions 2002 (and subsequent amendments), and will replace the existing Park and Ride signage.

Sustainability

5.2.8 This scheme is being promoted through the Government's 'Local Sustainable Transport Fund' (LSTF) that will deliver an integrated package of complimentary transport projects to encourage economic growth and reduce carbon emissions relating to transport.

Transport

5.2.9 The premise of Park and Ride at this location is to reduce car trips on the road network thereby reducing traffic congestion and improving air quality.

- 5.2.10 Its aim is to both intercept and reduce the length of existing car trips, and promote new trips by Park & Ride.

Responsible sourcing

- 5.2.11 As far as possible, the construction of the car park will utilise locally sourced and recycled construction materials to reduce the impact on the environment and the vehicle movements required as a result of the construction process.

Biodiversity

- 5.2.12 Existing ecology corridors around the site will be retained. Efforts will be made to maintain connectivity across the area. There is part of a former hedgerow which runs along the northern edge of the site which will be retained and enhanced to create connectivity and where possible maintain a dark corridor. This will be included within the Environmental Mitigation and Management Plan for the site.

Drainage

- 5.2.13 Non-infiltrating Sustainable Drainage System (SuDS) techniques are proposed in order to manage surface water at the site. The Proposed Development will have a maximum discharge of 5.8l/s to the River Thames and 5.0l/s to the surface water sewer for the 1% annual probability rainfall event including an allowance for climate change.

6 ACCESS

6.1 ACCESS - BUSES

- 6.1.1 Buses will access a separate pick-up and set-down area directly from the site access roundabout. This bus-only area will form a loop, with buses exiting on to the roundabout in order to head south on the A3290. Drawing 2699-ATR-001 shows a swept path assessment of the proposed arrangements.

6.2 ACCESS - CAR AND MOTORCYCLE

- 6.2.1 Access to the car park will be taken from a new access road linking to the roundabout junction of the A3290 and Thames Valley Park Drive to the east. The car park and bus access will be entirely segregated. Within the car park there will be clearly defined routes for cars.

6.3 ACCESS - WALKING AND CYCLING

- 6.3.1 A 3m-wide shared footway/cycleway will be provided along the site frontage. An existing footway runs along the western side of the A3290 which provides pedestrian access to the south, continuing along Thames Valley Park Drive to provide access to the business park and riverside footpaths to the east.

6.4 ACCESS - BLUE BADGE HOLDERS

- 6.4.1 Six dedicated parking spaces for blue badge holders will be located at the eastern end of the car park, in close proximity to the bus stop.

6.5 ACCESS - WIDER CONTEXT

- 6.5.1 Wokingham Borough Council's Local Transport Plan policy B12 and WT10 highlight the need to reconsider the existing transport strategy in this area, highlighting Park and Ride as a potential means of improving the existing infrastructure.
- 6.5.2 The site will primarily be used by local residents and people entering the area from the East and South.

Appendix E Site Photographs & Location Plan

East Reading Mass Rapid Transit Scheme

Lighting Assessment – Appendix E

On behalf of



Document Control Sheet

Project Name: East Reading Mass Rapid Transit Scheme
Project Ref: 28791
Report Title: Lighting Assessment – Appendix E
Doc Ref: 3011
Date: June 2017

	Name	Position	Signature	Date
Prepared by:	Alex Swann	Graduate Engineer		5 th May 2017
Reviewed by:	Neil Young	Principal Environmental Scientist		22 nd May 2017
Approved by:	Jonathan Riggall	Equity Director		8 th June 2017
For and on behalf of Peter Brett Associates LLP				

Revision	Date	Description	Prepared	Reviewed	Approved
Final	30 th June	Final	AS	NY	JR

This report has been prepared by Peter Brett Associates LLP ('PBA') on behalf of its client to whom this report is addressed ('Client') in connection with the project described in this report and takes into account the Client's particular instructions and requirements. This report was prepared in accordance with the professional services appointment under which PBA was appointed by its Client. This report is not intended for and should not be relied on by any third party (i.e. parties other than the Client). PBA accepts no duty or responsibility (including in negligence) to any party other than the Client and disclaims all liability of any nature whatsoever to any such party in respect of this report.

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Appendix A

Viewpoint 1 View From Kennet & Avon Canal looking North	Qualitative description of existing lighting
	Daytime visit: <u>Screening:</u> Full screening from viewpoint, by multiple railway bridges. <u>Topography:</u> Flat. <u>Vegetation, building/structures:</u> Victorian Railway bridges / viaducts in the foreground, deciduous trees. <u>Potential light sources:</u> Street lighting along Kennet side – column and mounted. <u>Primary Receptors:</u> Users of the public right of way/ wildlife in the River Kennet.
	Night-time visit <u>Light features in Site & surroundings:</u> Lighting from column mounted LED lighting along the PROW River Kennet towpath. <u>Principle light sources:</u> LED column lighting illuminating tow path alongside River Kennet. <u>Light intrusion, glare, aura and sky glow:</u> Light screened by deciduous trees, light intrusion into River Kennet, which reflects/ scatters light. Glare limited by trees, no sky glow.

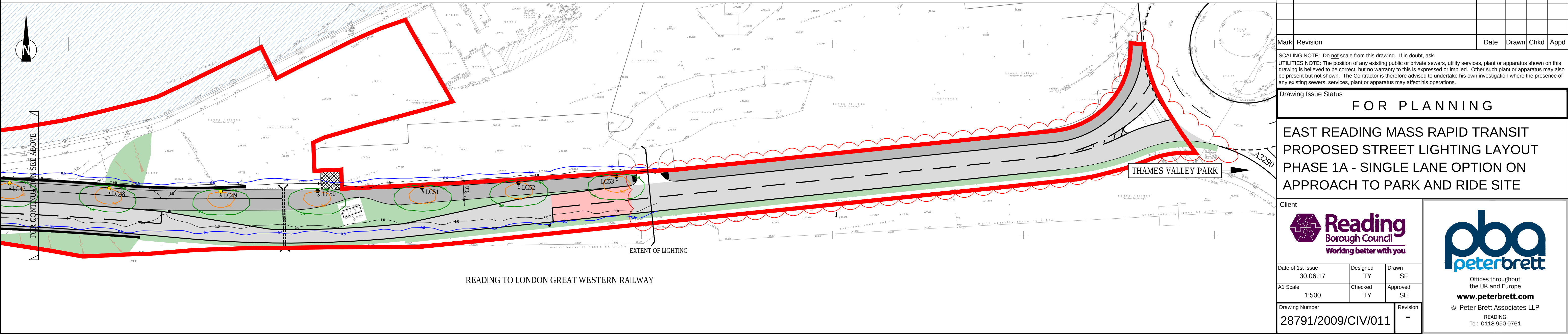
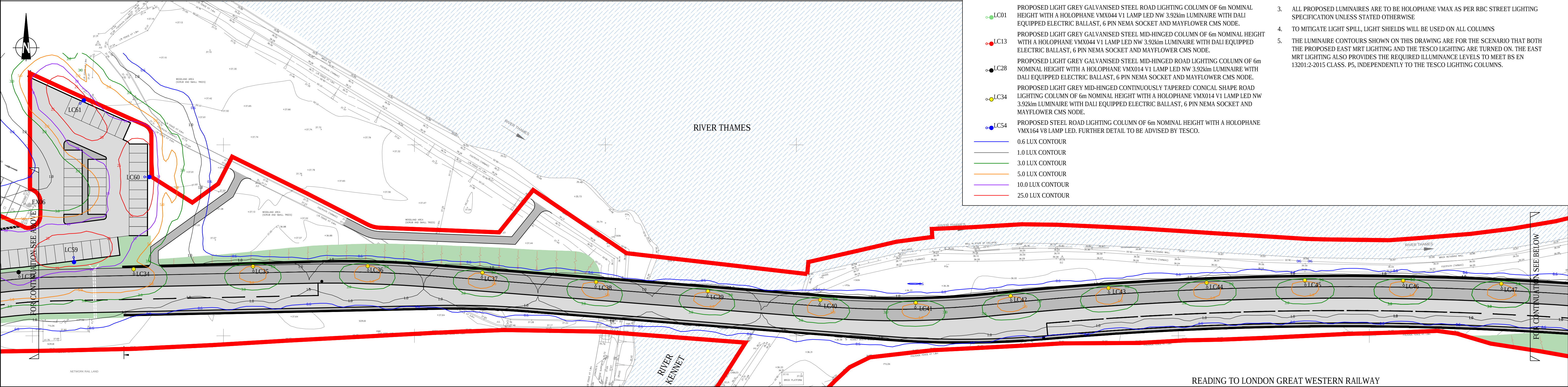
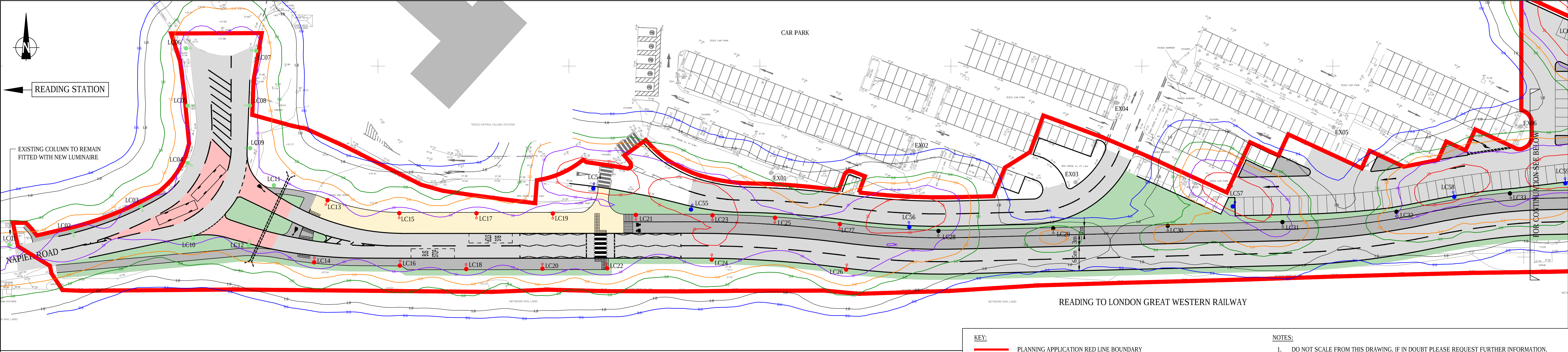
Viewpoint 2	Qualitative description of existing lighting
	Daytime visit: <u>Screening:</u> Site screened by trees and embankment along the River Thames. <u>Topography:</u> Flat. <u>Vegetation, building/structures:</u> Metal fencing along the Thames National Path, deciduous trees exist along the riverside. <u>Potential light sources:</u> High Pressure Sodium lighting from Thames Valley Park. <u>Primary Receptors:</u> Users of Thames National Path, wildlife in woodland adjacent.
Insufficient lighting for photos	Night-time visit <u>Light features in Site & surroundings:</u> Very faint light from Thames Valley Park, unable to view in photos. <u>Principle light sources:</u> Lighting on moored boats, distant footpath column lights (LED) and distant high pressure sodium street lighting. <u>Light intrusion, glare, aura and sky glow:</u> N/a

Viewpoint 3 View from Thames Path – West of River Kennet (looking east)	Qualitative description of existing lighting
	Daytime visit: <u>Screening:</u> Partially screened by hedgerows and trees (likely to be removed to accommodate for the development). <u>Topography:</u> Flat. <u>Vegetation, building/structures:</u> Large willow tree, scrubland and long grasses. Existing footbridge crossing the River Kennet mouth, Great Western Mainline bridge/ viaduct and train line. <u>Potential light sources:</u> LED lighting along Thames Path. <u>Primary Receptors:</u> Users of Thames Path, train drivers using the Great Western mainline.
	Night-time visit <u>Light features in Site & surroundings:</u> LED column lighting illuminating the Thames Path. <u>Principle light sources:</u> LED column lighting (mounted), shielded by willow tree. <u>Light intrusion, glare, aura and sky glow:</u> Light intrudes into River Thames, and sky glow was observed towards Reading Town Centre.

Viewpoint 4 View from Thames Path looking west (adjacent to Tesco)	Qualitative description of existing lighting
	Daytime visit: <u>Screening:</u> Full screening from site, due to deciduous trees and distance from site. <u>Topography:</u> Flat. <u>Vegetation, building/structures:</u> Metal fencing along the Thames National Path, deciduous trees exist along the riverside. <u>Potential light sources:</u> High pressure sodium lighting from Thames Valley Park, LED lighting from Thames Path at River Kennet. <u>Primary Receptors:</u> Users of Thames Path, wildlife in woodland.
	Night-time visit <u>Light features in Site & surroundings:</u> Minor lighting from distant Thames Valley Park and waterside centre, sky glow above East Reading. <u>Principle light sources:</u> High pressure sodium and coloured lighting from Waterside centre and Thames Valley Park, and on moored boats. <u>Light intrusion, glare, aura and sky glow:</u> Orange sky glow from the east, likely to be eastern suburbs of Reading. No light intrusion or glare.

Viewpoint 5 View from open space between Thames Path and Thames Valley Park Drive	Qualitative description of existing lighting
	Daytime visit: <u>Screening:</u> Fully screened – site lies beyond the waterside centre and Thames Valley Park roundabout. Screened by buildings and mature woodland. <u>Topography:</u> Flat. <u>Vegetation, building/structures:</u> Fully mature hedgerows and trees along the riverside, Waterside Centre building in the centre, and central Reading office buildings can be viewed in the distance. <u>Potential light sources:</u> Column street lighting on Thames Valley Park Drive. Operational lighting on Waterside Centre building, office lighting. <u>Primary Receptors:</u> Users of Thames Path and open space on the riverside.
	Night-time visit <u>Light features in Site & surroundings:</u> High Pressure Sodium street column lighting along Thames Valley Park Drive, spherical white lighting on/ adjacent to Waterside Centre. Light glow from Reading. <u>Principle light sources:</u> High Pressure Sodium street column lighting along Thames Valley Park Drive, spherical white lighting on/ adjacent to Waterside Centre, and office lighting from The Blade building in Reading Town Centre. <u>Light intrusion, glare, aura and sky glow:</u> Sky glow over Reading Town Centre and West Reading.

Appendix F East MRT Lighting Design Drawing



KEY:

- PLANNING APPLICATION RED LINE BOUNDARY
- EX01 EXISTING LIGHTING COLUMN
- LC01 PROPOSED LIGHT GREY GALVANISED STEEL ROAD LIGHTING COLUMN OF 6m NOMINAL HEIGHT WITH A HOLOPHANE VMX044 V1 LAMP LED NW 3.92km LUMINAIRE WITH DALI EQUIPPED ELECTRIC BALLAST, 6 PIN NEMA SOCKET AND MAYFLOWER CMS NODE.
- LC13 PROPOSED LIGHT GREY GALVANISED STEEL MID-HINGED COLUMN OF 6m NOMINAL HEIGHT WITH A HOLOPHANE VMX044 V1 LAMP LED NW 3.92km LUMINAIRE WITH DALI EQUIPPED ELECTRIC BALLAST, 6 PIN NEMA SOCKET AND MAYFLOWER CMS NODE.
- LC28 PROPOSED LIGHT GREY GALVANISED STEEL MID-HINGED ROAD LIGHTING COLUMN OF 6m NOMINAL HEIGHT WITH A HOLOPHANE VMX014 V1 LAMP LED NW 3.92km LUMINAIRE WITH DALI EQUIPPED ELECTRIC BALLAST, 6 PIN NEMA SOCKET AND MAYFLOWER CMS NODE.
- LC34 PROPOSED LIGHT GREY MID-HINGED CONTINUOUSLY TAPERED/ CONICAL SHAPE ROAD LIGHTING COLUMN OF 6m NOMINAL HEIGHT WITH A HOLOPHANE VMX014 V1 LAMP LED NW 3.92km LUMINAIRE WITH DALI EQUIPPED ELECTRIC BALLAST, 6 PIN NEMA SOCKET AND MAYFLOWER CMS NODE.
- LC54 PROPOSED STEEL ROAD LIGHTING COLUMN OF 6m NOMINAL HEIGHT WITH A HOLOPHANE VMX164 V8 LAMP LED. FURTHER DETAIL TO BE ADVISED BY TESCO.
- 0.6 LUX CONTOUR
- 1.0 LUX CONTOUR
- 3.0 LUX CONTOUR
- 5.0 LUX CONTOUR
- 10.0 LUX CONTOUR
- 25.0 LUX CONTOUR

- NOTES:**
- DO NOT SCALE FROM THIS DRAWING. IF IN DOUBT PLEASE REQUEST FURTHER INFORMATION.
 - ALL DIMENSIONS ARE IN METRES UNLESS STATED OTHERWISE.
 - ALL PROPOSED LUMINAIRES ARE TO BE HOLOPHANE VMAX AS PER RBC STREET LIGHTING SPECIFICATION UNLESS STATED OTHERWISE
 - TO MITIGATE LIGHT SPILL, LIGHT SHIELDS WILL BE USED ON ALL COLUMNS
 - THE LUMINAIRE CONTOURS SHOWN ON THIS DRAWING ARE FOR THE SCENARIO THAT BOTH THE PROPOSED EAST MRT LIGHTING AND THE TESCO LIGHTING ARE TURNED ON. THE EAST MRT LIGHTING ALSO PROVIDES THE REQUIRED ILLUMINANCE LEVELS TO MEET BS EN 13201-2:2015 CLASS. P5, INDEPENDENTLY TO THE TESCO LIGHTING COLUMNS.

Mark	Revision	Date	Drawn	Chkd	Appd

SCALING NOTE: Do not scale from this drawing. If in doubt, ask.

UTILITIES NOTE: The position of any existing public or private sewers, utility services, plant or apparatus shown on this drawing is believed to be correct, but no warranty to this is expressed or implied. Other such plant or apparatus may also be present but not shown. The Contractor is therefore advised to undertake his own investigation where the presence of any existing sewers, services, plant or apparatus may affect his operations.

Drawing Issue Status

FOR PLANNING

**EAST READING MASS RAPID TRANSIT
PROPOSED STREET LIGHTING LAYOUT
PHASE 1A - SINGLE LANE OPTION ON
APPROACH TO PARK AND RIDE SITE**

Client

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READING
Tel: 0118 950 0761

Date of 1st Issue 30.06.17	Designed TY	Drawn SF
A1 Scale 1:500	Checked TY	Approved SE
Drawing Number 28791/2009/CIV/011		Revision -

