

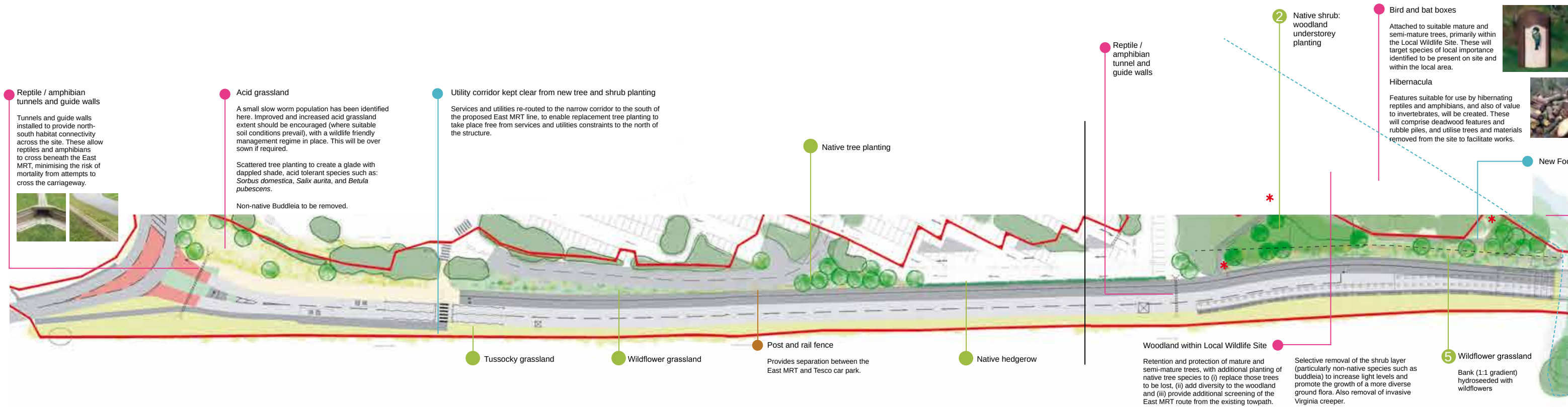


Figure 127. Detailed Landscape Strategy plan (see Landscape Strategy in ES for full detailed version)

Figure 126. Extract from the proposed trees and shrub planting palette



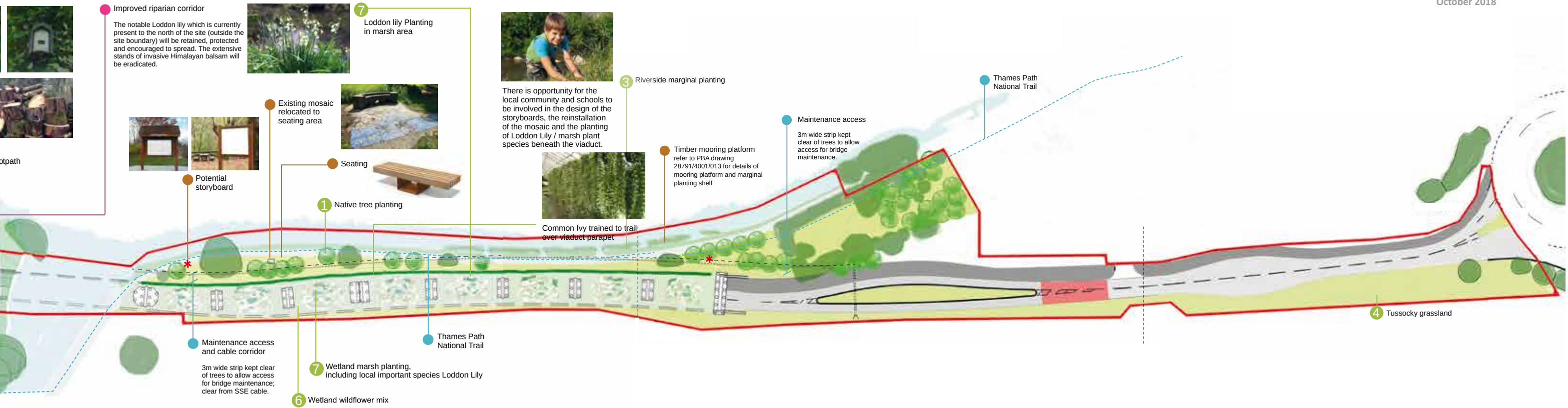
Planting strategy

24.14 The planting strategy comprises a combination of managing and supplementing existing areas of trees and vegetation, creating new areas of habitat, and providing structural, native planting. Whilst the proposals do require a number of trees to be removed, these are in many cases poor quality self-seeded or non-native specimens. These are to be replaced with native tree species of local provenance at a ratio of more than two for each tree removed. The replacement tree planting will be located so as to ensure that the trees are provided with suitable conditions to flourish in the long term.

Existing habitat

24.15 Broadleaved woodland within The Coal, Kennetmouth and Kings Meadow East LWS will be managed to include selective removal of non-native species, and the additional planting of native trees and understorey species. An area of poor semi-improved grassland matrix habitat at the western extent of the site will be managed to develop its acidic character and increase the extent of acid grassland species. Scattered planting of acid tolerant tree species will create a glade.

24.16 Existing trees will be retained where practicable; including the Willow tree at the mouth of the Kennet. Where trees are to be retained and are located to the north of the MRT viaduct, appropriate arboricultural methods would be utilised to enable their successful retention and longevity, including protective fencing during construction and pre-construction pollarding / canopy reductions.



New areas of habitat

- 24.17 Seed mixtures will be used to create swathes of grassland. A tussocky grassland mixture will be used, to the north and south of the East MRT route, in dry areas. Wildflower grassland will also be included upon the embankment to the west of the Kennet Mouth, and on the verge between the East MRT route and the Tesco access road. Wetland wildflower and grasses will be used beneath the viaduct, where a series of wetland marsh areas are proposed.
- 24.18 Group planting of native trees and shrubs is proposed, and native hedgerows will provide boundary treatments, where appropriate.
- 24.19 Riverside, native, marginal planting will be planted along the newly created marginal shelf at the edge of the River Thames, associated with the new mooring platforms. The existing concrete retaining wall is kept throughout with the proposed enhancements immediately in front and which provide native riparian habitat for the varying levels of water at the river margin. Where possible, sections of the existing concrete retaining wall will be reduced in height and buried to create a more naturalistic bank profile. As well as providing ecological enhancements, this will provide a positive enhancement of the site and river edge's landscape and visual amenity.

- 24.20 Beneath the viaduct, areas of marshy wetland and grasses will be created, providing an area for seasonal flooding, and a diverse marshy habitat, which includes the locally-occurring Loddon Lily which grows in swampy or damp soil. The design intention is to allow people to see beneath the viaduct, through to the railway embankment, and discourage public access beneath the viaduct.

Planting constraints

- 24.21 Proposed tree planting has been positioned taking into account services and maintenance access, including the SSE cable, which will lie to the north of the viaduct foundations.
- 24.22 SSE require a 10m easement, but it has been agreed that this can contain the structure's piers/piles/pile caps. A 4.2m clear route will be required for access.
- 24.23 Only low level shrubs/planting can be planted directly over the cables, with any significant planting approximately 2m away from the cable trench.
- 24.24 In order to accommodate maintenance access for the MRT viaduct, a 3m wide strip to the north is kept clear of trees above ground, however this area may contribute to the rooting zone of the trees.

Figure 128. Riverside marginal planting





Figure 129. Loddon Lily planting in marsh areas



Figure 130. Example of tussocky Grassland- a swathe of grassland between the river and the bridge, tolerant of partially shaded conditions, containing a mixture of wild flowers and grasses,



Figure 131. Example of wildflower grassland- a mixture of wild flowers and grasses.

Landscape elements			Access		Additional wildlife features		Net Change in Biodiversity		
24.25	New seating would be provided at the relocated mosaic, near to the location of moorings, where enhanced views of the river may be enjoyed.	24.28	Three timber mooring platforms would be provided as part of the riverbank enhancements (alongside the marginal shelf landscaping improvements). These would be new river elements which will provide additional short stay mooring facilities, which are lacking in the area. The mooring platforms and the new riverbank edge would help to improve the interface of the site with the River Thames and enhance people’s experience of the edge of the River Thames in this location.	24.30	The Thames Path National Trail and National Cycle Routes will continue on their existing routes through the site on completion of the scheme.	24.32	Night scented species - Nectar-rich plant species that are attractive to night-flying insects are included within planting scheme to enhance foraging opportunities for bats.	24.36	The landscape design has been ecologically informed, with consideration as to the ecological setting of the East MRT Site, the results of the baseline surveys and the anticipated impacts. The combined Ecology and Landscape Strategy will provide integrated ecological mitigation measures within the site itself, with improved habitat management practices and supplementary planting to be provided within the off-site portion of The Coal, Kennet Mouth and Kings Meadow East LWS and other nearby locations.
24.26	Information, or story, boards are proposed at locations throughout the linear space, which could provide information on the habitat enhancements and the locally occurring Loddon Lily, and to celebrate the confluence of the Thames and Kennet.			24.31	A new footpath link will connect the MRT route to the Thames Path, through the Coal Woodland. This will be routed through gaps and where a Category U tree is to be removed, to minimise the impact on existing trees	24.33	Reptile / amphibian tunnels and guide walls - Tunnels and guide walls installed to provide north-south habitat connectivity across the site. These allow reptiles and amphibians to cross beneath the MRT, minimising the risk of mortality from attempts to cross the carriageway.		
24.27	There is opportunity for the local community and schools to be involved in the design of the information / story boards, the reinstallation of the mosaic and the planting of Loddon Lily / marsh plant species beneath the viaduct.	24.29	In addition, the existing moorings between Kennet Mouth and the proposed new riverbank works are on land in 3rd party ownership (Wokingham Borough Council and Reading University). The existing moorings at Kennet Mouth are planned to be enhanced/ repaired by a third party, separate to this planning application, to full functionality (a section of the existing river wall in this location has partially failed).			24.34	Bird and bat boxes - Attached to suitable mature and semi-mature trees, primarily within the LWS. These will target species of local importance identified to be present on site and within the local area.	24.37	
						24.35	Hibernacula - Features suitable for use by hibernating reptiles and amphibians, and also of value to invertebrates, will be created. These will comprise deadwood features and rubble piles, and utilise trees and materials removed from the site to facilitate works.		Subject to the implementation of appropriate controls during construction, and adoption of ecologically informed landscape and lighting strategies, impacts on ecological features are not anticipated to be significantly adverse as a result of the proposed development. Overall, the proposed development will achieve a net gain in biodiversity, as required to meet national and local planning policy.



Figure 132. Examples of riverside marginal planting



Figure 134. There is opportunity for the local community and schools to be involved in the design of the landscape elements



Figure 135. Loddon Lily / marsh plant species to be planted beneath the viaduct.



Figure 133. Examples of information, or story, boards proposed at locations throughout the linear space



Tree Features	Removal	Planting
Individual Trees	33 individual trees (19B, 13C & 1C category shrub)	81 individual trees
Tree Groups	11 whole tree groups and hedgerows and 10 sections of tree groups (comprising an estimated 57 trees) (approx. 0.172 ha) (Part of tree group G119 approx. 0.0562 ha) removed by P&R) Therefore a total of 0.116 ha of tree groups to be removed [equating to an estimated 117 trees and 670 hedge plants/ shrubs/small hedge trees]	0.17 ha of understorey and hedgerow planting, plus the enhancement of 3.65 ha of existing woodland and scrub habitat [understorey and hedgerow planting will be agreed with WBC and RBC under a planning condition]

Table 137. Site Wide Summary of Tree Feature Removal and Planting for the Revised Scheme

Tree Features	Removal	Planting
Individual Trees	13 individual trees (8B, 5C category)	37 individual trees
Tree Groups	60% of G119 (approx. 0.0562 ha). (This proportion of G119 [approx. 0.0562 ha] has already been removed by P&R scheme) Therefore no tree groups removed. [equating to 0 trees and 0 hedge plants/shrubs/small hedge trees]	Up to 0.0750 ha of understorey and hedgerow planting [understorey and hedgerow planting will be agreed with WBC under a planning condition]

Table 138. : WBC Summary of Tree Feature Removal and Planting for the Revised Scheme

Tree Features	Removal	Planting
Individual Trees	20 individual trees (11B, 8C trees, 1C shrub category)	44 individual trees
Tree Groups	11 whole tree groups and hedgerows and 10 sections of tree groups (approx. 0.116 ha) [equating to an estimated 117 trees and 670 hedge plants/ shrubs/small hedge trees]	0.095 ha of understorey and hedgerow planting, plus the enhancement of 3.65 ha of existing woodland and scrub habitat [understorey and hedgerow planting will be agreed with RBC under a planning condition]

Table 139. RBC Summary of Tree Feature Removal and Planting for the Revised Scheme

Native trees (Heavy standard)

Abbr	Species Name	Common name	Form	Girth	Height	Root condition
Ac	<i>Acer campestre</i>	Field maple	3X Heavy standard	12-14 cm	3.5-4.2 m	RB
Bp	<i>Betula pendula</i>	Silver birch	3X Heavy standard	12-14 cm	3.5-4.2 m	RB
Pa	<i>Prunus avium</i>	Wild cherry	3X Heavy standard	12-14cm	3.5-4.2m	RB
Pp	<i>Prunus padus</i>	Bird cherry	3X Heavy standard	12-14cm	3.5-4.2m	RB

Native trees (feathered)

Abbr	Species Name	Common name	Form	Height	Root condition
Ac	<i>Acer campestre</i>	Field maple	2X Fthr	1.5-1.75m	RB
Ag	<i>Alnus glutinosa</i>	Common alder	2X Fthr	1.75-2.0 m	RB
Bp	<i>Betula pendula</i>	Silver birch	2X Fthr	1.75-2.0m	RB/CG
Cb	<i>Carpinus betulus</i>	Hornbeam	2X Fthr	1.5-1.75m	RB/CG
Sal	<i>Salix alba</i>	White willow	2X Fthr	2.0-2.5m	RB
Sau	<i>Sorbus aucuparia</i>	Rowan	2X Fthr	1.75-2.0m	RB

Native trees for acid soil

Abbr	Species Name	Common name	Form	Height	Root condition
Bpub	<i>Betula pubescens</i>	Downy birch	2X Fthr	1.2-1.5m	RB/CG
Sa	<i>Salix aurita</i>	Eared willow	2X Fthr	1.75-2.0m	RB
Sd	<i>Sorbus domestica</i>	Service tree	2X Fthr	1.75-2.0m	RB/CG

Figure 140. Tree schedule

26 Lighting, signals and signage

Lighting Design		Proposals	
26.1	A preliminary lighting design and lighting assessment accompany this application.	26.6	Lighting columns have been avoided completely along the bridge/viaduct section.
26.2	The lighting scheme proposed for the new bridge has been designed taking into account a number of different factors that have influenced both the luminaire selection and also the positioning of luminaires.	26.7	Lighting columns and luminaires where specified are the smallest units required for adopted highways with the minimum number required for a compliant design.
26.3	The main factors, both functional and aesthetic, which influence the lighting scheme, are: - Route and bridge users: functional lighting - Visual impact (light spill, glare and sky glow). - Security of bridge users. - Energy consumption and maintenance. - Relevant national guidance, including impacts on bats.	26.8	Lighting levels have been set at a minimum level according to highway safety and amenity requirements. This approach minimises both the number of columns and the amount of light spill upon and around the structure.
Feature lighting		26.9	Care has been taken to prepare a lighting design for the bridge which firstly meets the appropriate design standards, but also has low running costs and is maintainable in terms of, access, component supply and replacement. Luminaires have LED light sources which have low energy consumption and a service life in excess of 50,000 hours. There are two forms of lighting proposed
26.4	The use of feature lighting was considered to highlight features of the bridge in the landscape, to create reflectivity over water, and to give the bridge and its curtilage prominence at night. This approach was rejected on ecological impact grounds.	Parapet rail lighting	
26.5	In addition to general amenity lighting, wider opportunities to illuminate the bridge structure in order to create a more dramatic night-time presence have been considered, but rejected in this sensitive setting.	26.10	Low level LED linear lighting is proposed to be installed along the northern parapet of the structure, facing southwards (i.e. away from the River Thames) to light the pedestrian / cycleway only. This will minimise the levels of light spill from the structure on to surrounding habitat.
		Column lighting	
		26.11	Column lighting in line with both RBC and WBC specification, is proposed in all other sections of the East MRT.
		26.12	Mid-hinged columns will be installed to reduce maintenance requirements.



Figure 141. Bridge deck lighting concept (DW Windsor Garda LED Rail Lighting, copyright DW Windsor)



Figure 142. Bridge deck lighting concept (DW Windsor Garda LED Rail Lighting, copyright DW Windsor)

Tesco		Napier Road Junction		East MRT Conflict Area	
26.13	External lighting has been designed to replicate the existing car parking strategy to complement the existing car park lighting.	26.18	This section of highway is currently illuminated by High Pressure Sodium (SON) columns.	26.21	The initial (180 m) stretch of the bus carriageway from Napier Road towards the new bridge crossing will be lit to a BS EN 13201-2:2015 C3 Class. This is to allow for bus drivers’ eyes to acclimatise to lighting required for the proposed pedestrian (zebra) crossing located east of the Napier Road junction.
26.14	Lighting will illuminate the realigned access road into the Tesco car park including the realigned parking bays. This design will maintain consistency between the proposed lighting levels with the existing conditions.	26.19	New lighting columns will be mounted along the proposed road junction at a height of 6 m as specified within the RBC Street Lighting Specification at the back of footway or within the verge where there is no footway (Columns to be installed will be hot dipped galvanised according to BS EN ISO 1461). New luminaires for the street lighting design of the junction are proposed to be Holophane VMAX. Existing luminaires located along the junction that are not currently LED will be replaced with Holophane VMAXs.	26.22	The height of new columns along the East MRT conflict area will be 6 m as specified within the RBC Street Lighting Specification. Columns will be installed along the back of the footway and cycleway of the East MRT or within the verge where no footway is proposed. The columns will be hot dipped galvanised according to BS EN ISO 1461. New luminaires for the street lighting design of the conflict area are proposed to be Holophane VMAX.
26.15	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 Abacus Orion luminaires will be retained in the car park.	26.20	Shields will be installed to limit light intrusion into the residential area to the west.	26.23	Beam orientation will focus towards the route and shields are proposed on the luminaires to reduce light spill into the surrounding areas.
26.16	Beam orientation will face into the access road and new car parking bays to reduce the amount of spill into the surrounding environment.			26.24	Shields are proposed on the luminaires to mitigate light intrusion into the surrounding areas.
26.17	To reduce the impact of the car park lighting on the MRT footway and cycleway and other light sensitive areas, light shields can be attached to the luminaires.				

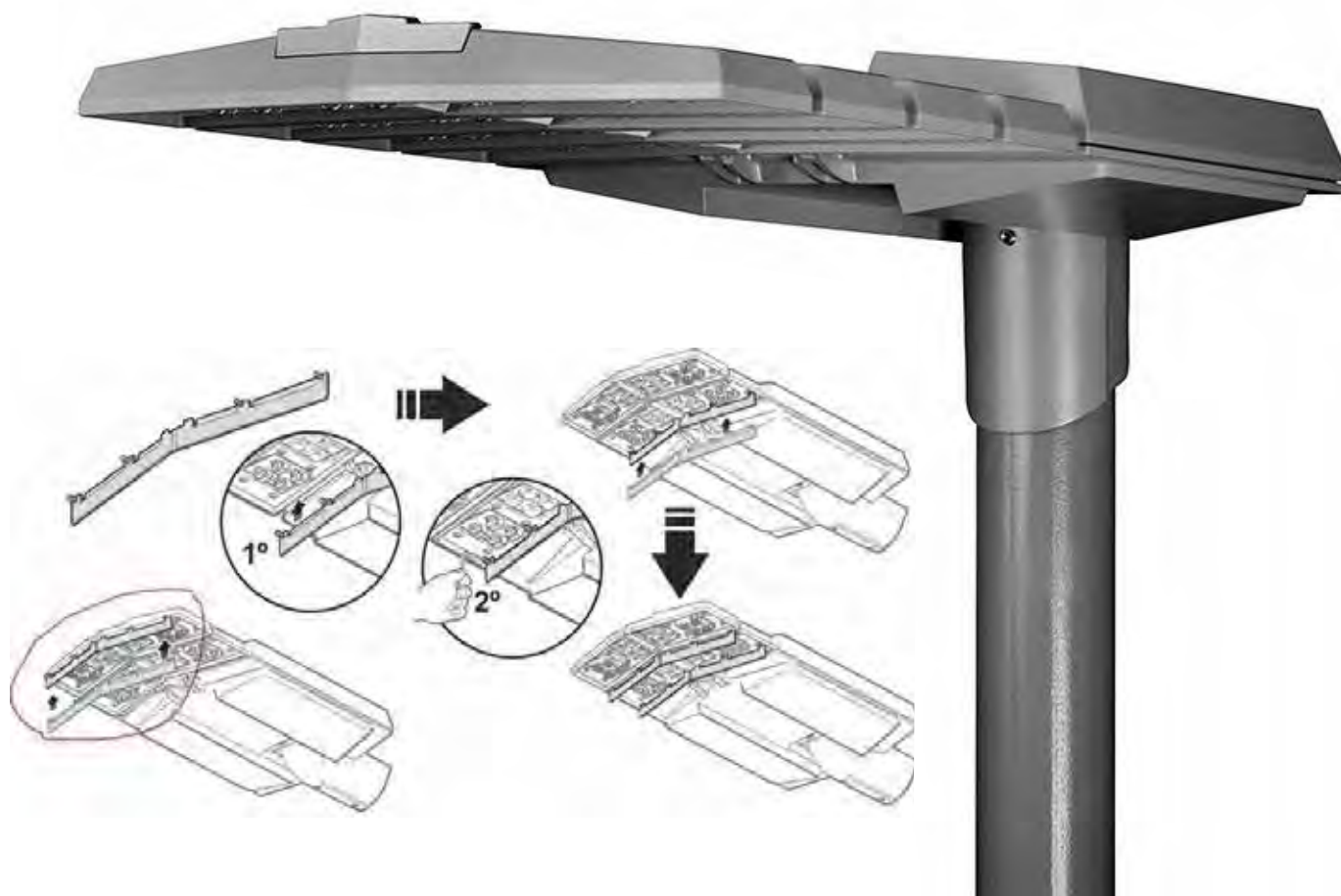


Figure 143. Column lighting luminaires (Holophane VMAX) and details of light shields on all luminaires to mitigate light spill into the surrounding area (inset)

Section	Napier Road Junction	East MRT Pedestrian Crossing	East MRT Footway/Cycleway	East MRT Bridge/Viaduct	Tescos
Lighting Columns	Light Grey Galvanised Steel Column	Light Grey Galvanised Steel Column Mid-hinged	Light Grey Galvanised Steel Column Mid-hinged	Parapet lighting	To be advised by Tescos
Height	6m	6m	6m	1.5-1.5m	6m
Lantern	Holophane VMAX	Holophane VMAX	Holophane VMAX	LED rail (DW Windsor Garda Anti-Climb attached to the top rail of the bridge parapet.	Holophane VMAX
Luminaires	VMX044 V1 LED	VMX044 V1 LED	VMX014 V1 LED	VMX014 V1 LED	VMX164 V8 LED

Figure 144. Lighting strategy extract

East MRT west (RBC) footway and cycleway

- 26.25 This will be illuminated with column mounted LED luminaires, proposed as Holophane VMAX. 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 back of the footway and cycleway and hot dipped galvanised according to BS EN ISO 1461.
- 26.26 Beam orientation will focus towards the footway and cycleway. Shields are proposed on the luminaires to reduce light spill into the surrounding areas.
- 26.27 The lighting design for all of the East MRT footway and cycleway sections has been designed to a BS EN 13201-2:2015 P5 Class. A P5 class is a pedestrian class to support safe and secure access for pedestrians.

Bridge/viaduct footway and cycleway

- 26.28 The footway and cycleway travelling the length of the bridge and viaduct will be illuminated with a LED rail, proposed as DW Windsor Garda Anti-Climb which will be attached to the top rail of the bridge parapet. The height of the LED rail along the bridge/viaduct section will be between 1.4 m and 1.5 m.
- 26.29 The LED modules within the LED rail will face towards the footway and cycleway as to reduce light spill to the surroundings. This is to minimise the impact on the surrounding area.

East MRT east (WBC) footway and cycleway

- 26.30 The east section of the footway and cycleway extends from the end of the bridge/viaduct section to the proposed access of the proposed Thames Valley Park & Ride. This will be illuminated with column mounted LED luminaires, proposed as Holophane VMAX. The height of new columns along the proposed footway and cycleway will be 6 m as specified within the WBC Street Lighting Specification. Columns to be installed along the back of the footway and cycleway.
- 26.31 Beam orientation will focus towards the footway and cycleway.
- 26.32 Shields are proposed on the luminaires to mitigate light spill into the surrounding areas.

Ecology and lighting

- 26.33 The lighting strategy has been designed to take in to account ecology and visual constraints. Measures include:
- 26.34 Implementation of an ecologically informed lighting strategy once the scheme is operational. This will include measures such as:
- Lighting along the northern extent of the bridge and viaduct only; and
 - Providing directional lighting to face away from the more sensitive areas (including The Coal LWS, Kennet Mouth and Kings Meadow East LWS and Henley Road Pit LWS).

Signage

- 26.35 No large signs or gantry signs will be placed on the main bridge/viaduct structure in order to minimise adverse visual impact.

Bus route enforcement

- 26.36 The entrance to the route will be defined with a section of coloured surface and 'bus only' signs to raise awareness that entry is prohibited for all vehicles except public service vehicles.
- 26.37 Enforcement cameras will be installed to deter private vehicles using the route. Once the scheme is operational, if these methods of control fail to deter private vehicles from using the East MRT Scheme, rising bollards will be installed to physically prevent the use of the route, and allow those with responders and/or registered vehicles. These cameras will be used to enforce any low emissions zone in the future.

Bridge signals design

- 26.38 Shuttle working will operate with a signal/indicator system to allow bus progress between the stop lines 190m apart.

27 Construction

Construction sequence		Deliveries		Vehicle Routes		Construction Environmental Management Plan			
27.1	It is anticipated that, subject to planning approval, construction of East Reading Mass Rapid Transit will commence in July 2019 with completion expected in Spring 2022. Some seasonal site clearance may need to commence earlier in 2019.	27.3	The embankment is expected to have the most significant impact on construction traffic due to the volumes of fill material being imported on site.	27.4	Deliveries will be limited to off-peak periods to avoid disruption in peak periods 09:30 – 16:30.	27.8	Construction vehicles accessing the eastern section of the site will be routed from the M4 in the south of Reading via the A3290.	27.11	Environmental effects arising during the construction phase of the proposed development will be controlled through the implementation of a Construction Environmental Management Plan (CEMP).
27.2	The main construction activities/phases comprise: • Service diversions (gas pipes and electricity cables). • Flood plain compensation measures. • Construction access and haul roads • Piling. • Pile caps, abutments, retaining walls, pier construction and drainage works. • Western embankment and associated supporting structures construction. • Surface water drainage systems. • Assembling main bridge and viaduct beams involving 600t+ installation crane. • Bridge and viaduct deck concrete pouring. • Road construction and finishing (including parapets and lighting). • Landscaping and ecological mitigation		27.5	Space will be provided within the site to accommodate delivery vehicles so that they are not obstructing the public highway. There will be various points for unloading and storing materials on the site.	27.9	Vehicles accessing the western section of the site will be routed from the M4 via the A33 and Vastern Road to Napier Road.	27.12	The CEMP will be agreed with WBC and RBC prior to commencement of construction.	
								27.13	The CEMP will outline the arrangements and management practices to adopt in order to minimise the environmental effects of construction.
								27.14	The CEMP will outline the following transport-specific details: • Site Logistics; • Working Hours; • Maintaining Access; • General Site layout, including accesses and routes; • Construction traffic; and • Designated access routes.
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